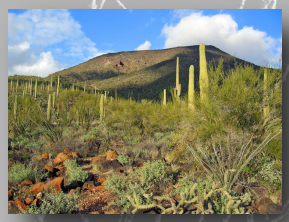

BLM

August 2011

Lower Sonoran and Sonoran Desert National Monument

Draft Resource Management Plan and Environmental Impact Statement

Lower Sonoran Field Office, Phoenix, Arizona

Bureau of Land Management

U.S. Department of Interior

Mission Statement

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau of Land Management (BLM) is responsible for the balanced management of public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based on the principles of multiple use and sustained yield, a combination of uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources. These resources include recreation; range; timber; minerals; watershed; fish and wildlife; designated wilderness and wilderness characteristics, and natural, scenic, scientific, and cultural values.

Abstract

The Lower Sonoran and Sonoran Desert National Monument (SDNM) Draft Resource Management Plan and Draft Environmental Impact Statement (DRMP/EIS) describe and analyze five alternatives for managing approximately 1.4 million surface acres and 1.5 million subsurface acres on public lands in south-central Arizona, mainly south and west of the Phoenix metropolitan area. Information provided by the public, other agencies and organizations, and BLM personnel has been used to develop and analyze the alternatives in these DRMP/EIS.

Alternative A is the No-Action Alternative and represents continuation of current management. **Alternative B** emphasizes recreation and resource development. **Alternative C** makes land available for recreation and resource development with greater opportunities to experience natural and cultural settings than under Alternative B. **Alternative D** emphasizes preservation of undeveloped primitive landscapes, including natural and cultural resources and opportunities for non-motorized recreation. **Alternative E**, the agency's preferred alternative, provides for a balance between human use and influence with protection of sensitive resources. Major issues addressed in the DRMP/EIS include management of recreation, travel management, energy and mineral resources, wilderness characteristics, biological and ecological resources, cultural and heritage resources, scenic quality and visual resources, air quality, vegetation and grazing, and designation and management of special areas.

BLM/AZ/PL-11/003

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Phoenix District
Lower Sonoran Field Office
21605 North 7th Avenue
Phoenix, Arizona 85027
www.blm.gov/az/

August 17, 2011

In Reply, Refer To:
1610 (P020)

Dear Reader:

Enclosed for your review and comment is the Lower Sonoran and Sonoran Desert National Monument (SDNM) Draft Resource Management Plan/Draft-Environmental Impact Statement (DRMP/EIS) for the Bureau of Land Management (BLM), Lower Sonoran Field Office (LSFO), Arizona. The BLM prepared this document in consultation with cooperating agencies and in accordance with the National Environmental Policy Act of 1969, the Federal Land Policy and Management Act of 1976, implementing regulations, the BLM's Land Use Planning Handbook (H-1601-1), and other applicable laws and policies.

The Planning Area consists of about 8.9 million acres of land that includes 1.4 million surface acres and 1.5 million subsurface/mineral-estate acres managed by the LSFO. These acres include about 486,400 surface acres and 461,000 subsurface acres within the SDNM. When completed, the approved RMP and associated Record of Decision for the Lower Sonoran and SDNM Decision Areas will guide management of public lands administered by the LSFO into the future. The plans will replace the Lower Gila South RMP, the Lower Gila North Management Framework Plan and the Phoenix Resource Area Plan, and applicable amendments, for all public lands within those decision areas. The Lower Sonoran and SDNM DRMP/EIS and supporting information are available on the BLM Arizona land use planning web page at **www.blm.gov/az/st/en/prog/planning/son_des.html**.

The BLM invites you to provide information and comments pertaining to the analysis presented in the Draft RMP/EIS. We are particularly interested in feedback concerning the adequacy and accuracy of the proposed alternatives, the analysis of their respective management decisions, and any new information that would help the BLM as it develops the plan. In developing the Proposed RMP/Final EIS, which is the next phase of the planning process, the BLM may select various management decisions from each of the alternatives analyzed in the DRMP/EIS to create a management strategy that best meets the needs of the resources and values in this area under the principles of multiple use and sustained yield. As a member of the public, your timely comments on the Lower Sonoran and SDNM DRMP/EIS will help formulate the Proposed RMP/Final EIS. Comments will be accepted for ninety (90) calendar days following the Environmental Protection Agency's publication of the notice of availability in the Federal Register (www.gpo.gov/fdsys). The BLM can best utilize your comments and resource information submissions if received within the review period.

Your comments on the content of the Draft RMP/EIS are critical to the success of this planning effort. If you wish to submit comments, we request that you make them as specific as possible. Comments will be more helpful if they are substantive in nature and specifically reference a section or page number. Substantive comments do at least one of the following: question, with reasonable basis, the

accuracy of information; question, with reasonable basis, the adequacy of, methodology for, or assumptions used for the environmental analysis; present valid new information relevant to the analysis; present reasonable alternatives other than those analyzed; and/or cause changes or revisions in one or more of the alternatives. Please note that comments containing only opinion or preferences will be considered and included as part of the decision making process, but they will not receive a formal response from the BLM.

To facilitate analysis of comments and information submitted, only written comments will be accepted and need to at least include your full name and address, but preferably also include your phone number and email address, if applicable. They may be submitted electronically following instructions provided on the land use planning web page, or submitted by mail, or in person, to the following address:

BLM, Phoenix District
LS-SDNM RMP
21605 North 7th Avenue
Phoenix, AZ 85027

Before including your address, telephone number, email address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personally identifying information from public review, we cannot guarantee that we will be able to do so.

Public meetings to provide an overview of the document, respond to questions, and take public comments will be announced by local media, website, and public mailings at least 15 days in advance. Exact dates, places, and times of public meetings will be posted on the land use planning web page.

Printed copies of the Draft RMP/EIS have been sent to affected Federal, state, and local government agencies. Copies are also available for public inspection at the following BLM office locations:

BLM, Lower Sonoran Field Office
21605 North 7th Avenue
Phoenix, Arizona 85027

BLM, Arizona State Office
One North Central Avenue, Suite 800
Phoenix, Arizona 85004

Copies will also be available at the following public library branches: Apache Junction, Buckeye, Casa Grande, Gila Bend and Salazar-Ajo.

Thank you for your continued interest in the Lower Sonoran and SDNM Draft RMP/EIS. We appreciate the information and suggestions you contribute to the planning process. For additional information or clarification regarding the plan or the planning process, please call the RMP Project Manager, Penny Foreman, at 623-580-5500 during business hours. You may also leave a message on the LSFO planning team's voice mail at 623-580-5526, or you may send an email to **blm_az_ls_sdnm_plan@blm.gov**.

Sincerely,

Emily Garber
Field Manager, Lower Sonoran Field Office

LOWER SONORAN AND SONORAN DESERT NATIONAL MONUMENT

DRAFT RESOURCE MANAGEMENT PLAN AND DRAFT ENVIRONMENTAL IMPACT STATEMENT

Prepared by

U.S. Department of the Interior
Bureau of Land Management
Phoenix District
Lower Sonoran Field Office

August 2011

Recommended by:

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Table of Contents

Executive Summary ..... **xlv**

1. Purpose & Need for the RMP **1**

1.1. Purpose and Need 2
1.1.1. Purpose and Need 2
1.1.2. Need for the Lower Sonoran and SDNM RMPs 2
1.2. Planning Area and Setting 3
1.2.1. Planning Area 3
1.2.2. Decision Areas 4
1.2.2.1. Lower Sonoran Decision Area 4
1.2.2.2. SDNM Decision Area 5
1.2.2.3. The Barry M. Goldwater Range Relinquished Parcels 5
1.3. Planning Process and Issues 5
1.3.1. Planning Process 5
1.3.2. Public Scoping 7
1.3.3. Collaboration 7
1.3.4. Planning Issues Addressed in the RMP Process 8
1.3.4.1. Issue 1: Travel Management 8
1.3.4.2. Issue 2: Wilderness Characteristics 9
1.3.4.3. Issue 3: Wildlife 9
1.3.4.4. Issue 4: Livestock Grazing 9
1.3.4.5. Issue 5: Energy Development 10
1.3.4.6. Issue 6: Recreation 10
1.3.5. Issues Considered But Not Analyzed 11
1.3.5.1. Issue Considered 1: Water Control 11
1.3.5.2. Issue Considered 2: Biological Resources 11
1.3.5.3. Issue Considered 3: Livestock Grazing 12
1.3.5.4. Issue Considered 4: Wild Horse & Burro Management 12
1.3.5.5. Issue Considered 5: Minerals Management 12
1.3.5.6. Issue Considered 6: Land Tenure Adjustment & Withdrawals 12
1.3.5.7. Issue Considered 7: Corridors, Communications Sites & Renewable Energy Sites 13
1.3.5.8. Issue Considered 8: Special Area Designations 13
1.3.5.9. Issue Considered 9: Visual Resources 14
1.3.5.10. Issue Considered 10: Travel Management 14
1.3.5.11. Issue Considered 11: Airspace 14
1.3.5.12. Issue Considered 12: Socioeconomics 15

1.3.5.13. Considered 13: Border Activity – Undocumented Immigrants and Drug Smuggling ... 15
1.3.6. Other Elements not Addressed in this Plan ... 16
1.4. Planning Area Guidance ... 16
1.4.1. Lower Sonoran Planning Guidance ... 16
1.4.1.1. Significance of the Lower Sonoran Decision Area ... 16
1.4.1.2. Management Vision ... 17
1.4.1.3. Overarching Goals ... 17
1.4.2. SDNM Planning Guidance ... 17
1.4.2.1. Monument Purpose ... 17
1.4.2.2. Significance of the SDNM ... 21
1.4.2.3. Management Vision ... 21
1.4.2.4. Overarching Goals ... 21
1.5. Planning Criteria ... 22
1.5.1. General Planning Criteria ... 22
1.5.2. Lower Sonoran Planning Criteria ... 23
1.5.3. SDNM Planning Criteria ... 24
1.6. Relationship to Other Plans ... 24
1.6.1. Relationship to Other Plans ... 24
1.6.2. Relationship to Other Plans ... 25
1.6.2.1. Specific Agreements ... 25

2. Alternatives ... 27

2.1. Introduction ... 29
2.2. Types of BLM Decisions ... 29
2.2.1. Resource Management Plan Decisions ... 30
2.2.1.1. Goals & Objectives ... 30
2.2.1.2. Management Actions and Allowable Uses ... 30
2.2.2. Implementation Decisions ... 30
2.2.3. Administrative Actions ... 31
2.3. Summary of the Alternatives ... 31
2.3.1. No Action Alternative Summary ... 31
2.3.2. Summary of the Lower Sonoran Decision Area Alternatives ... 31
2.3.3. Summary of SDNM Alternatives ... 36
2.3.3.1. No-Action Alternative A ... 36
2.3.3.2. Action Alternative B ... 37
2.3.3.3. Action Alternative C ... 37
2.3.3.4. Action Alternative D ... 38
2.3.3.5. Preferred Alternative E ... 39
2.4. Alternatives Considered but not Further Analyzed ... 40
2.4.1. Public Safety ... 40
2.4.2. Travel Management ... 41
2.4.3. Land Tenure ... 41
2.4.4. Livestock Grazing ... 41
2.5. Management Common to All Alternatives ... 42
2.5.1. Existing Management Decisions and Decisions to be Carried Forward ... 42
2.5.2. Wilderness ... 42
2.5.3. Arizona Land Health Standards ... 43

2.5.3.1. Standard One: Upland Sites 44
2.5.3.2. Standard Two: Riparian-Wetland Sites 44
2.5.3.3. Standard Three: Desired Future Conditions 45
2.6. Alternatives 46
2.6.1. Standard Operating Procedures & Best Management Practices 47
2.7. Resources 48
2.7.1. Air Quality 48
2.7.1.1. Existing Management Decisions, Alternative A (No Action) Air Quality. 48
2.7.1.2. Action Alternatives for Air Quality (AQ) 48
2.7.2. Cave Resources 51
2.7.2.1. Existing Management Decisions, Alternative A (No Action) For Cave Resources 51
2.7.2.2. Action Alternatives for Cave Resources Management (CR) 51
2.7.3. Cultural & Heritage Resources 52
2.7.3.1. Existing Management Decisions, Alternatives A (No Action) For Cultural & Heritage Resources 53
2.7.3.2. Action Alternatives for Cultural & Heritage Resources (CL) 54
2.7.4. Paleontological Resources (PL) 61
2.7.4.1. Existing Management Decisions, Alternative A (No Action) for Paleontological Resources 61
2.7.4.2. Action Alternatives for Paleontological Resources (PL) 61
2.7.5. Priority Wildlife Species & Habitat (PS) 63
2.7.5.1. Existing Management Decisions, Alternative A (No Action) for Priority Wildlife Species & Habitat 65
2.7.5.2. Action Alternatives for Priority Wildlife Species & Habitat Management (PS) 69
2.7.6. Soil Resources (SL) 85
2.7.6.1. Existing Management Decisions (Alternative A - No Action) Soil Resources 85
2.7.6.2. Action Alternatives for Soil Resources (SL) 86
2.7.7. Vegetation Resources 89
2.7.7.1. Existing Management Decisions, Alternative A (No Action) 89
2.7.7.2. Action Alternatives for Vegetation Resources (VM) 91
2.7.8. Visual Resources (VR) 97
2.7.8.1. Existing Management Decisions, Alternative A (No Action) for Visual Resources 98
2.7.8.2. Action Alternatives for Visual Resources (VR) 99
2.7.8.3. Management Actions and Allowable Uses 99
2.7.9. Water Resources (WR) 102
2.7.9.1. Existing Management Decisions, Alternative A (No Action) Water Resources (WR) 102
2.7.9.2. Action Alternatives for Water Resources (WR): 103
2.7.10. Wild Horse & Burro Management (HB) 106
2.7.10.1. Existing Management Decisions, Alternative A (No Action) 106
2.7.10.2. Wild Horse & Burro (HB) Action Alternatives 107
2.7.11. Wilderness Characteristics (WC) 108
2.7.11.1. Existing Management Decisions, Alternative A – No Action for Wilderness Characteristics 110
2.7.11.2. Action Alternatives for Wilderness Characteristics (WC) 110

2.7.12. Wildland Fire Management (WF) 114
2.7.12.1. Existing Management Decisions (Alternative A - No Action) 114
2.7.12.2. Action Alternatives for Wildland Fire Management (WF)) 115
2.7.12.3. Administrative Actions 116
2.8. Resource Uses 118
2.8.1. Lands & Realty (LR) 118
2.8.1.1. Land Use Authorizations (LUAs) 118
2.8.1.2. Land Tenure 122
2.8.1.3. Withdrawals, Classifications & Segregations 124
2.8.1.4. Existing Management Decisions (Alternative A — No Action) Lands & Realty 125
2.8.1.5. Action Alternatives for Lands & Realty (LR) 128
2.8.2. Livestock Grazing (GR) 137
2.8.2.1. Existing Management Decisions, Alternative A (No Action) Livestock Grazing 140
2.8.2.2. Action Alternatives for Livestock Grazing (GR) 142
2.8.3. Minerals Management (MM) 151
2.8.3.1. Existing Management Decision, Alternative A (No Action) 151
2.8.3.2. Action Alternatives for Minerals Management (MM) 153
2.8.4. Recreation Management (RM) 158
2.8.4.1. Existing Management Decisions, Alternative A (No Action) For Recreation Management 159
2.8.4.2. Action Alternatives for Recreation Management (RM) 165
2.8.5. Travel Management (TM) 180
2.8.5.1. Existing Management Decisions, Alternative A — No Action For Travel Management 181
2.8.5.2. Action Alternatives for Travel Management (TM) 183
2.9. Special Designations 194
2.9.1. Areas of Critical Environmental Concern (ACEC) 194
2.9.1.1. Existing Management Decisions, Alternative A (No Action) 194
2.9.1.2. Action Alternatives for Areas of Environmental Concern (AC) 195
2.9.2. National Byways (NB) 200
2.9.2.1. Existing Management Decisions, Alternatives A (No Action) National Byways 200
2.9.2.2. Action Alternatives for National Byways (BY) 200
2.9.3. National Trails (NT) 203
2.9.3.1. Existing Management Decisions, Alternative A (No Action) 203
2.9.3.2. Management Actions for National Trails (NT) Action Alternatives 203
2.9.4. Fred J. Weiler Green Belt Resource Conservation Area (GB) 207
2.9.4.1. Existing Management Decisions, Alternative A (No Action) 207
2.9.4.2. Management Actions for Resource Conservation Area (RCA) Action Alternatives 208
2.10. Tribal Interests, Public Safety, & Social and Economic Conditions 209
2.10.1. Hazardous Materials & Public Safety 209
2.10.1.1. Existing Management Decisions, Alternative A (No Action) for Hazardous Materials & Public Safety 209
2.10.1.2. Action Alternatives for Hazardous Materials & Public Safety (PS) 209
2.10.1.3. Management Actions and Allowable Uses 210
2.11. Scientific Research, Education & Public Outreach 213

2.11.1. Scientific Research 213
2.11.2. Interpretation, Environmental Education & Outreach 213
2.11.2.1. Resources Education 214
2.11.2.2. Public Uses and Visitor Information 215
2.11.2.3. Public Safety and Fire Education 215
2.12. Implementation, Adaptive Management & Monitoring 215
2.12.1. Implementation & Partnerships 215
2.12.2. Adaptive Management 216
2.12.3. Monitoring & Partnerships 217
2.13. Requirements for Further Environmental Analysis 217
2.14. Interrelationships 218
2.15. Comparison of Impact Intensities 219

3. Affected Environment 251

3.1. Introduction 253
3.2. Resources 254
3.2.1. Air Quality 254
3.2.1.1. Clean Air Act Land Classifications 254
3.2.1.2. Emission Sources 255
3.2.1.3. Quantifiable Indicators 256
3.2.2. Cave Resources 260
3.2.3. Climate Change 260
3.2.3.1. Emission Sources 260
3.2.3.2. Global Effects 261
3.2.3.3. Regional Effects 261
3.2.4. Cultural & Heritage Resources 263
3.2.5. Paleontological Resources 266
3.2.6. Priority Wildlife Species & Habitat 266
3.2.6.1. Wildlife Habitats 267
3.2.6.2. Threatened, Endangered, and Candidate Wildlife Species 269
3.2.6.3. BLM Sensitive and Other Priority Wildlife Species 276
3.2.6.4. Non-native Invasive Animal Species 279
3.2.7. Soil Resources 279
3.2.8. Vegetation Resources 282
3.2.8.1. Vegetation Communities 283
3.2.8.2. Special Status Plant Species 285
3.2.9. Visual Resources 287
3.2.9.1. Visual and Scenic Resources 289
3.2.10. Water Resources 289
3.2.10.1. Groundwater 289
3.2.10.2. Surface Water 290
3.2.10.3. Water Rights 296
3.2.11. Wild Horse & Burro Management 296
3.2.12. Wilderness Characteristics 298
3.2.13. Wildland Fire Management 302
3.2.13.1. Fire Ecology 302
3.2.13.2. Fire and Fuels Management 303
3.2.13.3. Fire Regimes and Condition Classes 304

3.2.13.4. Fire History 306
3.3. Resource Uses 307
3.3.1. Lands & Realty 307
3.3.1.1. Land Use Authorizations 307
3.3.1.2. Withdrawals 316
3.3.1.3. Land Tenure 317
3.3.2. Livestock Grazing 319
3.3.2.1. Rangeland Health and Condition 319
3.3.2.2. Grazing in the SDNM 322
3.3.2.3. Range Improvements 323
3.3.3. Minerals Management 323
3.3.3.1. Categories of Minerals on BLM Lands 324
3.3.3.2. Mineral Potential Maps 329
3.3.4. Recreation Management 330
3.3.4.1. Recreation Management in the Decision Areas 330
3.3.5. Travel Management 333
3.3.5.1. Regional Travel Routes 333
3.3.5.2. Motorized Vehicle Access to Public Lands 335
3.3.5.3. Existing Travel Management Situation in the Decision Areas 336
3.3.5.4. Non-Motorized Travel 336
3.3.5.5. Visitor Use & Travel Modes by Geographic Area 337
3.3.5.6. Data Collection and Analysis for Travel Planning 338
3.4. Special Designations 339
3.4.1. National Landscape Conservation System 339
3.4.2. Congressional Designations 341
3.4.2.1. Wilderness Areas 341
3.4.2.2. Juan Bautista de Anza National Historic Trail 342
3.4.3. Administrative Designations 343
3.4.3.1. Fred J. Weiler Green Belt Resource Conservation Area 343
3.4.3.2. Areas of Critical Environmental Concern 344
3.4.4. Other Special Designations 345
3.5. Tribal Interests, Public Safety & Social and Economic Conditions 345
3.5.1. Tribal Interests 345
3.5.2. Hazardous Materials & Public Safety 347
3.5.2.1. Landfills and Wildcat Dumping 347
3.5.2.2. Active and Abandoned Mines 348
3.5.2.3. Military Operations and Unexploded Ordnance 348
3.5.2.4. Recreational Target Shooting 349
3.5.2.5. Motor-Vehicle Operations 351
3.5.2.6. Other Permitted Uses 352
3.5.2.7. Illegal Drug Production 352
3.5.2.8. Drug Smuggling and Undocumented Immigrant Traffic 352
3.5.2.9. Wildfires and Fire Management 353
3.5.3. Social and Economic Conditions 354
3.5.3.1. Demographics 354
3.5.3.2. Employment, Income, and Subsistence 357
3.5.3.3. Attractiveness of the Decision Areas 366
3.5.3.4. Environmental Justice 367

4. Environmental Consequences 371

4.1. Introduction 373
4.1.1. Impact Assessment Methods 373
4.1.2. Overall Assumptions 373
4.1.3. Levels of Analysis (Programmatic & Implementation) 374
4.1.4. Types of Effects (Direct, Indirect, and Cumulative) 374
4.1.5. Qualitative Terms for the Intensity of Impacts 375
4.1.6. Reasonably Foreseeable Development ScenarioS 376
4.2. Impacts on Air Quality 385
4.2.1. Methods of Analysis 385
4.2.1.1. Indicators 385
4.2.1.2. Assumptions 386
4.2.1.3. Reasonably Foreseeable Development Scenarios 386
4.2.1.4. Program Areas with no Impacts on Air Quality 386
4.2.1.5. Qualitative Intensity Scale 386
4.2.2. Common to All Alternatives 387
4.2.2.1. Both Decision Areas 387
4.2.2.2. Lower Sonoran 387
4.2.2.3. Sonoran Desert National Monument 387
4.2.3. Alternative A (No Action) 387
4.2.3.1. Both Decision Areas 387
4.2.3.2. Lower Sonoran 387
4.2.3.3. Sonoran Desert National Monument 389
4.2.4. Alternative B 391
4.2.4.1. Both Decision Areas 391
4.2.4.2. Lower Sonoran 391
4.2.4.3. Sonoran Desert National Monument 392
4.2.5. Alternative C 393
4.2.5.1. Both Decision Areas 393
4.2.5.2. Sonoran Desert National Monument 394
4.2.5.3. Sonoran Desert National Monument 395
4.2.6. Alternative D 397
4.2.6.1. Both Decision Areas 397
4.2.6.2. Lower Sonoran 397
4.2.6.3. Sonoran Desert National Monument 398
4.2.7. Alternative E (Preferred Alternative) 399
4.2.7.1. Both Decision Areas 399
4.2.7.2. Lower Sonoran 399
4.2.7.3. Sonoran Desert National Monument 400
4.3. Impacts on Cave Resources 402
4.4. Impacts on Cultural & Heritage Resources 403
4.4.1. Methods of Analysis 404
4.4.1.1. Indicators 404
4.4.1.2. Assumptions 404
4.4.1.3. Qualitative Intensity Scale 405
4.4.1.4. Program Areas with No Impacts on Cultural Resources 406
4.4.2. Common to All Alternatives 406
4.4.2.1. Both Decision Areas 406

4.4.2.2. Lower Sonoran 408
4.4.2.3. Sonoran Desert National Monument 409
4.4.3. Alternative A (No Action) 409
4.4.3.1. Both Decision Areas 409
4.4.3.2. Lower Sonoran 410
4.4.3.3. Sonoran Desert National Monument 413
4.4.4. Alternative B 414
4.4.4.1. Both Decision Areas 414
4.4.4.2. Lower Sonoran 415
4.4.4.3. Sonoran Desert National Monument 418
4.4.5. Alternative C 420
4.4.5.1. Both Decision Areas 420
4.4.5.2. Lower Sonoran 420
4.4.5.3. Sonoran Desert National Monument 423
4.4.6. Alternative D 425
4.4.6.1. Both Decision Areas 425
4.4.6.2. Lower Sonoran 425
4.4.6.3. Sonoran Desert National Monument 427
4.4.7. Alternative E (Preferred Alternative) 429
4.4.7.1. Both Decision Areas 429
4.4.7.2. Lower Sonoran 429
4.4.7.3. Sonoran Desert National Monument 432
4.5. Impacts on Paleontological Resources 434
4.6. Impacts on Priority Wildlife Species & Habitat Management 435
4.6.1. Methods of Analysis 436
4.6.1.1. Indicators 436
4.6.1.2. Assumptions 436
4.6.1.3. Program Areas with No Impacts on Priority Wildlife Species and Habitat Management 437
4.6.1.4. Qualitative Intensity Scale 437
4.6.2. Common to All Alternatives 438
4.6.2.1. Common to Both Decision Areas 438
4.6.2.2. Lower Sonoran 438
4.6.2.3. Sonoran Desert National Monument 439
4.6.3. Alternative A (No Action) 439
4.6.3.1. Both Decision Areas 439
4.6.3.2. Lower Sonoran 440
4.6.3.3. Sonoran Desert National Monument 443
4.6.4. Alternative B 444
4.6.4.1. Common to Both Decision Areas 444
4.6.4.2. Lower Sonoran 446
4.6.4.3. Sonoran Desert National Monument 448
4.6.5. Alternative C 450
4.6.5.1. Common to Both Decision Areas 450
4.6.5.2. Lower Sonoran 452
4.6.5.3. Sonoran Desert National Monument 454
4.6.6. Alternative D 455
4.6.6.1. Common to Both Decision Areas 455
4.6.6.2. Lower Sonoran 456

4.6.6.3. Sonoran Desert National Monument 459
4.6.7. Alternative E (Preferred Alternative) 460
4.6.7.1. Common to Both Decision Areas 460
4.6.7.2. Lower Sonoran 461
4.6.7.3. Sonoran Desert National Monument 463
4.7. Impacts on Soil Resources 465
4.7.1. Methods of Analysis 465
4.7.1.1. Indicators 465
4.7.1.2. Assumptions 465
4.7.1.3. Program Areas with No Impacts on Soil Resources 466
4.7.1.4. Qualitative Intensity Scale 466
4.7.2. Common to All Alternatives 467
4.7.2.1. Both Decision Areas 467
4.7.3. Alternative A (No Action) 468
4.7.3.1. Lower Sonoran 468
4.7.3.2. Sonoran Desert National Monument 472
4.7.4. Alternative B 475
4.7.4.1. Lower Sonoran 475
4.7.4.2. Sonoran Desert National Monument 477
4.7.5. Alternative C 479
4.7.5.1. Lower Sonoran 479
4.7.5.2. Sonoran Desert National Monument 482
4.7.6. Alternative D 484
4.7.6.1. Lower Sonoran 484
4.7.6.2. Sonoran Desert National Monument 487
4.7.7. Alternative E (Preferred Alternative) 489
4.7.7.1. Lower Sonoran 489
4.7.7.2. Sonoran Desert National Monument 492
4.8. Impacts on Vegetation Resources 494
4.8.1. Methods of Analysis 494
4.8.1.1. Indicators 494
4.8.1.2. Assumptions 494
4.8.1.3. Program Areas with No Impacts on Vegetation Resources 494
4.8.1.4. Qualitative Intensity Scale 495
4.8.2. Common to All Alternatives 495
4.8.2.1. Both Decision Areas 495
4.8.2.2. Lower Sonoran 497
4.8.2.3. Sonoran Desert National Monument 497
4.8.3. Alternative A (No Action) 498
4.8.3.1. Both Decision Areas 498
4.8.3.2. Lower Sonoran 498
4.8.3.3. Sonoran Desert National Monument 501
4.8.4. Alternative B 504
4.8.4.1. Both Decision Areas 504
4.8.4.2. Lower Sonoran 504
4.8.4.3. Sonoran Desert National Monument 506
4.8.5. Alternative C 507
4.8.5.1. Both Decision Areas 507
4.8.5.2. Lower Sonoran 508

4.8.5.3. Sonoran Desert National Monument 510
4.8.6. Alternative D 511
4.8.6.1. Both Decision Areas 511
4.8.6.2. Lower Sonoran 511
4.8.7. Sonoran Desert National Monument 513
4.8.8. Alternative E (Preferred Alternative) 515
4.8.8.1. Both Decision Areas 515
4.8.8.2. Lower Sonoran 515
4.8.8.3. Sonoran Desert National Monument 516
4.9. Impacts on Visual Resources 519
4.9.1. Methods of Analysis 519
4.9.1.1. Indicators 519
4.9.1.2. Assumptions 519
4.9.1.3. Program Areas with No Impacts on Visual Resources 520
4.9.1.4. Qualitative Intensity Scale 520
4.9.2. Common to All Alternatives 521
4.9.2.1. Both Decision Areas 521
4.9.2.2. Lower Sonoran 522
4.9.2.3. Sonoran Desert National Monument 524
4.9.3. Alternative A (No Action) 526
4.9.3.1. Lower Sonoran 526
4.9.3.2. Sonoran Desert National Monument 527
4.9.4. Alternative B 528
4.9.4.1. Lower Sonoran 528
4.9.4.2. Sonoran Desert National Monument 529
4.9.5. Alternative C 530
4.9.5.1. Lower Sonoran 530
4.9.5.2. Sonoran Desert National Monument 531
4.9.6. Alternative D 532
4.9.6.1. Lower Sonoran 532
4.9.7. Sonoran Desert National Monument 533
4.9.8. Alternative E (Preferred Alternative) 534
4.9.8.1. Lower Sonoran 534
4.9.8.2. Sonoran Desert National Monument 535
4.10. Impacts on Water Resources 537
4.10.1. Methods of Analysis 537
4.10.1.1. Indicators 537
4.10.1.2. Assumptions 537
4.10.1.3. Program Areas with No Impacts on Water Resources 538
4.10.1.4. Qualitative Intensity Scale 538
4.10.2. Common to All Alternatives 539
4.10.3. Alternative A (No Action) 539
4.10.3.1. Lower Sonoran 539
4.10.3.2. Sonoran Desert National Monument 543
4.10.4. Alternative B 545
4.10.4.1. Lower Sonoran 545
4.10.4.2. Sonoran Desert National Monument 548
4.10.5. Alternative C 550
4.10.5.1. Lower Sonoran 550

4.10.5.2. Sonoran Desert National Monument 553
4.10.6. Alternative D 554
4.10.6.1. Lower Sonoran 554
4.10.6.2. Sonoran Desert National Monument 557
4.10.7. Alternative E (Preferred Alternative) 559
4.10.7.1. Lower Sonoran 559
4.10.7.2. Sonoran Desert National Monument 561
4.11. Impacts on Wild Horse & Burro Management 562
4.12. Impacts on Wilderness Characteristics 563
4.12.1. Methods of Analysis 563
4.12.1.1. Indicators 563
4.12.1.2. Assumptions 564
4.12.1.3. Program Areas with No Impacts on Wilderness Characteristics 564
4.12.1.4. Qualitative Intensity Scale 564
4.12.2. Common to All Alternatives 565
4.12.2.1. Both Decision Areas 565
4.12.2.2. Lower Sonoran 566
4.12.2.3. Sonoran Desert National Monument 566
4.12.3. Alternative A (No Action) 567
4.12.3.1. Both Decision Areas 568
4.12.3.2. Lower Sonoran 568
4.12.3.3. Sonoran Desert National Monument 574
4.12.4. Alternative B 577
4.12.4.1. Both Decision Areas 577
4.12.4.2. Lower Sonoran 578
4.12.4.3. Sonoran Desert National Monument 581
4.12.5. Alternative C 583
4.12.5.1. Both Decision Areas 584
4.12.5.2. Lower Sonoran 584
4.12.5.3. Sonoran Desert National Monument 588
4.12.6. Alternative D 591
4.12.6.1. Both Decision Areas 591
4.12.6.2. Lower Sonoran 591
4.12.6.3. Sonoran Desert National Monument 594
4.12.7. Alternative E (Preferred Alternative) 596
4.12.7.1. Both Decision Areas 597
4.12.7.2. Lower Sonoran 597
4.12.7.3. Sonoran Desert National Monument 600
4.13. Impacts on Wildland Fire Management 603
4.13.1. Methods of Analysis 603
4.13.1.1. Indicators 603
4.13.1.2. Assumptions 603
4.13.1.3. Program Areas with No Impacts on Wildland Fire Management 604
4.13.1.4. Qualitative Intensity Scale 604
4.13.2. Common to All Alternatives 604
4.13.2.1. Both Decision Areas 604
4.13.2.2. Lower Sonoran 606
4.13.2.3. Sonoran Desert National Monument 606
4.13.3. Alternative A (No Action) 606

4.13.3.1. Both Decision Areas 606
4.13.3.2. Lower Sonoran 608
4.13.3.3. Sonoran Desert National Monument 608
4.13.4. Alternative B 609
4.13.4.1. Both Decision Areas 609
4.13.4.2. Lower Sonoran 610
4.13.4.3. Sonoran Desert National Monument 611
4.13.5. Alternative C 612
4.13.5.1. Both Decision Areas 612
4.13.5.2. Lower Sonoran 613
4.13.5.3. Sonoran Desert National Monument 613
4.13.6. Alternative D 614
4.13.6.1. Both Decision Areas 614
4.13.6.2. Lower Sonoran 615
4.13.6.3. Sonoran Desert National Monument 615
4.13.7. Alternative E (Preferred Alternative) 616
4.13.7.1. Both Decision Areas 616
4.13.7.2. Lower Sonoran 617
4.13.7.3. Sonoran Desert National Monument 617
4.14. Impacts on Lands & Realty Management 618
4.14.1. Methods of Analysis 618
4.14.1.1. Indicators 618
4.14.1.2. Assumptions 618
4.14.1.3. Program Areas with No Impacts on Lands & Realty Management 619
4.14.1.4. Qualitative Intensity Scale 619
4.14.2. Common to All Alternatives 619
4.14.2.1. Both Decision Areas 619
4.14.2.2. Lower Sonoran 621
4.14.2.3. Sonoran Desert National Monument 621
4.14.3. Alternative A (No Action) 622
4.14.3.1. Both Decision Areas 622
4.14.3.2. Lower Sonoran 622
4.14.4. Alternative B 626
4.14.4.1. Both Decision Areas 626
4.14.4.2. Lower Sonoran 627
4.14.4.3. Sonoran Desert National Monument 629
4.14.5. Alternative C 631
4.14.5.1. Both Decision Areas 631
4.14.5.2. Lower Sonoran 631
4.14.5.3. Sonoran Desert National Monument 634
4.14.6. Alternative D 635
4.14.6.1. Both Decision Areas 635
4.14.6.2. Lower Sonoran 635
4.14.6.3. Sonoran Desert National Monument 637
4.14.7. Alternative E (Preferred Alternative) 638
4.14.7.1. Both Decision Areas 638
4.14.7.2. Lower Sonoran 638
4.14.7.3. Sonoran Desert National Monument 639
4.15. Impacts on Livestock Grazing 641

4.15.1. Method of Analysis 641
4.15.1.1. Indicators 641
4.15.1.2. Assumptions 641
4.15.1.3. Program Areas with No Impacts on Livestock Grazing 642
4.15.1.4. Qualitative Intensity Scale 642
4.15.2. Common to All Alternatives 642
4.15.2.1. Both Decision Areas 642
4.15.2.2. Lower Sonoran 643
4.15.2.3. Sonoran Desert National Monument 644
4.15.3. Alternative A (No Action) 644
4.15.3.1. Both Decision Areas 644
4.15.3.2. Lower Sonoran 645
4.15.3.3. Sonoran Desert National Monument 647
4.15.4. Alternative B 649
4.15.4.1. Both Decision Areas 649
4.15.4.2. Lower Sonoran 650
4.15.4.3. Sonoran Desert National Monument 652
4.15.5. Alternative C 655
4.15.5.1. Both Decision Areas 655
4.15.5.2. Lower Sonoran 655
4.15.5.3. Sonoran Desert National Monument 658
4.15.6. Alternative D 660
4.15.6.1. Both Decision Areas 660
4.15.6.2. Lower Sonoran 661
4.15.6.3. Sonoran Desert National Monument 661
4.15.7. Alternative E (Preferred Alternative) 661
4.15.7.1. Both Decision Areas 661
4.15.7.2. Lower Sonoran 661
4.15.7.3. Sonoran Desert National Monument 663
4.16. Impacts on Minerals Management 666
4.16.1. Methods of Analysis 666
4.16.1.1. Indicators 666
4.16.1.2. Assumptions 666
4.16.1.3. Program Areas with No Impacts on Minerals 666
4.16.1.4. Qualitative Intensity Scale 667
4.16.2. Common to All Alternatives 667
4.16.2.1. Both Decision Areas 667
4.16.2.2. Lower Sonoran 667
4.16.2.3. Sonoran Desert National Monument 667
4.16.3. Alternative A (No Action) 667
4.16.3.1. Both Decision Areas 668
4.16.3.2. Lower Sonoran 668
4.16.3.3. Sonoran Desert National Monument 670
4.16.4. Alternative B 670
4.16.4.1. Both Decision Areas 670
4.16.4.2. Lower Sonoran 670
4.16.4.3. Sonoran Desert National Monument 672
4.16.5. Alternative C 673
4.16.5.1. Both Decision Areas 673

4.16.5.2. Lower Sonoran 673
4.16.5.3. Sonoran Desert National Monument 675
4.16.6. Alternative D 675
4.16.6.1. Both Decision Areas 675
4.16.6.2. Lower Sonoran 675
4.16.6.3. Sonoran Desert National Monument 677
4.16.7. Alternative E (Preferred Alternative) 677
4.16.7.1. Both Decision Areas 678
4.16.7.2. Lower Sonoran 678
4.16.7.3. Sonoran Desert National Monument 680
4.17. Impacts on Recreation Management 681
4.17.1. Methods of Analysis 682
4.17.1.1. Indicators 682
4.17.1.2. Assumptions 682
4.17.1.3. Program Areas with No Impacts on Recreation 682
4.17.1.4. Qualitative Intensity Scales 682
4.17.2. Common to All Alternatives 683
4.17.2.1. Both Decision Areas 683
4.17.3. Alternative A (No Action) 685
4.17.3.1. Lower Sonoran 685
4.17.3.2. Sonoran Desert National Monument 687
4.17.4. Alternative B 688
4.17.4.1. Lower Sonoran 688
4.17.4.2. Sonoran Desert National Monument 691
4.17.5. Alternative C 693
4.17.5.1. Lower Sonoran 693
4.17.5.2. Sonoran Desert National Monument 694
4.17.6. Alternative D 696
4.17.6.1. Lower Sonoran 696
4.17.6.2. Sonoran Desert National Monument 697
4.17.7. Alternative E (Preferred Alternative) 698
4.17.7.1. Lower Sonoran 698
4.17.7.2. Sonoran Desert National Monument 699
4.18. Impacts on Travel Management 700
4.18.1. Methods of Analysis 704
4.18.1.1. Indicators 704
4.18.1.2. Assumptions 706
4.18.1.3. Program Areas with No Impacts on Travel Management 706
4.18.1.4. Qualitative Intensity Scale 707
4.18.2. Common to All Alternatives 707
4.18.3. Alternative A (No Action) 707
4.18.3.1. Both Decision Areas 707
4.18.3.2. Lower Sonoran 707
4.18.3.3. Sonoran Desert National Monument 710
4.18.4. Alternative B 714
4.18.4.1. Both Decision Areas 714
4.18.4.2. Lower Sonoran 714
4.18.4.3. Sonoran Desert National Monument 718
4.18.5. Alternative C 722

4.18.5.1. Both Decision Areas 722
4.18.5.2. Lower Sonoran 722
4.18.5.3. Sonoran Desert National Monument 726
4.18.6. Alternative D 729
4.18.6.1. Both Decision Areas 729
4.18.7. Alternative E (Preferred Alternative) 737
4.18.7.1. Both Decision Areas 737
4.18.7.2. Lower Sonoran 737
4.18.7.3. Sonoran Desert National Monument 740
4.19. Impacts on Special Designations 743
4.19.1. Methods of Analysis 744
4.19.1.1. Indicators 744
4.19.1.2. Assumptions 745
4.19.1.3. Qualitative Intensity Scale 747
4.19.1.4. Program Areas with no Impacts on Special Designations 747
4.19.2. Common to All Alternatives 748
4.19.2.1. Both Decision Areas 748
4.19.2.2. Lower Sonoran 751
4.19.2.3. Sonoran Desert National Monument 751
4.19.3. Alternative A (No Action) 752
4.19.3.1. Both Decision Areas 752
4.19.3.2. Lower Sonoran 755
4.19.3.3. Sonoran Desert National Monument 761
4.19.4. Alternative B 765
4.19.4.1. Both Decision Areas 766
4.19.4.2. Lower Sonoran 767
4.19.4.3. Sonoran Desert National Monument 773
4.19.5. Alternative C 777
4.19.5.1. Both Decision Areas 777
4.19.5.2. Lower Sonoran 779
4.19.5.3. Sonoran Desert National Monument 785
4.19.6. Alternative D 789
4.19.6.1. Both Decision Areas 789
4.19.6.2. Lower Sonoran 790
4.19.6.3. Sonoran Desert National Monument 801
4.19.7. Alternative E (Preferred Alternative) 805
4.19.7.1. Both Decision Areas 805
4.19.7.2. Lower Sonoran 806
4.19.7.3. Sonoran Desert National Monument 814
4.20. Impacts on Hazardous Materials & Public Safety 818
4.20.1. Methods of Analysis 818
4.20.1.1. Indicators 818
4.20.1.2. Assumptions 819
4.20.1.3. Program Areas with no Impacts on Hazardous Materials & Public Safety 819
4.20.1.4. Qualitative Intensity Scale 820
4.20.2. Common to All Alternatives 820
4.20.2.1. Both Decision Areas 820
4.20.2.2. Lower Sonoran 820

4.20.2.3. Sonoran Desert National Monument 820
4.20.3. Alternative A (No Action) 820
4.20.3.1. Both Decision Areas 820
4.20.3.2. Lower Sonoran 821
4.20.3.3. Sonoran Desert National Monument 823
4.20.4. Alternative B 825
4.20.4.1. Both Decision Areas 825
4.20.4.2. Lower Sonoran 825
4.20.4.3. Sonoran Desert National Monument 827
4.20.5. Alternative C 829
4.20.5.1. Both Decision Areas 829
4.20.5.2. Lower Sonoran 829
4.20.5.3. Sonoran Desert National Monument 830
4.20.6. Alternative D 832
4.20.6.1. Both Decision Areas 832
4.20.6.2. Lower Sonoran 832
4.20.6.3. Sonoran Desert National Monument 833
4.20.7. Alternative E (Preferred Alternative) 834
4.20.7.1. Both Decision Areas 834
4.20.7.2. Lower Sonoran 835
4.20.7.3. Sonoran Desert National Monument 836
4.21. Impacts on Socioeconomics 837
4.21.1. Methods of Analysis 837
4.21.1.1. Indicators 837
4.21.1.2. Assumptions 837
4.21.1.3. Program Areas with no Impacts on Socioeconomics 838
4.21.1.4. Qualitative Intensity Scale 838
4.21.2. Common to All Alternatives 839
4.21.2.1. Both Decision Areas 839
4.21.2.2. Lower Sonoran 839
4.21.2.3. Sonoran Desert National Monument 839
4.21.3. Alternative A (No Action) 840
4.21.3.1. Both Decision Areas 840
4.21.3.2. Lower Sonoran 842
4.21.3.3. Sonoran Desert National Monument 843
4.21.4. Alternative B 843
4.21.4.1. Both Decision Areas 844
4.21.4.2. Lower Sonoran 845
4.21.4.3. Sonoran Desert National Monument 846
4.21.5. Alternative C 847
4.21.5.1. Both Decision Areas 847
4.21.5.2. Lower Sonoran 849
4.21.5.3. Sonoran Desert National Monument 850
4.21.6. Alternative D 851
4.21.6.1. Both Decision Areas 852
4.21.6.2. Lower Sonoran 854
4.21.6.3. Sonoran Desert National Monument 855
4.21.7. Alternative E (Preferred Alternative) 856
4.21.7.1. Both Decision Areas 856

4.21.7.2. Lower Sonoran 858
4.21.7.3. Sonoran Desert National Monument 858
4.22. Impacts on Environmental Justice 859
4.22.1. Methods of Analysis 859
4.22.1.1. Indicators 859
4.22.1.2. Assumptions 859
4.22.1.3. Program Areas with no Impacts on Environmental Justice 859
4.22.2. Common to All Alternatives 859
4.22.2.1. Both Decision Areas 859
4.22.2.2. Lower Sonoran 859
4.22.2.3. Sonoran Desert National Monument 860
4.22.3. Alternative A (No Action) 860
4.22.3.1. Both Decision Areas 860
4.22.3.2. Lower Sonoran 860
4.22.3.3. Sonoran Desert National Monument 860
4.22.4. Alternative B 861
4.22.4.1. Lower Sonoran 861
4.22.4.2. Sonoran Desert National Monument 861
4.22.5. Alternative C 861
4.22.5.1. Both Decision Areas 861
4.22.5.2. Lower Sonoran 862
4.22.5.3. Sonoran Desert National Monument 862
4.22.6. Alternative D 862
4.22.6.1. Both Decision Areas 862
4.22.6.2. Lower Sonoran 862
4.22.6.3. Sonoran Desert National Monument 862
4.22.7. Alternative E (Preferred Alternative) 862
4.22.7.1. Both Decision Areas 862
4.22.7.2. Lower Sonoran 863
4.22.7.3. Sonoran Desert National Monument 863
4.23. Impacts on Tribal Interests 864
4.23.1. Methods of Analysis 864
4.23.1.1. Indicators 864
4.23.1.2. Assumptions 864
4.23.1.3. Program Areas with no Impacts on Tribal Interests 864
4.23.1.4. Qualitative Intensity Scale 864
4.23.2. Common to All Alternatives 865
4.23.2.1. Both Decision Areas 865
4.23.2.2. Lower Sonoran 865
4.23.2.3. Sonoran Desert National Monument 865
4.23.3. Alternative A (No Action) 865
4.23.3.1. Both Decision Areas 865
4.23.3.2. Lower Sonoran 867
4.23.3.3. Sonoran Desert National Monument 868
4.23.4. Alternative B 868
4.23.4.1. Both Decision Areas 868
4.23.4.2. Lower Sonoran 869
4.23.4.3. Sonoran Desert National Monument 870
4.23.5. Alternative C 870

4.23.5.1. Both Decision Areas 870
4.23.5.2. Lower Sonoran 871
4.23.5.3. Sonoran Desert National Monument 871
4.23.6. Alternative D 872
4.23.6.1. Both Decision Areas 872
4.23.6.2. Lower Sonoran 873
4.23.6.3. Sonoran Desert National Monument 873
4.23.7. Alternative E (Preferred Alternative) 874
4.23.7.1. Both Decision Areas 874
4.23.7.2. Lower Sonoran 875
4.23.7.3. Sonoran Desert National Monument 875
4.24. Cumulative Impacts 875
4.24.1. Methods of Analysis 875
4.24.1.1. Indicators 875
4.24.1.2. Assumptions 876
4.24.1.3. Qualitative Intensity Scale 876
4.24.2. common to all alternatives 876
4.24.2.1. Both Decision Areas 876
4.24.2.2. Lower Sonoran 882
4.24.2.3. Sonoran Desert National Monument 883
4.24.3. Alternative a (no Action) 884
4.24.3.1. Both Decision Areas 884
4.24.3.2. Lower Sonoran 885
4.24.3.3. Sonoran Desert National Monument 888
4.24.4. Alternative B 890
4.24.4.1. Both Decision Areas 890
4.24.4.2. Lower Sonoran 891
4.24.4.3. Sonoran Desert National Monument 893
4.24.5. Alternative C 895
4.24.5.1. Both Decision Areas 895
4.24.5.2. Lower Sonoran 895
4.24.5.3. Sonoran Desert National Monument 897
4.24.6. Alternative D 899
4.24.6.1. Both Decision Areas 899
4.24.6.2. Lower Sonoran 899
4.24.6.3. Sonoran Desert National Monument 901
4.24.7. Alternative e (Preferred alternative) 902
4.24.7.1. Both Decision Areas 902
4.24.7.2. Lower Sonoran 903
4.24.7.3. Sonoran Desert National Monument 904
4.25. Implementation Level Analysis 906
4.25.1. Methodology for Analyzing Implementation-Level Decisions Within the SDNM 906
4.25.1.1. Route Designations 906
4.25.1.2. Livestock Grazing 907
4.25.1.3. Target Shooting 907
4.25.2. Implementation-Level Analysis for Cultural & Historical Sites Monument Objects 907

4.25.3. Implementation-Level Analysis for Priority Wildlife & Habitat Species Monument Objects 920
4.25.4. Implementation-Level Analysis for Vegetation Monument Objects 931

Glossary 947

Appendix A. Sonoran Desert National Monument Presidential Proclamation 999

Appendix B. Applicable Laws, Regulations, and Policies 1003

B.1. General Laws, Regulations & Policies 1003
B.1.1. Archaeological Resource Protection Act (ARPA) of 1979 1003
B.1.2. BLM Land Use Planning Handbook 1003
B.1.3. BLM Manual 1003
B.1.4. Clean Air Act (CAA) of 1970 & Amendments of 1977 and 1990 1004
B.1.5. CERLA and SARA 1004
B.1.6. Endangered Species Act (ESA) of 1973 1005
B.1.7. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898, February 11, 1994) 1005
B.1.8. Federal Land Policy and Management Act (FLPMA) of 1976 1005
B.1.9. National Historic Preservation Act (NHPA) of 1966 1006
B.1.10. Sikes Act of 1960 1006
B.1.11. Taylor Grazing Act of 1934, as amended and supplemented 1006
B.1.12. Wild and Scenic Rivers Act (WSRA) of 1968 1007
B.2. Program-Specific Laws, Regulations & Policies 1007
B.2.1. Resources 1007
B.2.2. Resource Uses 1014
B.2.3. Special Designation Management 1019
B.2.4. Tribal Interests, Public Safety & Socioeconomics 1020

Appendix C. State, County, Local and Other Related Agency Plans 1023

C.1. State 1023
C.2. County 1023
C.3. City 1024
C.4. Other Federal 1024

Appendix D. Wild and Scenic River Eligibility Assessment 1027

D.1. Wild and Scenic River Eligibility Assessment 1027
D.2. ATTACHMENT 1: Resource Values of the Lower Gila River 1034

Appendix E. Appendix E Draft Compatibility Analysis 1039

E.1. Background 1039
E.1.1. A Brief History of Grazing on Public Lands 1039
E.1.2. Historic Use of Gila Bend, Arizona, and Surrounding Areas 1040

E.1.3. Current Land Health Standards and Guidelines for Grazing Management on Public Lands 1041
E.1.4. Current Livestock Grazing Management on the SDNM 1041
E.1.5. Legal Mandates Relating to Public Lands Grazing 1042
E.2. Compatibility Analysis & Determination Process 1042
E.2.1. Step 1: Identify the Monument Objects Specific to the SDNM 1043
E.2.2. Step 2: Conduct a Literature Review 1047
E.2.2.1. Functioning Desert Ecosystem 1047
E.2.2.2. Saguaro Cactus Forests 1048
E.2.2.3. Vegetation Communities 1048
E.2.2.4. Wildlife 1049
E.2.2.5. Archaeological and Historic Sites 1050
E.2.2.6. Summary of the Literature Review 1052
E.2.3. Step 3: Conduct a Land Health Evaluation 1052
E.2.3.1. Data Collection and Analysis 1054
E.2.3.2. Analysis, Interpretation & Evaluation of Effects of Livestock Grazing on Monument Objects 1055
E.2.3.3. Summary of Land Health Evaluation Findings by Monument Object . 1066
E.2.4. Step 4: Analysis of the Effects of Livestock Grazing on Archaeological & Historic Objects 1071
E.2.4.1. Indicators to Evaluate the Condition of Monument Cultural Objects .. 1071
E.2.4.2. Summary of Grazing Effects on Cultural Monument Objects 1073
E.2.5. Step 5: Compatibility Analysis Findings and Determination 1074
E.2.5.1. Findings 1074
E.2.5.2. Determination 1075
E.2.6. Step 6: Develop Full Range of Livestock Grazing Management Alternatives in the Draft Lower Sonoran & SDNM RMP 1075
E.2.6.1. Manager Recommendation 1076
E.3. References 1077

Appendix F. Arizona Land Health Evaluation for the Sonoran Desert National Monument 1081

F.1. Introduction 1081
F.2. Monument Profile 1081
F.2.1. Monument Description 1081
F.2.2. Physical Description of the SDNM 1082
F.2.2.1. Grazing Allotments within the SDNM 1082
F.2.2.2. Climate 1083
F.2.2.3. Soils 1084
F.2.2.4. Watersheds 1084
F.2.2.5. Water Quality 1084
F.2.3. Biological Resources 1084
F.2.3.1. Vegetation 1084
F.2.3.2. Major Land Resource Areas 1086
F.2.3.3. Wildlife Resources 1086
F.2.3.4. Special Status and Sensitive Species: 1086
F.2.3.5. General Wildlife: 1088
F.2.4. Special Management Areas 1088

F.2.5. Recreational Resources 1089
F.2.6. Visual Resources 1089
F.2.7. Cultural Resources 1089
F.3. Grazing Management 1089
F.3.1. Grazing History 1089
F.3.2. Current Management 1090
F.3.3. Terms and Conditions of the Current Permits 1090
F.4. Planning and Environmental Documents 1092
F.5. Rangeland Management Programs Objectives 1092
F.5.1. BLM Objectives 1092
F.5.2. SDNM Desired Future Conditions 1093
F.5.3. SDNM Land Health Objectives by Ecological Site 1093
F.5.3.1. Land Health Standard 1 — Upland Sites 1097
F.5.3.2. Land Health Standard 2 — Riparian — Wetland Site 1098
F.5.3.3. Land Health Standard 3 — Desired Resource Conditions 1098
F.5.3.4. Ecological Site-Level Desired Plant Community Objectives 1098
F.5.4. Utilization Guidelines 1102
F.6. Inventory and Monitoring Methodology 1102
F.6.1. Rangeland Survey 1102
F.6.2. Key Areas 1103
F.6.3. Pacific Biodiversity Institute Site Data 1104
F.7. Management Evaluation and Summary of Studies Data 1105
F.7.1. Actual Use 1105
F.7.2. Precipitation 1105
F.7.3. Key Area Data 1106
F.7.4. Utilization and Use Pattern Mapping 1106
F.8. Conclusions 1107
F.9. Barry M. Goldwater Range/Area A Reference Site 1108
F.10. Big Horn Allotment 1108
F.10.1. Land Health Standard 1 — Upland Sites 1108
F.10.2. Land Health Standard 3 — Desired Resources Conditions 1109
F.10.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites 1109
F.10.2.2. Summary of Ecological Site Analysis 1113
F.11. Beloat Allotment 1114
F.11.1. Land Health Standard 1 — Upland Sites 1114
F.11.2. Land Health Standard 3 — Desired Resources Conditions 1114
F.11.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites 1115
F.11.2.2. Summary of Ecological Site Analysis 1117
F.12. Conley Allotment 1118
F.12.1. Land Health Standard 1 — Upland Sites 1118
F.12.2. Land Health Standard 3 — Desired Resources Conditions 1119
F.12.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites 1119
F.12.2.2. Summary of Ecological Site Analysis 1121
F.13. Hazen Allotment 1123
F.13.1. Land Health Standard 1 — Upland Sites 1123
F.13.2. Land Health Standard 3 — Desired Resources Conditions 1123

F.13.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites ... 1124
F.13.2.2. Summary of Ecological Site Analysis ... 1126
F.14. Lower Vekol Allotment ... 1127
F.14.1. Land Health Standard 1 — Upland Sites ... 1127
F.14.2. Land Health Standard 3 — Desired Resources Conditions ... 1127
F.14.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites ... 1127
F.14.2.2. Summary of Ecological Site Analysis ... 1129
F.15. Arnold Allotment ... 1130
F.15.1. Land Health Standard 1 — Upland Sites ... 1130
F.15.2. Land Health Standard 3 — Desired Resources Conditions ... 1131
F.15.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites ... 1131
F.15.2.2. Summary of Ecological Site Analysis ... 1131
F.16. Management Recommendations ... 1132
F.17. References ... 1134
F.18. ATTACHMENT 1: Arizona Rangeland Health Standards and Guidelines for Grazing Administration ... 1135
F.18.1. Introduction ... 1135
F.18.2. Fundamentals & Definitions of Rangeland Health ... 1136
F.18.3. Standards and Guidelines Definitions ... 1137
F.18.3.1. Implementing Standards & Guidelines ... 1138
F.18.4. Arizona Standards & Guidelines ... 1139
F.18.4.1. Standard 1: Upland Sites ... 1139
F.18.4.2. Standard 2: Riparian-Wetland Sites ... 1140
F.18.4.3. Standard 3: Desired Resource Conditions ... 1141
F.18.5. Lotic and Lentic Checklist ... 1142
F.19. ATTACHMENT 2: SDNM Presidential Proclamation ... 1144
F.20. ATTACHMENT 3: Key Area Data ... 1147
F.21. ATTACHMENT 4: Pacific Biodiversity Institute Study Plots ... 1165
F.22. ATTACHMENT 5: Pacific Biodiversity Institute Saguaro Study ... 1179
F.23. ATTACHMENT 6: Resource Condition Objectives Related to Grazing Management ... 1180
F.24. ATTACHMENT 7: Key Management Species List ... 1180

Appendix G. Sonoran Desert National Monument Recreational Target Shooting Analysis ... 1183

G.1. Summary ... 1183
G.2. Introduction ... 1183
G.3. Method of Analysis ... 1184
G.3.1. Phase One: GIS Analysis ... 1184
G.3.1.1. GIS Criteria 1: Presence of Monument Objects ... 1184
G.3.1.2. GIS Criteria 2: Presence of Suitable Terrain ... 1185
G.3.2. Phase Two: Field Analysis ... 1186
G.3.2.1. Field Criteria 1: Monument Objects or High Resource Sensitivity ... 1186
G.3.2.2. Field Criteria 2: Visitor Safety and Experience ... 1187
G.3.2.3. Field Criteria 3: Accessibility by Motor Vehicle ... 1189

G.3.2.4. Field Criteria 4: Physical Suitability of Terrain 1189
G.3.2.5. Field Rating 1190
G.4. Results of Analysis 1190
G.4.1. Phase One: GIS Analysis 1190
G.4.1.1. Results from Significant Presence of Monument Objects 1190
G.4.1.2. Results from Presence of Suitable Terrain 1191
G.4.2. Phase Two: Field Analysis 1191
G.4.2.1. Step 1: Summary Rankings by Area and Field Criteria 1191
G.4.2.2. Step 2: Numeric Suitability Rankings by Area and Field Criteria 1192
G.4.2.3. Step 3: Site Categorization Based on Numeric Ranking 1192
G.5. Summary Conclusions 1193
G.6. Figures 1194
G.7. References 1202
G.8. Attachment G-1: Comparison of Impacts Documented at Shooting and Non-Shooting Sites 1202
G.8.1. Data Analysis 1202
G.8.2. Statistical Analysis 1204
G.8.2.1. Method 1204
G.9. Attachment G-2: Sample Field Rating Sheet 1209

Appendix H. Best Management Practices & Standard Operating Procedures 1211

H.1. Resources 1211
H.1.1. Cave Resources 1211
H.1.2. Cultural Resources 1211
H.1.3. Paleontological Resources 1212
H.1.4. Soil Resources 1213
H.1.5. Vegetation Resources 1213
H.1.6. Visual Resource Management 1214
H.1.7. Wildlife Resources 1214
H.2. Resource Uses 1215
H.2.1. Lands & Realty 1215
H.2.2. Livestock Grazing 1217
H.2.3. Mineral Resources 1218
H.2.4. Recreation 1218
H.2.5. Travel Management 1225
H.2.6. Wildland Fire & Fuels Management 1226
H.3. Special Designations 1227
H.3.1. Back Country Byways 1227
H.3.2. Areas of Critical Environmental Concern 1228
H.4. Social & Economic 1228
H.4.1. Public Health & Safety 1228

Appendix I. Cultural Use Allocations 1231

Appendix J. Wildlife & Plant Priority Species 1235

Appendix K. Conservation Measures from Fish and Wildlife Service Biological Opinions 1239

Appendix L. Guidelines for Grazing Administration 1253

Appendix M. Painted Rock Burro Herd Manageability Analysis 1257

Appendix N. Analysis for Renewable Energy Sensitivity 1263

Appendix O. Arizona Land Tenure Strategy 1267

O.1. Background Summary 1267
O.2. Strategic Goals and Objectives 1267
O.3. Acquisition Tools for Land Tenure 1268
O.4. Disposal Tools for Land Tenure 1269
O.5. Implementation Goals and Measures 1270
O.6. LAND TENURE EVALUATION PROCESS 1273
O.7. Appendix A 1274

Appendix P. Grazing Allotment Information 1281

Appendix Q. Recreation Settings and Descriptions 1285

Q.1. Community Interface 1285
Q.2. Front Country 1286
Q.3. Passage 1287
Q.4. Back Country 1288
Q.5. Description Matrix 1289

Appendix R. Benefits Based Recreation Worksheets 1295

Appendix S. Route Evaluation Methodology & Impact Analysis 1311

S.1. Route Evaluation Methodology 1311
S.1.1. Route Inventory 1311
S.1.2. Route Evaluation 1311
S.2. Impact Analysis 1313

Appendix T. Route Mitigations 1319

Appendix U. Definition of Transportation Asset Type, Functional Class, Maintenance Intensity 1321

Appendix V. ACEC Evaluations 1325

Appendix W. Land Health Standards 1339

W.1. Standard One: Upland Sites 1339
W.2. Standard Two: Riparian-Wetland Sites 1339
W.3. Standard Three: Desired Future Conditions 1340

Appendix Y. List of Preparers 1345

Appendix Z. References 1349

Appendix AA. Abbreviations & Acronyms 1367

Index 1369

List of Tables

Table 1. Key Land Use Allocations and Decisions for the Lower Sonoran Decision Area xlvii
Table 2. Key Land Use Allocations and Decisions for the SDNM Decision Area xlix
Table 3. Environmental Consequences by Program Area for the Planning Area (In Alphabetical Order) lix
Table 1.1. Current Land Use Plans and Plan Amendments 2
Table 1.2. Surface Management Responsibility/Ownership in the Lower Sonoran Planning Area 4
Table 1.3. Land Use Planning Process 6
Table 1.4. SDNM Objects 18
Table 2.1. Wilderness Areas of the Lower Sonoran and SDNM Decision Areas 43
Table 2.2. Program Area Categories and Abbreviations 46
Table 2.3. Proposed Site Use Allocations by Alternative 54
Table 2.4. Proposed Cultural and Historic Resources Land Use Allocations (SCRMAs) 55
Table 2.5. Wildlife Habitat Areas by Alternative 70
Table 2.6. VRM Classes by Alternative 99
Table 2.7. Acres of Lands Managed to Protect Wilderness Characteristics by Alternative 110
Table 2.8. Description of LUA Types 119
Table 2.9. Lands and Realty Allocations For the Lower Sonoran Decision Area 128
Table 2.10. Lands and Realty Allocations For the SDNM Decision Area 129
Table 2.11. Proposed Livestock Grazing Allocations for Lower Sonoran Decision Area 142
Table 2.12. Proposed Livestock Grazing Allocations for the SDNM 143
Table 2.13. Proposed Permitted Animal Unit Months (AUMs) for the SDNM 143
Table 2.14. Proposed Livestock Grazing Acres for the SDNM North of Interstate 8 Only 144
Table 2.15. Acres of Public Lands Available for Mineral Activity by Alternative 153
Table 2.16. Recreation Management Area and Zone Allocations 165
Table 2.17. Recreation Allocations by Decision Area for LSFO and SDNM 178
Table 2.18. Recreation Settings by Decision Area 178
Table 2.19. Off-Highway Vehicle Area Designations by Alternative 183
Table 2.20. Proposed Route Designation Table by Alternative 184
Table 2.21. ACEC Acres Based on Alternative 195
Table 2.22. Potential Byway Designations by Alternative 201
Table 2.23. Comparison of Impact Intensities 219
Table 3.1. Estimated Extent of Cultural Resources Survey and Recorded Resources 264
Table 3.2. Lower Sonoran & SDNM Decision Area Soils (BLM Land) 282
Table 3.3. Vegetative Communities on Public Lands in the Planning Area 283
Table 3.4. Special Status Plant Species on Public Lands in the Planning Area 285
Table 3.5. Extent of VRI Class Designations 288
Table 3.6. Monthly Mean Discharge (Flow) of Key Streams in Planning Area 291
Table 3.7. Montly Temperature & Precipitation for Planning Area (Gila Bend Weather Station) 291
Table 3.8. Definition of Hydrologic Unit Codes in the Planning Area 292
Table 3.9. Surface Water Sub-basins in Planning Area 292
Table 3.10. Units Under Consideration - Wilderness Characteristics 301
Table 3.11. Fire Management Units in Phoenix District that Overlap the Planning Area 303
Table 3.12. Communities at Risk in the Planning Area by Fire Management Unit 304
Table 3.13. Historical Fire Regimes Based on Fire Frequency and Severity 304
Table 3.14. Current Fire Regime Condition Classes by Vegetative Community 305
Table 3.15. Utility Corridors within the Lower Sonoran 308
Table 3.16. Existing Utility Corridors within the SDNM 314
Table 3.17. Animal Unit Months 1998–2007 322

Table 3.18. BLM Mineral Estate Acreage 323
Table 3.19. Acreage Open to Minerals Activity 324
Table 3.20. Locatable Mineral Potential in Lower Sonoran & SDNM Decision Areas 326
Table 3.21. Leasable Mineral Potential Lower Sonoran & SDNM 327
Table 3.22. Mineral Materials (Salable) Potential Lower Sonoran & SDNM 329
Table 3.23. Types of Trail Users as a Percentage of Population, 2003-2008 331
Table 3.24. Recreation Land Use Allocations in the Decision Areas 331
Table 3.25. Recreation Opportunity Spectrum Classes of the Lower Sonoran Decision Area ... 332
Table 3.26. Primary Use and Current Settings for Existing Travel Routes 337
Table 3.27. Special Designations Within the Planning Area 340
Table 3.28. Population Growth 2000 to 2008, Six Cities and Towns near the Decision Area 355
Table 3.29. Selected 2008 Demographic Information 356
Table 3.30. Key Employment Statistics: Changes from 2001 to 2007, Tri-County Region 357
Table 3.31. Unemployment Rates, Annual Averages 2000-2005 358
Table 3.32. Key Income Statistics: Changes from 2001 to 2007, Tri-County Region 359
Table 3.33. Employment and Income in the North American Industry Classification System ... 359
Table 3.34. Comparison of National, State, and Decision Area Trend in Decorative Rock Values 360
Table 3.35. 2001 Economic Impacts of Wildlife Viewing (in $ millions) 362
Table 3.36. 2001 Economic Impacts of Hunting and Fishing (in $ millions) 362
Table 3.37. 2002 Economic Impacts of OHV Recreation Activity (in $ millions 363
Table 3.38. 2009 PILT Entitlement Acreage by Federal Agency 364
Table 3.39. PILT Payment and Entitlement Acreage 365
Table 3.40. Minority and Low-Income Populations, 2003 368
Table 4.1. Qualitative Terms for the Intensity of Impacts 375
Table 4.2. Miles of Routes in PM_{10} Nonattainment Areas for the Lower Sonoran 389
Table 4.3. Miles of Routes in PM_{10} Nonattainment Areas for the SDNM 390
Table 4.4. Acres of Soils with Potential for Wind Erosion by Grazing Type under Alternative A 469
Table 4.5. VRM Classes by Alternative 521
Table 4.6. Lower Sonoran Travel Management RFD Scenarios 524
Table 4.7. SDNM Designated Route Mileage 525
Table 4.8. Comparison Between VRM and VRI under Alternative A in the Lower Sonoran 527
Table 4.9. Comparison Between VRM and VRI under Alternative A in the SDNM 528
Table 4.10. Comparison Between VRM and VRI under Alternative B in the Lower Sonoran ... 529
Table 4.11. Comparison Between VRM and VRI under Alternative B in the SDNM 530
Table 4.12. Comparison Between VRM and VRI under Alternative C in the Lower Sonoran ... 531
Table 4.13. Comparison Between VRM and VRI under Alternative C in the SDNM 532
Table 4.14. Comparison Between VRM and VRI under Alternative D in the Lower Sonoran ... 533
Table 4.15. Comparison Between VRM and VRI under Alternative D in the SDNM 534
Table 4.16. Comparison Between VRM and VRI under Alternative E in the Lower Sonoran ... 535
Table 4.17. Comparison Between VRM and VRI under Alternative E in the SDNM 535
Table 4.18. Acres of Lands with Wilderness Characteristics Within SRMAs and ROS Settings, Alternative A 572
Table 4.19. Acres of Lands with Wilderness Characteristics Within Visual Resources Management Classes, Alternative A 573
Table 4.20. Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative C 586
Table 4.21. Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternative C 587

Table 4.22. Acres of Lands Managed to Protect Wilderness Characteristics within Recreation Management Areas and Settings, Alternative D 593
Table 4.23. Acres of Lands Managed to Protect Wilderness Characteristics Within SRMAs and Recreation Management Settings, Alternative E 598
Table 4.24. Alternative A Mineral Entry Status 668
Table 4.25. Alternative B Mineral Entry Status 670
Table 4.26. Alternative C Mineral Entry Status 673
Table 4.27. Alternative D Mineral Entry Status 675
Table 4.28. Alternative E Mineral Entry Status 677
Table 4.29. Equivalency of the Statutory Authority Related to Route Evaluation Questions 701
Table 4.30. Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects 907
Table 4.31. Impacts from Implementation Level Decisions on Priority Species Monument Objects 920
Table 4.32. Impacts from Implementation Level Decisions on Vegetation Monument Objects . 931
Table D.1. Observations on Gila River Segments Assessed for WSR Eligibility 1027
Table D.2. Flow of Gila River Segments Considered for WSR Eligibility 1028
Table D.3. Presence and Extent of Scenic, Recreational, Geological, Fish and Wildlife, Historical, Cultural or Other Values in Gila River Segments 1030
Table E.1. Acres of Public Lands and Permitted Use within SDNM Grazing Allotments 1041
Table E.2. Monument Objects Specific to the SDNM 1044
Table E.3. Creosote Bush-Bursage Land Health Standard Achievement Status 1056
Table E.4. Palo-Verde Mixed Cactus Land Health Standard Achievement Status 1057
Table E.5. Desert Wash Community Land Health Standard Achievement Status 1057
Table E.6. Average Number of Perennial Species Per Plot (Diversity) 1058
Table E.7. Results of the Land Health Evaluation (LHE Objectives by Monument Object) 1060
Table E.8. Land Health Standard Status & Causal Factor Determination by Allotment/Ecological Site 1068
Table E.9. Land Health Standard Status & Determination by Vegetation Community 1070
Table E.10. Results of the Cultural Evaluation by Monument Object 1071
Table F.1. SDNM Grazing Allotments, Acreage of Public Lands and Permitted Use North of Interstate 8 1083
Table F.2. Land Health Objectives by Monument Object 1094
Table F.3. Rangeland Health Attributes 1104
Table F.4. Grazing Allotment Use, Permitted and 10 Year Average 1105
Table F.5. Average Precipitation (in Inches) for Gila Bend, Arizona, 1999 to 2008 1105
Table F.6. Average Precipitation (in Inches) for Maricopa, Arizona, 1999 to 2008 1106
Table F.7. Utilization Estimates on Key Areas Within the Big Horn and Conley Allotments .. 1106
Table F.8. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – BGR/Area A 1108
Table F.9. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Big Horn Allotment 1113
Table F.10. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Beloat Allotment 1118
Table F.11. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment 1122
Table F.12. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment 1126

Table F.13. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Lower Vekol Allotment 1130
Table F.14. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Arnold Allotment 1132
Table F.15. SDNM Grazing Allotments Permitted Use* (AUMs) 1132
Table F.16. Vegetation Composition Data 1147
Table F.17. Departure from Ecological Site Description 1159
Table F.18. Ground Cover Data (%) 1160
Table F.19. Average Cover of Microbiotic Crusts (% by Plot) 1161
Table F.20. BMG/Area A Comparison Plots – Big Horn Allotment 1161
Table F.21. BGR/Area A Pacific Biodiversity Institute Plots 1162
Table F.22. Pacific Biodiversity Institute Study Plots 1165
Table F.23. : Saguaro Cover & Stem Count Information for the Palo Verde-Mixed Cacti Community (PBI 2004) 1179
Table G.1. Shooting Analysis Criteria 1184
Table G.2. Field Criteria for Resources and Monument Objects 1187
Table G.3. Field Criteria for Visitor Safety and Nearby Uses and Facilities 1188
Table G.4. Field Criteria for Motor Vehicle Accessibility 1189
Table G.5. Field Criteria for Physical Suitability of Target Shooting 1190
Table G.6. GIS Overlays and Cumulative Acreage of the SDNM Not Suitable for Recreational Target Shooting 1191
Table G.7. Summary of Field Analysis for Sites Potentially Suitable for Recreational Target Shooting in the SDNM 1191
Table G.8. Numeric Suitability Rankings for Sites Potentially Suitable for Target Shooting in the SDNM 1192
Table G.9. Summary of Potentially Suitable Target Shooting Sites by Numeric Ranking 1193
Table G.10. Comparison of Impacts Documented at Shooting & Non-Shooting Sites in the SDNM, 2003-2005 1203
Table J.1. Priority Species in the Lower Sonoran and SDNM Decision Areas 1235
Table O.1. PROPOSED STAFFING 1276
Table P.1. Grazing Allotment Information 1281
Table Q.1. Description of Recreation Management Settings for Lower Sonoran and SDNM 1289
Table S.1. Description of SDNM Site-Specific Sample Areas 1314
Table T.1. Nature of the conflict with routes and use of routes 1319

INTRODUCTION

The U.S. Department of the Interior, Bureau of Land Management (BLM), is engaged in a planning process to update management direction for the portion of the State of Arizona administered by the BLM's Phoenix District, Lower Sonoran Field Office (LSFO). The Lower Sonoran Planning Area includes parts of Maricopa, Pinal, Pima, Gila, and Yuma counties. The geographic region encompassed in the Planning Area includes approximately 8.9 million acres of public, state, and private lands, of which approximately 1.4 million surface acres and 1.5 million subsurface acres are administered by the BLM (refer to Map 1-1). These include about 486,400 surface acres and 461,000 subsurface acres within the Sonoran Desert National Monument (SDNM), referred to as the SDNM Decision Area. In the areas located outside of the SDNM, referred to as the Lower Sonoran Decision Area, the BLM manages about 930,200 surface acres and 1.1 million subsurface acres.

The BLM manages public lands, including both surface land and subsurface mineral estate, under the Federal Land Policy and Management Act (FLPMA) of 1976 [43 United States Code (USC) 1701 et seq.] and other applicable laws. The BLM's land use planning regulations, 43 Code of Federal Regulations (CFR) 1600, set forth procedures for preparing land use plans and making planning decisions in accordance with FLPMA. These plans and decisions are the basis for every on-the-ground action the BLM undertakes. To ensure that management of public lands is consistent with FLPMA and other applicable laws and policy guidance, BLM prepares and periodically updates its resource management plans (RMPs).

While BLM makes decisions applicable only to public lands and the resources it administers, it is responsible for collaboratively planning with adjacent jurisdictions and the public to encourage compatible land uses within a regional context (Planning Area).

The LSFO is preparing one Draft RMP to provide management direction for the Lower Sonoran and SDNM Decision Areas. The Lower Sonoran and SDNM Draft RMP will consolidate or replace current management guidance for the two Decision Areas under existing plans implemented from 1983 through 2005. Seven management plans and plan amendments currently apply to all or parts of the Lower Sonoran Decision Area, and five of these apply to all or parts of the SDNM established in 2001.

The SDNM is guided by Presidential Proclamation 7397, issued on January 17, 2001. The proclamation supersedes some of the guidance provided by the area's current land use plans, and is the legal instrument that established its boundaries and purposes. Management priority for SDNM must be protective of the natural and cultural resource values for which it was designated.

PURPOSE & NEED FOR THE PROPOSED ACTION

The purpose of the Lower Sonoran and SDNM Draft RMP/Environmental Impact Statement (EIS) is to provide guidance for managing the use of public lands and provide a framework for future land management actions within the Planning Area. The Draft RMP/EIS will consolidate and replace the current management guidance for the Decision Areas and respond to changed conditions by identifying and carrying forward previous decisions that are still applicable and, where necessary, modify existing management direction. While the RMP is consistent with the

planning framework, each Decision Area will have unique goals and management direction where appropriate.

First and foremost, the SDNM RMP is needed to respond to the establishment of SDNM. Presidential Proclamation 7397 assigns BLM the responsibility to protect the special qualities for which the monument was designated and requires an RMP be prepared to ensure management actions needed to do so are identified and implemented. In the absence of such a plan, current management for SDNM falls under interim monument guidance, the various existing RMPs, and plan amendments. These documents do not address many of the current management issues.

In addition, there is a need to consolidate the three previous RMPs and seven plan amendments because these plans contain obsolete planning boundaries and management decisions. Over the past 30 years, significant and ongoing changes have occurred that dramatically altered the natural and social environments. Existing management decisions in these plans have not kept pace with changing circumstances, demographics, resource conditions, and/or policies. A new RMP is needed to address these changing conditions, which include:

- Unprecedented regional population growth and urban expansion into surrounding public lands is increasing demand for access to and use of public lands and resources. Growth contributes to dramatic increases in and demands for commodities, utilities, renewable energy, communication, transportation, and infrastructure on public lands.

- Emerging recreational activities, some based on recent technologies, has yielded new recreational equipment and increased use of public lands.

- New legal and BLM policy requirements have resulted in additional or revised management responsibilities.

- New information and understandings of ecological relationships has led to changes in management direction.

PLANNING ISSUES & MANAGEMENT CONCERNS IDENTIFIED DURING SCOPING

Analysis of more than 6,000 comments received during scoping showed that the various concerns expressed by the public, non-governmental organizations, agencies, and tribal and local governments could be grouped into 18 issue categories. Six of the 18 issue categories accounted for more than 95 percent of the comments received. The six issue areas most frequently mentioned by all respondents were:

- **Issue 1:** Travel Management: How will travel and access be managed?

- **Issue 2:** Wilderness Characteristics: How will wilderness characteristics be managed in the Decision Areas?

- **Issue 3:** Wildlife: How will BLM address wildlife management, including special status species and wildlife water developments, in the Decision Areas?

- **Issue 4:** Livestock Grazing: How will livestock grazing be addressed in the Decision Areas, particularly in the SDNM?

- **Issue 5:** Energy Development: How will renewable and traditional energy facilities (including transmission corridors) be managed?

- **Issue 6:** Recreation: How will public recreation activities be managed?

The character of the comments grouped in the issue categories varied considerably. For example, some favored designation of additional wilderness and other special management areas, some criticized the way existing areas are managed, and others either opposed any expansion in these areas or called for their elimination. Some people and organizations favored reducing or eliminating livestock grazing on public lands while others supported its continuation. Some parties favored more liberal access to public lands for public use, including off-highway vehicle (OHV) access, while others expressed concerns that excessive recreation access, including that for recreational vehicles, threatens sustainable management of biological and cultural resources.

Although they may be in opposition with each other, all of these comments are equally valid and of use to the planning process for the Draft RMP. They reflect the range of values BLM must consider and balance when managing public lands for both resource sustainability and multiple use. The collective sweep of the comments received helped to define the breadth and character of the management issues these new plans should address. These issues help to define the range of alternatives that must be addressed through the associated EIS in order to provide BLM decision makers and the public with a reasonable range of options to consider for the future management of the Lower Sonoran and SDNM Decision Areas.

ALTERNATIVES

This section summarizes the alternatives for managing the Lower Sonoran and SDNM Decision Areas. The goal of developing alternatives is to prepare different combinations of management to address issues and to resolve conflicts among uses. Alternatives must meet the purpose and need; be reasonable; provide a mix of resource protection, use, and development; be responsive to the issues; and meet the established planning criteria. Each Alternative is a complete land use plan that provides a framework for multiple use management of the full spectrum of resources, resource uses, and programs present in the Planning Area. Under all alternatives, BLM would manage the public lands in accordance with all applicable laws, regulations, and BLM policy and guidance. Each alternative reflects intergovernmental and interagency collaboration, and public participation.

Table 1, "Key Land Use Allocations and Decisions for the Lower Sonoran Decision Area" (p. xlvii) and Table 2, "Key Land Use Allocations and Decisions for the SDNM Decision Area" (p. xlix) identify key land use allocations and decisions proposed under the No Action (Alternative A) and the four action alternatives proposed for the Lower Sonoran and SDNM Decision Areas. Following these tables is a brief description of the five alternatives.

Table 1. Key Land Use Allocations and Decisions for the Lower Sonoran Decision Area

Decision	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Resources					
Cultural: Number of Sites/Total Acres of Proposed Site Allocations for Lower Sonoran					

Decision	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Public and Scientific Use	1 site/200 acres	3 sites/283 acres	3 sites/283 acres	1 site/200 acres	3 sites/283 acres
Scientific Use Only				2 sites/83 acres	
Cultural: Acres in Special Cultural Resource Management Areas					
Total	0		142,300	0	
Priority Wildlife: Acres Managed as Wildlife Habitat Areas					
Total	0		425,900	255,700	255,700
Wilderness Characteristics: Acres Managed to Protect Wilderness Characteristics					
Total	0		128,100	276,500	55,400
Resource Uses					
Lands & Realty: Acres Avoided and Excluded from Utility-scale Renewable Energy Development					
Avoided	0	520,900	604,300	328,300	310,200
Excluded	105,100		126,500	510,700	380,100
Lands & Realty: Acres of Land Available for Disposal					
Total	27,400	38,200	36,200	19,400	30,500
Livestock Grazing: Acres Available and Unavailable for Livestock Grazing and Total AUMs					
Available			830,200	0	830,200
Unavail-able			100,000	930,200	100,000
Total	17,541	10,431	17,541	0	17,541
Minerals: Acres Available within BLM Managed Surface Estate					
Locat-able Min-erals	713,300	710,950	710,950	331,800	710,350
Leasable Minerals	713,300	713,050	713,050	331,800	659,600
Mineral Materials	713,300	647,500	528,500	191,900	521,000
Recreation: Acres in Special Recreation Management Areas					

Decision	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Total	379,400	646,600	639,000	100,200	639,800
Travel Management: Acres Open, Closed, and Limited for Motorized Travel					
Open	0	40	0		40
Closed	110,700	101,800		378,300	152,800
Limited to Existing Roads	819,500	0			
Limited to Designated Roads	0	828,360		551,900	777,360
Special Designations					
Acres in Areas of Critical Environmental Concern (ACECs)					
Total	8,900	63,300		267,100	250,800

Table 2. Key Land Use Allocations and Decisions for the SDNM Decision Area

Decision	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Resources					
Cultural: Number of Sites/Total Acres of Proposed Site Allocations for SDNM					
Public and Scientific Use	1 site/3,600 acres	4 sites/3,615 acres	4 sites/3,615 acres		4 sites/3,615 acres
Scientific Use Only				4 sites/3,615 acres	
Cultural: Acres in Special Cultural Resource Management Areas					
Total	0		17,700	0	17,700
Wilderness Characteristics: Acres Managed to Protect Wilderness Characteristics					
Total	0		112,200	153,000	110,900
Resource Uses					
Lands & Realty: Acres Avoided and Excluded from Utility-scale Renewable Energy Development					

Decision	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Avoided					0
Excluded					486,400
Lands & Realty: Acres of Land Available for Disposal					
Total					0
Livestock Grazing: Acres Available and Unavailable for Livestock Grazing and Total AUMs					
Available	252,200	244,0000	207,700	0	157,210
Unavailable	233,900	242,400	278,700	486,400	329,190
AUMs	8,703	5,321	7,092	0	3,114
Recreation: Acres in Special Recreation Management Areas					
Total					486,400
Travel Management : Acres Open, Closed, and Limited for Motorized Travel					
Closed	161,200	157,700	157,700	310,700	157,700
Open					0
Limited to Existing Roads	325,200				0
Limited to Designated Roads	0	328,700	328,700	175,700	328,700
Travel Management Route Designations: Miles of Designated Open, Closed, or Limited Road Networks					
Open	604.9	555.6	419.3	261.0	392.2
Closed	26.6	69.5	150.2	322.2	193.6
Limited	0	6.0	44.5	11.0	41.0
Limited to Administrative Use	0	0.4	17.5	37.3	4.7
New Proposed	0	8	0	0	8

ALTERNATIVE A — NO ACTION

The No Action Alternative is the current management situation for both the Lower Sonoran and SDNM Decision Areas, and serves as a baseline for most resource and land-use allocations. Selecting Alternative A for the Lower Sonoran RMP would continue current management without change to land or public uses or resource management, and would not address issues that were unforeseen or nonexistent when the current plans were prepared. Selecting Alternative A for the SDNM RMP would continue current management under the existing land use plans as modified by Presidential Proclamation 7397, which established it and specified certain management provisions.

ALTERNATIVE B

The management decisions prescribed under Alternative B identify the greatest amount of public lands suitable for appropriate multiple uses. Emphasis is placed on motorized and developed recreational uses, while opportunities to visit remote settings and experience non-motorized, primitive recreation would be reduced from current conditions. As a result, this alternative would require the most intensive management as well as "hands-on" resource stabilization and restoration measures in order to ensure the desired outcomes would be achieved and/or to maintain resource conditions. Actions and allocations would ensure that SDNM resources, set in the proclamation, would be protected.

ALTERNATIVE C

This alternative represents an attempt to balance resource protection with human use and influence. It provides opportunities for a variety of uses while placing emphasis on resource protection and conservation, and proposes a mix of natural processes and "hands-on" techniques for resource stabilization and restoration. These measures would likely reduce the need for intensive management to avoid or mitigate any adverse effects. As under Alternative B, actions and allocations would ensure that SDNM resources, set in the proclamation, would be protected.

ALTERNATIVE D

Alternative D places the greatest emphasis on minimizing human use/influence and maintaining primitive landscapes. It focuses on natural processes and other unobtrusive methods for resource stabilization and restoration, so the need for both intensive management and "hands-on" resource measures would be the least in comparison to any other alternative. As under Alternative B and C, actions and allocations would ensure that SDNM resources, set in the proclamation, would be protected.

ALTERNATIVE E — PREFERRED ALTERNATIVE

This is BLM's preferred alternative for public land management within the Lower Sonoran and SDNM Decision Areas. This alternative incorporates elements from each of the other action alternatives, offering a unique way for managing the Decision Areas while at the same time providing long-term protection and conservation of resources. Alternative E places a priority on the protection and conservation of its resources while offering increased recreational opportunities. Alternative E thus attempts to balance human use and influence with resource protection.

PUBLIC INVOLVEMENT

The planning issues for the Lower Sonoran and SDNM RMPs were identified through scoping, a process conducted early in the planning effort, that seeks input from agencies and the public. Public scoping for the draft RMPs and accompanying EIS was announced in a Federal Register notice on April 24, 2002 for the SDNM RMP and a second notice on December 9, 2002 for the Lower Sonoran RMP. The opportunity to comment was also publicized through news releases, mail notification, flyers, and other methods. Eleven scoping meetings were held where the public could voice their concerns. The public was also invited to submit written comments. More than 6,000 comments were received during this period.

Since scoping, BLM has held additional public workshops throughout the Planning Area to collaborate on the topics of (1) purpose, significance, management vision, and overarching goals; (2) RMP goals and objectives; and (3) preliminary alternatives.

Consultation with American Indian tribes and coordination with numerous agencies and governments at the Federal, State, and local levels has been an ongoing aspect of the planning process, and periodic interdisciplinary team meetings have been held at key points in the process. Early in the process, BLM invited all agencies and tribes in Arizona to attend a workshop discussing the cooperating agency process. As a result, cooperating agencies for preparation of these draft RMPs and EIS include the Tohono O'odham Nation, Ak-Chin Indian Community, U.S. Air Force, U.S. Marine Corps, Department of Homeland Security (Border Patrol), Federal Highway Administration, Arizona Game and Fish Department, and Arizona Department of Transportation. A Memorandum of Understanding (MOU) also exists between BLM and the U.S. Fish and Wildlife Service (USFWS) pursuant to both agencies' responsibilities under the Endangered Species Act (ESA). Another MOU exists between BLM and the Arizona State Historic Preservation Office (SHPO) for cultural resources.

AFFECTED ENVIRONMENT

The EIS portion of this document describes the environmental components of public lands within the Planning Area (i.e., the Lower Sonoran and SDNM Decision Areas) that would potentially be affected by implementation of the draft RMPs. The Decision Areas' resources, uses, and conditions are described below.

RESOURCES:

AIR RESOURCES

The largest source of particulate matter emissions within the Decision Areas is related to surface-disturbing activities including construction, mining, and OHV (recreation-related) travel. These activities are managed through State and local non-point source regulations. Regardless of air quality permit requirements, all sources must comply with best management practices (BMPs). These BMPs include implementation of mitigation measures (such as watering or using chemical dust suppressants), which can reduce the amount of emissions in the localized area.

Most vehicle routes in the Decision Areas are unpaved. Travel on such routes results in particulate emissions, or fugitive dust, except during periods with high levels of humidity (e.g., after a rainstorm), which are generally rare in the Planning Area. Although fugitive dust is not included in air qualityevaluations, it can affect local air quality, especially in areas of concentrated travel on unpaved roads and during periods of heavy winds.

CAVE RESOURCES

The Decision Areas contain Paleozoic sedimentary deposits and Tertiary volcanic rocks known to contain caves elsewhere in Arizona. While Paleozoic limestones occur in the Sand Tank Mountains, no caves or cave resources are known to exist on public lands in the area; however, two lava tubes occur in the Sentinel Plain.

CULTURAL & HERITAGE RESOURCES

Most of the public land cultural resources are archaeological sites, reflecting both pre-Columbian and post-contact occupation of the region. Almost 80 percent of the sites reflect aboriginal occupation and 13 percent reflect Euro-American occupation, while the cultural and temporal affiliations of the remaining sites have not been determined. Four percent of the Lower Sonoran Decision Area has been surveyed and almost 600 sites recorded, while 6 percent of the SDNM has been surveyed with almost 300 sites discovered. These statistics suggest there could be 13,000 archeological sites in the Lower Sonoran and 5,000 within the SDNM Decision Areas.

Approximately 127,737 acres of the Anza Trail cross the Decision Areas. The setting of the trail through SDNM has probably been altered less since its original use than any other segment of the entire 1,200 mile route (National Park Service 1996). The Painted Rock Petroglyph Site has thousands of aboriginal petroglyphs, as well as some pictographs and historic-period glyphs. The site is located along the Butterfield Overland Stage Route.

PALEONTOLOGICAL RESOURCES

Three physiographic provinces characterize Arizona: the Colorado Plateau, Basin and Range, and a Transition Zone between those two provinces having some characteristics of each. Most of the Planning Area is within the Basin and Range province. The Gila River is the main drainage for mountains and valleys and flows east to west, carrying sediments from the various rock units. In a few areas, steep cliff faces and unusually-shaped rock features provide high scenic values, i.e., Saddle Mountain, Gila River cliffs, and the San Tank Mountains.

Paleontological resources include vertebrate and invertebrate animal fossils, plant fossils, and trace fossils. In the Planning Area, fossils of birds, fish, and mammals are typically found in unconsolidated Quaternary silt, sand, and gravel deposits and Tertiary sedimentary rocks; however, no significant paleontological resources are known to occur in the Decision Areas.

PRIORITY WILDLIFE SPECIES & HABITAT

A total of 28 special status plant and animal species reside or have the potential to reside within the Decision Areas. These species include nine mammals, five birds, four reptiles, three fish, and one invertebrate. Five of these (lesser long-nosed bat, Sonoran pronghorn antelope, Yuma clapper rail, southwestern willow flycatcher, and Arizona hedgehog cactus) are federally listed under the ESA. The yellow-billed cuckoo is a candidate species, meaning enough information is available to list it, but is precluded by other, higher priority species. As of December 2010, the Sonoran desert tortoise has been federally listed as an endangered species candidate. The population is deemed vulnerable and declining over much of its range due to habitat loss, degradation, and fragmentation; genetic contamination; collection; and disease (AGFD 1996).

SOIL RESOURCES

Soils are primarily the product of climate, parent material (i.e. underlying bedrock lithology or alluvium), and landscape. Landforms in the Planning Area consist of broad, alluvial basin floors separated by basaltic or granitic mountains, hills, and rock outcrops, dissected by several major drainages and numerous ephemeral ones. Upland parts of the basins are carved by desert washes with soils that are coarse- to medium-textured and cobbly to gravelly on the surface. Several large desert ephemeral (i.e. xeroriparian) washes divide the Planning Area. Deep, stratified sands, silts, and cobbles underlie the channels and floodplains with textures dependent on flow regimes.

Soil disturbance and compaction are present in long-term use areas, including livestock-congregation sites, roads, and parking areas. Larger areas of accelerated erosion and sedimentation are mainly in the Vekol Valley south of I-8. Based on best-available data and analysis in the allotment evaluations, accelerated soil erosion occurs infrequently. Water-erosion hazard is highest on the coarse-textured, steeper soils found in the granitic soils in the western and southwestern portions of the Planning Area. Wind-erosion hazards are highest on the fine-textured, irrigated soils of the major drainages. Except for data collected on allotments, very little soil condition data is collected that could be used to indicate trends.

VEGETATION RESOURCES

The Decision Areas contain eight major ecological zones: Creosote bush-Bursage, PaloVerde-Mixed Cacti, Sonoran Desert Mountain Community, Apacherian-Chihuahuan upland scrub, Mogollon Chaparral, Desert Grasslands, Riparian, and large Desert Washes (Xeroriparian). Six species of status plant species are known to occur or have the potential to occur within theDecision Areas. The acuña cactus is a candidate species for listing, meaning there is enough information available to list, but they are precluded by other higher priority species. Invasive species occur to varying degrees throughout the Lower Sonoran and SDNM Decision Areas and include Sahara mustard (*Brassica tournefortii*), fountain grass (*Pennisetum setaceum*), buffelgrass (*Pennisetum ciliare*), and salt cedar (*Tamarix ramosissima*), among others. In most cases these species are sparsely scattered throughout the planning area and can be controlled through proactive control measures. Infestation by salt cedar in some locations within the riparian community is so great that some native species are threatened with extirpation due to competition as well as habitat degradation and destruction.

VISUAL RESOURCES

The Planning Area typifies the Sonoran Desert, with northwest-southeast trending mountain ranges separated by broad valleys dissected by numerous ephemeral and perennial riparian corridors, the largest of which are the Gila River and Salt River systems. The dominant mountains within the Decision Areas are considered scenic quality Class A because of their distinctive ridgelines and dark color contrasts against the tan and green desert floor. In addition, Class A and Class B units are identified in bajada and xeroriparian areas, where there are added elements of visual interest from variation in landform, vegetation, color, and influence of adjacent scenery. Class C units are primarily found in the valley floors where variation is lowest in the flat terrain interspersed with low-to-moderate density coverage of desert scrub vegetation. Some areas are assigned a higher scenic quality rating due to the overall scarcity (i.e., unique, memorable, or

rare) within the region. In the Planning Area, the elements of "visibility" and "dark skies" also contribute to scenic quality.

WATER RESOURCES

The Planning Area includes portions of seven ground water basins and sub-basins, including the Harquahala Irrigation Non-Expansion Area and Phoenix, Pinal, and Tucson Active Management Areas. Shallow groundwater quality issues throughout the Planning Area are primarily related to the infiltration of agricultural wastewater, particularly in the Gila and Salt River valleys. Under the current amounts of groundwater mining, levels under the Planning Area will drop; however, the effects will be felt differently in different locations.

The Gila River is the predominant watercourse in the Lower Sonoran Decision Area. The BLM conducted an evaluation of the Gila River from Hayden Dam to the Colorado River to assess its eligibility for inclusion in the National Wild and Scenic River System, but concluded that this river does not meet the necessary qualifications.

WILD HORSE AND BURRO MANAGEMENT

Wild burros and, occasionally, a few wild horses have historically used portions of the Decision Areas on a year-round basis. Burros and wild horses are managed within the 215,000 acre Painted Rock Herd Area, which only exists in the Lower Sonoran Decision Area. The last census in the herd area (1999) found no animals present.

WILDERNESS CHARACTERISTICS

Wilderness characteristics are fully considered in the LS-SDNM Draft RMP. Approximately 429,500 acres were considered representing over 31 percent of the land in the combined Planning Area. Comparison of the 1978-1980 wilderness characteristics review, completed for Arizona public lands, with fieldwork conducted in 2003 and 2005, indicated that no incompatible land uses with long-lasting or irreversible effects had occurred. In fact, this comparison revealed a greater acreage than expected was found to exhibit wilderness characteristics in the Planning Area in 2005, indicating that recent land use patterns might have been favorable for maintenance of wilderness characteristics.

WILDLAND FIRE

Fire is not a major natural process in the Sonoran Desert ecosystem as associated vegetation types are not considered dependent or adapted to fire; however, above average winter precipitation can generate a sufficiently dense growth of grasses and other annual plants to potentially carry wildfire over a more widespread area than during years with average or below-average precipitation. Based on information collected for the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (2003), most public lands in the Planning Area are a mixture of Condition Class 1 and 2, with a small component of Condition Class 3, under average and less than average annual moisture trends. Condition classes are moisture dependent and above-average annual moisture results in a greater percentage of Condition Classes 2 and 3, which can result in the propagation of more grasses and invasive species.

RESOURCE USES:

LANDS & REALTY

The BLM administers approximately 1,416,600 acres of public lands (surface estate) in the Decision Areas, which includes 486,400 acres in the SDNM and 930,200 acres in the Lower Sonoran. The current land pattern is difficult to manage in areas of scattered and isolated parcels. Larger blocks of public lands provide for improved and more efficient management. Approximately 30,500 acres are designated as disposal or exchange areas (for surface estate) within the Lower Sonoran. The proclamation designating SDNM said all public land within it would be retained, unless a proposed exchange would further its protective purposes.

Currently, there are 10 designated utility corridors in the Lower Sonoran and three in the SDNM Decision Areas. The corridors generally are 1-mile wide, although near designated wilderness areas, widths are slightly narrower.

The Lower Sonoran Decision Area has the potential to support utility-scale renewable energy developments (primarily in the form of solar development); however no suitable locations for such developments exist in the Decision Area. Wilderness areas and the SDNM are closed to utility-scale renewable energy development.

LIVESTOCK GRAZING

The Lower Sonoran Decision Area has 44 permitted BLM-authorized grazing allotments, 21 of which have the potential to be ephemeral. There is a perennial permitted capacity of 17,541 Animal Unit Months (AUM's) for livestock forage. The SDNM Decision Area has 6 BLM-authorized grazing allotments north of Interstate-8. The total perennial permitted capacity is 8,703 AUMs. The SDNM proclamation mandated that grazing permits on public lands within the Monument south of I-8 would not be renewed at the end of their current term. All of these permits expired in 2008 and 2009. The proclamation also states that grazing on public lands north of I-8 will be allowed to continue only to the extent that the BLM determines that grazing is compatible with the paramount purpose of protecting the Monument objects identified in the proclamation. Overall, AUM's within the Planning Area have decreased over time, although the actual number varies from year to year as operators adjust their livestock numbers based on climatic conditions. This is due to grazing and grazing management in the Planning Area being substantially dependent on precipitation and the corresponding improvement in the abundance and vigor of forage species, as well as non-forage species that support the general health and condition of the soil and plant community.

MINERALS MANAGEMENT

There have been 33 exploratory wells drilled in the Planning Area since 1913. There has been no economic production to date, although there is moderate potential for oil and gas resources in approximately 10 percent of the Decision Areas. There is low potential and no known occurrences or prospects for carbon dioxide, helium, sodium or coal in the Planning Area. There is high potential for low-temperature geothermal resources in approximately 5 percent of the Planning Area, and moderate potential in about 85 percent of the Planning Area and Decision Areas. SDNM is closed to mineral leasing, subject to valid existing rights.

There is moderate potential for locatable minerals in approximately 10 percent of the Lower Sonoran Decision Area, located primarily in the mountain ranges with mineralized rock outcroppings in the Ajo Block, Gila Bend Mountains, and Buckeye Hills, and on public lands in northeast Pinal and Gila counties. Salable mineral resources have high potential throughout most of the Planning Area; there are currently eight pits in the Lower Sonoran and three existing pits in the SDNM Decision Areas.

RECREATION MANAGEMENT

Recreational experiences, setting, and activities in the Planning Area range from areas with primitive, unroaded qualities to more modified and roaded natural areas. Within the Decision Areas, visitors can, among other things, bike, camp, hike, ride horseback, backpack, hunt, target shoot, drive OHVs on vehicle routes, picnic, rock hound, geocache, observe cultural and historic sites, view/photograph wildlife, and experience wilderness areas.

The dramatic increase in population within and surrounding the Planning Area has resulted in increased demands for outdoor recreational opportunities and management of public lands. Recreational activities in both Decision Areas have increased substantially due to newly developed residential communities adjacent to large blocks of public lands.

TRAVEL MANAGEMENT

The Lower Sonoran and SDNM Decision Areas are affected by surface and air transportation, including motor vehicle use on highways, secondary roads, local streets, and improved and unimproved roads; OHV travel; non-motorized travel; and railroad operations.

Non-motorized travel commonly includes pedestrian, equestrian, and bicycling activities. All three occur within both the Decision Areas, although day hiking and backpacking are the most prevalent. All wilderness areas and the Coffeepot Botanical and Vekol Valley Grasslands ACECs are closed to OHV use. In all other parts, motor vehicles are limited to existing or designated routes. Visitors are required to obtain an annual safety briefing and access permit prior to entering and traveling in the Sand Tank Mountain area of SDNM.

SPECIAL DESIGNATIONS

Seventeen special designation areas currently exist within the Decision Areas. Five are located within the Lower Sonoran Decision Area and include Sierra Estrella, Signal Mountain, and Woolsey Peak wildernesses; Juan Bautista de Anza National Historic Trail (NHT); and Coffeepot Botanical ACEC. Six occur within the SDNM Decision Area and include the Monument itself plus the North and South Maricopa Mountains and Table Top wildernesses; Vekol Valley Grasslands ACEC; and Juan Bautista de Anza NHT.

HAZARDOUS MATERIALS & PUBLIC SAFETY

Seven active landfills are located within the Planning Area, but none within the Decision Areas. A significant waste issue, commonly known as “wildcat dumping,” frequently occurs on public lands, and commonly occurs near the urban-interface areas. Another form of hazardous

and non-hazardous waste involves litter from recreational users in the Decision Areas and undocumented aliens traveling through.

Data show over 180 active and abandoned mines located in the Lower Sonoran and SDNM Decision Areas. The BLM is researching and ranking the human health and safety risks from known abandoned sites to develop long-term reclamation, remediation, and restoration projects. Known and potential unexploded ordnance contamination represents an immediate public safety hazard. It exists in and around the Sand Tank Mountains (formerly Area A of the Barry M. Goldwater Range [BMGR]) and Sentinel Plain, due to their longtime inclusion in the BMGR).

Available data associated with the use of paved public highways, unpaved backcountry roads, and off-road areas indicate that the highest numbers of accidents on public highways and roads in the Decision Areas occur on I 8, State Route 85, and State Route 238/Maricopa Road. A number of accidents were also attributed to livestock along State Route 238/Maricopa Road. Excessive speed is the most common contributor to accidents on major roadways traversing public lands.

SOCIAL & ECONOMIC CONDITIONS

Based on the 2000 U.S. Census, the population of the tri-county region (consisting of Maricopa, Pima, and Pinal counties) was nearly 4.1 million, with nearly 3.1 million (75 percent) residing in Maricopa County, representing nearly 80 percent of Arizona's total population. Between 2000 and 2005, the region added another 750,000 persons.

Local population estimates, available for incorporated cities and towns, indicate the City of Maricopa had the fastest-growth rate of any city or town in the state between 2000 and 2005, while Buckeye and Goodyear had growth rates ranked sixth and seventh, respectively. Some communities, however, showed extremely slow population growth. This is especially true for the Gila County communities of Globe and Miami.

Resources and programs, such as minerals, renewable energy, livestock grazing, recreation, lands and realty, and public finance and government services provide direct, public economic ties that are important in some localities near the Decision Areas. Some resources, such as open spaces and sense of place, share closer social affinities than economic ties. As a result, there are stronger overall social ties between the public lands and the large economic centers in the Planning Area than there are economic ties to local communities.

Environmental Justice relates to disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority populations, low-income populations, and American Indian tribes. The proportion of minority population in Pima and Pinal counties exceeds that of the state, while Maricopa and Gila counties have a smaller minority share than the state. Most of the individual incorporated and unincorporated areas analyzed are minority communities, as well as all American Indian reservations. Of the four counties considered (Maricopa, Pima, Pinal and Gila), all but Maricopa have poverty rates that exceed the statewide average. In most cases, poverty rates among individual communities are relatively close to the state average. However, exceptions occur on the Gila River Indian Community and the Tohono O'odham Nation where poverty levels were considerably higher than the state average.

ENVIRONMENTAL CONSEQUENCES

The foreseeable environmental effects of the five alternatives analyzed in these Draft RMP/EIS on the above resources, uses, and conditions are summarized below.

Table 3. Environmental Consequences by Program Area for the Planning Area (In Alphabetical Order)

Alternative	General Range of Impact Intensities	General Summary of the Impacts
Resources::		
A	Negligible-Moderate	The primary air quality measure affected by activities on public lands is particulate matter, particularly PM_{10} and $PM_{2.5}$. Impacts would stem from surface-disturbing activities and vehicular travel on unpaved routes. Management practices in all action alternatives would generally improve air quality throughout the Decision Areas. Alternative D would have the least impact related to air quality in the planning area. Though BLM's contribution to air pollution in the Planning Area is negligible, proposals to limit motorized vehicles to designated routes and allocations or special area designations that limit expansion of route networks would result in target pollutants at or reduced from current levels.
B	Negligible-Moderate	
C	Negligible-Moderate	
D	Negligible-Minor	
E	Negligible-Moderate	
Cave Resources		
No cave resources have been identified in the decision areas. Although a small amount of known Paleozoic limestone outcrops and lava tubes do exist, LUP level impacts on these resources were are anticipated to be negligible.		
Cultural & Heritage Resources		
A	Negligible-Major	Impacts on cultural resources result from ground disturbance such as cross-country OHV travel, wildfires, unauthorized collection, vandalism, trash accumulation, and trampling due to human or livestock activities. Other impacts, including permanent destruction of site features, result from recreational target shooting activities, especially those that are intensive, repetitive, and concentrated. Under all alternatives, cultural resources would continue to be affected by natural weathering and erosion processes and all alternative management actions would provide sufficient protection for known cultural resources, although there would be varying levels of impacts to sites developed for public use.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Paleontological Resources		
Limited paleontological resources have been found in the planning area, therefore impacts on these resources are not discussed in detail.		
Priority Wildlife Species & Habitat		

Alternative	General Range of Impact Intensities	General Summary of the Impacts
A	Negligible-Major	Impacts would stem primarily from loss or alteration of native habitats. Alterations could lead to the increased expansion of noxious and invasive weed species, decreased water availability, and increased habitat fragmentation, changes in habitat and species composition, and direct loss of wildlife. Actions designed to maintain or improve conditions for the desert tortoise should help their populations and avoid listing as threatened or endangered.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Soil Resources		
A	Negligible-Major	Impacts would stem primarily from ground-disturbing activities such as grazing, recreation (especially OHV use), and mineral exploration. Impacts include accelerated erosion, compaction, displacement, puddling, and rutting of soils, which impact soils natural productivity. Management proposed under all the alternatives provides measures to reduce soil erosion and maintain or enhance soil productivity.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Vegetation Resources		
A	Negligible-Major	Impacts to vegetation communities generally occur from surface disturbing activities such as: mining, authorizing land actions, recreation and livestock grazing. Impacts from various surface disturbing activities include the direct removal of vegetation, the spread of invasive weed species, and changes in ecological conditions necessary to support functioning and healthy vegetation communities (i.e. impacts to soils or water supply and/or quality).
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Visual Resources		
A	Negligible-Major	Impacts would stem primarily from management actions that visibly change the natural landscape, which are guided by visual resource management classes. All alternatives explore allocations that minimize visual impacts while meeting demand for public land resources. Most impacts are associated with resource use activities such as recreation, utility development, grazing, and mining, which typically are visual distractions to public land visitors.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Water Resources		

Alternative	General Range of Impact Intensities	General Summary of the Impacts
A	Negligible-Moderate	Impacts would stem primarily from ground-disturbing activities such as grazing, recreation (especially OHV use), and mineral exploration. Management practices proposed under all alternatives are designed to promote or improve water production and quality. Most water related issues in Arizona are a result of rapid population growth on lands not within the National System of Public Lands. Though BLM's management actions can have only limited effects, proposals to manage motorized vehicles, actions designed to improve vegetation cover and protect or enhance riparian vegetation communities would improve or maintain water production and quality in the Decision Areas.
B	Negligible-Moderate	
C	Negligible-Moderate	
D	Negligible-Minor	
E	Negligible-Moderate	
Wild Horses & Burros		
Due to the fact that the intent of the existing decisions and proposed alternative decision is to remove all wild horse or burros from the Painted Rocks Herd Area, any impacts from other program areas on these wild horses and burros would be negligible, therefore, impacts from other resources will not be discussed in detail.		
Wilderness Characteristics		
A	Negligible-Major	Impacts would stem primarily from actions that affect the extent, distribution or quality of naturalness and/or opportunities for solitude and primitive and unconfined recreation. Although designated wilderness would continue to be protected, current management could allow progressive degradation of areas with wilderness characteristics not protected by congressional wilderness designation. The alternatives explore shifting emphasis from current management to management of large areas allocated as lands managed to protect wilderness characteristics. All alternatives explore differing mixes of allocations devoted to both motorized and non-motorized recreation. Alternatives C, D and E emphasize a range of lands managed to protect wilderness characteristics.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Wildland Fire		
A	Negligible-Moderate	Impacts would stem primarily from actions that would affect the type and abundance of fuels, increase or limit sources of ignition, and affect fire-suppression activities. Though the alternatives explore varying allocations for large undeveloped areas, few impacts to fire suppression or fire use management are anticipated.
B	Negligible-Moderate	
C	Negligible-Moderate	
D	Negligible-Moderate	
E	Negligible-Moderate	
Resource Uses:		
Lands & Realty		

Alternative	General Range of Impact Intensities	General Summary of the Impacts
A	Negligible-Major	Impacts would stem primarily from land use allocations or actions that would prevent the authorization of ROWs, leases, and land tenure actions in certain resource rich areas. Impacts from restrictive actions could force utility development onto non-federal lands in the planning area, in order to meet the utility demands of the growing population in the planning area. The amount of restricted acres varies among the alternatives, with Alternative B being the least restrictive and Alternative D being the most restrictive. However, throughout all of the alternatives, there are available opportunities for land use authorizations and land tenure actions.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Livestock Grazing		
A	Negligible-Major	Impacts would stem primarily from management actions that affect forage levels, ability to construct range improvements, human disturbance of livestock, costs associated with livestock management, and recreation. The greatest potential for impacts would likely occur from recreation under Alternatives A, B, C, and E. Alternative D explores complete cessation of grazing in the Decision Areas, potentially putting many livestock operators that currently use the Planning Area's public lands out of business.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Minerals Management		
A	Negligible-Moderate	Impacts would stem primarily from land use allocations or actions that would prohibit ground disturbing activities related to mining activities from taking place. As with lands and realty actions, impacts from these restrictive actions would promote mineral development on other non-federal lands in the planning area or would hinder the mining industry.
B	Negligible-Moderate	
C	Negligible-Moderate	
D	Negligible-Major	
E	Negligible-Moderate	
Recreation Management		
A	Negligible-Major	Impacts would stem primarily from management actions that affect recreational resources and travel across public lands. Conflicts between different types of recreation uses constitute one of the most pressing issues on public lands in Central Arizona. Target shooting for example is restricted within the SDNM in Alternatives D and E and portions of the SDNM in Alternatives B and C. Each alternative attempts to address recreation management in ways that allow a variety of activities throughout the Decision Areas, and places a different emphasis on the type of recreation (i.e., motorized versus primitive non-motorized).
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Travel Management		

Alternative	General Range of Impact Intensities	General Summary of the Impacts
A	Negligible-Moderate	Impacts would stem primarily from RMP-level travel management decisions for designating areas as open, limited, or closed to OHV use, and the implementation-level decisions for designating particular routes as open, limited, or closed to public use. The alternatives explore progressively increasing restrictions to motorized recreation and access, which would result in a progressively limited, motorized route network and reduced access. Within the SDNM, a route designation system would be implemented, except within Alternative A. Impacts from not having a route system could result in the continue establishment of unwanted access points and routes leading into public lands, which would result in more negative impacts to monument objects.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Special Designations		
A	Negligible-Moderate	Impacts would stem primarily from management of resource values associated with the existing or proposed special designations. Therefore, actions related to recreation, lands actions, grazing, and mining would indirectly impact the special designations by impacting resources such as vegetation. Proposed management would generally have little impact to existing designations, though they are altered under some alternatives.
B	Negligible-Moderate	
C	Negligible-Moderate	
D	Negligible-Moderate	
E	Negligible-Moderate	
Hazardous Materials & Public Safety		
A	Negligible-Major	Impacts would stem primarily from management actions that affect responses to physical hazards (e.g., abandoned mines), hazardous materials, and illegal activity related to the U.S./Mexico border. Management related to wildlands fire management, utility development, and other resource uses could present public safety concerns. Impacts are substantially similar across all of the alternatives.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	
Socioeconomics		
A	Negligible-Major	Impacts to social and economic conditions and environmental justice would stem primarily from management actions that alter employment/income and social well-being. Such impacts would be negligible on a regional basis under all alternatives. At the local level, however, impacts could be major under Alternative D, with the potential loss of nearly 100 ranch businesses from grazing cessation. Additional closures to mineral development would not result in loss of current jobs or reduction in current economic development, but may result in the loss of potential jobs and income for future mining opportunities. Implementation of any alternative proposed in these Draft RMPs would not result in a disproportionate impact to any minority or low-income group.
B	Negligible-Major	
C	Negligible-Major	
D	Negligible-Major	
E	Negligible-Major	

Alternative	General Range of Impact Intensities	General Summary of the Impacts
Tribal Interests		
A	Negligible-Moderate	Several American Indian tribes have traditional cultural affiliations with the Decision Areas. The Ak-Chin Indian Community, Fort McDowell Yavapai Nation, Fort Sill Apache Tribe of Oklahoma, Gila River Indian Community, Hopi Tribe, Pascua Yaqui Tribe, Salt River Pima-Maricopa Indian Community, San Carlos Apache Tribe, Tohono O'odham Nation, Tonto Apache, White Mountain Apache Tribe, Yavapai-Apache Nation, and Yavapai-Prescott Indian Tribe were contacted by formal consultation letters and follow-up telephone calls. More recently, three tribal communities, the Fort Mohave Indian Tribe, Fort Yuma-Quechan Tribe, and Colorado River Indian Tribes, were identified for consultations as well.
B	Negligible-Moderate	
C	Negligible-Moderate	
D	Negligible-Moderate	
E	Negligible-Moderate	

Chapter 1. Purpose & Need for the RMP

The U.S. Department of the Interior (DOI), Bureau of Land Management (BLM) prepares resource management plans (RMPs) to guide and manage resources and uses in the National System of Public Lands. These RMPs are the basis of future management of BLM-administered public lands (public lands) and provide a framework for developing subsequent detailed plans for specific resources and uses. The BLM's Phoenix District, Lower Sonoran Field Office (LSFO) is engaged in a planning process to update management direction for public lands in the south central portion of Arizona, which is referred to as the Lower Sonoran Planning Area (Planning Area) throughout this document. While the BLM makes decisions related only to public lands and associated resources, the agency is responsible for collaboratively planning with adjacent jurisdictions and the public to encourage compatible land uses within a regional context.

On January 17, 2001, a portion of the Planning Area was designated as the Sonoran Desert National Monument (SDNM) when President William J. Clinton issued Presidential Proclamation 7397 (Appendix A, *Sonoran Desert National Monument Presidential Proclamation* (p.)). The Monument was created to protect an array of scientific, biological, archaeological, geological, cultural, and historical objects. These objects, both individually and collectively, in the context of the natural environments that support and protect them, are referred to as "Monument objects." The LSFO is responsible for the management of public lands within the SDNM in a manner that is consistent with management guidance outlined in the proclamation. Due to such special management requirements for the Monument, the Lower Sonoran Planning Area is divided into two Decision Areas: the SDNM Decision Area, which includes all public lands in the Monument, and the Lower Sonoran Decision Area, which includes all public lands within the Planning Area outside the Monument. In this planning effort, the LSFO will provide management direction for the Lower Sonoran Decision Area and another for the SDNM Decision Area. The planning process presented in this Draft RMP/EIS will be used to develop two separate RMPs/Records of Decision (RODs): one that will provide management direction for the Lower Sonoran Decision Area and another for the SDNM Decision Area.

This document, the Lower Sonoran and SDNM Draft RMP and Draft EIS (Draft RMP/EIS), was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [USC] 4321 et seq.) and the U.S. Council on Environmental Quality (CEQ) implementation regulations (40 Code of Federal Regulation [CFR] 1500 et seq.). This document was produced in accordance with all applicable Federal statutes and regulations (Appendix B, *Applicable Laws, Regulations, and Policies* (p. 1003)). The selected planning approach is consistent with the requirements found in the Federal Land Policy & Management Act (FLPMA) of 1976 (43 USC 1701). The process is also compliant with the set of instruction memoranda, information bulletins, and other appropriate BLM manuals, handbooks, and strategic plans that embody the most current BLM practices regarding the process and content resulting documents.

Note: New regulations, manuals, policies, and guidance have been issued that affect the management of several resources and resource uses within the Planning Area. Less complex adjustments have been incorporated into this draft; however, changes requiring further analysis or a re-evaluation of proposed allocations and management decisions will be postponed until after this draft is published. Changes will be included in the Proposed RMP/EIS, including changes related to BLM Director's Office Instruction Memorandum (IM) No. DOIM 2011-004, which revises recreation land-use planning guidance; IM No. AZ-2011-005, which updates the BLM plant and animal sensitive-species list; and the addition of the Sonoran desert tortoise to the U.S. Fish and Wildlife Service (USFWS) candidate species list.

1.1. PURPOSE AND NEED

1.1.1. Purpose for the Lower Sonoran and SDNM RMPs

The purpose of the Lower Sonoran/SDNM Draft RMP is to provide guidance for managing the use of public lands and to provide a framework for future land-management actions within the Planning Area. To accomplish this, the Draft RMP/EIS will consolidate and replace the current management guidance for each Decision Area and respond to changed conditions by identifying and carrying forward previous decisions that are still applicable and, where necessary, modify existing management direction. Management of the decision areas is currently provided by a series of existing land use plans and plan amendments that were implemented at various times from 1983 through 2008. These existing plans, and amendments and the Decision Area to which they apply, are presented in Table 1.1, "Current Land Use Plans and Plan Amendments" (p. 2) and in Map 1–2. The Monument is also guided by Presidential Proclamation No. 7397 and interim Monument guidance.

Table 1.1. Current Land Use Plans and Plan Amendments

Land Use Plans or Land Use Plan Amendment	Lower Sonoran Decision Area	SDNM Decision Area
Land Use Plans		
Lower Gila North Management Framework Plan (BLM 1983)	Yes; Saddle Mountain area only	No
Lower Gila South RMP (BLM 1988)	Yes; excluding Saddle Mountain, East Valley parcels, and Sentinel Plain.	Yes, excluding Sand Tank Mountains
Phoenix Resource Area RMP (BLM 1989)	Yes; East Valley parcels only	No
Land Use Plans Amendments		
Lower Gila South RMP Goldwater Amendment (BLM 1990)	Yes; Sentinel Plain and Ajo parcels only	Yes; Sand Tank Mountains only*
Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (BLM 1997)	Yes; entire Decision Area	Yes; entire Decision Area
Statewide Amendment for Fire, Fuels, and Air Quality (BLM 2003)	Yes; entire Decision Area	Yes; entire Decision Area
Cameron Allotment Amendment to the Lower Gila South RMP (2004)	Yes; grazing allotments in the Ajo area	No
Amendment to the Lower Gila North Management Framework Plan and the Lower Gila South RMP (2005)	Yes; excludes East Valley parcels	Yes; entire Decision Area
* Some decisions superseded by the Monument proclamation and interim guidance		

1.1.2. Need for the Lower Sonoran and SDNM RMPs

The SDNM RMP is needed to respond to the establishment of the SDNM. The Monument proclamation assigns the BLM with the responsibility to protect objects for which the Monument was established, and requires that an RMP be prepared to ensure that the management actions needed to do so are identified and implemented. In the absence of such a plan, current management for the SDNM falls under interim Monument guidance, the various existing RMPs, and plan amendments. These documents do not address many current management issues.

In addition, there is a need to consolidate the three previous RMPs and five plan amendments (see Table 1.1, "Current Land Use Plans and Plan Amendments" (p. 2)) for both the Lower Sonoran

and SDNM Decision Areas because existing plans contain obsolete planning boundaries and management decisions. Over the nearly 30 years during which these plans have been in effect, significant and ongoing changes have occurred that have dramatically altered the natural and social environments in the Planning Area. Existing management decisions in these plans have not kept pace with changing circumstances, demographics, resource conditions, and policies. New RMPs are needed to address changing conditions, which include:

- Unprecedented regional population growth and urban expansion into surrounding public lands is increasing demand for access to and use of public lands and resources. Growth increases demand for commodities, utilities, renewable energy, communication facilities, transportation, and infrastructure on public lands;

- Emerging recreational activities, some of which are based on recent technologies, have yielded new recreational equipment;

- New legal and BLM policy requirements have resulted in additional or revised management responsibilities; and

- New information and understandings of ecological relationships has lead to changes in management direction.

1.2. PLANNING AREA AND SETTING

1.2.1. Planning Area

The Planning Area, identified on Map 1–1, covers nearly 8.9 million acres of south-central Arizona and includes much of Maricopa County, as well as sections of Gila, Pima, Pinal, and Yuma counties. Population centers within or adjacent to the Planning Area include metropolitan Phoenix and the communities of Goodyear, Buckeye, Gila Bend, Ajo, Globe-Miami, Tonopah, Mobile, Maricopa, Casa Grande, and Sells. The Planning Area encompasses Federal and State-administered, private, and tribal lands. As identified in Table 1.2, "Surface Management Responsibility/Ownership in the Lower Sonoran Planning Area" (p. 4), the BLM manages 1,416,600 surface acres of public lands in the Planning Area, which include 1,338,300 acres of mineral estate also managed by the BLM. The State manages the remaining acres. The BLM manages another 210,000 acres of mineral estate where the surface acres are managed by other non-Federal landowners, which are referred to as split estate lands. More information regarding mineral estate management may be found in Chapter 3, *Affected Environment* (p. 251). Unless otherwise identified, this Draft RMP/EIS focuses on surface acres of public lands. The BLM is responsible only for the management of public lands within the Planning Area. These lands are divided into the two Decision Areas (Lower Sonoran and SDNM), which are discussed in detail in the following section.

Note: Due to BLM efforts to review, research, and correct parcels and GIS data shape files, information regarding surface-management responsibility and other acreage/mile figures used for allocations and analysis calculations may be adjusted between this draft and the proposed final RMP. Notes are made throughout the document and on maps where this may occur.

Table 1.2. Surface Management Responsibility/Ownership in the Lower Sonoran Planning Area

Surface Management Responsibility/Ownership	Planning Area Surface Acres	% of Area	Planning Area Surface Acres (Excluding SDNM)	% of Area	SDNM Surface Acres	% of Area
BLM	1,416,600	16.0	930,200	11.1	486,400	97.9
Other Federal Agencies	2,374,300	26.8	2,368,800	28.3	--	--
American Indian Tribes	3,237,100	36.5	3,236,100	38.7	--	--
State Lands	366,300	4.1	371,500	4.4	3,900	0.8
Private Lands	1,402,000	15.8	1,386,100	16.6	6,100	1.2
Other Non-Federal Lands	71,700	0.8	--	--	--	--
Total Surface Acres/Total Percent of Area	8,868,000	100.0	8,371,400	100.0	496,600	100.0
SOURCE: BLM 2010						

While the majority of public lands in the Planning Area are consolidated, some small tracts are interspersed with other Federal, State, and private lands. Other Federal land managers include the U.S. Air Force, National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), Bureau of Reclamation, and U.S. Forest Service (USFS). Some of the large landowners and managers include Arizona State Land Departmentfor State Trust Land; county parks; and various tribes including the Tohono O'odham Nation, Gila River Indian Community, Salt River Pima-Maricopa Indian Community, and Ak-Chin Indian Community. In addition, other agencies may have specialized management responsibilities, such as the Arizona Game and Fish Department (AGFD) responsibility for managing wildlife for the State.

1.2.2. Decision Areas

As mentioned above, the BLM is responsible only for management of public lands the Planning Area, which is divided into the Lower Sonoran and SDNM Decision Areas (see Map 1–1). The acres of public lands reported in Table 1.2, "Surface Management Responsibility/Ownership in the Lower Sonoran Planning Area" (p. 4) Responsibility/Ownership in the Lower Sonoran Planning Area are subject to change if the BLM acquires or disposes of such lands. Newly acquired lands would be managed according to the decisions in the applicable RMP, negating the need for a plan amendment.

1.2.2.1. Lower Sonoran Decision Area

The Lower Sonoran Decision Area covers a wide geographic region. Specific geographic areas are used for reference in subsequent discussions throughout the plan. These geographic areas are shown on Map 1–3 and are summarized below:

- Saddle Mountain (Area 1 on map): Public lands in the north portion of the Planning Area near Tonopah and Interstate 10 (I-10)
- Buckeye Hills, and Rainbow and Vekol valleys (Area 2 on map): Tracts of public lands east of State Route 85 but outside the SDNM
- Gila Bend and Painted Rock mountains (Area 3 on map): Public lands in the portion of the Planning Area west of the SDNM and between Interstate 8 (I-8) and I–10

- Sentinel Plain (Area 4 on map): Public lands west of Gila Bend and south of I-8
- South Gila Bend (Area 5 on map): The small but consolidated block of public lands southeast of Gila Bend and west of the SDNM
- Ajo Block (Area 6 on map): The tract of public lands in the vicinity of Ajo, Arizona
- East Valley and Globe/Miami (Area 7 on map): The scattered tracts east of the Phoenix metropolitan area

1.2.2.2. SDNM Decision Area

As stated in Presidential Proclamation 7397, the SDNM was designated to protect "a magnificent example of untrammeled Sonoran desert landscape" with an "extraordinary array of biological, scientific, and historic resources" (see Appendix A, *Sonoran Desert National Monument Presidential Proclamation* (p.)). The Monument is considered a geographic area (area 8 on Map 1-3), which contains one sub-area, the Sand Tank Mountains, formerly known as "Area A", (area 9 on map), which is located in the southwest corner of the Monument.

1.2.2.3. The Barry M. Goldwater Range Relinquished Parcels

In addition to the above, specific geographic parcels also referred to throughout the plan are the "BGR relinquished parcels." These lands were withdrawn and reserved for military use in the 1940s by the Secretary of the Air Force to be managed as part of the BGR and were relinquished to the BLM in 2001 per Public Law 106-65 (1999). These parcels include 78,000 acres in the southern portion of the SDNM (formerly known as "Area A"), 21,400 acres in Sentinel Plain (portions of the geographic area noted above), and 2,900 acres near the Ajo Airport referred to as the "Ajo Airport parcels."

1.3. Planning Process and Issues

1.3.1. Planning Process

An RMP is the master land-use plan that guides the management of public lands in a particular area or administrative unit. They are usually prepared to cover the lands administered by a certain field office. An approved RMP establishes the following items in a written document:

- Resource condition goals and objectives,
- Allowable resource uses and related levels of production or use to be maintained,
- Land areas to be managed for limited, restricted, or exclusive resource uses or for transfer from BLM administration,
- Program constraints and general management practices and protocols,
- General implementation schedule or sequences, and
- Intervals and standards for monitoring the plan.

In accordance with 43 CFR 1610.4, preparation of an RMP involves interrelated steps as described in Table 1.3, "Land Use Planning Process" (p. 6). This table identifies where this Draft RMP/EIS fit in the overall planning process.

Table 1.3. Land Use Planning Process

Planning Steps	Description
Identify Issues	Issues or land use problems that need to be resolved are identified. This ongoing process ties to the NEPA scoping process.
Develop Planning Criteria	Planning criteria establish constraints and guides for the planning process; streamline the process; establish standards, rules, and measures; set the scope of inventory and data collection; identify the range of alternatives; and estimate the extent of analysis. Preliminary planning criteria developed by the BLM can be modified through public comment.
Issue Notice of Intent (NOI)/ Scoping	The NOI is published in the Federal Register, local media, mailings, etc. The NOI identifies the preliminary issues and planning criteria and provides for a 30-day public review and comment period. This is also the start of the formal NEPA scoping process inviting the public to identify issues or land use problems that need to be resolved. In addition to the Federal Register notice, ideas are solicited through mailings, newspaper articles, public meetings, and workshops. Ideas from public, private, and internal sources are gathered, screened, and evaluated. The issues to guide the planning process are also summarized.
Collect Inventory Data	Inventory data is collected based on the planning criteria. Data is generally collected from existing sources. New data collection is limited to what is needed to resolve the planning issues identified.
Write Analysis of the Management Situation (AMS)	Information is gathered on the current management situation, pertinent physical and biological characteristics are described, and the capability and condition of the resources are evaluated. This analysis provides a reference for developing and evaluating alternatives.
Formulate Alternatives	A range of reasonable combinations of resource uses and management practices is identified. Reasonable alternatives are developed that address issues identified during scoping and that offer a distinct choice among potential management strategies. This includes a "No Action" Alternative, which is representative of the current management situation.
Estimate Effects of Alternatives	The impacts of each alternative on the environment and management situation are estimated.
Select the Preferred Alternative	The Field Manager recommends to the State Director a preferred alternative that best resolves planning issues and promotes balanced multiple use objectives. The State Director approves the selection of the preferred alternative along with the other alternatives under consideration.
Issue Draft RMP/EIS	**The Notice of Availability (NOA) is published in the Federal Register, media, mailings, etc. The NOA notifies the public of the availability of the Draft RMP/EIS and provides for a 90-day public review and comment period.**

Planning Steps	Description
Issue Proposed RMP/ Final EIS (PRMP/FEIS)	Public comments are evaluated and any needed modifications are made. A second NOA is published and a copy of the PRMP/FEIS is filed with the Environmental Protection Agency. This initiates the 30-day protest period under 43 CFR 1610.5-2.
Governor's Consistency Review	A 60-day Governor's review to identify inconsistencies with State or local plans is initiated simultaneously with the protest period on the PRMP/FEIS.
Protests	Protests are resolved by the Director by dismissing, denying, remanding, or granting the protests in whole or in part. Planning decisions that are not under protest, or that are denied or dismissed, may be implemented.
Plan Approval	Once protests have been resolved and the Governor's consistency review has been completed, the State Director may approve the RMPs by signing the Records of Decision (RODs). An NOA is issued indicating that the Approved Plans/RODs are available.
Monitor and Evaluate the RMPs	The BLM ensures that the RMPs are continually monitored and evaluated until they are replaced.

1.3.2. Public Scoping

The first step of preparing a draft RMP is identifying land use problems or issues that need be addressed. These planning issues focus the direction and character of future public land management so that existing resource conflicts may be resolved, goals and objectives may be achieved, and future demands for resource use may be met.

Public scoping for the Draft RMP/EIS was announced in a Federal Register notice on April 24, 2002 for the SDNM Decision Area and in a second notice on December 9, 2002 for the Lower Sonoran Decision Area. The opportunity to comment was also publicized through news releases, mail notification, flyers, and other methods. Eleven public scoping meetings were held and the public was invited to submit written comments. Overall, more than 6,000 comments were received during the scoping period.

Since scoping, the BLM has held additional public workshops throughout the Planning Area to collaborate on (1) planning criteria, (2) RMP goals and objectives, (3) the range of alternatives, and (4) preliminary alternatives.

1.3.3. Collaboration

Consultation with American Indian tribes and coordination with numerous agencies and governments at the Federal, State, and local levels has been an ongoing aspect of the planning process. Periodic interdisciplinary team meetings have been held at key points in the process. Early in the process, the BLM invited all agencies and tribes in Arizona to attend a workshop discussing the cooperating agency process. As a result, cooperating agencies for preparation of the Draft RMP/EIS include the Tohono O'odham Nation, Ak-Chin Indian Community, U.S. Air Force, U.S. Marine Corps, Department of Homeland Security (Border Patrol), Federal

Highway Administration, AGFD, and Arizona Department of Transportation. A memorandum of understanding (MOU) is also in place between the BLM and USFWS pursuant to both agencies' responsibilities under the Endangered Species Act. An agreement also is in place between the BLM and State Historic Preservation Office (SHPO) pursuant to responsibilities for cultural resources.

1.3.4. Planning Issues Addressed in the RMP Process

One of the most important outcomes of the scoping process was the identification of significant issues to be addressed in this Draft RMP/EIS. For planning purposes, an "issue" is defined as a matter of controversy or dispute over potential land and resource allocations, levels of resource use, production, and related management practices. Issues help determine what decisions will be made in the RMP and what the Draft EIS must address as required by NEPA.

Based on the more than 6,000 scoping comments received and subsequent analysis and evaluation, six major planning issues were identified within the scope of this Draft RMP/EIS. All six issues center on larger issue of balancing resource use and human activity with the mandated level of resource protection.

The issues presented here are broadly stated. Nested within each of these issues are many resource questions that are addressed in this document. The variety of ways these questions can be answered, within BLM legal mandates and current management direction constraints, helped to formulate the action alternatives considered in this Draft RMP/EIS.

1.3.4.1. Issue 1: Travel Management

How will the BLM manage travel and public access?

Travel management is an important issues for the public and presents a management challenge for the BLM. Many who commented during the public scoping process felt that existing roads and trails should be kept open for public use and, where necessary, maintained, upgraded, or improved to provide safe and efficient public access. Others were opposed to the creation of new roads and/or believed that unnecessary roads should be closed for the protection of resources, particularly those roads that might fragment wildlife habitat or damage archaeological sites or riparian areas.

Additionally, members of the public expressed concern with the type of motor vehicle use that should be allowed to gain access to the Decision Areas, with viewpoints falling into two general categories: 1) those that valued off-highway vehicle (OHV) use and favored no or minimal further limitations on such use and 2) those that expressed concern for the adverse effects from unregulated or increased OHV activities.

The SDNM proclamation specifically states that all off-road motorized and mechanized vehicle use will be prohibited except for emergency or authorized administrative purposes. Such use, however, is considered for the Lower Sonoran Decision Area under the action alternatives described in Chapter 2, *Alternatives* (p. 27).

1.3.4.2. Issue 2: Wilderness Characteristics

How will the BLM manage wilderness characteristics in the Decision Areas?

A number of individuals and groups voiced their concern for protecting areas with wilderness characteristics in the Decision Areas, specifically in the SDNM. A number of citizen groups and individuals suggested additional wilderness designations during the public scoping period, including the establishment of 16 new wilderness study areas (WSAs) totaling 250,000 acres. Other commenters felt that there is an abundance of existing wilderness, national monuments, wildlife refuges, and other restricted access lands in the region and were opposed to the additional wilderness-related allocations.

The discussion concerning recommending the designation of additional wilderness areas is outside the scope of this Draft RMP/EIS. Only Congress can designate wilderness areas and there is no BLM policy for establishment of WSAs. However, areas that contain wilderness characteristics can be managed by the BLM to protect those characteristics. Various alternatives are presented in Chapter 2, *Alternatives* (p. 27) of this document.

1.3.4.3. Issue 3: Wildlife

How will the BLM address wildlife management, including special status species and wildlife water developments in the Decision Areas?

Various wildlife-water development programs, initiated in the 1940s and 1950s throughout the western United States, have provided sources of freestanding water under the assumption that this is a key limiting factor on wildlife populations in arid habitats. Critics have suggested that wildlife water developments have not yielded expected benefits and may negatively influence wildlife by increasing predation, competition, and disease transmission. The scientific community in Arizona, led by the efforts of AGFD, is studying whether water developments are necessary for wildlife, what effect developments might have on populations of non-target animals (e.g., predators), and the development of additional wildlife waters. Scoping comments received regarding wildlife water developments represent both sides of the debate. Some individuals advocated that no new wildlife waters be developed while others stressed the importance of allowing the continued access, maintenance, redevelopment, and/or construction of wildlife waters.

Wildlife corridors have also arisen as an important issue related to wildlife. Due to growth, existing rights-of-way (ROWs), and the preponderance of wildlife corridors lying outside of BLM jurisdiction in the Planning Area, there is concern about maintenance of sufficient wildlife movement corridors within the Decision Areas. Several alternatives to addressing this issue are discussed in Chapter 2, *Alternatives* (p. 27) of this document.

1.3.4.4. Issue 4: Livestock Grazing

How will livestock grazing be addressed in the Decision Areas, particularly in the SDNM?

The scoping process identified livestock grazing as an important issue for a number of people. Many comments pertained to better management of livestock grazing or were in favor of ending

livestock grazing on public lands. There were some who advocated prohibiting certain kinds of grazing (e.g., year-round, domestic animals, stock grazing) and those who advocated prohibiting grazing in certain areas (e.g., Sonoran pronghorn and/or desert tortoise habitat, riparian areas), or under certain conditions (e.g., drought, when not sustainable).

The SDNM proclamation mandates that grazing permits on public lands within the Monument south of I-8 will not be renewed at the end of their current term. All of these permits expired in 2008 and 2009. The proclamation also states that grazing on public lands north of I-8 will be allowed to continue only to the extent that the BLM determines that grazing is compatible with the paramount purpose of protecting the Monument objects identified in the proclamation. These constraints are included in the grazing alternatives in Chapter 2, *Alternatives* (p. 27).

1.3.4.5. Issue 5: Energy Development

How will renewable and traditional energy facilities and transmission corridors be managed?

Given the growth in renewable energy interest in the Sonoran Desert, much concern was expressed regarding utility corridors and some concern was expressed regarding renewable energy, particularly solar sites. The energy-generating and transmission industries urged the BLM to consider the importance of providing additional utility corridors to meet growing demands for electrical energy requirements in Arizona. Others urged the BLM to consolidate requests for new transmission lines within existing utility corridors and to refrain from granting ROWs for new corridors. One exception to the opposition to new corridors was a proposal that new transmission lines be accommodated within corridors established within 400 feet of each side of highways.

Given public concern and increased demand for energy, several alternatives for mineral and transmission use, along with land use authorizations, are discussed in Chapter 2, *Alternatives* (p. 27).

1.3.4.6. Issue 6: Recreation

How will public recreation activities be managed?

During public scoping, people reported that they enjoy a wide variety of activities in the Decision Areas, including hiking, hunting, sightseeing, camping, observing wildlife, and OHV use. They expressed desires for continued opportunities for such activities. Many of the comments overlapped with the travel management issues, particularly with regard to OHV use. Some disagreed with the types of recreational activities that should be allowed in the Decision Areas, or specifically on the Monument. Many expressed concern for the management of certain types of recreation to minimize environmental impacts. Some commenters advocated for dispersed recreation, while others advocated for the development of various types of recreational services (e.g., interpretive sites, restrooms, recreational vehicles areas, equestrian facilities, etc.). Some individuals advocated the development of non-motorized recreational opportunities while others preferred motorized forms of recreation. There were comments in support of dispersed, primitive-type camping as well as comments in support of having more developed camping with services and facilities.

While some people indicated that they enjoy recreational shooting within the Decision Areas, others expressed their opposition to recreational shooting due to its resource impacts as well as noise and public safety concerns. The BLM also is concerned with the public safety implications of recreational target shooting and the damage it may cause to resources in the Decision Areas, particularly to Monument objects.

Given the proximity of the Decision Areas to the Phoenix metro area and the increased participation of people in recreation pursuits on public lands over time, ineffective management of visitor activities is recognized as potentially having profound environmental effects on both Decision Areas. These possible effects, along with potential user conflicts, make appropriate management of recreational activities crucial to protecting public resources. Decisions such as where and what kind of recreational facilities to provide, how to minimize potential user conflicts, and what types of recreation settings should be maintained in specific areas, are important elements addressed in Chapter 2, *Alternatives* (p. 27) of this document.

1.3.5. Planning Issues Considered But Not Further Analyzed in this RMP Process

The issues identified during public scoping (discussed above) shape the alternatives carried forward in this RMP process. Others issues identified during public scoping were also considered but are not analyzed further in this planning process because they fall outside of BLM jurisdiction or are beyond the scope of this RMP effort. A list of these issues and the rationale for not analyzing them further in this planning process is provided below.

1.3.5.1. Issue Considered 1: Water Control

Restore water to the rivers

- Rationale: The BLM does not control water rights on any of the rivers in the Planning Area, and it is unlikely that any management action proposed by the BLM could restore water flow.

Local aquifers are being depleted and mineral-laden water is being pumped to the surface, polluting waterways and killing vegetation

- Rationale: The BLM does not have the authority to permit or deny pumping of groundwater in Arizona. Such authority lies with the Arizona Department of Water Resources.

1.3.5.2. Issue Considered 2: Biological Resources

Protect and restore native fish populations impacted by dams and non-native species

- Rationale: The BLM does not manage any suitable perennial aquatic habitat for native fish species in the Planning Area. Streams within the Decision Areas are typically dry and flow only in response to storm events.

Protect and manage Sonoran pronghorn and Sonoran pronghorn habitat within the SDNM

- Rationale: The SDNM is outside the current range of Sonoran pronghorn. The BLM will, however, coordinate with the Sonoran pronghorn recovery team during the RMP process and

take any necessary measures for protection of historic habitat, as well as consider possible reintroduction of Sonoran pronghorn into the Monument.

1.3.5.3. Issue Considered 3: Livestock Grazing

Increase grazing fees and use the money to hire more staff to study and protect the land

- Rationale: The BLM has no authority to adjust or change the grazing fee. It is set by a formula contained in law, as is the disposition of the fees collected.

1.3.5.4. Issue Considered 4: Wild Horse & Burro Management

Do not implement wild horse and burro management in the SDNM

- Rationale: There are no wild, free-roaming horses or burros within the Monument, and no herd areas have been designated or recognized, making it unnecessary to address their management. There are feral burros on the adjacent Barry M. Goldwater Range and they may extend into the southeastern part of the Monument; however, these feral burros are managed outside of The Wild Free-Roaming Horses and Burros Act of 1971.

1.3.5.5. Issue Considered 5: Minerals Management

Allow mining in the Monument; do not grant new mineral leases; ensure any new mining claims are valid and limit to small-scale operation; study/regulate coal-bed methane wells; limit or prohibit resource use in the Monument except for strategic and low impact mineral extraction

- Rationale: Lands within the SDNM are closed to mineral development (subject to valid existing rights) by Monument proclamation. There is no coal in either of the Decision Areas.

It is inappropriate that hardrock mining on public lands is governed by outdated laws such as the General Mining Law of 1872

- Rationale: The BLM does not have discretionary authority to disregard existing laws. Rather, a course of action that complies with existing laws, such as the General Mining Law of 1872, must be pursued.

1.3.5.6. Issue Considered 6: Land Tenure Adjustment & Withdrawals

Within the SDNM, sell BLM holdings only as an absolute last resort

- Rationale: According to the Monument proclamation, the BLM does not have the authority to sell public lands in the SDNM and can only exchange such lands when it furthers the purposes of the Monument.

Use zoning laws to establish a balance between property rights and conservation of natural resources

- Rationale: The BLM does not have jurisdiction over zoning laws. Rather, local and county governments are responsible for establishing zoning laws and controlling land use through

zoning. On the other hand, the potential for acquisition, disposal, and exchange of public lands could indirectly affect zoning and development and is considered further in the RMP.

Allow renewal of the lease for public lands bound by Mountain View Road on the east, Goldfield Road on the west, and U.S. 60 on the north near Apache Junction

- Rationale: The land specified in this comment is under a variety of withdrawals, leases, and permits, including a recreation and public purposes (R&PP) lease to the City of Apache Junction for equestrian and other recreational activities. The R&PP lease will remain in effect for the duration as identified in the lease and will not be affected by the RMP.

1.3.5.7. Issue Considered 7: Corridors, Communications Sites & Renewable Energy Sites

In the Lower Sonoran Decision Area, do not use the Palo Verde-Devers route as a utility corridor if it would result in building additional power lines or pipelines through the Kofa National Wildlife Refuge

- Rationale: The Kofa National Wildlife Refuge is located outside of the Lower Sonoran Planning Area and is administered by the USFWS. It is thus not addressed in this RMP.

1.3.5.8. Issue Considered 8: Special Area Designations

Designate 140,506 acres in the Sand Tank Mountains, Margie's Peak, and Butterfield Pass units as WSAs as outlined in the Arizona Wilderness Coalition proposal

In the Lower Sonoran Planning Area, designate the Sentinel Plain and Gila Bend Mountains region, Saddle Mountain and Palo Verde Hills, and 16 other areas as WSAs, totaling 250,000 acres

Do not designate any additional wildernesses or WSAs; these misguided preservation designations have detrimental impacts on wildlife populations because of unwarranted burdens

- Rationale: Only Congress has the authority to designate wilderness and the current DOI and BLM policy does not provide for designation of additional WSAs. However, areas that contain wilderness characteristics can be actively managed by the BLM to protect those characteristics and various alternatives for this management are presented in Chapter 2, *Alternatives* (p. 27) of this document.

Designate segments of the Gila River as a wild and scenic river to protect the river itself and the surrounding riparian areas

- Rationale: The Gila River's eligibility for the National Wild and Scenic River System (NWSRS) was assessed in a series of field surveys from 1992 to 2005. The Wild and Scenic Rivers Act of 1968 authorizes the protection of free-flowing rivers with "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values." None of the segments of the lower Gila River that run through the Planning Area was found to be eligible for the NWSRS. See Appendix D, *Wild and Scenic River Eligibility Assessment* (p. 1027) for more information.

1.3.5.9. Issue Considered 9: Visual Resources

Protect the viewsheds through zoning and other mechanisms

- Rationale: Local and county governments control land use through zoning; however, the BLM can address the protection of viewsheds through other means. The BLM considers viewshed protection through the visual resource management program. Various degrees of such protection have been incorporated into the alternatives proposed in Chapter 2, *Alternatives* (p. 27).

1.3.5.10. Issue Considered 10: Travel Management

Provide additional motorized public access in wilderness areas for people who are unable to walk long distances

- Rationale: Wilderness areas are designated by Congress and must be managed in accordance with the Wilderness Act of 1964, which expressly prohibits motorized vehicle use by the public for recreational purposes. The BLM thus has no authority to develop new or open old motorized vehicle routes within designated wilderness.

Within the SDNM, designate OHV use areas in locations with low wildlife-habitat values or where OHV use is already popular; keep each OHV use area to about 30 acres with twisting and interlaced trails

- Rationale: Presidential Proclamation 7397 prohibits off-road use in the SDNM; consequently, OHV areas cannot be designated within the Monument.

Provide or re-open cherry stem access of existing roads in some areas, such as the Cabeza Prieta National Wildlife Refuge

- Rationale: The BLM has no authority to address management of the Cabeza Prieta National Wildlife Refuge due to the lack of public lands in the refuge; however, the BLM will address vehicle access and route designation in the Decision Areas.

1.3.5.11. Issue Considered 11: Airspace

Consider how wilderness designations could adversely affect military overflights

- Rationale: As identified under Issue Considered 8, the BLM does not have the authority designate new WSAs or wilderness areas. There would thus be no potential for conflicts to emerge between military airspace use and new WSA/wilderness designations. In terms of conflicts with existing wilderness areas in the SDNM, the Monument proclamation establishing the SDNM provides for continued military use of airspace over the SDNM, including over existing wilderness areas

Work closely with nearby military bases and airports to schedule flights and design flight paths that are the least intrusive to wildlife populations and the Monument

- Rationale: The Monument proclamation does not address the need for the BLM to dictate flight paths, and the many and varied uses by the military of the airspace over the Monument preclude establishing specific flight paths. The military already has specific high altitude flight paths, but they are very wide and have little impact on Monument resources.

1.3.5.12. Issue Considered 12: Socioeconomics

Include a full identification of the social and economic impacts on all of the approved regional extra-high-voltage electric system components

- Rationale: This document evaluates economic impacts of the alternatives, including those regarding corridors and ROWs, as needed at a programmatic level to assess the potential environmental impacts. Cumulative economic impacts (i.e., the impacts of the alternatives when combined with past, present, and reasonably foreseeable actions) are also addressed. A full social and economic impact analysis of the regional extra-high-voltage electric system components, however, is beyond the scope of this EIS.

1.3.5.13. Considered 13: Border Activity – Undocumented Immigrants and Drug Smuggling

Manage illegal immigration and drug smuggling

- Rationale: BLM does not manage specifically for illicit immigration or drug smuggling. U.S. Customs and Border Protection (CBP), under the Department of Homeland Security (DHS), has the mission and responsibility for securing the U.S. Border and enforcing federal immigration and drug laws. While the BLM can respond to crime and resource impacts from border activity, jurisdiction of illegal immigration and international drug smuggling lies with the CBP and DHS. BLM law enforcement is predominantly responsible for visitor safety and resource protection. In coordination with CBP, DHS, and state and local law enforcement agencies, BLM:
    - Develops integrated resource and law enforcement goals and priorities on NLCS units and other Borderlands locales;
    - coordinates resource rehabilitation and mitigation with deployment of law enforcement resources to maximize effectiveness of both within the Borderlands;
    - monitors smuggling activity levels, resource impacts and mitigation efforts through existing and developing technologies;
    - communicates and coordinates effectively with agency partners and public, including sharing of funding and intelligence;
    - works with partners to identify key areas for increased enforcement, closure, restoration, protection efforts and visitor safety;
    - actively deploys and collaborates on enhanced communication technologies;
    - implements coordinated safety measures for agency staff, fire and law enforcement personnel, and public visitors.

1.3.6. Other Elements not Addressed in this Plan

Various laws, regulations, policies, and executive orders require specific resource elements be considered during the NEPA process. Based on an evaluation of these elements by the BLM, the following was determined to be not present within or otherwise relevant to the Decision Areas and is dismissed from further consideration in this analysis:

- **Prime and Unique Farmlands:** In accordance with the Farmland Protection Policy Act, the BLM determined that no prime or unique farmlands or farmlands of statewide or local importance are present on public lands in the Planning Area.

1.4. Planning Area Guidance

The BLM developed a significance statement for the Lower Sonoran Decision Area based on management principals identified by FLPMA. For the SDNM Decision Area, the BLM developed "purpose" and "significance" statements to clarify the intent of the Monument proclamation and to help shape the development of this Draft RMP/Draft EIS. Purpose statements clarify why the Monument was set aside as units for special management, while significance statements address what makes the area unique.

The BLM also developed a vision and goals for both Decision Areas. A vision, as used in this context, is an ideal to strive for which is not quantifiable or set to a specific period. It reflects the goals that are common to all alternatives that are presented in Chapter 2, *Alternatives* (p. 27) and helps integrate the various resource management programs (i.e., resources, resource uses, special designations, and social and economic conditions).

1.4.1. Lower Sonoran Decision Area Planning Guidance

1.4.1.1. Significance of the Lower Sonoran Decision Area

The Lower Sonoran Decision Area provides a wide diversity of resources and opportunities and includes wide-open expanses of Sonoran Desert landscapes, including some of the largest open areas near Phoenix and Tucson. Public lands also provide important habitat to support the robust diversity of wildlife found in the Sonoran Desert. In concert with other large landowners and managers in southwestern Arizona, these lands provide large landscapes that help sustain healthy populations of wildlife for the long term. Public lands also contain a history and evidence of human use spanning more than 10,000 years, including villages, farms, rock art, ranches, and travel corridors.

These public lands provide some of the last opportunities for undeveloped and dispersed recreation in the area. These opportunities are particularly important because of the rapid urban growth in Phoenix and Tucson and the increasing number of people living near and recreating on public lands. Public lands also attract visitors from all over the United States and many other countries.

Public lands provide important resources to the growing communities in southern Arizona. These include providing corridors for transmission of utilities to new and growing communities and providing access to mineral and renewable energy development.

1.4.1.2. Management Vision

The Lower Sonoran Decision Area will retain its wide-open spaces and healthy functioning Sonoran Desert ecosystems while providing opportunities for a multitude of public uses and benefits.

1.4.1.3. Overarching Goals

- Manage natural and cultural resources to ensure that these resources are conserved, enhanced, restored, or preserved in a healthy condition for use by current and future generations consistent with the concepts of multiple use and sustained yield.
- Manage commercial and industrial uses of public lands to meet community needs, benefit the public, and obtain economic return consistent with other resource management responsibilities.
- Sustain a diverse array of recreation settings in order to produce a variety of benefits, opportunities, and experiences to meet the needs of public land users consistent with resource protection goals.
- Sustain a diverse array of recreation settings in order to produce a variety of benefits, opportunities, and experiences to meet the needs of public land users consistent with resource protection goals.
- Promote compatibility between the management of public and adjacent lands.
- Encourage interagency and community partnerships to enhance effective management of public lands.
- Develop outreach and educational programs that build constituencies, expand understanding and appreciation of public lands and resources, and enable an enjoyable experience on the public lands.
- Manage public lands in a manner that considers public health and safety.

1.4.2. Sonoran Desert National Monument Decision Area Planning Guidance

1.4.2.1. Monument Purpose

The purpose of the SDNM designation is to protect and manage the Monument's natural, geologic, and cultural resources (i.e., Monument objects) for long-term conservation, and to further our knowledge and understanding of such resources through scientific research and interpretation. The Monument was specifically designated to protect certain resources, including:

- A large Sonoran Desert landscape that connects to other large natural areas;
- The ecological diversity of the Sonoran Desert, including a diversity of flora and fauna associated with rare woodlands assemblages, palo verde-mixed cacti, creosote-bursage, desert washes, and rare desert grasslands vegetation communities;

- A cultural landscape that appears largely unchanged, with a rich history that spans at least 10,000 years, from the Archaic to modern day.

Resources mentioned above summarize the Monument objects that are to be the focus of protection in the SDNM RMP. The Monument objects are described in the text of Presidential Proclamation 7397. Table 1.4, "SDNM Objects" (p. 18) further clarifies the objects and identified specific protection criteria for each object or set of objects. Specific discussion regarding proposed uses and potential affects and impacts regarding these Monument objects may be found in the relevant resource sections in Chapter 4, *Environmental Consequences* (p. 371) or the appendices of this plan.

Table 1.4. SDNM Objects

Paragraph from Presidential Proclamation 7397	Monument Object	Characteristics	Protection Criteria
1. "The Sonoran Desert National Monument is a magnificent example of untrammeled Sonoran desert landscape. The area encompasses a functioning desert ecosystem with an extraordinary array of biological, scientific, and historic resources. The most biologically diverse of the North American deserts, the Monument consists of distinct mountain ranges separated by wide valleys, and includes large saguaro cactus forest communities that provide excellent habitat for a wide range of wildlife species."	Functioning Desert Ecosystem	**Physical:** Distinct mountain ranges separated by wide valleys **Ecological:** Sonoran Desert landscape with properly functioning desert ecosystem, large saguaro cactus forest communities, habitat for a wide range of wildlife species	Prevent avoidable soil loss. Maintain properly functioning plant communities defined by structure, cover, diversity, composition, and presence or absence of invasive species.
2. "The Monument's biological resources include a spectacular diversity of plant and animal species. The higher peaks include unique woodland assemblages, while the lower elevation lands offer one of the most structurally complex examples of palo verde/mixed cacti association in the Sonoran Desert. The dense stands of leguminous trees and cacti are dominated by saguaros, palo verde trees, ironwood, prickly pear, and cholla. Important natural water holes, known as tinajas, exist throughout the Monument. The endangered acuña pineapple cactus is also found in the Monument."	Diversity of Plant and Animal Species	**Biological:** Saguaros, palo verde trees, ironwood, prickly pear, cholla, acuña pineapple cactus **Physical:**: Tinajas **Ecological:** Woodland assemblages, structurally complex palo verde-mixed cacti association, dense stands of leguminous trees and cacti	Maintain normal variation in plant composition, diversity, and abundance of native species, diversity of niches, and landscape-level structural complexity.

Paragraph from Presidential Proclamation 7397	Monument Object	Characteristics	Protection Criteria
3. "The most striking aspect of the plant communities within the Monument are [sic] the abundant saguaro cactus forests. The saguaro is a signature plant of the Sonoran Desert. Individual saguaro plants are indeed magnificent, but a forest of these plants, together with the wide variety of trees, shrubs, and herbaceous plants that make up the forest community, is an impressive site [sic] to behold. The saguaro cactus forests within the Monument are a national treasure, rivaling those within the Saguaro National Park."	Saguaro Cactus Forests	**Biological:** Saguaro **Ecological:** Plant communities; saguaro cactus forests; wide variety of trees, shrubs, and herbaceous plants	Maintain age class and stand structure and density. Ensure suitable nurse plants are present and saguaro recruitment is adequate for cactus forest sustainability.
4. "The rich diversity, density, and distribution of plants in the Sand Tank Mountains area of the Monument is especially striking and can be attributed to the management regime in place since the area was withdrawn for military purposes in 1941. In particular, while some public access to the area is allowed, no livestock grazing has occurred for nearly 50 years. To extend the extraordinary diversity and overall ecological health of the Sand Tanks [sic] Mountains area, land adjacent and with biological resources similar to the area withdrawn for military purposes should be subject to a similar management regime to the fullest extent possible."	Sand Tank Mountains	**Physical:** Sand Tank Mountains **Ecological:** Diversity, density, and distribution of plants	Maintain normal variation in diversity, density, and distribution of plants.
5. "The Monument contains an abundance of packrat middens, allowing for scientific analysis of plant species and climates in past eras. Scientific analysis of the midden [sic] shows that the area received far more precipitation 20,000 years ago, and slowly became more arid. Vegetation for the area changed from juniper-oak-pinion pine woodland to the vegetation found today in the Sonoran Desert, although a few plants from the more mesic period, including the Kofa Mountain barberry, Arizona rosewood, and junipers, remain on higher elevations of north-facing slopes."	Scientific Analysis of Plant Species and Climates	**Biological:** Packrat middens, mesic period, Kofa Mountain barberry, Arizona rosewood, junipers	Protect packrat middens, dry caves or rock shelters, and relic species. Within establish guidelines, make middens available for scientific study and analysis.
6. "The lower elevations and flatter areas of the Monument contain the creosote-bursage plant community. This plant community thrives in the open expanses between the mountain ranges, and connects the other plant communities together. Rare patches of desert grassland can also be found throughout the Monument, especially in the Sand Tank Mountains area. The washes in the area support a much denser vegetation community than the surrounding desert, including mesquite, ironwood, palo verde, desert honeysuckle, chuperosa, and desert willow, as well as a variety of herbaceous plants. This vegetation offers the dense cover bird species need for successful	Vegetation Communities: Creosote Bush-Bursage, Desert Grassland, and Washes	**Biological:** Mesquite, ironwood, palo verde, desert honeysuckle, chuperosa, desert willow, herbaceous plants **Physical:** Sand Tank Mountains **Ecological:** Creosote-bursage plant community,	Prevent avoidable soil loss. Maintain properly functioning plant communities as defined by structure, cover, diversity, composition, invasive species, desert washes-bank stability,

Paragraph from Presidential Proclamation 7397	Monument Object	Characteristics	Protection Criteria
nesting, foraging, and escape, and birds heavily use the washes during migration."		desert grassland, densely vegetated wash communities	woody over story, and continuity of vertical structure.
7. "The diverse plant communities present in the Monument support a wide variety of wildlife, including the endangered Sonoran pronghorn, a robust population of desert bighorn sheep, especially in the Maricopa Mountains area, and other mammalian species such as mule deer, javelina, mountain lion, gray fox, and bobcat. Bat species within the Monument include the endangered lesser long-nosed bat, the California leaf-nosed bat, and the cave myotis. Over 200 species of [song] birds are found in the Monument, including 59 species known to nest in the Vekol Valley area. Numerous species of raptors and owls inhabit the Monument, including the elf owl and the western screech owl. The Monument also supports a diverse array of reptiles and amphibians, including the Sonoran desert tortoise and the red-backed whiptail. The BLM has designated approximately 25,000 acres of land in the Maricopa Mountains area as critical habitat for the desert tortoise. The Vekol Valley and Sand Tank Mountain areas contain especially diverse and robust populations of amphibians. During summer rainfall events, thousands of Sonoran green toads in the Vekol Valley can be heard moving around and calling out."	Wildlife	**Biological:** Sonoran pronghorn, desert bighorn sheep, mule deer, javelina, mountain lion, gray fox, bobcat, bat species (including lesser long-nosed bat, California leaf-nosed bat, and cave myotis), 200 species of songbirds, raptors, owls (including elf owl and western screech owl), red-backed whiptail, Sonoran green toads, critical habitat for Sonoran desert tortoise Physical: Maricopa Mountains, Vekol Valley, Sand Tank Mountains **Ecological:**: Diverse plant communities	Maintain viable populations of wildlife species, focusing, as appropriate, on foraging habitat, hiding cover, nesting/roosting habitat, escape cover, and thermal cover. Prevent avoidable loss of special status species.
8. "The Monument also contains many significant archaeological and historic sites, including rock art sites, lithic quarries, and scattered artifacts. Vekol Wash is believed to have been an important prehistoric travel and trade corridor between the Hohokam and tribes located in what is now Mexico. Signs of large villages and permanent habitat sites occur throughout the area, and particularly along the bajadas of the Table Top Mountains. Occupants of these villages were the ancestors of today's O'odham, Quechan, Cocopah, Maricopa, and other tribes. The Monument also contains a much used trail corridor 23 miles long in which are found remnants of several important historic trails, including the Juan Bautista de Anza National Historic Trail, the Mormon Battalion Trail, and the Butterfield Overland Stage Route."	Archaeological and Historic Sites	**Cultural:** Archaeological and historic sites, rock art sites, lithic quarries, scattered artifacts, large villages, permanent habitat sites, Anza National Historic Trail corridor, Mormon Battalion Trail, Butterfield Overland Stage Route **Physical:** Vekol Wash, bajadas, Table Top Mountains	Reduce threats and resolve conflicts from natural and human-caused degradation affecting integrity of sites and settlement clusters, site condition context, setting, stability, and capacity to yield scientific information. For the Anza Trail, reduce threats related to the historic trail corridor, its setting, and loss of interpretative opportunities.

1.4.2.2. Significance of the SDNM

The SDNM includes natural resources that represent the biological diversity of the Sonoran Desert, including ecological communities found in both the Arizona uplands subdivision and the Lower Colorado River subdivision of the Sonoran Desert biome. The ecological communities include large, high-quality examples of common Sonoran Desert communities such as creosote bursage and palo verde-mixed cacti, which contain expansive saguaro cactus forests and provide habitat for a wide variety of wildlife, including cactus ferruginous pygmy-owls, Sonoran desert tortoise, lesser long-nosed bat, Sonoran pronghorn, and desert bighorn sheep. Less common communities include rare woodland assemblages typically found in wetter climates, desert grasslands, and other habitats that are important for foraging and nesting birds and amphibians. Cutting through these communities are desert washes that provide important wildlife cover, movement corridors, and forage, especially in hot summer months. This ecological diversity provides habitat for animals and plants to complete their life cycles and survive drought. There are also excellent opportunities for scientific research on many aspects of the Sonoran Desert.

The Monument includes a diverse cultural landscape that appears little changed from prehistoric to modern times and provides a rare opportunity to protect, in one area, a wide diversity of sites, both in time and in place. It contains sites representative of the time periods from the Archaic through the modern day, including villages, camps, Ak-Chin farming sites, rock art, lithic scatters, homesteads, and historic ranches, as well as economically important trade and travel routes. These and other sites are an important connection for contemporary tribal peoples and descendants of those who have traveled through and settled here. The Monument provides significant opportunities to expand our knowledge and understanding of aboriginal peoples, Spanish explorers, and Euro-Americans within a landscape that encompassed all aspects of their daily lives.

The Monument is a large area of Sonoran Desert that supports large-scale ecological processes. This largely undeveloped area provides important open space, wilderness opportunities, and a valuable visual landscape in the midst of a rapidly urbanizing area.

1.4.2.3. Management Vision

The SDNM shelters and will continue to shelter a healthy and functioning ecosystem that includes the diversity of biological, cultural, geologic, and scientific resources found in the Sonoran Desert while providing compatible recreation and other public use opportunities.

1.4.2.4. Overarching Goals

Public land management goals are derived from the overriding purpose and vision for an area and provide refined guidance for the RMP. The overarching plan-level goals of the SDNM RMP are as follows:

1. Assign the highest planning and management priority to the protection of the cultural, biological, physical, and scientific resources for which the Monument was created.

2. Protect, restore, maintain, and manage the native biological diversity and associated values of the Monument within their broader ecosystem context, with particular attention to retaining connectivity with other natural areas and conserving habitats for viable populations of a full range of native species.

3. Protect and manage the cultural resources of the Monument, paying particular attention to the cultural landscape and the relationship of individual sites to the larger landscape.
4. Encourage scientific research that aims to expand understanding and improve management of Sonoran Desert resources.
5. Manage natural, recreational, and social settings to protect the undeveloped and natural character of the Monument while providing opportunities for compatible, sustainable public use and enjoyment.
6. Develop outreach and educational programs and materials that build constituencies, expand understanding and appreciation of the Monument and its resources, and provide for enjoyable experiences at the Monument.
7. Manage the Monument in a manner that considers public health and safety.

1.5. PLANNING CRITERIA

Planning criteria are the standards, rules, and guidelines that help to guide the RMP planning process. The LSFO has developed planning criteria to help guide the development of this Draft RMP/EIS. The planning criteria were derived principally from FLPMA and other applicable laws and, in the case of the SDNM, from Presidential Proclamation 7397, as well as collaboration with partner agencies, American Indian tribes, and the public during the RMP planning process. The planning criteria were provided to the public for review during the scoping process and were included in the scoping report. General planning criteria are presented below.

1.5.1. General Planning Criteria Common to Both Decision Areas

- The planning process will include an EIS that will comply with NEPA standards. Two records of decision will be issued: one for the Lower Sonoran Decision Area and one for the SDNM Decision Area.
- The RMP will be completed in compliance with FLPMA, the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.), NEPA, the Archaeological Resources Protection Act, and all other relevant Federal laws and executive orders, as well as the management policies of the BLM.
- Where planning decisions have previously been made that still apply, those decisions will be carried forward into the RMP. The BLM will also use information developed and management alternatives proposed in previous studies of the Planning Area, including the proposed Amendment and Environmental Assessment to the Lower Gila North Management Framework Plan and the Lower Gila South RMP (BLM 2000).
- Planning decisions will be made in the context of the best-available data, including information specific to public lands. Regional contextual data may also be used to identify the regional importance of public lands for resource use and protection.
- The planning team will work collaboratively with the State of Arizona; Maricopa, Pinal, Pima, Gila, and Yuma counties; tribal governments; municipal governments; other Federal agencies; the Resource Advisory Council; and all other interested groups, agencies, and individuals. Decisions in the plans will strive to be compatible with existing plans and

policies of adjacent local, State, tribal, and Federal agencies, consistent with Federal law and regulations. Opportunities to coordinate management with adjoining landowners for resource protection and public uses will be considered.

- The RMP will be developed to be flexible and adaptable to new and emerging issues and opportunities. During implementation of the RMP, the BLM will continue to work in partnership with the public and local, State, and tribal governments and agencies to identify priority implementation projects and to identify and resolve emerging issues.
- Native American tribal consultations will be conducted in accordance with policy, and tribal concerns will be given due consideration. The planning process will include the consideration of any impacts on Indian trust assets.
- Consultation with the USFWS will take place throughout the planning process in accordance with Section 7 of the ESA and the National Memorandum of Agreement (August 30, 2000) to identify conservation actions and measures for inclusion in the plans.
- Coordination with the Arizona SHPO will be conducted throughout the planning process.
- The plans will recognize the State's authority to manage wildlife populations, including hunting and fishing, within the Planning Area. Coordination with AGFD will occur in accordance with the statewide MOU (March 1987).
- The plans will set forth a framework for managing recreational and commercial activities in order to maintain existing natural landscapes and to provide for the enjoyment and safety of the visiting public.
- The lifestyles of area residents, including the wide variety of uses of the public lands, will be considered in the RMP.
- Any lands, or interests therein, acquired by the BLM within the Planning Area boundary will be managed consistently with the RMP, subject to any constraints associated with the acquisition.
- The RMP will address travel management for the public lands. Areas will be identified as open to vehicles, closed to vehicles, or limited to designated roads. Within the Monument and in other areas identified in the RMP, motorized and mechanized routes will be designated.
- The RMP will recognize valid, existing rights.
- Federal Geographic Data Committee standards and other applicable BLM standards will be followed in the development and management of data.
- Management of existing wilderness will continue. The RMP will not address reduction or elimination of existing wilderness, changes in boundaries of existing wilderness, or opening of roads or mechanized or motorized access into existing wilderness.

1.5.2. Lower Sonoran Decision Area Planning Criteria

- The Lower Sonoran RMP will establish management guidance for public lands outside of the SDNM. The Lower Sonoran RMP will replace and supersede all other BLM RMPs for the lands covered by the Lower Sonoran RMP.

1.5.3. SDNM Decision Area Planning Criteria

Planning criteria for the SDNM is derived from Presidential Proclamation 7397 that established the SDNM "for the purpose of protecting the objects" for which the Monument was designated. The proclamation also states that the BLM will manage the Monument "pursuant to applicable legal authorities, to implement the purposes of the proclamation." Thus, any BLM planning criteria developed for the SDNM is inextricably tied to protecting the objects identified in the proclamation.

- The SDNM RMP will establish guidance upon which the BLM will manage the SDNM, and will replace and supersede all other BLM RMPs for the lands covered by the SDNM RMP.
- The SDNM RMP will meet the requirements of the Presidential Proclamation 7397, dated January 17, 2001, to protect the objects of geological, archaeological, historical, and biological value within the Monument.
- In accordance with the proclamation, acquired lands and interests within the Monument's boundary will be added to the Monument and will be managed consistently with the SDNM RMP.
- To maintain the existing natural and cultural landscapes of the SDNM to the maximum extent possible, facilities will be located outside the Monument's boundary or in neighboring communities. Facilities that must be located within the Monument's boundaries will be placed in such a way that they are unobtrusive, to the extent practicable.
- The SDNM RMP will not address Monument boundary adjustments or proposals to change the Proclamation.

1.6. RELATIONSHIP TO OTHER PLANS

1.6.1. Relationship to Other BLM Plans, Plan Amendments & Programmatic EISs

In addition to the management plans and amendments being revised in this document, a number of existing management plans, programmatic documents, and standards and guidelines were considered in the preparation of this Draft RMP/EIS. These documents include the following:

- "Eastern Arizona Grazing EIS and Rangeland Program Summary" (BLM 1985): applicable to part of the Lower Sonoran Decision Area (East Valley parcels only),
- "Lower Gila North Grazing EIS and Rangeland Program Summary" (BLM 1983): applicable to part of the Lower Sonoran Decision Area (Saddle Mountain only),
- "Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic EIS" (BLM 2007): applicable to the Lower Sonoran and SDNM Decision Areas,
- "Vegetation Treatments on BLM Lands in 17 Western States Programmatic Environmental Report" (BLM 2007): applicable to the Lower Sonoran and SDNM Decision Areas,

- "Designation of Energy Corridors on Federal Lands in the 11 Western States Programmatic Environmental Impact Statement" (DOE 2007): applicable to the Lower Sonoran and SDNM Decision Areas,
- "Draft Programmatic EIS for Solar Energy Development in Six Southwestern States" (DOE-BLM 2010).

Management of public lands within the SDNM is directed by Presidential Proclamation 7397, issued on January 17, 2001. The proclamation is the legal instrument that establishes the boundaries and purposes of the SDNM. The priority for management of the SDNM is protection of the natural and cultural resource values for which the area was designated, subject to withdrawals, leases, and valid existing rights. The proclamation supersedes some of the guidance provided by existing RMPs for the area.

1.6.2. Relationship to State, Local, Tribal, and other Federal Plans, Laws, Policies & Programs

Bureau of Land Management land use planning regulations (43 CFR 1610.3), FLPMA (43 USC 1712), and regulations for implementing NEPA (40 CFR 1501.5 and 1501.6) guide the BLM in coordinating and cooperating with other Federal and State agencies, local governments and American Indian tribes during the land use planning process. This collective guidance instructs the BLM to:

- Stay informed of Federal, State, local, and tribal plans,
- Ensure that it considers these plans in its own planning,
- Help resolve inconsistencies between such plans and BLM planning,
- Cooperate with other agencies and tribal governments in the development of RMPs and NEPA analysis.

In accordance with these provisions, the BLM initially informed other Federal, State, local, and tribal officials of its intent to prepare new RMPs, as detailed in the Scoping Report. Collaboration with these agencies has continued throughout the planning and EIS process.

Agency coordination efforts have included reviewing numerous plans that provide the policies and guide the activities of these agencies and governments. Plans consulted in the preparation of this Draft RMP/EIS can be found in Appendix C, *State, County, Local and Other Related Agency Plans* (p. 1023).

1.6.2.1. Specific Agreements

The BLM and AGFD have agreed to work cooperatively to manage wildlife resources on public lands throughout Arizona. The master MOU (AZ-930-0703) between the BLM's Arizona State Office and the Arizona Game and Fish Commission, which sets policy for the management, preservation, and harvest of wildlife and fish resources, establishes the BLM's responsibility for managing wildlife habitat on public lands and the AGFD's public trust responsibility to manage fish and wildlife populations through the authority of the Commission. As stated in the MOU, the BLM and the AGFD "consider the management of fish and wildlife resources as a high

priority and agree to work cooperatively to achieve a shared goal to actively manage, sustain, and enhance those resources."

The BLM, Arizona Department of Transportation (ADOT), and Arizona Division of Federal Highway Administration (FHWA) have agreed to establish and improve cooperative working relationships (MOU No. AZ-931-0309 Amendment 2). This MOU provides for a coordinated approach to accomplish land and resource management along with transportation development and operation management. The MOU is designed to reduce/eliminate duplication of work, establish procedures for streamlining work processes, ensure that each agency is provided with sufficient lead-time, share available resources, and develop and execute action programs that maximize responsiveness to public needs and concerns. Per the MOU, BLM will coordinate with responsible agencies to develop design features that minimize the fragmenting effect of the planned roadway and evaluate/incorporate safe and effective wildlife crossings. Where planned roadways potentially fragment other resources, BLM will work with the responsible agency to provide continued connectivity for those purposes. BLM will also work with the agency to provide continued safe access to public lands from any developed roadway for recreation and other public land users.

Chapter 2. Alternatives

2.1. INTRODUCTION

This chapter describes and compares alternatives for developing the Lower Sonoran and Sonoran Desert National Monument (SDNM) Draft Resource Management Plan and accompanying Draft Environmental Impact Statement (Draft RMP/EIS). The documents consist of five alternatives: a No-Action (or current management) Alternative and four action alternatives. The No-Action Alternative means that management of the affected public lands and resources would continue without change from the guidance provided by existing applicable land use plans (LUPs) and, in the case of SDNM, Presidential Proclamation 7397 and its associated Interim Guidance. The action alternatives present various combinations of public land uses and resource management practices that address issues identified during the scoping process. Each alternative varies in perspective and intensity of management, and describes a series of decisions and desired outcomes that collectively would direct future management for the Lower Sonoran and SDNM Decision Areas. Additionally, each alternative consists of a set of designations, land use allocations, allowable uses, and management actions needed for implementation of that alternative. All alternatives have been assessed for potential environmental impacts, which are summarized at the end of this chapter. A detailed discussion of the potential impacts is presented in Chapter 4, *Environmental Consequences* (p. 371).

The alternatives represent a reasonable range of management options identified in accordance with the National Environmental Policy Act (NEPA), other applicable laws, intergovernmental and interagency collaboration, and public participation. These inputs were used to derive the management purposes, missions, and goals for the Lower Sonoran and SDNM Draft RMP/EIS, described in Chapter 1, *Purpose & Need for the RMP* (p. 1). Consistency with these purposes, missions, and goals was a basic requirement for each alternative.

Once the purposes, missions, and goals were established, the intergovernmental/interagency planning team developed management alternatives that incorporated decisions for a number of resource or resource use categories. These are described below in Table 2.2, " Program Area Categories and Abbreviations" (p. 46)

The above information was presented, reviewed, and discussed at public workshops throughout the Lower Sonoran Planning Area. Public input from the workshops was carefully considered by the planning team and incorporated into the scope and content of the alternatives provided in this DEIS.

Each alternative portrays a different management focus, as defined by the desired outcomes and actions selected for each alternative. All alternatives meet the Bureau of Land Management's (BLM's) overarching principles of multiple use and sustained yield. All action alternatives provide a high degree of protection for SDNM resources, as required by Presidential Proclamation 7397.

2.2. TYPES OF BLM DECISIONS

These plans include two types of BLM decisions: RMP and implementation. This document describes other administrative actions the BLM takes when managing public lands. These types of decisions and administrative actions are described below.

2.2.1. RESOURCE MANAGEMENT PLAN DECISIONS

RMP decisions represent the goals and objectives for the Planning Area, and the actions needed to achieve them. These decisions guide future land management actions and subsequent site-specific implementation decisions.

2.2.1.1. Goals & Objectives

LUPs must identify goals and objectives that direct the BLM actions to meet legal mandates, regulatory responsibilities, national policy, State Director guidance, and other resource or social needs. "Goals" are broad statements that define desired outcomes. "Objectives" define specific desired outcomes for a selected resource or use, and are considered necessary to achieve the overarching goal. Examples of objectives include maintaining or restoring palo verde-mixed cacti vegetation communities or direct public recreation use to areas that provide the appropriate resource setting, opportunity, and experience.

2.2.1.2. Management Actions and Allowable Uses

Management actions and allowable uses describe actions the BLM or its partners will take. They guide how allowable uses of the public land will be managed to achieve the desired outcomes.

Special Designations

Special designations include those designated by Congress for special protection, such as wilderness areas or national historic or scenic trails. Such designations are not LUP decisions; however, designation recommendations can be made to Congress at this level. Congress may then act on these recommendations at a later time. Administrative designations made by BLM are also considered special designations and can be decided in the LUP. These include designating areas of critical environmental concern (ACECs) or back country byways.

Land Use Allocations

Land use allocations are LUP decisions that describe geographic areas for specific resources or uses, such as where grazing is authorized, specific areas to enhance wildlife habitat, target cultural management objectives or where off-highway vehicle (OHV) areas are available. Allocations have geographic boundaries, shown on maps provided in this document. Proposed resource management decisions are described under the alternatives.

2.2.2. IMPLEMENTATION DECISIONS

Implementation decisions are management actions tied to a specific location, and are used to implement LUP decisions. Unlike RMP-level decisions, implementations are not subject to protest under the planning regulations. Implementation decisions are generally appealable to the Office of Hearings and Appeals under 43 CFR 4.410. These decisions constitute BLM's final approval allowing on-the-ground actions to proceed. Further NEPA analysis is not required to begin implementation of these decisions. Most implementation decisions are developed following adoption of an RMP. A single land use planning/NEPA process, however, may be used to make both RMP-level and implementation decisions, when doing so is timely and has undergone

appropriate NEPA analysis. Activity-level decisions that are ready for implementation, in tandem with the development of the Lower Sonoran and SDNM RMP, include (1) route designation in the Monument for approved motorized and/or non-motorized public use (see Section 2.8.5, "Travel Management (TM)" (p. 180)); (2) livestock grazing decisions in the Monument based on the grazing compatibility analysis findings (which can be found in Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)); and (3) target shooting decisions based on findings from analysis within the SDNM (Appendix G, *Sonoran Desert National Monument Recreational Target Shooting Analysis* (p. 1183)).

2.2.3. ADMINISTRATIVE ACTIONS

Administrative actions are day-to-day activities conducted by BLM, which are often required by the Federal Land Policy and Management Act (FLPMA), but not requiring NEPA analysis or written decision by a responsible official to be accomplished. Examples of administrative actions include, but are not limited to: mapping, surveying, inventorying, monitoring, partnering, developing education materials, adjusting staffing, patrolling, and scientific research and studies.

2.3. SUMMARY OF THE ALTERNATIVES

The range of management alternatives considered in this DRMP/DEIS are described in detail in ??? of this chapter. The following section summarizes the general scope and key highlights of each alternative.

2.3.1. NO ACTION ALTERNATIVE SUMMARY

BLM lands within the Planning Area are currently managed under three separate resource-management plans and several amendments. The decisions from these plans have been extracted and are listed by year of approval. Because none of these current land use plans encompass the entire Planning Area, very few of the current decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable. In addition, the interim management guidance required by Proclamation for the SDNM are being considered current management actions and those policy statements are included with the decisions. Alternative A, the No Action Alternative, consists of the current management actions for both Lower Sonoran and SDNM Decision Areas.

2.3.2. SUMMARY OF THE LOWER SONORAN DECISION AREA ALTERNATIVES

Land management must address resources that are unevenly distributed across a landscape. As described in Section 2.3.3, "Summary of SDNM Alternatives" (p.), the Lower Sonoran Decision Area public lands are divided into six relatively large geographic regions, or blocks, dispersed over a large region (see Map 1-3 and Table 1.3, "Land Use Planning Process" (p. 6)). Noteworthy as management factors, the wide distribution and geographic segregation represent a considerable variety of environments, land uses, public interests, and threats to natural and cultural resources. Some management issues are best addressed through RMP-level decisions applied to the entire Decision Area. Other management issues differ from place to place in character, value, and/or social or economic interest, and thus require more place-specific management techniques found

in implementation decisions. The RMP or implementation decisions must be sensitive to the geographically distinct characteristics of the Decision Area. As a result, the alternatives for the Lower Sonoran Decision Area include RMP-level decisions that would be applicable across the entire area.

No-Action Alternative A

Selecting the No-Action Alternative for the Lower Sonoran Decision Area would continue current management without change to land or public use or resource protection management, and would not address issues that were unforeseen or nonexistent when the existing management plans were prepared.

Under Alternative A:

- Wildlife waters would continue to be developed and maintained in the current manner.
- No specific priority wildlife species or cultural resource provisions or allocation would be followed; however, management actions would be consistent with the long-term protection of priority species and cultural resources as required by law and policy.
- No management actions would be specific to wildlife movement corridors.
- The Fred J. Weiler Green Belt RCA would continue to be managed by the BLM, AGFD and USFWS as specified in cooperative agreements.
- The Coffeepot ACEC would be maintained and would be the only ACEC designation.
- No areas would be managed to protect wilderness characteristics.
- No Back Country Byways would be allocated.
- Four SRMA allocations would continue without management changes.
- The existing route system would be available for use. This alternative would include the least restrictions and also the least management of motorized use and access.
- Recreational use opportunities would be unchanged from current mix and distribution.
- Opportunities for developed and motorized, as well as primitive and non-motorized, recreation would continue.
- Ten 1-mile wide utility corridors would remain as currently designated.
- Grazing allotments would continue to be allocated as perennial, perennial-ephemeral or ephemeral, as appropriate to allotment-specific characteristics.

Action Alternative B

The management decisions prescribed by Alternative B would identify the greatest extent of public land suitable for the widest potential array of uses, and emphasize opportunities for those uses. It generally emphasizes motorized and developed recreation; opportunities to visit remote settings and experience non-motorized, primitive recreation would be reduced from the current condition. As a result, this alternative would require the most intensive use management, as

well as "hands-on" resource stabilization and restoration measures, as compared to the other alternatives, in order to ensure desired outcomes would be achieved.

Under Action Alternative B:

- Cultural and heritage tourism and interpretation would be promoted in appropriate locations.
- No special cultural resource management areas (SCRMAs) would be allocated.
- The Fred J. Weiler Green Belt Resource Conservation Area allocation would continue to be managed by the BLM, AGFD and USFWS as specified in cooperative agreements.
- Existing wildlife waters would be managed or redeveloped, and new ones would be built to sustain or enhance wildlife populations.
- No wildlife habitat areas (WHAs) would be allocated, and few special management actions would be applied for wildlife corridors.
- The Coffeepot ACEC would be maintained as the only ACEC and expanded to include additional potential wildlife habitat.
- No areas would be managed to protect wilderness characteristics.
- Visual and scenic resources would be managed to facilitate various public uses, including mineral development.
- No back country byways would be allocated.
- Seven SRMAs, including recreation management zones (RMZs) with targeted recreation objectives would be allocated to produce the most opportunity for recreational development, particularly motorized-based, day-use community access, dispersed use, and intensive recreational use areas would be developed.
- Routes would be designated as open year-round, open seasonally or closed year-round to motorized vehicle use in all areas where route inventories have been completed. This alternative would include more restrictions to motorized use then Alternative A, but would include the most managed and best maintained motorized network.
- Ten one-mile-wide, multiuse utility corridors would be designated.
- The least amount of land-use authorization (LUA) exclusion and avoidance areas, for any alternative, would be designated.
- Ephemeral grazing applications would continue to be considered, but perennial stocking rates would be reduced by approximately 40 percent.

Action Alternative C

This alternative represents an attempt to balance resource protection with human use and influence by providing opportunities for a variety of uses, while placing an emphasis on resource protection and conservation. It proposes a mix of natural processes and "hands-on" techniques for resource stabilization and restoration, thus reducing the need for intensive use management to avoid or mitigate any adverse effects.

Under Alternative C:

- Cultural and heritage tourism and interpretation would be promoted only when use is compatible with resource protection.
- Two SCRMAs would be allocated to provide protection and management of cultural resources.
- Existing wildlife waters would be managed or redeveloped, and new ones would be built to sustain or enhance wildlife populations.
- The Fred J. Weiler Green Belt Resource Conservation Area allocation would continue to be managed by the BLM, AGFD and USFWS as specified in cooperative agreements.
- Four WHAs would be allocated to protect biological resources, and special management prescriptions would be applied to wildlife movement corridors.
- Two ACECs would be designated. The Coffeepot Batamote ACEC in the Ajo area would be expanded from the current Coffeepot ACEC to better align with the mountain range. The Cuerda de Lena ACEC south of Ajo would be designated for Sonoran Pronghorn.
- Wilderness characteristics would be protected on approximately 128,100 acres.
- The scenic and visual resource in high value areas would be protected, and any facilities developed in these areas would be built to be less noticeable, to the extent possible.
- Agua Caliente Road would be allocated as a Back Country Byway to provide sightseeing and recreational opportunities.
- Six SRMAs with RMZs would be allocated to provide a diversity of recreational opportunities, and increased non-motorized recreation.
- A modest reduction in motor vehicle access, compared to the current condition, would occur by limiting selected routes in the existing system to seasonal use, and closing other routes to reduce system redundancy or protect resources.
- Nine 1-mile-wide, multiuse utility corridors would be designated (a portion of the El Paso Natural Gas Corridor from Ajo to the Tohono O'odham Indian Reservation would be excluded).
- Grazing allotments designated as perennial/ephemeral would be reclassified as perennial only, with no supplemental ephemeral grazing applications considered. This alternative does not apply to ephemeral-only allotments. Season of use adjustments on perennial allotments would be considered.

Action Alternative D

This alternative would place the greatest emphasis on resource protection/conservation, and opportunities to visit remote settings and experience non-motorized, primitive recreation. It focuses on natural processes and other unobtrusive methods for resource stabilization and restoration, so the need for both intensive use management and "hands-on" resource measures would be reduced by the greatest extent among all alternatives.

Under Alternative D:

- Cultural and heritage tourism and scientific research would only be allowed when use is compatible with resource protection.
- No SCRMAs would be allocated; they would be become ACECs.
- Existing wildlife waters would be managed or redeveloped, and new ones would be built to sustain or enhance wildlife populations.
- The Fred J. Weiler Green Belt Resource Conservation Area allocation would continue to be managed by the BLM, AGFD and USFWS as specified in cooperative agreements.
- There would be one WHA and four ACEC designations, containing more acres than any other alternative.
- ACECs would be closed to mineral entry and opportunities for mineral development would be reduced.
- Agua Caliente Road would be allocated as a back country byway to provide sightseeing and recreational opportunities.
- Three SRMAs with RMZs would be allocated to provide a diversity of recreational opportunities, with increased non-motorized recreation.
- The largest number of acres managed to protect wilderness characteristics, for a total of 276,500, would be proposed.
- Scenic and visual resources across the area would be managed to maintain or improve scenic views.
- Recreational opportunities would focus on primitive and non-motorized recreation.
- Opportunities for developed and motorized-vehicle uses would be reduced, due to a smaller number of open vehicle routes.
- Seven 1-mile-wide, multiuse utility corridors would be designated (the fewest among all alternatives).
- All allotments currently open to grazing would become unavailable as permits expire.

Preferred Alternative E

Alternative E is the BLM's preferred alternative for the Lower Sonoran Decision Area. It incorporates elements from each of the other alternatives, and offers a unique prescription for managing the Decision Area while, at the same time, providing long-term protection and resource conservation. Alternative E balances human use and influence with resource protection.

Under Alternative E:

- Cultural and heritage tourism and scientific research would only be allowed when use is compatible with resource protection.
- No SCRMAs would be allocated, they would become ACECs.
- Existing wildlife waters would be managed or reconstructed, and new ones would be built to sustain or enhance wildlife populations.
- The Fred J. Weiler Green Belt RCA would continue to be managed by the BLM, AGFD and USFWS as specified in cooperative agreements.
- There would be one WHA, special management actions for protection of wildlife movement corridors would be applied, and three ACECs would be designated.
- Wilderness characteristics would be protected on approximately 55,400 acres.
- Agua Caliente Road would be allocated as a back country byway to provide sightseeing and recreational opportunities.
- Six SRMAs with RMZs would be allocated to provide a diversity of recreational opportunities. Some would be allocated to provide motorized recreational opportunities, while others would provide a mix of recreation or undeveloped, self-directed recreational opportunities.
- Scenic and visual resources would be managed to maintain visual values in some areas, while accommodating appropriate development in higher use areas.
- A moderate reduction in motor vehicle access would occur as a result of route closures and seasonal limitations.
- Eight one-mile-wide multiuse, utility corridors would be designated (a portion of the El Paso Natural Gas Corridor from Ajo to the Tohono O'odham Indian Reservation would be excluded).
- Grazing allotments would be allocated as perennial, perennial-ephemeral, or ephemeral, as appropriate to allotment-specific characteristics. Season of use adjustments on perennial allotments would be considered.

2.3.3. SUMMARY OF SDNM ALTERNATIVES

2.3.3.1. No-Action Alternative A

Selection of the No-Action Alternative for the Monument would continue current management under the existing LUPs, except as changed by Presidential Proclamation 7397, which established it and specified certain management provisions. This continues current public use and resource protection/conservation prescriptions without change. It neither sets desired outcomes for resource management or most uses, nor addresses new issues unforeseen or nonexistent when the current management plans were prepared.

Under Alternative A:

- Livestock grazing permits south of Interstate 8 (I–8) are terminated. Livestock grazing north of I–8 would continue if determined to be compatible with protecting Monument resources.

- Motorized or mechanical vehicle use, off road, would be prohibited, except for emergency or authorized purposes.
- The Monument is withdrawn from sale, new mining claims, mineral or geothermal leasing or other forms of appropriation.
- The Vekol Valley Grasslands ACEC would be maintained, even though provisions of the Proclamation satisfy the ACEC's objectives
- Three 1-mile-wide, utility corridors would be maintained.

2.3.3.2. Action Alternative B

The management decisions in Alternative B generally identify the areas of the Monument that would be most suitable for the widest potential uses, and emphasize opportunities for those uses. It sets desired outcomes and allocations for resources discussed in the Proclamation, including natural, cultural, and visual, while providing appropriate human use/influence and an array of visitor experiences and opportunities. It focuses on "hands-on" techniques for ecosystem restoration, resource management, and scientific research, and likely requires more intensive use management to avoid or mitigate any adverse effects.

Under Alternative B:

- Existing wildlife waters would be managed or redeveloped, and new ones would be built to sustain or enhance wildlife populations.
- No WHAs would be allocated, but management prescriptions would be applied to protect Monument objects.
- Cultural and heritage tourism and interpretation would be promoted in appropriate locations, as long as resources and Monument objects are protected.
- No areas would be managed to protect wilderness characteristics.
- Grazing allotments north of I–8 would be allocated as perennial grazing with an approximate 40 percent reduction in AUMs. Applications for ephemeral grazing would be considered. Monument objects found to be incompatible with livestock grazing would be fenced of to prevent impacts from livestock grazing.
- The entire Monument would be allocated as an SRMA with two RMZs to provide appropriate developed and non-developed recreational opportunities, as long as resources and Monument objects are protected.
- The route system would be slightly reduced, but motorized opportunities would continue to be available along with non-motorized recreation being provided.
- Three one-mile-wide, multiuse utility corridors would be maintained.

2.3.3.3. Action Alternative C

The management decisions in this alternative generally represent an attempt to balance resource protection and human use and influence. As in Alternative B, it sets desired outcomes and

allocations for the resources discussed in the Monument's proclamation, including natural, cultural, and visual. It proposes a moderate amount of open roads and trails and a mix of recreational opportunities. It proposes a mix of natural processes and "hands-on" techniques for ecosystem restoration, resource management, and scientific research, and would likely reduce the need for intensive use management to avoid or mitigate any adverse effects.

Under Alternative C:

- Existing wildlife waters would be managed or redeveloped, and new ones would be built to sustain or enhance wildlife populations.
- No WHAs would be allocated, but management prescriptions would be applied to protect Monument objects.
- Cultural and heritage tourism and interpretation would be allowed, when such use is compatible with resource protection and Monument objects. A priority would be placed on scientific research.
- The Lower Gila Historic Trail SCRMA would be allocated to protect a number of historic trails.
- Certain areas, primarily in the Sand Tank Mountains, would be managed to protect wilderness characteristics for a total of 112,200 acres.
- Grazing allotments north of I-8 would be allocated as perennial grazing only, with no ephemeral grazing. Monument objects found to be incompatible with livestock grazing would be fenced off to prevent impacts from livestock grazing.
- One SRMA with two RMZs would be allocated to provide appropriate developed and non-developed recreational opportunities, as long as resources and Monument objects are protected.
- A diversity of recreational opportunities would be provided, with increased non-motorized recreation. Certain uses, such as recreational target shooting and wood collecting for campfires, would be limited, compared to current conditions.
- A modest reduction in motor vehicle access, compared to current conditions, would occur by limiting selected routes in the existing system to seasonal use and, closing other routes, to reduce system redundancy or protect resources.
- Two half-mile wide, multiuse utility corridors (where only underground utilities would be allowed) would be allocated.
- Highway 238 would be allocated as a Scenic Byway.

2.3.3.4. Action Alternative D

Alternative D places the greatest emphasis on minimal human use/influence and maintenance of primitive landscapes. It focuses on natural processes and other unobtrusive methods for ecosystem restoration, resource management, and scientific research, while emphasizing resource protection/conservation. As in the other alternatives, it sets desired outcomes and allocations for Monument resources discussed in the Proclamation, including natural, cultural, and visual,

while allowing a lower level of human use. The need for both intensive use management and "hands-on" resource stabilization and restoration measures would be reduced by the greatest degree under Alternative D.

Under Alternative D:

- Existing wildlife waters would be managed or redeveloped, and new ones would be built to sustain or enhance wildlife populations.
- Passive restoration would be used, and management implemented through limiting human access and development.
- No WHAs would be allocated, but management prescriptions would be applied to protect Monument objects.
- Cultural and heritage tourism and scientific research would be allowed only when such use is compatible with resource protection.
- The largest number of acres (153,000) would be managed to protect wilderness characteristics.
- Allotments currently open to grazing would become unavailable as permits expire.
- One SRMA with one RMZ would be allocated to provide appropriate developed and non-developed recreational opportunities.
- Recreational opportunities would focus on primitive and non-motorized recreation. Certain uses, such as recreational shooting, paintball, and wood collection for campfires, would not be allowed.
- All-terrain vehicles, motorcycles, and vehicles weighing less than 1,800 pounds would be prohibited on the Monument. A smaller number of vehicle routes would remain open for public use.
- No multiuse utility corridors would be designated and new LUAs would not be allowed.
- Highway 238 and Interstate 8 would be allocated as Scenic Byways.

2.3.3.5. Preferred Alternative E

Alternative E is BLM's preferred alternative for the SDNM Decision Area. This incorporates elements from each of the other alternatives, offering a unique prescription for managing public use of the Monument while, at the same time, providing long-term protection and conservation of resources. It balances human use and influence with resource protection. The need for both intensive use management and "hands-on" resource stabilization and restoration measures would be reduced by an intermediate degree.

Under Alternative E:

- New wildlife waters would be built when needed to maintain or enhance wildlife resources.
- Passive restoration would be used, and management implemented through limiting human access and development.

- No WHAs would be allocated, but management prescriptions would be applied to protect Monument objects.
- Cultural and heritage tourism and interpretation, as well as scientific research, would be allowed when use is compatible with resource protection.
- The Lower Gila Historic Trail SCRMA would be allocated to protect a number of historic trails.
- Certain areas in the Sand Tank Mountains area would be managed to protect wilderness characteristics for a total of 110,900 acres.
- Grazing allotments north of I–8 would be allocated as perennial, perennial-ephemeral, or ephemeral, as appropriate to allotment-specific characteristics. Monument objects found to be incompatible with livestock grazing would be fenced off to prevent impacts from livestock grazing. Additionally, the portion of Conley Allotment within SDNM boundaries would become unavailable for livestock use. Grazing use across the Monument would be adjusted as needed, in accordance with grazing regulations, and in response to the grazing determinations required by the Proclamation.
- One SRMA with two RMZs would be allocated to provide appropriate developed and non-developed recreational opportunities.
- A diversity of recreational opportunities would be provided, with increased non-motorized recreation. Certain uses, such as recreational target shooting, paintball, and wood collecting for campfires likely to cause resource damage, would not be allowed.
- A modest reduction in motor vehicle access similar to Alternative C would occur by limiting selected routes in the existing system to seasonal use and closing other routes to reduce system redundancy or protect resources and Monument objects.
- No multiuse utility corridors would be designated and new LUAs would not be allowed.
- Highway 238 and I–8 would be allocated as scenic byways.

2.4. ALTERNATIVES CONSIDERED BUT NOT FURTHER ANALYZED

This section briefly describes alternatives considered but not incorporated into an alternative for further analysis in this DEIS. The management actions considered were recommended by members of the public either during scoping or in the alternatives' development workshops, or by resource specialists. The management actions are described below, along with the rational for excluding them from further consideration.

2.4.1. Public Safety

There was a recommendation to prohibit the carrying of weapons. By law, U.S. citizens may carry weapons on or through public lands for a number of legitimate purposes including, but not necessarily limited to, hunting and self-protection. Alternatives for managing recreational

target shooting activities are being considered in this Draft RMP for public safety and resource protection purposes, but a prohibition against the possession of firearms is not being pursued.

2.4.2. Travel Management

Driving in Washes

A proposal was submitted that driving in washes be allowed in all washes large enough to accommodate a four wheel-drive vehicle as a long-standing, traditional use. This alternative was not carried forward into an action alternative because allowing vehicular travel in washes not specifically designated as a BLM asset, such as a primitive road, would force drivers to determine whether or not the wash was open for travel. Such ambiguity could lead to situations of unlawful driving and resource damage. The travel route inventory conducted by the BLM since 2000 includes routes in washes.

In addition, authorizing unlimited driving in washes, at the driver's discretion, would essentially open hundreds of miles of wash system to ATVs or four-wheel drives, as this action would include currently traveled washes as well as untraveled washes. This type of travel is inconsistent with Presidential Proclamation 7397, which expressly prohibits, with the exception of emergency or authorized administrative use, all motorized and mechanized vehicle use "off road" in the Monument. Furthermore, washes throughout the Lower Sonoran Planning Area contribute substantially to sustaining healthy, diverse, and productive ecosystems and cultural landscapes. Due to potentially adverse resource impacts on wildlife habitat, soils, and vegetation, unlimited driving in washes is inconsistent with the resource protection and management goals established for both the Lower Sonoran and SDNM Decision Areas. Vehicle travel in certain washes would be considered during the route evaluation process for the Lower Sonoran Decision Area as part of the comprehensive travel management plans.

2.4.3. Land Tenure

Land Disposal

The recommendation was to identify Federal lands bordering the Gila River Indian Reservation in the Estrella Mountains for disposal. While there are lands that border the Reservation analyzed in detail for disposal among the alternatives, those lands situated in the Sierra Estrella Wilderness and within the Juan Bautista National Trail boundaries cannot be disposed of. They are congressionally protected and designated under the Wilderness Act of 1964 and National Trails System Act of 1968.

2.4.4. Livestock Grazing

For livestock grazing allotments within the Lower Sonoran Decision Area, an alternative was considered regarding the potential conversion of all, or some, perennial and perennial/ephemeral livestock grazing allotments to strictly ephemeral use only. This alternative was not evaluated further as these decisions would be determined on an individual allotment basis based on monitoring findings and through a land health evaluation process which were not conducted for this plan.

2.5. MANAGEMENT COMMON TO ALL ALTERNATIVES

2.5.1. EXISTING MANAGEMENT DECISIONS AND DECISIONS TO BE CARRIED FORWARD

Management actions and decisions that apply to all alternatives include those related to the Arizona Land Health Standards and actions and decisions from previous RMPs or amendments that are determined to be valid and are carried forward under the revised plan. However, the public lands within this Planning Area are currently managed under three separate RMPs and several amendments (refer to Map 1-2 for the geographic areas that each of these plans encompass). Therefore, many of the existing decisions only cover portions of the Planning Area, not the entire Planning Area.

Existing management decisions come from the following RMPs or RMP Amendments that overlay the Planning Area (in chronological order):

- Lower Gila North Management Framework Plan (MFP) (1983)
- Phoenix Resource Management Plan (RMP) (1989)
- Lower Gila South RMP (1988)
- Lower Gila South RMP (Goldwater Amendment) (1990)
- Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (1997)
- Statewide Amendment for Fire, Fuels, and Air Quality (2003)
- Cameron Allotment Amendment (2004)
- Amendment to the Lower Gila North MFP and Lower Gila South RMP (2005)

In addition to the LUPs above, several programmatic environmental impact statements (EISs) are also adopted and incorporated into this plan where applicable. These are the following:

- Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic EIS (2007) and Vegetation Treatments on BLM Lands in 17 Western States Programmatic Environmental Report (2007)
- Programmatic Environmental Impact Statement, Designation of Energy Corridors on Federal Land in the 11 Western States (2009)

2.5.2. Wilderness

The Planning Area includes six Wilderness Areas designated by the *Arizona Desert Wilderness Act of 1990.* These areas total 249,450 acres: 91,750 acres in the Lower Sonoran Decision Area and 157,700 acres in the SDNM Decision Area and are identified in Table 2.1, “Wilderness Areas of the Lower Sonoran and SDNM Decision Areas” (p. 43).

Table 2.1. Wilderness Areas of the Lower Sonoran and SDNM Decision Areas

Wilderness	Size (Acres)
Lower Sonoran	
Sierra Estrella	14,400
Signal Mountain	13,350
Woolsey Peak	64,000
SDNM	
North Maricopa Mountains	63,200
South Maricopa Mountains	60,100
Table Top	34,400
Total	**249,450**

BLM management policy directs that each BLM wilderness area have a management plan (BLM Manual 8560). Management guidance is provided under the Maricopa Complex Wilderness Management Plan (BLM 1996; for the North Maricopa Mountains, Sierra Estrella, South Maricopa Mountains, and Table Top Wildernesses) and the Woolsey Peak Wilderness and Signal Mountain Wilderness Management Plan (BLM 2003) and there are no proposals in this RMP changing any decisions contained in these management plans.

As stated in Chapter 1, *Purpose & Need for the RMP* (p. 1), only Congress has the authority to designate wilderness and wilderness study areas so no new areas will be proposed in this plan. However lands with wilderness characteristics can be managed by the BLM to protect those characteristics and are discussed throughout the chapters within this document.

2.5.3. ARIZONA LAND HEALTH STANDARDS

The Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (Standards and Guidelines, or S&Gs) were developed, pursuant to 43 CFR 4180, through a collaborative process involving BLM staff and the Arizona BLM Resource Advisory Council, and approved by the Secretary of the Interior in April 1997. The Standards and Guidelines have been developed to identify the characteristics of healthy ecosystems on public lands and the management actions that promote them.

When approved, the S&Gs became Arizona BLM policy, guiding the planning for and management of BLM public lands. Arizona Standards and Guidelines, therefore, have been incorporated into this DRMP/EIS. The Standards for Rangeland Health describe the conditions necessary to encourage proper functioning of ecological processes, and are adopted as Land Health Standards. In managing and implementing all resource programs, the BLM must consider the Land Health Standards and they are identified below.

The Guidelines for Grazing Administration are a series of management practices used to ensure that grazing activities meet the Standards. These Guidelines are incorporated into the Draft RMP/EIS in Section 2.8.2, "Livestock Grazing (GR)" (p. 137) and may be found in Appendix L, *Guidelines for Grazing Administration* (p. 1253).

Listed below are the standards that describe the conditions needed to encourage proper functioning of ecological processes.

2.5.3.1. Standard One: Upland Sites

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Criteria for Meeting Standard One

Soil conditions support the proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including suitable amounts of vegetation cover, litter, and soil porosity and organic matter. When soils and ecological sites function properly, rates of soil loss and infiltration are consistent with the site's potential.

Ground cover in the form of plants, litter, or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

As indicated by:

- Ground cover,
- Litter,
- Live vegetation (e.g., grass, shrubs, trees) amount and type,
- Rock,
- Signs of erosion,
- Flow pattern,
- Gullies, and
- Rills and plant pedestaling.

Exceptions and exemptions (where applicable):

- None

2.5.3.2. Standard Two: Riparian-Wetland Sites

Riparian-wetland areas are in proper functioning condition.

Criteria for Meeting Standard Two

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate the stream energy of high-water flows.

Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetation, soil and erosion-deposition factors. The BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as shown by the results of applying the appropriate checklist.

The checklist for riparian areas is in Technical Reference 1737-9, Process for Assessing Proper Functioning Condition (BLM 1993d). The checklist for wetlands is in Technical Reference 1737-11, Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas (BLM 1994c).

As indicated by:

- Gradient,
- Width/depth ratio,
- Channel roughness and sinuosity of stream channel,
- Bank stabilization,
- Reduced erosion,
- Captured sediment,
- Ground water recharge, and
- Dissipation of energy by vegetation.

Exceptions and exemptions (where applicable):

- Dirt tanks, wells, and other water facilities built or placed at a location to provide water for livestock or wildlife and not determined through local planning to provide for riparian or wetland habitat are exempt.
- Water impoundments permitted for construction, mining, or other similar activities are exempt.

2.5.3.3. Standard Three: Desired Future Conditions

Productive, diverse upland and riparian-wetland plant communities of native species exist and are maintained.

Criteria for Meeting Standard Three

Upland and riparian-wetland plant communities meet Desired Plant Community (DCP) objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species and the requirements of the Taylor Grazing Act (TGA); FLPMA; Endangered Species Act (ESA); Clean Water Act (CWA); and other laws, regulations, and policies.

Additionally, DPC objectives will be developed to assure that soil conditions and ecosystem function described in Standards 1 and 2 are met. These objectives detail a site-specific plant community, which when obtained, will assure rangeland health; State water quality standards; and

habitat for endangered, threatened, and sensitive species. Thus, DPC objectives will be used as an indicator of ecosystem function and rangeland health.

As indicated by:

- Composition,
- Structure, and
- Distribution.

Exceptions and exemptions (where applicable):

- Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical are exempt

2.6. ALTERNATIVES

Detailed alternatives' descriptions for the Lower Sonoran and SDNM Decision Areas are presented by program area and include:

- A brief introduction about the program area.
- Existing Management Decisions (Alternative A), split between five of the existing LUPs.
- Alternative Allocation Tables (if the program area has any land use allocations).
- Action Alternative (Alternatives B, C, D, and E) Management Action Tables.

Within the Action Alternative Management Action Tables, abbreviations are used to note which Decision Area and alternative applies to an individual action. Abbreviations are also used for the program areas themselves. Program area abbreviations appear before each decision number. The abbreviations used in this chapter are outlined below in Table 2.2, " Program Area Categories and Abbreviations" (p. 46).

Table 2.2. Program Area Categories and Abbreviations

Planning Decision Areas	
Lower Sonoran	LS
Sonoran Desert National Monument	SDNM
Resource Program Areas	
Air Quality	AQ
Cave Resources	CR
Cultural and Heritage Resources	CH
Paleontological Resources	PL
Priority Wildlife and Habitat Management	PW
Soil Resources	SR
Vegetation	VG
Visual Resources	VR
Water Resources	WR
Wild Horse & Burro Management	HB
Wilderness Characteristics	WC
Wildland Fire Management	WF
Resource Use Program Areas	
Lands and Realty	LR

Livestock Grazing	GR
Minerals Management	MM
Recreation Management	RM
Travel Management	TM
Special Designations	
Special Designations	SD
Social and Economic Concerns	
Hazardous Materials & Public Safety	PS

2.6.1. STANDARD OPERATING PROCEDURES & BEST MANAGEMENT PRACTICES

Review of the alternatives must always consider that, despite the goals, objectives, and management actions prescribed, the BLM functions using a set of standard operating procedures (SOP) and best management practices (BMP) that guide day-to-day operations and business practices. Every alternative should be reviewed within the context of the way the BLM conducts business. The SOPs and BMPs are the combined product of procedures developed to comply with laws, regulations, policies, and other guidance and are often institutionalized in manuals and handbooks. The SOPs and BMPs are described in detail (although not all inclusive) by program in Appendix H, *Best Management Practices & Standard Operating Procedures* (p. 1211).

2.7. RESOURCES

2.7.1. AIR QUALITY

The Environmental Protection Agency (EPA) has delegated rulemaking pertaining to air quality and achieving attainment of air quality standards to states, which further delegate authority to counties through state implementation plans. Activities on BLM lands contribute a very small share of target pollutants in central Arizona. However, within air pollution nonattainment areas in the vicinity of Phoenix, rules made by Maricopa County apply to BLM lands. BLM activities that emit target pollutants in nonattainment areas need to be managed so that they do not contribute to standards violations. The primary target pollutant emitted by activities on BLM lands is particulate matter up to 10 microns (PM_{10}). The goals, objectives, and management actions below are intended to assure that activities on BLM land comply with the appropriate rules.

2.7.1.1. Existing Management Decisions, Alternative A (No Action) Air Quality.

Lower Gila South Resource Management Plan — Goldwater Amendment (1990)

[Applies to the three relinquished Sentinel Plain, Sand Tank Mountains, and Ajo Airport parcels]:

- Control excessive fugitive dust at Bureau of Land Management (BLM)-permitted construction sites and recreation activity areas (WS-12).
- Monitor air quality trends (WS-13).

2.7.1.2. Action Alternatives for Air Quality (AQ)

Management Actions and Allowable Uses

Goal 1: ***Protect, maintain, and improve the quality of air resources associated with authorized uses and activities on public lands.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Maintain existing air quality and air quality-related values (e.g., visibility) by ensuring that authorized uses on public lands comply with and support Federal, State, and local laws and regulations for protecting air quality.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**AQ-1.1.1:** State and local agencies and adjacent land managers would be consulted to address emissions that affect public lands.
LS	**SDNM**	**B**	**C**	**D**	**E**	**AQ-1.1.2:** Appropriate management techniques and practices would be applied to all authorized surface-disturbing projects and activities as needed to ensure compliance with standards.
Objective 1.2: Apply mitigation measures for uses and activities within and near adjoining communities, wilderness areas, and large particulate-matter $(PM)_{10}$ (i.e., dust) non-attainment and maintenance areas, especially as they pertain to unpaved roads that traverse public lands.						

Goal 1: *Protect, maintain, and improve the quality of air resources associated with authorized uses and activities on public lands.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS	**SDNM**	**B**	**C**	**D**	**E**	**AQ-1.2.1:** Excessive fugitive-dust generation from unpaved roads, construction sites, recreation activity areas, and other areas would be managed to ensure emissions do not exceed air-quality standards, particularly those more rigid requirements in non-attainment areas.
LS	**SDNM**	**B**	**C**	**D**	**E**	**AQ-1.2.2:** Fugitive-dust emissions from unpaved roads would be mitigated through appropriate control methods, including, but not limited to: ● Lowering speed limits by creating obstacles such as speed bumps; ● Using fugitive-dust control measures such as dust. suppressants, gravel, or pavement; ● Installing cattle guards where unpaved roads meet paved roads; ● Reducing vehicle-use intensity or duration, reducing route density, or re-routing travel routes to more stable soils; ● Limiting the vehicle type on roads or in areas that are susceptible to excessive dust due to unstable soils; ● Closing high-use areas during high-pollution days; ● Closing areas that frequently exceed PM_{10} standards to non-compliant recreation and other projects until mitigation measures are implemented. ● Implementing temporary, seasonal, or permanent route closures when other methods are unsuccessful at controlling fugitive dust that exceeds regulatory limits.

Administrative Actions

- Participate in the Interagency Smoke Program and other programs related to air quality.
- Participate and comment on proposed projects identified as requiring Prevention of Significant Deterioration/New Source Review permits for their effects on air quality and affected resources within 100 kilometers of wilderness areas. Request that location-specific pre-application monitoring be conducted to support the permit review process when appropriate.
- Review projects requiring non-major permits within 10 km of wilderness areas to determine their effects on air quality and affected resources, and provide comments to the appropriate regulatory agency.
- Participate in the public workshops and provide comments on the Maricopa County or other proposed air quality rule changes.
- Work with adjoining land managers and users to mitigate air quality effects on public lands.
- Coordinate with county or municipal authorities to encourage control of fugitive dust emissions from unpaved roads that affect attainment of air quality standards

- Work with Federal, state, and local agencies to monitor air quality on public lands, particularly in wilderness and other special areas. Air-quality monitoring should include visibility, ozone, acid deposition or other relevant air-quality indicators.

- Work with Federal, state, and local agencies to gather meteorological data, including installing meteorological stations on the public lands, as needed and appropriate.

- Encourage research of air quality-related issues.

- Address air-quality impacts when planning and executing prescribed burns to comply with Federal and state air quality standards and adhere to Article 15 of the Arizona Administrative Code and State Implementation Plan provisions.

Specific to the SDNM Decision Area.

- Review projects requiring non-major permits within 10 km of the SDNM to determine their effects on air quality and affected resources and provide comments to the appropriate regulatory agency.

- Work with adjoining land managers and users and county or municipal authorities to mitigate air quality effects on the SDNM. Make control of fugitive dust emissions from unpaved roads, construction sites, or other activity areas within 10 kilometers of SDNM a priority of this effort.

- Coordinate with county or municipal authorities to encourage control of fugitive dust emissions from unpaved roads that affect attainment of air quality standards in the SDNM.

- Increase public awareness and appreciation of air-quality resources and visibility through interpretative displays as part of the public outreach program and visitor facilities planning for SDNM.

- Work with Federal, State, and local agencies to monitor air quality in the SDNM. Air-quality monitoring should include visibility, ozone, acid deposition, or other relevant air quality indicators.

- Promote the study of air quality conditions in the SDNM, including the effects of ozone, acid deposition and other related pollutants on plants and the supporting ecosystems. Cooperate and promote such activity with academic institutions and other interested parties.

2.7.2. CAVE RESOURCES

Although no caves have been identified in the Decision Area, there may be undocumented caves located in geologically suitable rock units. Any newly discovered caves would be evaluated for scientific, educational, biological, and recreational value.

The Planning Area contains Paleozoic sedimentary deposits and Tertiary volcanic rocks that are known to contain caves elsewhere in Arizona. While Paleozoic limestone occurs in the Sand Tank Mountains, no caves or karst resources are known to exist. The Sentinel Plain area contains two lava tubes. Small rock overhangs and shallow openings are present in some rock units of the lava tubes; however, by definition these do not qualify as caves. The definition of a cave requires that its depth exceed its width.

BLM Manual 8380, Cave and Karst Resources Management, provides guidance and direction for the management of cave and karst resources on BLM-administered lands, including aquifers and their surface water and groundwater-drainage areas.

2.7.2.1. Existing Management Decisions, Alternative A (No Action) For Cave Resources

No existing management decisions exist for caves and cave resources.

2.7.2.2. Action Alternatives for Cave Resources Management (CR)

Management Actions and Allowable Uses

Goal 1: Protect and conserve caves and karst resources as they are discovered on the public lands.						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Manage caves and karst resources to maintain or enhance their physical integrity and scientific interest.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**CR-1.1.1:** Evaluate and inventory caves and karst resources, as they are discovered, to determine if the cave contains significant cultural, scientific, biological, geological, hydrological, educational, or recreational values.
LS	**SDNM**	**B**	**C**	**D**	**E**	**CR-1.1.2:** Protect and manage significant caves and karst resources for cultural, scientific, biological, geological, hydrological, educational, and recreational values.
LS	**SDNM**	**B**	**C**	**D**	**E**	**CR-1.1.3:** Public access to all caves within this Decision Area will be by permit only unless public entry is signed as open. Federal, State and local government employees operating within the scope of their authorizations would be exempt from permit issuance.

2.7.3. CULTURAL & HERITAGE RESOURCES

Cultural and heritage resources are the physical and traditional remnants of thousands of years of human occupation and use of the land and its resources. Cultural resource sites date to both prehistoric and historic time periods, up to the mid-twentieth century. Sites may contain tools or other artifacts; features, such as rock art or structural remains; and other items, such as charcoal, bone, and plant remains. Sites vary in size and occur in a variety of locations and environmental zones. Individual sites may even exhibit evidence of use and occupations dating to various periods. The BLM strives to protect the informational, heritage, and interpretive values of archaeological and heritage sites. Cultural resources also include places of traditional importance to Native Americans.

Cultural and heritage sites are recognized as fragile and irreplaceable resources with potential public and scientific uses. Allocation to one of five use categories is prescribed in BLM Manual 8100 can include:

- Scientific use,
- Conservation for future use,
- Traditional use,
- Public use, or
- Experimental use.

Some sites may be allocated to two (or more) categories simultaneously. Some categories are mutually exclusive. In order to manage a diversity of cultural sites, allocations to these categories are necessary. Re-allocation is possible based on changing management and physical scenarios and does not require a resource management plan amendment (see Appendix I, *Cultural Use Allocations* (p. 1231) for more information on site allocations).

Management of sites on a regional or landscape level can be achieved by allocating an area as a Special Cultural Resource Management Area (SCRMA). This is an area containing cultural resources (archaeological sites, historic sites or places of traditional cultural importance) that are particularly important for public use, scientific use, traditional use or other uses as defined in BLM Manual 8110.4. Management prescriptions for these areas should reflect and support the primary values for which the areas are allocated. For example, management prescriptions for a SCRMA allocated primarily for public use should focus on developing and interpreting sites for public visitation, including heritage tourism. Management prescriptions for a special area allocated primarily for scientific use should focus on protecting sites for study, supporting field schools and other research efforts. Management prescriptions for a special area allocated primarily for traditional use should seek to accommodate the traditional cultural practices of Indian tribes or other cultural groups that ascribe religious or other heritage values to the area.

Management prescriptions for a special area allocated primarily to protect scarce sites of singular importance that should not be subjected to invasive studies or other uses that would threaten their present condition should focus on conserving sites for the future. Management prescriptions for a single SCRMA can focus on more than one type of use, just as a single cultural property can be allocated to more than one of the use categories described in Manual 8110.4. For example, a special area might contain a set of cultural properties that, linked together and interpreted as a

group, would make a good auto tour route for heritage tourism. At the same time, the area might contain several cultural properties of unusual historic importance that should be segregated from land or resources uses that might impair their present condition or setting. While both kinds of properties should receive management emphasis, they can be subsumed within a single land use allocation with management prescriptions tailored to support public visitation of the sites along the auto tour route, and protection for the sites that warrant segregation.

The primary purpose of this land use allocation is to differentiate some portions of a Planning Area from others in terms of cultural resource values. The allocation can denote priority for the expenditure of time and funds or the need for special protection to achieve management objectives. However, highlighting a geographic area for its special cultural resource values does not diminish the importance of cultural resources in other areas. Cultural resources on lands not included within special areas still need to be managed for the values they contain and opportunities they afford.

The regulatory framework under which cultural and heritage resources are managed include a list of laws, regulations, and Executive Orders. The most important laws are the National Historic Preservation Act (NHPA), Archaeological Resources Protection Act (ARPA), National Trails System Act, American Indian Religious Freedom Act (AIRFA), Antiquities Act of 1906, Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), National Environmental Policy Act of 1969 (NEPA), Federal Land Policy and Management Act of 1976 (FLPMA), Historic Sites Act of 1935, Reservoir Salvage Act of 1960 as amended by the Archaeological and Historic Preservation Act of 1974, and the Archaeological and Historic Preservation Act.

Sonoran Desert National Monument

The purpose of the SDNM designation according to Presidential Proclamation 7397 is to protect the “objects” of the Monument. Some cultural and historic objects were listed individually and some were inferred. The objects include the natural historic landscape settings of a 23-mile corridor segment of the Juan Bautista de Anza National Historic Trail (Anza NHT) corridor, and the Butterfield Overland Stage Route and the Mormon Battalion Trail located within the same 23-mile corridor. The other named objects include rock art, lithic quarries, historic and prehistoric structures, prehistoric routes, objects of historic or scientific interest, significant archaeological and historic sites, large prehistoric villages, permanent habitation sites, protohistoric villages, Vekol Wash and other prehistoric travel and trade corridors.

The cultural and heritage resources located on the Monument are a far more diverse collection than this list of object names. Less than three percent of the Monument has been inventoried. As the inventory grows, a greater understanding of these resources and their relationship with each other will be discovered and documented. Protection of these resources as Monument objects will ensure their survival into the future.

2.7.3.1. Existing Management Decisions, Alternatives A (No Action) For Cultural & Heritage Resources

The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila North Management Framework Plan (1983)

- Allocate cultural resources identified through inventory for scientific uses. (CL-01 and 02).
- Reduce or eliminate indirect impacts of land uses on cultural resources as identified through study plots. (CL-03).
- Conserve a representative sample of site types in the Planning Area for future use (CL-04).
- Provide immediate and long-term in-place preservation and protection of selected cultural resources that are threatened or deteriorating (CL-05).

Lower Gila South Resource Management Plan (Goldwater Amendment — 1990)

(Applicable to the three relinquished BGR parcels)

- Provide special protection for significant cultural sites that are being impacted or threatened by the public. For sites being impacted or threatened by the military, a different process will be followed. The BLM will be available to the military at all times as a consultant. (CL-3).
- Minimize impacts on cultural resources by avoiding cultural property locations whenever feasible and using previously disturbed areas as the preferred locations for ground-disturbing activities when practical. (CL-4).

Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (1997)

- S&G Guideline 3-7: Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites, and plants of significance to Native American peoples (CL-9).

2.7.3.2. Action Alternatives for Cultural & Heritage Resources (CL)

Program Goals

- **Goal 1:** Identify, preserve, and protect important cultural resources and Monument Objects. Ensure they are available for appropriate uses by present and future generations.
- **Goal 2:** Reduce threats, reduce or prevent damage, and resolve potential conflicts from naturally occurring or unauthorized human-caused damage or deteriorations.
- **Goal 3:** Manage assemblages of sites within the Decision Areas as cultural landscapes.

Land Use Allocation Summary Tables

Table 2.3. Proposed Site Use Allocations by Alternative

Allocation by Decision Area	Alternatives (BLM acres)				
	A	B	C	D	E

Lower Sonoran					
Painted Rock Petroglyph Site – Public and Scientific Use		200	200	200	200
Butterfield West – Public and Scientific Use		10	10		10
Sundad – Public and Scientific Use		73	73		73
Butterfield West – Scientific Use				10	
Sundad – Scientific Use				73	
SDNM					
Bighorn Station – Public and Scientific Use		<5	<5		<5
Christmas Camp – Public and Scientific Use		<5	<5		<5
Happy Camp (Desert Station) – Public and Scientific Use		<5	<5		<5
Selected segments of Butterfield Overland Stage Route (Butterfield Pass) – Public and Scientific Use		3,600	3,600		3,600
Bighorn Station – Scientific Use				<5	
Segments of Butterfield Overland Stage Route – Conservation for Public Use				3,600	
Christmas Camp – Scientific Use				<5	
Happy Camp (Desert Station) – Scientific Use				<5	

Table 2.4. Proposed Cultural and Historic Resources Land Use Allocations (SCRMAs)

Allocation by Decision Area	Alternatives (BLM acres)				
	A	B	C	D	E
Lower Sonoran					
Saddle Mountain SCRMA			48,500	ACEC	ACEC
Lower Gila Terraces and Historic Trails SCRMA			79,100	ACEC	ACEC
SDNM					
Sonoran Desert Historic Trails SCRMA			16,200		16,200

Management Actions and Allowable Uses

Goal 1: ***Identify, preserve, and protect important cultural resources and Monument Objects. Ensure they are available for appropriate uses by present and future generations.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Allocate known and evaluated cultural resource sites to one of five use categories: (1) scientific use, (2) conservation for future use, (3) traditional use, (4) public use or (5) experimental use, or classify as "discharged from management." Newly discovered and recorded sites would be evaluated and allocated within one year. (Use categories and criteria to determine categories are described in Appendix I, *Cultural Use Allocations* (p. 1231)).						
Site Use Allocations						
LS		**B**	**C**	**D**	**E**	**CL-1.1.1**: Painted Rock Petroglyph Site would remain a public and scientific use site for heritage tourism and interpretation purposes. The site would continue to be managed for interpretation and education uses according to the existing project and business plans (Maps 2-1b, 2–1c, 2–1d and 2–1e.)
LS		**B**	**C**	**D**	**E**	**CL-1.1.2**: Retain public lands and acquire available state and private lands and/or easements to assure long term use, protection and access to important cultural sites that occupy a particular and definitive role in the cultural landscape or are of particular importance to local Native American tribes. Emphasize lands located within allocated use site categories and SCRMAs.
LS		**B**	**C**	**D**	**E**	**CL-1.1.3**: All cultural sites allocated to the public use category as identified in Appendix I, *Cultural Use Allocations* (p. 1231) would be closed to locatable mineral exploration and development, and mineral material disposals (saleables). Public lands would be recommended for withdrawal.

Goal 1: ***Identify, preserve, and protect important cultural resources and Monument Objects. Ensure they are available for appropriate uses by present and future generations.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**	**C**	**D**	**E**	**CL-1.1.4**: Public use sites would remain open to all leasable minerals, but any lease or energy LUA would contain a no surface occupancy stipulation.
LS		**B**	**C**	**D**	**E**	**CL-1.1.5**: Public use sites would be exclusion areas for utility scale energy development and multiuse corridor LUAs. They would be avoidance areas for minor linear and nonlinear LUAs and mitigated to be consistent with management objectives.
LS	**SDNM**	**B**	**C**		**E**	**CL-1.1.6**: Sundad, Butterfield West (selected segment of the Butterfield Overland Stage Route west of the Painted Rock Site), Anza-Butterfield Interpretive Trail (a high potential segment of the Juan Bautista de Anza NHT and Butterfield Overland Stage Route within the SDNM), Happy Camp, Christmas Camp and Bighorn Station would be allocated as public and scientific use sites. Management prescriptions for public use sites would follow those set forth in the applicable special designation sections of the RMP when more restrictive. Inventory, recordation, documentation, and preparation of all sites for increased public visitation must be accomplished prior to implementing interpretive developments. Sundad would only be developed if critical safety issues are addressed. Big Horn Station would only be developed if stabilization measures are taken, critical safety issues are addressed and legal access is obtained. (Maps 2-1b, 2–1c and 2–1e.)
LS	**SDNM**			**D**		**CL-1.1.7**: Sundad, Butterfield, Anza-Butterfield Interpretive, Happy Camp, Christmas Camp and Bighorn Station sites would be allocated as scientific use sites only. Sites would not be used for tourism or interpretive development (Map 2-1d). Management prescriptions for these areas would follow those set forth in the applicable special designation sections of the RMP where more restrictive.
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-1.1.8**: Motorized vehicle use would be allowed on the Anza-Butterfield Interpretive Trail high potential segment providing Monument Objects are protected.
	SDNM			**D**		**CL-1.1.9**: The Anza-Butterfield Interpretive Trail high potential segment would be limited to non-motorized uses.
	SDNM	**B**	**C**		**E**	**CL-1.1.10**: Camping within 100 feet of centerline along the Anza-Butterfield Interpretive Trail high potential segment would be limited to designated campsites as determined in activity level planning.
	SDNM			**D**		**CL-1.1.11**: No camping (motorized or non-motorized) would be allowed along the Anza-Butterfield Interpretive Trail high potential segment.
Objective 1.2: Encourage appropriate scientific use of cultural resources.						
LS	**SDNM**	**B**	**C**		**E**	**CL-1.2.1** Provide opportunities for scientific research and inventory at selected sites, including excavation by qualified researchers.
LS	**SDNM**			**D**		**CL-1.2.2** Opportunities would be provided for scientific research and inventory at selected sites by qualified researchers if designed to have a minor or negligible impact to cultural resources.
Objective 1.3: Allocate cultural and historical features as Special Cultural Resource Management Areas (SCRMAs) to protect the features, visual settings and enhance visitor experience.						
Common To All SCRMAs						
LS	**SDNM**		**C**			**CL-1.3.1**: The Saddle Mountain, the Lower Gila Terraces and Historic Trails, and the Sonoran Desert Historic Trails SCRMAs would be designated on selected public lands as presented in Table 2.4, "Proposed Cultural and Historic Resources Land Use Allocations (SCRMAs)" (p. 55) and as shown on Map 2-1c. (The Sonoran Desert Historic Trails SCRMA is the only SCRMA designated in Alternative E).

Goal 1: ***Identify, preserve, and protect important cultural resources and Monument Objects. Ensure they are available for appropriate uses by present and future generations.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS	**SDNM**		**C**			**CL-1.3.2**: Motorized vehicle routes would be closed, limited or mitigated as needed to protect the cultural resources during the route designation process or when conflicts with cultural resources are identified.
LS	**SDNM**		**C**			**CL-1.3.3**: Heritage tourism would be allowed only if compatible with protection measures as described in BLM Manual 8140.
LS	**SDNM**		**C**			**CL-1.3.4**: Inventory and evaluations on cultural resources in SCRMAs would be increased and emphasized.
LS	**SDNM**		**C**			**CL-1.3.5**: Sites allocated to Public Use may be developed for interpretation and environmental education.
LS			**C**			**CL-1.3.6** The Saddle Mountain and portions of the Lower Gila River and Historic Trails SCRMAs located outside the SDNM would be open to locatable minerals but closed to mineral material disposals (saleables).
LS			**C**			**CL-1.3.7**: All LUAs would be avoided, mitigated, and otherwise managed, within the Saddle Mountain and portions of the Lower Gila Terraces and Historic Trails SCRMA located outside the SDNM to be consistent with management objectives.
The Gila River Terraces and Lower Gila Historic Trails SCRMA						
LS			**C**			**CL-1.3.8**: Portions of the Lower Gila Terraces and Historic Trails SCRMA located outside the SDNM would remain open to all leasable minerals but any mining lease, would contain a No Surface Occupancy stipulation.
LS			**C**			**CL-1.3.9**: Treatments of invasive species would be allowed within the SCRMAs if they can be designed to have a minor or negligible impact to cultural resources.
LS			**C**			**CL-1.3.10**: Vegetation would be rehabilitated and restored in priority areas consistent with cultural landscape, viewshed and cultural resource integrity.

Goal 2: ***Reduce threats, reduce or prevent damage, and resolve potential conflicts from naturally occurring or unauthorized human-caused damage or deterioration.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Impacts by erosion, natural processes, or those due to vandalism visitation, vehicle traffic or other unauthorized human activity would be reduced.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-2.1.1** Potential conflicts from other resource uses would be minimized, reduced or unauthorized by complying with Section 106 of the National Historic Preservation Act, and using mitigation or avoidance strategies as prescribed by law, regulation and the BLM Cultural Resources 8100 Manual.
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-2.1.2**: Sites suffering damage or deterioration resulting from natural or human causes would be restored, stabilized, or mitigated.
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-2.1.3** Sites and Monument objects would be protected from degradation due to erosion and other natural processes by using a wide variety of techniques and tools, such as wash bank stabilization, rip rap and vegetation restoration.
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-2.1.4** Sites and Monument Objects damaged by vandalism, excessive visitation, vehicle traffic, or other causes, would be protected and stabilized by implementing protection measures as described in BLM Manual 8140.

Goal 2: ***Reduce threats, reduce or prevent damage, and resolve potential conflicts from naturally occurring or unauthorized human-caused damage or deterioration.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-2.1.5**: Special recreation permit holders would be required to provide archaeological site etiquette and resource conservation information to all participants, employees and volunteers associated with permitted activities.
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-2.1.6**: The number of visitors at cultural or historic sites would be limited to 25 people at the site, at any one time, to emphasize resource protection. Some sites may require further limitations to protect the resource. Casual use or group limits for SRPs may be higher on a case-by-case basis if determined to be acceptable in site specific evaluations and the activity/action can be designed to have a minor or negligible impact to cultural resources.

Goal 3: *Manage assemblages of sites within the Decision Areas as cultural landscapes.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 3.1: Distinct cultural landscapes would be described and mapped as defined by human use of the environment to protect the physical integrity, enhance visitor experience, and maintain or enhance visual settings. *Cultural landscapes are a new and holistic land use concept that attempts to understand human interaction with each other and their environment through time on a landscape scale.*						
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-3.3.1**: The age, function and interrelationship of sites attributed to historic indigenous populations in different environmental settings would be identified when possible.
LS	**SDNM**	**B**	**C**	**D**	**E**	**CL-3.3.2**: Cumulative impacts to the cultural landscape as well as impacts to individual sites would be analyzed as part of the project assessment when projects are proposed.

Administrative Actions

SHPO/NHPA.

- Continue to regularly communicate with the State Historic Preservation Office to share information and obtain technical advice on issues relating to compliance with Sections 106 and 110 of the NHPA, in accordance with the Arizona State Protocol.
- Focus proactive (Section 110) inventories on areas defined as Special Cultural Resource Management Areas, ACECs, and areas along historic trail routes.

Tribal Consultation and Concerns.

- Continue to consult with the Gila River Indian Community, the Ak-Chin Indian Community, the Salt River Pima-Maricopa Indian Community, the Tohono O'odham Nation, the Hopi Tribe, the Yavapai Prescott Indian Tribe, Fort Yuma – Quechan Tribe, and other interested Indian tribes to identify places of traditional importance and associated access needs. Develop measures for management and protection of such places that may be identified by tribes during the life of the approved RMP.
- Identify sacred areas in consultation with Indian tribes and, where practicable, limit land uses to those that do not conflict with ascribed values.
- Honor tribal requests to protect the confidentiality of sensitive information to the extent permitted by law.

- Provide opportunities for participation by Indian tribes in research and interpretation.
- Specific management prescriptions for sites allocated to the Traditional Use category will be developed in consultation with the Indian tribes to which they are culturally important.
- Restrict public information about the locations of sites that are not allocated to public use as allowed by law and regulation.

Research Opportunities.

- Complete documentary research and oral histories to gain a better understanding of cultural resources from homesteading, mining, ranching, and other historical period activities.
- Establish collaborative research partnerships with academic institutions, tribes, professional and nonprofit organizations, vocational organizations, and other entities for an orderly process of cultural research, recordation, and education.
- Work with researchers, tribes, interested members of the public, contractors, local communities, and published materials to define specific cultural landscapes. Work with tribal groups and individuals to define temporal, functional, and inter-relationships of sites within certain landscape settings.
- Provide opportunities for training and participation in site documentation, research, protection, and education projects by tribal members, students, and volunteers. Ensure adequate professional oversight of work conducted by tribal members, students, and volunteers.

Interpretation and Education.

- Map and document sites before interpretive development for public use, as needed, to preserve archeological data, plan for interpretive data, and provide a baseline condition assessment for monitoring changes resulting from visitor use.
- Complete interpretive plans for public use sites selected for interpretive development.
- Develop interpretive materials and facilities for selected sites. Provide educational opportunities to the public, including resource protection and appreciation, education, and stewardship
- Continue to participate in Arizona Archaeology Awareness Month events and other educational outreach programs to highlight the values of cultural heritage resources and the need to protect these resources.
- Provide opportunities for tribal and interested public participation in interpretation.

Monitoring.

- Continue to work with and support the Arizona Site Steward Program.
- Develop a monitoring scheme to evaluate the condition of cultural resources.
- Implement procedures for systematic monitoring of all sites developed or authorized for public visitation.

Planning.

- The BLM will develop Cultural Resource Project Plans for protection or interpretation projects that require precise descriptions of implementation procedures, workforce, scheduling, equipment, and supplies. Project planning will be implemented following guidance in BLM's Manual 8130, Planning for Uses of Cultural Resources.

Special Programs/Cultural Landscapes.

- Work with researchers, tribes, concerned members of the public, contractors, local communities, and other stakeholders to make use of previously published materials to define certain cultural landscapes.

- Develop a strategy to identify, assess, and monitor the view sheds along the historic trail corridor and other important cultural landscapes on the SDNM and within ACECs. Use Geographical Information System (GIS) technology to create view shed studies and collect information for the monitoring program.

2.7.4. PALEONTOLOGICAL RESOURCES (PL)

Paleontological resources constitute a fragile and non-renewable scientific record of the history of life on Earth. Once damaged, destroyed, or improperly collected, their scientific and educational value may be lost forever. In addition to their scientific, educational, and recreational values, paleontological resources can be used to understand the relationships between the biological and geological components of ecosystems over long periods of time. The BLM strives to manage paleontological resources for their scientific, educational, and recreational values, and to mitigate adverse impacts to them. On the SDNM, paleontological resources are considered objects of the Monument, implied by the statement "other objects of historic or scientific interest that are situated upon the … National Monuments." (Proclamation 7397).

Historic trends have shown that very few geologic units in the Planning Area contain paleontological material. This is due primarily to the lack of sedimentary formations in this part of Arizona. It should be noted, however, that very little of the Planning Area was inventoried for paleontological remains or the geologic units that tend to carry them.

The Paleontology Program Manual and Handbook, BLM Manual 8270 and H-8270-1, provide guidelines for implementing the Paleontological Resource Management Program.

2.7.4.1. Existing Management Decisions, Alternative A (No Action) for Paleontological Resources

SDNM Current Management Guidance (2002):

The collection of any objects, including vegetation, paleontological resources, or rock specimens, should not be permitted, except where intended for legitimate scientific uses for which documentation is provided to the satisfaction of the responsible management official. Scientific, archaeological, and historical investigations that increase our understanding of the Monument's resources are important, but surface disturbance should be avoided.

2.7.4.2. Action Alternatives for Paleontological Resources (PL)

Management Actions and Allowable Uses

Goal 1: Protect and manage vertebrate or noteworthy occurrences of invertebrate or plant fossils discovered on public lands for scientific, educational, or recreational values as they are discovered.						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Manage paleontological resources to maintain or enhance their physical integrity and scientific interest while avoiding all surface-disturbing activities that would damage significant or noteworthy occurrences of paleontological materials.						
LS		**B**	**C**	**D**	**E**	**PL-1.1.1:** Collection of all vertebrate fossils would be prohibited without written authorization from a BLM authorized officer in accordance with BLM Handbook H-8270-1. Invertebrate or plant fossils would be restricted on a case-by-case basis if they are determined to be noteworthy, of legitimate scientific or educational use, or if the resource cannot be protected on site.
	SDNM	**B**	**C**	**D**	**E**	**PL-1.1.2:** Collection of paleontological resources for personal use would be prohibited except where intended for legitimate scientific uses and for which written authorization is obtained from the BLM authorized officer.

Goal 1: Protect and manage vertebrate or noteworthy occurrences of invertebrate or plant fossils discovered on public lands for scientific, educational, or recreational values as they are discovered.						
Applicable Decision Area		Applicable Alternative				Management Actions and Allowable Uses
LS	SDNM	B	C	D	E	
Objective 1.1: Manage paleontological resources to maintain or enhance their physical integrity and scientific interest while avoiding all surface-disturbing activities that would damage significant or noteworthy occurrences of paleontological materials.						
LS	SDNM	B	C	D	E	**PL-1.1.3:** Standard discovery stipulations would be included in any permit approval that is likely to affect significant paleontological resources. Stipulations would require the user or operator to: ● Suspend operations immediately upon discovery of paleontological resources that would disturb them, ● Contact the authorized officer as soon as reasonably possible, ● Bear the cost of required mitigation.
LS	SDNM	B	C	D	E	**PL-1.1.4:** Upon notification of discovery by a permit user or operator, the BLM would: ● Evaluate the discovery and inform the user/operator within 5 days, ● Allow resumption of use/operations only after completion of mitigation.

Administrative Actions

- Geologic units would be assigned and entered into the Potential Fossil Yield Classification (PFYC) System (per Instruction Memorandum No. 2008-009) using geological maps and professional consideration. A separate class ranking would be assigned to each recognized geologic formation or member present at the surface in accordance with the guidelines provided in the IM.
- All assigned units entered into the PFYC System would be integrated onto a Geographical Information System (GIS)-based geologic map.

2.7.5. PRIORITY WILDLIFE SPECIES & HABITAT (PS)

The BLM Land Use Planning Handbook (H-1601-1) requires the BLM to designate priority species and habitats, in addition to special status species, for fish or wildlife species recognized as significant for at least one factor such as density, diversity, size, public interest, remnant character, or age. Because priority wildlife species includes special status species, as well as the majority of other wildlife species in the Planning Area, this section also covers special status species in order to display in a single section all actions and desired outcomes for wildlife species.

The primary categories of priority species are listed below. For the complete list of priority wildlife species see Appendix J, *Wildlife & Plant Priority Species* (p. 1235).

- Special status species, including species listed as threatened or endangered, or those proposed for listing under the Endangered Species Act (ESA), and BLM sensitive species (BLM Manual 6840);
- Bats;
- Migratory birds, including birds of conservation concern;
- Raptors;
- Game species;
- Species for which there is a signed conservation agreement or strategy.

The BLM focuses most of its wildlife management efforts on priority species habitat. The general assumption is that if the habitat requirements for priority species are met, the habitat for most other wildlife species also is met. The BLM manages priority species in accordance with a variety of laws, regulations, policies, plans, manuals, and agreements. Priority species include fish and wildlife species requiring protective measures and management guidelines to ensure their perpetuation. Moreover, priority wildlife species includes State endangered, threatened, sensitive, and candidate species; animal aggregations considered vulnerable; and those species of recreational, commercial, or tribal importance that are vulnerable. The major sources of guidance the BLM uses to manage priority species are the Endangered Species Act of 1973; Migratory Bird Treaty Act of 1918; Executive Order 13186 (2001); Bald and Golden Eagle Act of 1940; FLPMA of 1976; BLM Manual 174, Introduction, Transplant, Augmentation and Reestablishment of Fish, Wildlife and Plants; BLM Manual 6840 Special Status Species Management (2008), Desert Tortoise Rangewide Plan (1990); and various Instructional Memoranda. See Chapter 3, *Affected Environment* (p. 251) and Appendix B, *Applicable Laws, Regulations, and Policies* (p. 1003) for a comprehensive list and descriptions.

Priority habitats are defined as fish and wildlife habitats requiring protective measures or management guidelines to ensure habitat availability. Priority habitats are limited in range and size; provide necessary components for threatened, endangered and special status species; connect two or more priority habitat areas; or are especially sensitive to disturbance and degradation. Priority habitats are large areas that encompass wildlife habitat areas (WHAs) and wildlife movement corridors. Connection between these habitat patches is important to provide wildlife the ability to move along elevation gradients and between habitat areas. As climate conditions change, wildlife must be able to adapt by expanding or contracting according to the needs of their lifecycles. Therefore, it is necessary to maintain corridors of undisturbed vegetation that connect

to other undisturbed habitat areas. Human population growth that results in the development of subdivisions, highways, and other infrastructure creates barriers to wildlife movement. In order to provide for wildlife movement, the BLM, in coordination with Arizona Game and Fish Department (AGFD), developed movement corridors where surface-disturbing activities must mitigate damage to habitat and maintain connectivity to other undisturbed areas. In this plan, WHAs are proposed in the various alternatives, and numerous wildlife movement corridors are identified in all action alternatives for the Lower Sonoran Field Office Decision Area.

Arizona's wildlife is one of its most precious resources. To protect wildlife and wildlife habitat, we have proposed allocations of WHAs with an emphasis on habitat management for priority species. This designation contains management prescriptions that are designed to enhance and protect wildlife habitats within the WHA. Also incorporated are wildlife movement corridors. These corridors are not an allocation; however, they would be managed to enhance opportunities for wildlife to traverse from one area to another with relative ease and security. Therefore, there is overlap in the designation of the WHAs and a number of the corridors. These overlaps facilitate management actions in both areas to ensure habitat availability for wildlife species, passage ways for wildlife species, and their continued persistence. WHAs and wildlife corridors are defined as follows:

Wildlife Habitat Area: A wildlife habitat area (WHA) is an area that offers feeding, roosting, breeding, nesting, and refuge areas for a variety of wildlife species native to an area. The WHAs proposed in the Planning Area are large areas with a multitude of different habitats and uses within their boundaries. Public lands compose the vast majority of each WHA, but they also may contain State and private land. The proposed WHA include recommendations to protect and enhance their areas for all wildlife species and would target priority species for management purposes while facilitating multiple uses. The proposed WHA consider both the quality and quantity of habitat when determining whether they will support local populations of wildlife.

Wildlife Movement Corridors: A wildlife movement corridor (WMC) is a continuous natural pathway that allows native wildlife species to move between habitats in relative security over short or great distances. The goal of identifying wildlife movement corridors is to maintain a belt of native vegetation between various habitats that is as nearly contiguous as possible while facilitating multiple uses. Corridors work best when they are composed of land that is sparsely developed and unfragmented. The land through which wildlife must pass when traveling between these habitats may, at times, consist of lands in private, State and public ownership. Corridors can and do encompass public roads, rights-of-way, trails, farmlands, OHV areas, and urban areas. Corridors with appropriate management actions facilitate movements of wildlife and aid in maintaining genetic diversity. Genetic diversity plays a very important role in the survival and adaptability of a species. Corridors also facilitate the ability for wildlife to expand and contract based on habitat availability and population cycles, allowing wildlife to travel from sub-par habitat types during drought, for example, to more suitable and sustainable habitat types. Adaptive management and best management practices would be used in WHAs and corridors to allow for multiple uses while preserving passage areas for wildlife. Numerous areas have been identified as movement corridors for wildlife and vary in size and shape depending on alternatives.

These areas contain characteristics necessary for wildlife to traverse their natural range securely and with relative ease. These corridors encompass topography ranging from mountainous terrain to desert flats and washes. While wildlife do not notice or use lines on a map, we as habitat managers must in some fashion delineate areas for management prescriptions. Therefore, the

areas delineated include prescriptions for habitat management, and protections are provided to assist wildlife in their quest to survive.

2.7.5.1. Existing Management Decisions, Alternative A (No Action) for Priority Wildlife Species & Habitat

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Please note that the majority of the decisions regarding the management of wildlife and desert tortoise were standard operating procedures or administrative actions and may be found in Appendix B, Applicable Laws, Regulations, and Policies (p. 1003) or at the end of this section.

Lower Gila North Management Framework Plan (1983):

- Provide wildlife safe access to year-round water at 150 livestock waters on public lands by 1987 and cooperate with allottees to develop similar considerations on private lands. (WL-1.1)
- Develop small and upland game waters in 11 areas by FY-87. (WL-1.2)
- Avoid subdividing bighorn sheep lambing areas with fencing and monitor livestock use of these key areas. Negotiate with range users to alleviate competition where documented. This will be done by change in season of use or by instituting a grazing system to rest lambing areas during critical lambing season (January through May). (WL-2.4)
- Decrease cattle densities in bighorn habitat to relieve competition between bighorn sheep and livestock for space, water, and browse. Graze domestic sheep as far from bighorn habitat as possible to decrease bighorn disease vectors. Management will begin by 1990. Implementation of this recommendation will be met through range management in the following allotments: Aguila (intensive), Ohaco, and Calhoun (non-intensive). Implementation of this recommendation will be met through habitat management plans for the remaining allotments or as a result of planning for Lower Gila South (Crowder Cattle Company-portion lying within LGN; K-Lazy-B-portions lying within LGN; Carter-Herrera; Muse portion lying within LGN; Clem-portion lying within LGN; and Orosco). Domestic sheep will graze as far from bighorn habitat as practicable. (WL-2.8)
- Cooperate with Arizona Game and Fish to acquire water rights to maintain or enhance spring habitats and riparian habitats in the planning unit. Specific sites will be determined in the Habitat Management Plan to achieve the goals stated in the plan. (WL-4.4)
- Within distribution of desert and Arizona night lizards (10,000 acres) and Sonoran Mountain king-snake (1,200 acres), utilize 43 CFR 3809 (Surface Mining Regulations) to minimize habitat disturbance during new road construction. Specify closing new roads as a provision in new mining plans of operation, when and where necessary, to prevent recreation disturbance to night lizard and king-snake habitat. (WL-5.2)

Phoenix Resource Management Plan (1989):

- Maintain and improve habitat and viable wildlife populations. (VM-01)

Lower Gila South Resource Management Plan (1989):

- As a general practice, new roads will not be bladed for use in fence construction. Vehicles will travel overland or fences will be built by hand. (Not numbered)
- Before installing facilities, the BLM will conduct a site evaluation for State-protected animals and will develop mitigation to protect these species and their habitats. Such mitigation might include project relocation, redesign, or abandonment. (Not numbered)
- The BLM will continue to place wildlife escape ramps in water troughs and construct or maintain new wildlife waters in coordination with State and other Federal agencies. (Not numbered)
- Fences proposed in big game habitat will be designed to reduce adverse impacts to big game movement. Specifications in BLM Manual 1737 and in local BLM directives will be used. The BLM will consult with the AGFD on the design and location of new fences. (Not numbered)
- Where existing fences in big game habitat do not meet BLM specifications, they will be modified, according to BLM Manual 1737, when they are scheduled for replacement or major maintenance. (Not numbered)
- New livestock waters to be located within two miles of crucial tortoise habitat and/or crucial desert bighorn sheep habitat will be analyzed on a case-by-case basis to determine potential impacts. Significant impacts will be mitigated with appropriate stipulations on site selection. (Not numbered)
- All livestock waters will provide safe, usable water for wildlife. As funding and opportunities permit, existing facilities will be modified to make them safe wildlife use.

Lower Gila South Resource Management Plan - Goldwater Amendment (1990):

(Applies to the three relinquished Sentinel Plain, Sand Tank Mountains, and Ajo Airport parcels):

- Support continued Sonoran pronghorn monitoring and recovery efforts, including specific recovery efforts stipulated in the EMP. (Not numbered)
- Eliminate all trespass grazing by livestock, goats and burros and construct fences where trespass is a problem. (Not numbered)

Vegetation Treatment of Public Lands in Thirteen Western States Final EIS (1991):

- Projects that may affect areas of threatened or endangered species of plants or animals will be postponed or site design modified to protect the presence of these species. Section 7 Consultation (as required by the Endangered Species Act) with the appropriate office of the USFWS will be initiated. (Not numbered)

Cameron Allotment Amendment to the Lower Gila South Resource Management Plan (2004):

See Appendix K, *Conservation Measures from Fish and Wildlife Service Biological Opinions* (p. 1239) for the measures in their entirety including administrative actions.

Lower Gila Resource Management Plan Amendment (2005):

Objectives:

- Objective 1: Not relevant
- Objective 2: Complete and maintain a continuing inventory and monitoring program for tortoise populations and habitats to assist in making management decisions, including habitat categorization, on public lands. The BLM's desert tortoise inventory and monitoring handbook will contain the standards for inventory and monitoring in Arizona.
- Objective 3: Develop and maintain a monitoring program specifically for land-use activities that adversely affect tortoise habitats for use in analyzing and responding to the cumulative impacts of land-use decisions on tortoise habitats.
- Objective 4: Comply fully with the Endangered Species Act of 1973, as amended, as it relates to tortoise population and habitat management on public lands.
- Objective 5: Coordinate and cooperate with other Federal and State agencies and other publics concerning tortoise populations and habitat management.
- Objective 6: Conduct research and studies sufficient to develop and document the knowledge and techniques needed to ensure the viability of tortoise populations and habitats in perpetuity.
- Objective 7: Manage the public lands on a continuing basis to protect the scientific, ecological, and environmental quality of tortoise habitats consistent with the goals and objectives of the *Rangewide Plan*. This implies management, within BLM's capability, of an adequate number of healthy and vigorous tortoise populations of sufficient size and resilience to withstand the most severe environmental disturbances, and with appropriate sex and age ratios and recruitment rates to maintain viable populations in perpetuity.
- Objective 8: When the need is identified through the BLM planning system, acquire and/or consolidate, under BLM administration, management units with high tortoise habitat values. When public land tortoise habitat values will be affected by the issuance of a lease, permit, right-of-way, or other land use authorization, mitigate to minimize loss of those values.
- Objective 9: Ensure that off-highway-vehicle (OHV) use in desert tortoise habitats is consistent with the category goals, objectives, and management actions of the *Rangewide Pla*n and the Strategy.
- Objective 10: Ensure that livestock use is consistent with the category goals, objectives, and management actions of the *Rangewide Plan* and the Strategy. This may include limiting, precluding, or deferring livestock use as documented in activity plans or other site-specific plans.
- Objective 11: Manage wild horses and burros in a manner consistent with the category goals, objectives, and management actions of the *Rangewide Plan* and the Strategy. This may include limiting or precluding wild horse and/or burro use.

- Objective 12: Manage other wildlife on the public lands consistent with the goals, objectives, and management actions of the *Rangewide Plan* and the Strategy.
- Objective 13: Cooperate as necessary with the Arizona Game and Fish Department and Animal and Plant Health Inspection Service-Animal Damage Control to control predators that are taking desert tortoises. This will be considered only where predation is interfering with attaining the goals and objectives of the *Rangewide Plan* or the Strategy.
- Objective 14: Manage the BLM's energy and minerals program in a manner consistent with the goals and objectives of the *Rangewide Plan* and the Strategy.

Management Decisions/Administrative Actions:

- Phoenix Field Office personnel will participate, when asked and when appropriate, in public events such as fairs and open houses with information and displays showing the management of public lands including desert tortoise habitat. (WL-1)
- The Phoenix Field Office will develop a public brochure on desert tortoise. (WL-2)
- Records of environmental assessments that contain stipulations pertaining to the desert tortoise will be maintained for the express purpose of tracking compliance and effectiveness of the stipulations. (WF-5)
- An annual summary of the environmental assessments of actions in desert tortoise habitats will be provided to the Arizona State Office. (WF-6)
- The Phoenix Field Office will comply with Section 2 of the Endangered Species Act and BLM policy for managing habitat of candidate species to ensure that the Sonoran population of the desert tortoise does not become threatened or endangered through BLM actions. (WL-7)
- The Phoenix Field Office will continue to work with, share information, and support to the extent possible the interests and work of other agencies and public entities concerning tortoise populations and habitat management. (WL-8)
- The Phoenix Field Office will forward tortoise-related research proposals received to the Desert Tortoise Management Oversight Group. (WL-9)
- Specific and quantifiable desert tortoise management objectives for categorized habitat will be included at the interdisciplinary planning level. (WL-10)
- Environmental decision documents for all actions occurring in desert tortoise habitat will address and include mitigation measures sufficient to offset, to the extent possible, any loss of tortoise habitat quantity or quality in category I, II, and III habitats. (WL-11)
- New land uses will be granted in category I, II, and III tortoise habitats only if no reasonable alternative exists. If no alternative exists, mitigation, including compensation, will be evaluated to meet the no net loss goal. (WL-12)
- Competitive OHV race courses are prohibited in category I desert tortoise habitat. (WL-13)
- Competitive OHV race courses will not be located in category II desert tortoise habitat unless no reasonable alternative site exists. If no reasonable alternative site exists, impacts will be fully mitigated. (WL-14)

- Competitive OHV race courses will be evaluated in category III desert tortoise habitat and impacts will be mitigated. (WL-15)
- Categorized desert tortoise habitat will be reviewed in relation to ongoing livestock use on public lands in the MFP and RMP planning areas; forage needs of desert tortoise and ecological site potential will be considered in determining and prioritizing the resolution of conflicts. (WL-16)
- In category I and II desert tortoise habitat, only those range improvements for livestock that do not conflict with desert tortoise habitat or populations will be allowed. (WL-17)
- New wildlife improvements will be allowed in category I and II desert tortoise habitats only if there is no conflict with desert tortoise habitat populations or habitat. (WL-18)
- Information on predation of desert tortoises will be collected as opportunities arise. (WL-19)
- BLM actions in desert tortoise habitats will be evaluated to assure that they do not encourage the proliferation or range expansion of predator populations. (WL-20)
- The Phoenix Field Office will use the BLM's discretionary authorities relating to leasable and saleable minerals to meet the desert tortoise habitat category goals and objectives. (WL-21)
- Boulder sale permits will be restricted to areas that will result in no net loss of tortoise habitat. (WL-22)
- The Arizona Game and Fish Department, in cooperation with the Phoenix Field Office, may use re-establishment and augmentation to assist desert bighorn sheep populations in reaching their natural potential. (WL-23)
- Re-establishment and augmentation of desert bighorn sheep populations will be done in areas where conflicts with other uses and resources do not occur, or where conflicts can be resolved. (WL-24)
- Final decisions on re-establishment and augmentation proposals will be considered on a case-by-case basis within the appropriate level of National Environmental Policy Act documentation that addresses conflicts and meets the requirement for public participation. (WL-25)

2.7.5.2. Action Alternatives for Priority Wildlife Species & Habitat Management (PS)

Program Goals

The following goals have been developed to manage habitat for all wildlife with an emphasis on priority wildlife species habitats. These goals are intended to provide diverse and healthy habitat for the continued and future occupancy of species that are or were native to the area. Adapted management, best management practices and mitigation will be instituted where applicable. The associated objectives may be found in the management decisions section. The goals cover both Decision Areas unless otherwise indicated.

- **Goal 1:** Ensure habitat availability and diversity for priority wildliferesources within WHAs where priority species would receive primary focus when analyzing activities and projects.
- **Goal 2:** Maintain, protect, and make accessible roosts and contiguous foraging habitat for lesser long-nosed bats.
- **Goal 3:** Protect Sonoran pronghorn habitat and ensure that suitable habitat is available for future occupancy.
- **Goal 4:** Ensure the southwest willow flycatcher and yellow-billed cuckoo habitats are maintained and/or restored.
- **Goal 5:** Ensure that Yuma clapper rail habitats are maintained and/or improved.
- **Goal 6:** Ensure that the natural abundance and diversity of bat habitats are maintained and/or restored.
- **Goal 7:** Maintain or restore habitats to support cactus ferruginous pygmy owls foraging and nesting needs.
- **Goal 8:** Ensure that tortoise habitat provides sufficient forage and shelter for viable populations.
- **Goal 9:** Ensure that migratory bird habitats are maintained and/or restored.
- **Goal 10:** Ensure that raptor habitats are maintained and/or restored.
- **Goal 11:** Ensure that bighorn sheep, mule deer and other game species habitats are maintained and/or restored.
- **Goal 12:** Ensure wildlife movement corridors contain ample habitat to assist wildlife in moving from one area to another in a relatively safe manner.
- **Goal 13:** Ensure that priority wildlife habitats are maintained and/or restored.
- **Goal 14:** Ensure wildlife is provided safe, usable, year-round access to water.
- **Goal 15:** Ensure that undesirable non-native animal species do not occur in the Decision Areas or that their presence does not adversely affect ecological processes.

Land Use Allocations Summary

The wildlife habitat areas (WHAs) proposed for designation are presented in Table 2.5, “Wildlife Habitat Areas by Alternative” (p. 70) below.

Table 2.5. Wildlife Habitat Areas by Alternative

WHA	Alternative (BLM Acres)				
	A	B	C	D	E
Lower Sonoran					
Batamote Mountains	0		62,900	0	
Cuerda de Lena	0		58,500	0	
Gila Bend Mountains	0		255,700	255,700	255,700
Saddle Mountain	0		48,800	0	

SDNM	
Wildlife Habitat Areas	0

Management Actions and Allowable Uses

Goal 1 (Wildlife Habitat Area Management): ***Ensure habitat availability and diversity for priority wildlife resources is maintained and/or improving within WHAs, where priority species would receive primary focus when analyzing activities and projects.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Designate WHAs to maintain and improve the continuity and productivity of habitats for priority wildlife species to support AGFD and USFWS wildlife population objectives. Manage suitable and occupied habitat for desert tortoise, mule deer, bighorn sheep, Sonoran pronghorn antelope, lesser-long-nosed bat, and cactus ferruginous pygmy-owl consistent with recovery plan and species' objectives.						
Common to all WHAs for Alternatives C through E						
Note: Only the Gila Bend Mountains WHA is proposed in Alternatives D and E; Refer to Section 2.9.1, "Areas of Critical Environmental Concern (ACEC)" (p. 194) for actions affecting the other WHAs in D and E						
LS			**C**	**D**	**E**	**PS-1.1.1:** WHAs would be designated as described by alternative as presented in Table 2.5, "Wildlife Habitat Areas by Alternative" (p. 70).
LS			**C**	**D**	**E**	**PS-1.1.2:** All public lands would be retained, and available state trust lands and private parcels would be acquired to maintain habitat connectivity as funding or other opportunities permit.
LS			**C**	**D**	**E**	**PS-1.1.3:** Maintenance of utility corridors, including vegetation clearing, would be restricted to the existing authorized LUA corridor only.
LS			**C**	**D**	**E**	**PS-1.1.4:** Motorized vehicle use would be prohibited in washes that occupy, or are found to be occupied, cactus ferruginous pygmy-owls habitat from February 1 to September 15 to protect pygmy-owls during the breeding, nesting, and dispersal season. All other areas would be limited to existing or designated routes.
LS			**C**	**D**	**E**	**PS-1.1.5:** Routes that conflict with resource protection and management could be closed, limited by seasonal restrictions, or mitigated to prevent habitat degradation and fragmentation.
LS			**C**	**D**	**E**	**PS-1.1.6:** Through the route-designation process, route densities would be reduced and the designation of upland routes would be emphasized. Necessary use of access routes in washes would be allowed; however, these access routes may contain seasonal closures.
LS			**C**	**D**	**E**	**PS-1.1.7:** All new roads or highways crossing public land would be designed to facilitate movement of wildlife and would be mitigated to minimize disturbance.
LS			**C**	**D**	**E**	**PS-1.1.8:** Priority habitat areas would be maintained during road improvements (e.g., altering, upgrading, paving, and widening) and improvements must meet desert tortoise-protection standards. Mitigation may include at-grade wildlife crossings, wildlife under- or over passes, wildlife-appropriate fencing, speed limits, and other appropriate actions.
LS			**C**		**E**	**PS-1.1.9:** WHAs would be avoidance areas for utility-scale renewable energy development. Uses would be concentrated in less sensitive resource areas or in areas already disturbed. If no other options exist, activities must be mitigated and managed to ensure consistency with management objectives, with an emphasis to maintain wildlife habitat and movement connectivity within WHAss.

Goal 1 (Wildlife Habitat Area Management): ***Ensure habitat availability and diversity for priority wildlife resources is maintained and/or improving within WHAs, where priority species would receive primary focus when analyzing activities and projects.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Designate WHAs to maintain and improve the continuity and productivity of habitats for priority wildlife species to support AGFD and USFWS wildlife population objectives. Manage suitable and occupied habitat for desert tortoise, mule deer, bighorn sheep, Sonoran pronghorn antelope, lesser-long-nosed bat, and cactus ferruginous pygmy-owl consistent with recovery plan and species' objectives.						
LS			**C**		**E**	**PS-1.1.10:** WHAs would be open for locatables, leasables and mineral materials actions. Activities must be mitigated and managed to ensure consistency with management objectives, with an emphasis to maintain wildlife habitat and movement connectivity within WHAs. Valid existing rights would be respected. Existing mineral material free use permits used as community pits would be allowed to continue and be reissued upon expiration.
LS			**C**			**PS-1.1.11:** The construction of routes would be allowed if consistent with natural resource objectives (habitat quality and quantity based on ecological site descriptions) and do not conflict with wildlife management objectives. Closed roads could be converted for use as non motorized trails if consistent with natural resource objectives.
Specific to Cuerda de Lena WHA						
Note: In Alternatives D and E, the area would be managed under the proposed Cuerda de Lena ACEC. Also see Section 2.7.5, "Priority Wildlife Species & Habitat (PS)" (p. 63) for actions related to Sonoran pronghorn.						
LS			**C**			**PS-1.1.12:** The WHA would be closed to the public for general recreational use during pronghorn fawning between March 15 and July 15 or as determined annually by the Sonoran pronghorn antelope recovery team. Minor non-linear LUAs would also be prohibited unless deemed necessary by the authorized officer. Federal, State and local government employees and BLM permit holders operating within the scope of their authorizations would be exempt from the closure.
LS			**C**			**PS-1.1.13:** Mineral material disposals would be prohibited in washes that are known, or found to contain, cactus ferruginous pygmy-owl habitat.
Specific to Gila Bend Mountains WHA						
LS				**D**		**PS-1.1.14:** The WHAwould be an exclusion area for utility-scale renewable energy development and exploration.
LS				**D**		**PS-1.1.15:** The WHA would be closed to all locatable and leasable minerals exploration and development (including geothermal and sodium), and mineral material disposals. Public lands in the WHA would be recommended for withdrawal to all forms of mineral entry.
Specific to Saddle Mountain WHA						
Note: In Alternatives D and E, the area is managed under the proposed Saddle Mountain ACEC.						
LS			**C**			**PS-1.1.16:** Facilities, including those for recreational purposes, and construction of new roads, would be prohibited within ½ mile of known bat roosts and cliffs or other unique habitat features used by nesting raptors.

Goal 2 (Lesser Long Nosed Bat): ***Maintain, protect, and make accessible roosts and contiguous foraging habitat for lesser long-nosed bats.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Protect known roosting habitat for lesser long-nosed bat on public land and maintain contiguous foraging habitat at its current range and distribution.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-2.1.1:** Mitigation could occur for facility development, including those for recreation purposes, within 4 miles of known lesser long-nosed bat roosts as long as the action does not impact roost sites. In the event that mitigation is not sufficient, the development would be relocated at least 4 miles from roost sites.
LS	**SDNM**	**B**	**B**	**D**	**E**	**PS-2.1.2:** Activities with the potential to impact lesser long-nosed bats or their habitats would be evaluated on a case-by-case basis and impacts would be mitigated or avoided.
LS	**SDNM**	**B**	**B**	**D**	**E**	**PS-2.1.3:** Medium to high density columnar cactus habitat (≥ 30 saguaro/acre) within 40 miles of known roost sites would be maintained and/or restored.
LS	**SDNM**	**B**	**B**	**D**	**E**	**PS-2.1.4:** Protect long-nosed bat forage plants-saguaros and high concentrations of agaves-from modification by treatment activities (prescribed fire, vegetation treatments), to the greatest extent possible. Saguaros and high concentrations of agaves would be excluded from treatments. Agave concentrations are contiguous stands or concentrations of more than 20 plants per acre.

Goal 3 (Sonoran Pronghorn): ***Protect and enhance Sonoran pronghorn habitat and ensure that suitable habitat is available for future occupancy based on recovery goals.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 3.1: Manage for no net loss of Sonoran pronghorn habitat. Protect the creosote-bursage, desert washes (xero-riparian), and palo verde mixed cacti communities which provide nutritious forage species that encourages fawn recruitment, provides thermal cover, enables predator avoidance, and provides for growth and survival. Protect areas that provide for chain-fruit cholla production.						
LS		**B**	**C**	**D**	**E**	**PS-3.1.1**: Conservation measures as applied to the Sonoran pronghorn habitat recovery area would be adopted as identified in Appendix K, *Conservation Measures from Fish and Wildlife Service Biological Opinions* (p. 1239).
LS		**B**	**C**	**D**	**E**	**PS-3.1.2**: The pronghorn habitat area south of Ajo (see Maps 2-2a, 2–2b, 2–2c, 2–2d, and 2–2e) would be closed to the public for general recreational use during pronghorn fawning between March 15 and July 15 or as determined annually by the Sonoran pronghorn antelope recovery team. Minor non-linear LUAs would also be prohibited unless deemed necessary by the authorized officer. Federal, State and local government employees and BLM permit holders operating within the scope of their authorizations would be exempt from the closure.
LS		**B**	**C**	**D**	**E**	**PS-3.1.3**: Portions of both Decision Areas would be identified as potential reintroduction sites for an experimental/nonessential population of Sonoran pronghorn. (See Map 3-4).
LS		**B**	**C**	**D**	**E**	**PS-3.1.4**: Sonoran pronghorn experimental/nonessential populations would be managed to achieve recovery goals. Mitigation could be required for activities that may impede movements or otherwise disturb the species or habitat.

Goal 3 (Sonoran Pronghorn): ***Protect and enhance Sonoran pronghorn habitat and ensure that suitable habitat is available for future occupancy based on recovery goals.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 3.1: Manage for no net loss of Sonoran pronghorn habitat. Protect the creosote-bursage, desert washes (xero-riparian), and palo verde mixed cacti communities which provide nutritious forage species that encourages fawn recruitment, provides thermal cover, enables predator avoidance, and provides for growth and survival. Protect areas that provide for chain-fruit cholla production.						
Objective 3.2: Manage habitat for future populations of experimental/nonessential Sonoran pronghorn within the SDNM.						
	SDNM	**B**	**C**	**D**	**E**	**PS-3.2.1**: Sonoran pronghorn observed within the SDNM area designated experimental/nonessential would be managed to achieve recovery goals. Mitigation would be required for activities that could impede movements or otherwise disturb the species or habitat.

Goal 4 (Southwestern Willow Flycatcher and Yellow-billed Cuckoo): ***Ensure that Southwestern willow flycatcher and yellow-billed cuckoo habitats are maintained and /or improving.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 4.1: Protect, maintain, and restore southwestern willow flycatcher and yellow-billed cuckoo habitats and prevent actions that could harm individuals of the two listed species.						
LS		**B**	**C**	**D**	**E**	**PS-4.1.1**: Southwestern willow flycatcher and yellow-billed cuckoo habitats in the Fred J. Weiler Green Belt would be maintained and/or restored in coordination with USFWS and AGFD.
LS		**B**	**C**	**D**	**E**	**PS-4.1.2**: Recreation activities will only be allowed outside of ½ mile of occupied or found to be occupied habitat when birds may be present (breeding season of April 1 – September 30).
LS		**B**	**C**	**D**	**E**	**PS-4.1.3**: Vegetation treatment projects adjacent to occupied or found to be occupied habitat will only be conducted when willow flycatchers are not present (October 1 – March 31).
LS		**B**	**C**	**D**	**E**	**PS-4.1.4**: Avoid surface disturbing activities that would result in fragmentation or a reduction in habitat quality for both species.

Goal 5 (Yuma Clapper Rail): ***Ensure that Yuma clapper rail habitats are maintained and/or improving.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 5.1: Maintain and protect riparian and wetland areas with potential or occupied habitats.						
LS		**B**	**C**	**D**	**E**	**PS-5.1.1**: Yuma clapper rail habitat would be maintained and/or restored by developing or engineering projects that would encourage native emergent vegetation.
LS		**B**	**C**	**D**	**E**	**PS-5.1.2**: Vegetation treatment projects in occupied, or found to be occupied, marsh habitat would only occur between September 1 and March 15 to avoid the Yuma clapper rail breeding and molting seasons.
LS		**B**	**C**	**D**	**E**	**PS-5.1.3**: Mechanical removal of overstory habitat (*Tamarisk*) would only occur September 1 to March 15, to avoid the Yuma clapper rail breeding and molting seasons.

Goal 6 (Sonoran Desert Tortoise): ***Ensure that tortoise habitat provides sufficient forage and shelter for a viable population.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 6.1: Achieve the following objectives in desert tortoise habitat, as identified by habitat category: ● Category I - Maintain stable, viable populations and protect existing tortoise habitat values and increase populations where possible. ● Category II - Maintain stable, viable populations and halt further declines in tortoise habitat values. ● Category III - Limit tortoise habitat and population declines to the extent possible through mitigation. ● Retain natural shelter sites (boulders or caliche caves or similar features used by tortoises for sheltering) in Category I and II desert tortoise habitats, and ● Maintain or restore a diverse mixture of forage species and adequate cover of vegetation for desert tortoise habitat as recommended by the 1988 Rangewide Plan (BLM 1988b).						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-6.1.1**: Public lands currently allocated for management as Category I, II, and III Sonoran Desert tortoise habitat, as described in , would be managed according to the objectives listed above. **Sonoran Desert Tortoise Habitat by Category** ● Category I: 24,800 (LSFO); 166,00 (SDNM) ● Category II: 355,700 (LSFO); 124,700 (SDNM) ● Category III: 65,300 (LSFO); 3,500 (SDNM)
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-6.1.2:** Habitat-management categories and boundaries may be revised as new population information becomes available. The criteria that would be used in revising categories and boundaries are those in the 1988 Rangewide Plan (BLM 1988b). The criteria for Category I tortoise habitat areas are as follows: ● Habitat areas are essential to the maintenance of large, viable populations; ● Conflicts are resolvable; ● Populations are medium- to high-density or low-density contiguous with medium- or high-density; ● Populations are increasing, stable, or decreasing. The criteria for Category II tortoise habitat areas are as follows: ● Habitat areas may be essential to maintenance of viable populations; ● Most conflicts are resolvable; ● Populations are medium- to high-density or low-density contiguous with medium- or high-density; ● Populations are stable or decreasing. The criteria for Category III tortoise habitat areas are as follows:

Goal 6 (Sonoran Desert Tortoise): ***Ensure that tortoise habitat provides sufficient forage and shelter for a viable population.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
						• Habitat areas are not essential to maintenance of viable populations; • Most conflicts are not resolvable; • Populations are low- to medium-density and not contiguous with medium- or high-density; • Populations are stable or decreasing.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-6.1.3**: No net loss would occur in the quality or quantity of Category I and II desert tortoise habitat. Mitigation for adverse impacts would be permissible to achieve no net loss in quantity or quality of desert tortoise habitat in accordance with the Desert Tortoise Rangewide Plan and other applicable policy guidance.
LS		**B**	**C**	**D**	**E**	**PS-6.1.4**: In Category I and II tortoise habitats, all motorized competitive speed races would be prohibited from March 31 through October 15. All other use requests during this time would be reviewed on a case-by-case basis and could be denied or adjusted to avoid conflict with tortoise activity and habitat. Mitigation for conflicts would be permissible to achieve no net loss in quantity or quality of desert tortoise habitat. Specific onsite inspections for tortoise habitat would occur at the time a notice or plan is processed. Development and uses must be compatible with wildlife objectives.
LS		**B**				**PS-6.1.5**: Category I, II and III tortoise habitat would be open to all uses and activities but actions would be mitigated in accordance with applicable policies and guidance, and managed to ensure consistency with management objectives with an emphasis to maintain habitat.
LS			**C**		**E**	**PS-6.1.6**: Surface disturbing activities, including utility-scale renewable energy development and exploration, would be avoided in Category I and II habitat to the extent practicable. Category III habitat would be available on a case by case basis. Uses would be concentrated in less sensitive resource areas or in areas already disturbed. If no other options exist, activities must be mitigated in accordance with the Desert Tortoise Rangewide Plan and other applicable policy guidance.
LS			**C**			**PS-6.1.7**: Category I and II tortoise habitat would be open to mineral material disposals on a case by case basis. Uses must be mitigated in accordance with applicable policies and guidance, and managed to ensure consistency with management objectives with an emphasis to maintain habitat. Uses would be concentrated in less sensitive resource areas or in areas already developed or disturbed. Specific onsite inspections for tortoise habitat would occur at the time a notice or plan is processed.
LS			**C**			**PS-6.1.8**: Category III tortoise habitat would be open to all non-renewable leasable minerals actions, and mineral material disposals, on a case-by-case basis with mitigation. Specific onsite inspections for tortoise habitat would occur at the time a notice or plan is processed. Stipulations would be applied to prevent habitat fragmentation, to the extent practible, between Category I and II habitat.
LS				**D**		**PS-6.1.9**: Surface disturbing activities would be excluded in Category I, II and III tortoise habitat, including utility-scale renewable energy development and exploration. Uses would be concentrated in less sensitive resource areas or in areas already disturbed.

Goal 6 (Sonoran Desert Tortoise): ***Ensure that tortoise habitat provides sufficient forage and shelter for a viable population.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS				**D**		**PS-6.1.10**: Category I, II and III tortoise habitat would be closed to all locatable and non-renewable leasable minerals exploration and development (including geothermal and sodium), and mineral material disposals. Public lands in the habitats would be recommended for withdrawalto all forms of mineral entry.
LS					**E**	**PS-6.1.11**: Surface disturbing activities, including utility-scale renewable energy leasing and exploration would be avoided in Category I and II tortoise habitat. Uses would be concentrated in less sensitive resource areas or in areas already disturbed. If no other options exist, activities must be mitigated in accordance with the Desert Tortoise Rangewide Plan and other applicable policy guidance.
LS					**E**	**PS-6.1.12**: Surface disturbing activities within Category III tortoise habitat would be authorized on a case-by-case basis. Uses must be mitigated in accordance with applicable policies and guidance, and managed to ensure consistency with management objectives with an emphasis to maintain habitat. Uses would be concentrated in less sensitive resource areas or in areas already developed or disturbed. Specific onsite inspections for tortoise habitat would occur at the time a notice or plan is processed.
LS					**E**	**PS-6.1.13**: Category I and II tortoise habitat would be open to all non-renewable leasable minerals actions (including geothermal and sodium) on a case by case basis. Uses must be mitigated in accordance with applicable policies and guidance, and managed to ensure consistency with management objectives with an emphasis to maintain habitat.
LS					**E**	**PS-6.1.14**: Category I and II desert tortoise habitat would be open to mineral material disposals on a case by case basis in accordance with applicable policies and guidance, and if managed to ensure consistency with management objectives with an emphasis to maintain habitat.

Goal 7 (Cactus Ferruginous Pygmy Owls): ***Maintain or restore habitats to support cactus ferruginous pygmy owls.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 7.1: Protect cactus ferruginous pygmy-owls from disturbance during the breeding and nesting seasons. Maintain or improve a complex, multi-layered vegetative structure provided by perennial plants within the range of the cactus ferruginous pygmy-owl. Structure should consist of approximately 30 percent each of grasses and forbs, shrubs, and trees as dictated by site conditions. Maintain current or improve interconnected habitat patches of sufficient quality (diversity, density, and structure) and quantity (≥ 3 acres) to support cactus ferruginous pygmy-owls. Maintain sufficient vegetation between patches to allow for dispersal.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-7.1.1:** Activities would be managed to protect, maintain, or improve occupied, or found to be occupied, cactus ferruginous pygmy-owl habitat.
LS	**SDNM**	**B**	**C**		**E**	**PS-7.1.2:** Surface disturbing activities would be avoided within ½ mile of a known active cactus ferruginous pygmy-owl nest site from February 1 through July 31. All actions would be mitigated and managed to ensure consistency with management objectives, with an emphasis to maintain available habitat. Development planned to occur within 330 feet of any known or found to be occupied CFPO nest site would be evaluated on a site-specific basis, but significant modification of habitat within these areas should be avoided year round. Uses would be concentrated in less sensitive resource areas or in areas already disturbed.

Goal 7 (Cactus Ferruginous Pygmy Owls): ***Maintain or restore habitats to support cactus ferruginous pygmy owls.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS	**SDNM**		**C**		**E**	**PS-7.1.3:** Motorized use within washes that are known to be occupied, or found to be occupied cactus ferruginous pygmy-owl habitat would be prohibited from February 1 to July 31 to protect pygmy-owls during their breeding, nesting, and dispersal season. Exceptions to the prohibitions would be authorized only for personnel engaged in constructing, maintaining, or repairing facilities; conducting research or surveys; or for authorized law-enforcement or fire-suppression emergencies.
LS	**SDNM**			**D**		**PS-7.1.4:** Surface disturbing activities would be excluded within ½ mile of known active cactus ferruginous pygmy-owl nest site from February 1 through July 31.
LS	**SDNM**			**D**		**PS-7.1.5:** Motorized use within known to be occupied, or found to be occupied, cactus ferruginous pygmy-owl habitat would be prohibited from February 1 to July 31 to protect pygmy-owls during their breeding, nesting, and dispersal season. Exceptions to the prohibitions would be authorized only for personnel engaged in constructing, maintaining, or repairing facilities; conducting research or surveys; or for authorized law-enforcement or fire-suppression emergencies.

Goal 8 (General Bats): ***Ensure that the natural abundance and diversity of bat habitats are stable or increasing.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 8.1: Protect bat roosts associated with natural caves and abandoned mine features that are necessary to provide roosting locations for existing bat populations and opportunities for expansion.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-8.1.1:** In cooperation with AGFD, the protection of important bat roosts would be ensured and mitigation measures would be used to resolve potential resource conflicts.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-8.1.2:** New water developments would be configured to allow for safe use by bats.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-8.1.3:** Hazardous mine features occupied by bats would be remediated by installing bat gates or, if other roosts are readily available, by backfilling.

Goal 9 (Migratory Birds): *Ensure that migratory bird habitats are maintained and/or improving to meet the needs of migratory birds in general.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 9.1: Avoid take of migratory birds (adults, nests, eggs, and chicks) to comply with the Migratory Bird Treaty Act and Executive Order 13186.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-9.1.1:** Applications for activities on public lands would evaluate the effects of the BLM's actions on migratory birds during the NEPA process, if any, and identify where take reasonably attributable to agency actions may have a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. In such situations, the BLM will implement approaches lessening such take.
LS		**B**	**C**	**D**	**E**	**PS-9.1.2:**Burrowing owl artificial habitats would be developed to facilitate introduction/transplant of owls in suitable locations.

Goal 10 (Raptor Habitats): *Ensure that raptor habitats are maintained and/or improving to meet the needs of raptors in general.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	

Objective 10.1: Manage activities that could reduce raptor nest production.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-10.1.1:** Authorized developments, uses, and activities within ¼ mile of known occupied raptor nests would be avoided, relocated, or seasonally limited.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-10.1.2:** Authorized developments, uses, and activities **within** ½ mile of communal raptor nesting areas would be avoided.
LS		**B**	**C**	**D**	**E**	**PS-10.1.3:** Surface disturbing activities would be evaluated on a case-by-case basis within active eagle nest territories to comply with BGEPAof 1940.

Goal 11 (Bighorn Sheep/Big Game): ***Ensure that bighorn sheep, and other big game, habitats are maintained and/or improving.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 11.1: Provide water for bighorn sheep and protect them from communicable diseases.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-11.1.1:** Additional waters may be installed in high elevations of bighorn sheep habitat to improve habitat suitability.
LS		**B**	**C**	**D**	**E**	**PS-11.1.2:** Domestic sheep use would be prohibited on all allotments within 9 miles of bighorn sheep habitat.
	SDNM	**B**				**PS-11.1.3:**Domestic goats or sheep would not be permitted within nine miles of suitable bighorn sheep habitat or within allotments that contain suitable bighorn sheep habitat.
	SDNM		**C**	**D**	**E**	**PS-11.1.4:** Domestic sheep grazing would be prohibited within the Monument.

Goal 12 (Wildlife Movement Corridors):*Ensure wildlife movement corridors contain ample habitat to assist wildlife in moving from one area to another in a relatively safe manner.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 12.1: Manage wildlife movement corridors in a manner that would assist wildlife in safe passage from one area to another.						
Specific to Wildlife Movement Corridors (WMCs)						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-12.1.1:** All new roads where average speeds may be greater than 45 miles per hour, or highways crossing public land, would be designed to facilitate movement of wildlife to reduce mortality of wildlife from vehicle collisions.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-12.1.2:** Maintenance or expansion of existing roads would incorporate measures to maintain or restore wildlife habitat connectivity and would incorporate, where appropriate, wildlife underpasses or overpasses.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-12.1.3:** Routes would be subject to seasonal closures if conflicts with wildlife cannot be mitigated.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-12.1.4:** New surface disturbance within 100 meters of the edge of large washes located in the desert washes vegetative community (those depicted on USGS 1:24,000 maps) would be mitigated as needed to protect the integrity of washes as corridors.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-12.1.5:** Road density would be limited to 3 miles of road per section or less within the wildlife movement corridors in accordance with the Habitat Guidelines for Mule Deer (Mule Deer Working Group 2006).
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-12.1.6:** Treatments of invasive plant species would be allowed.
LS		**B**	**C**			**PS-12.1.7:** WMCs would be open to all locatable and leasable minerals exploration and development (including geothermal and sodium) and mineral material disposals with the exception of seasonal restrictions in Sonoran pronghorn habitat for leasables and mineral material disposals (See 1.1.13). All activities would be managed through existing regulations. Mitigation, terms and conditions would be applied as necessary to retain or improve habitat.

Goal 12 (Wildlife Movement Corridors): ***Ensure wildlife movement corridors contain ample habitat to assist wildlife in moving from one area to another in a relatively safe manner.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 12.1: Manage wildlife movement corridors in a manner that would assist wildlife in safe passage from one area to another.						
LS			**C**		**E**	**PS-12.1.8:** Surface-disturbing activities would be evaluated on a case-by-case basis, including large scale renewable energy developments. Uses would be concentrated in less sensitive resource areas or in areas already disturbed. If no other options are available, actions must be mitigated and managed to ensure consistency with management objectives, with an emphasis to maintain wildlife habitat continuity and movement connectivity. If impacts to wildlife cannot be mitigated, the action would be denied.
LS				**D**		**PS-12.1.9:** WMCs would be exclusion areas for utility-scale renewable energy development and exploration.
LS				**D**		**PS-12.1.10:** WMCs would be closed to all locatable and leasable minerals exploration and development (including geothermal and sodium), and mineral material disposals. Public lands located within the corridors would be recommended for withdrawal.
LS					**E**	**PS-12.1.11:** WMCs would be open to all locatable minerals. Exploration and development would be managed through existing regulations. Mitigation, terms and conditions would be applied as necessary to retain or improve habitat.
LS					**E**	**PS-12.1.12:** WMCs would be open to all non-renewable leasable minerals actions, including geothermal and sodium, but would be mitigated to allow available habitat no less than 200 meters wide as a corridor to facilitate wildlife movement.
LS					**E**	**PS-12.1.13:** WMCs would be open to mineral material sales on a case-by-case basis. Preference would be to place the surface disturbance outside of the WMC but if an area within the WMC is unavoidable, mitigation to improve or enhance the habitat would occur. Development and uses must be compatible with wildlife objectives and not detrimental to wildlife or its habitat. If impacts cannot be mitigated, the action would be denied.

Goal 13 (Priority Species Management Guidance): ***Ensure that priority wildlife habitats are maintained and/or improved.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 13.1: Ensure that habitats for priority species are maintained and/or improving to meet the needs of wildlife in general.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-13.1.1:** Reintroductions, transplants, and supplemental stockings of native priority wildlife populations (as defined in BLM Manual 1745 or subsequent guidance) could occur in their current or historic range with collaboration between the AGFD and USFWS.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-13.1.2:** The release of rehabilitated or displaced wildlife on public lands would be allowed, which could involve constructing artificial habitats where appropriate, for species that are compatible with other resource-management and use objectives.

Goal 13 (Priority Species Management Guidance): ***Ensure that priority wildlife habitats are maintained and/or improved.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-13.1.3:** Acquisitions of non-Federal lands and disposals of Federal land that have, or potentially have, priority species or habitats would include the potential to: ● Enhance the conservation and management of threatened, endangered or special status species habitat, riparian habitat, desert tortoise habitat, key big game habitat; ● Improve the overall manageability of wildlife habitat; ● Improve habitat connectivity in and around the WHA and wildlife movement corridors. The BLM would not transfer (dispose of) from Federal ownership the following: ● Designated or proposed critical habitat for a listed or proposed threatened, endangered or special status species; ● Lands supporting listed or proposed threatened or endangered species if such transfer would be inconsistent with recovery needs and objectives or conservation measures or would likely affect the recovery of the listed or proposed species, and lands supporting Federal candidate species if such action would contribute to the need to list the species as threatened or endangered. Retain Category I and II tortoise habitat unless it is in the general public interest to dispose of them, and losses in habitat quality and quantity can be mitigated. Exceptions to the above could occur if: ● The recipient of the lands agrees to protect the species or critical habitat under the ESA, such as disposal to a non-Federal governmental agency or private organization; ● If conservation of the habitat would still be achieved and ensured; or ● In a land exchange if a net gain in the value of species habitat or protection is achieved.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS–13.1.4:** Treatments of invasive species would be allowed to benefit visual resources or wildlife habitat unless otherwise restricted.

Goal 14 (Wildlife Waters): *Provide wildlife with safe, usable, year-round access to water.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 14.1: Increase, improve or maintain the density and distribution of wildlife waters on public lands throughout the Planning Area to sustain and enhance wildlife populations across their range.						

LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-14.1.1:** Maintain and re-develop existing and develop additional wildlife waters in cooperation with AGFD. Increase the density and/or restore the distribution of wildlife waters throughout the Planning Area to sustain and enhance native wildlife populations across their range. All existing wildlife waters would be maintained or improved as needed to maintain the presence of perennial water for native wildlife. New wildlife waters would be built when needed to maintain, restore, or enhance native wildlife population numbers or distributions.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-14.1.2:** In the event that range water developments are no longer needed for livestock use, the BLM would take over maintenance of such water sources. If the BLM deems some water developments are not viable for wildlife distribution some water sources would be removed in cooperation with the AGFD.

Goal 15 (Non-Native Invasive Animal Species Guidance): *Ensure that undesirable non-native animal species do not occur in the Decision Areas or that their presence does not adversely affect ecological processes.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 15.1: Limit the distribution and abundance of invasive animal species to current levels. Reduce the impact of invasive species on native ecosystems from current levels.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-15.1.1:** Non-native, invasive animal species would not be allowed except for biological controls for which peer-reviewed scientific literature states that the introduced species would have no detrimental effects to any native wildlife or plant species in the Planning Area.

Administrative Actions:

- Work in partnership with AGFD to manage wildlife and wildlife habitat to achieve AGFD's wildlife population goals. Cooperatively develop HMPs to meet Sikes Act requirements and address site-specific habitat management objectives consistent with other natural resource objectives. Wildlife management activities administered by AGFD include, but are not limited to surveys, telemetry, transplants, water management, vegetation restoration and enhancement, invasive species control, research, law enforcement activities, setting and administering hunting permits, and other wildlife or habitat management projects as identified in the Master Memorandum of Understanding (MOU) between the Arizona Game and Fish Commission and the BLM.

- Work in partnership with AGFD to manage wildlife and wildlife habitat to achieve AGFD's wildlife population goals and other activities as identified in the Master MOU between AGFD and the BLM.

- Work with other land owners within wildlife movement corridors to maintain or improve vegetative connectivity and prevent actions that would obstruct the movement of wildlife through the areas.

- Emphasize maintaining and restoring ecological connectivity through land acquisition, partnerships with local landowners, and vegetation resources. If opportunities for wildlife movement cannot be adequately maintained, then mitigation to maintain isolated wildlife populations will be adopted.

- Eliminate trespass grazing by cattle, sheep, goats, burros, and other non-native animals and construct wildlife-passable fences where trespass is a problem.

- Livestock waters will provide safe, usable water for wildlife, where possible. As funding and opportunities permit, existing facilities will be modified for safe wildlife use. The above ground height of livestock troughs and tanks will not exceed 20 inches. The BLM will install wildlife escape ladders in each facility and provide ramps for small bird and mammal access. Storage tanks will be configured to reduce evaporation and prevent wildlife from drowning.

Threatened and Endangered Species:

- The BLM will initiate formal Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) on all actions that may affect Federal listed threatened and endangered species or critical habitat as required by the Endangered Species Act of 1973 as amended.

- The ESA of 1973, as amended, provides for the protection of T&E and proposed T&E species of plants and animals. Specifications of the ESA pertain to both the Lower Sonoran and SDNM Decision Areas. BLM Manual 6840 prescribes conservation measures (outlined in Appendix K, *Conservation Measures from Fish and Wildlife Service Biological Opinions* (p. 1239)) for T&E species, including conservation measures for fire management activities and species-specific conservation measures. To a large extent, these measures have been built in to the RMP alternatives evaluated in this DEIS.

- Monitor existing populations and inventory for additional populations of threatened and endangered species.

Priority Wildlife Species:

- Maintain and develop a proactive public education program on the desert tortoise and its habitat requirements, including participation in public events with tortoise habitat information.

- Continue to work with and support other agencies and public entities in desert tortoise conservation.

- Coordinate invasive animal species control and education efforts with AGFD.

- Follow management prescriptions for livestock grazing allotments in the Woolsey Peak and Signal Mountain wilderness areas as provided in the wilderness management plans or, if different, as described in S&G evaluations.

- Design fences to reduce adverse impacts to wildlife movement. Specifications in BLM Manual 1741 and in local BLM directives will be used. The BLM will consult with AGFD on the design and location of new fences. Where existing fences in wildlife habitat do not meet BLM specifications, they will be modified according to BLM Manual 1741 when they are scheduled for replacement or major maintenance. Special consideration will be given to placement, type, and installation of fences in Category I and II desert tortoise habitat to facilitate desert tortoise movement, dispersal, and protection. Before installing facilities, the BLM will conduct a site evaluation for special status and state-protected animals and will develop mitigation to protect these species and their habitats. Such mitigation might include project relocation, redesign, and abandonment.

- Inventory for federally listed, proposed, and candidate species. Implement monitoring programs on known populations of listed, proposed, and candidate, species and other special status species (as defined in BLM Manual 6840) to document population levels and status.

Where monitoring finds threats to these populations, actions will be taken to protect the species and their habitats.

- Standardize desert tortoise management throughout its habitat. Management would be consistent with the following documents:
  - Desert Tortoise Habitat Management on Public Lands: A Range wide Plan (BLM 1988b).
  - Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona, Instruction Memorandum No. AZ-91-16 (BLM 1990a)
  - Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona: New Guidance on Compensation for the Desert Tortoise, Instruction Memorandum No. AZ-92-46 (BLM 1992)
  - Instructional Memorandum No. 94-018 Ephemeral Grazing Policy in Desert Tortoise Habitat Supplemental Guidance for Desert Tortoise Compensation, Instruction Memorandum No. AZ-99-008 (BLM 1999).
- Desert Tortoise Mitigation Policy, Instruction Memorandum No. AZ-2009-010 (BLM 2009)
- Establish additional desert tortoise study plot(s) or other monitoring methods, as necessary. Read plots at 5-year intervals, or as necessary, and as funding permits.

2.7.6. SOIL RESOURCES (SL)

Soil resources are fundamental to all other resources and resource uses. Guidance for management of soil resources is published in BLM Manual7100. Primary authority for management includes the Taylor Grazing Act, the Public Rangelands Improvement Act, and FLPMA, which address use of Federal rangelands, including assessment, conservation, and improvement of soil resources. The Clean Water Act indirectly affects soil management by controlling the release of nonpoint-source pollution such as sedimentation caused by erosion. The BLM's Phoenix District Office uses surveys developed by the U.S. Department of Agriculture's National Resources Conservation Service (NRCS), as well as on-site assessments, when possible, to determine soil types and characteristics when assessing management actions.

Soil conditions are monitored and assessed through land health assessments. Impacts to soils are analyzed during the development of EISs or EAs for projects and use authorizations. The soil program works to reduce impacts to soil and associated vegetation resources through allocation of uses such as transportation and grazing, and through mitigation of project impacts. The soil program also works with other programs to implement restoration projects.

2.7.6.1. Existing Management Decisions (Alternative A - No Action) Soil Resources

The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila South Resource Management Plan (1989):

- Install gully plugs, waterbars, and other erosion structures to prevent excessive erosion on existing roads in Vekol Valley ACEC (WS-18).
- During construction of all rangeland developments, surface disturbance will be minimized. After construction, disturbed surfaces will be restored to a natural condition to the extent practicable (WS-19).
- Repair and maintain the existing watershed dike system and associated watershed fence (WS-21).

Phoenix Resource Management Plan (1989)::

- Maintain and improve soil cover and productivity through erosion-prevention measures and land treatments (WS-03).
- Salinity control measures will be incorporated into erosion-prevention strategies and rehabilitation treatments (WS-04).

Lower Gila South Resource Management Plan - Goldwater Amendment (1990): :

[Applies to the three relinquished BGR parcels]

- Restrict the operation of motorized vehicles and heavy equipment to established roadways and previously impacted areas except when the use relates to a specific permitted project (WS-8).
- Assess, as part of site appraisals for the National Environmental Policy Act (NEPA), the vulnerability of soils to disruption and subsequent wind and water erosion (WS-9).
- Use the following techniques to minimize soil disturbance and conserve soil resources on previously unimpacted sites:
  - Gain access to the site, where possible, by using existing roads and trails.
  - Use equipment, where possible, that creates the least amount of soil disturbance.
  - Return disturbed areas to as close to pre-disturbed conditions as possible.
  - Minimize activities where it is known that soils are unstable and subject to wind erosion.

Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (1997)::

- Guideline 1-1: Management activities will maintain or promote ground cover that provides for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites within management units. The ground cover should maintain soil organisms, plants, and animals to support the hydrologic and nutrient cycles and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.
- Guideline 1-2: When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

2.7.6.2. Action Alternatives for Soil Resources (SL)

Program Goals

- **Goal 1:** Ensure watersheds are functioning appropriately and are consistent with Land Health Standards. Characteristics of a properly functioning watershed include channels that are stable and in balance with the landscape; erosion and sediment deposition appropriate for the ecological site; infiltration of surface water in soils sufficient to support desired future conditions (DFCs) and minimize erosion from runoff; and flood frequencies, durations, and magnitudes appropriate for the landscape.
- **Goal 2:** Maintain or improve sensitive soils to avoid accelerated erosion rates.

Management Actions and Allowable Uses

Goal 1 (Watershed): ***Ensure watersheds are functioning appropriately and are consistent with Land Health Standards. Characteristics of a properly functioning watershed include channels that are stable and in balance with the landscape; erosion and sediment deposition appropriate for the ecological site; infiltration of surface water in soils sufficient to support desired future conditions (DFC) and minimize erosion from runoff; and flood frequencies, durations, and magnitudes appropriate for the landscape.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Maintain or restore upland, channel, and riparian components of watersheds that help stabilize or improve watershed conditions. Major indicators of watershed health include maintaining total cover (vegetation and litter) consistent with desired future conditions, riparian areas in proper function condition, and erosion and sedimentation rates appropriate to the ecological site.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**SL-1.1.1:**Priorities for restoration would be established for disturbed areas. Priorities would be based the potential for soil erosion and loss, damage to cultural or ecologically sensitive sites, and effects on water quality and quantity.
LS	**SDNM**	**B**	**C**	**D**	**E**	**SL-1.1.2:**Degraded sites would be stabilized and restored to slow or stop accelerated soil erosion and sedimentation and limit erosion to the natural rate for the ecological site.
LS	**SDNM**	**B**	**C**	**D**	**E**	**SL-1.1.3:**Benefits and risks of retaining the Vekol Valley spreader dike system would be evaluated along with benefits and risks of retaining or implementing vehicle closures in areas with eroded or otherwise degraded roads and trails.
LS	**SDNM**	**B**	**C**	**D**	**E**	**SL-1.1.4:** Soil erosion at cultural and ecologically sensitive sites would be evaluated. Soil erosion or degradation at these sites would be mitigated.
	SDNM	**B**	**C**	**D**	**E**	**SL-1.1.5:** Any management-caused soil erosion or degradation of the protected objects of the SDNM would be mitigated and restored to the extent possible.
LS	**SDNM**	**B**	**C**	**D**	**E**	**SL-1.1.6:** New or redeveloped facilities not related to water management would be constructed: ● Outside riparian areas and the 100-year floodplain of washes or water ways, ● In a manner that avoids changing natural water flow or watershed dynamics, and consistent with other resource and public-safety goals. ● Existing facilities could be relocated or modified if they are significantly affecting watershed or floodplain function. Where water-management facilities are necessary, the BLM would pursue options that minimize changes to natural water flow and watershed dynamics. Any activities in the 100-year floodplain would be planned for compliance with any county or Federal floodplain regulations.

Goal 2 (Soils): *Maintain or improve sensitive soils to avoid accelerated erosion rates.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Actions**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Disturbance of sensitive soil surfaces, including those classified as highly susceptible to wind and water erosion and those with protective desert pavement or well-developed cryptogamic crust will be avoided. If disturbance occurs, damage will be mitigated.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**SL-2.1.1:** Developments and ground disturbing activities would be located away from areas of significant desert pavement, cryptogamic crust, and other sensitive or fragile soils that are vulnerable to disruption or have high wind or water erosion potential unless project goals cannot be met in another location. Where facilities or projects cannot be relocated, mitigation measures would be taken, including application of ground cover, to minimize erosion.
LS		**B**	**C**	**D**	**E**	**SL-2.1.2:** The density of roads and trails would be reduced during route designation within areas known to have sensitive soils. Closed roads would be rehabilitated. Roads left open would be treated to mitigate wind and water erosion.

LS	**SDNM**	**B**	**C**	**D**	**E**	**SL-2.1.3:** Motorized vehicle use would be limited to designated roads, primitive roads and trails. Specific designations would occur within this plan for the SDNM. LSFO routes would be designated within 5 years of RMP completion. Vehicle travel in LSFO would be restricted to inventoried routes only for the interim.
LS		**B**	**C**	**D**	**E**	**SL-2.1.4:** Vehicle parking and camping would be limited to 100 feet from the road centerline or designated sites in areas determined to have sensitive soils. Designated sites in such locations would be inventoried, mapped and signed. If monitoring results show effects that exceed limits of acceptable change, motorized vehicles will not be allowed to pull off a designated route 100 feet either side of centerline.
	SDNM	**B**	**C**	**D**	**E**	**SL-2.1.5:** Vehicle parking and camping would be limited to 25 feet from the road centerline or designated sites in areas determined to have sensitive soils. Designated sites in such locations would be inventoried, mapped and signed. If monitoring results show effects that exceed limits of acceptable change, motorized vehicles will not be allowed to pull off a designated route 25 feet either side of centerline.
	SDNM	**B**	**C**	**D**	**E**	**SL-2.1.6:** Surface-disturbing activities – including vehicle camping, parking and recreation-facilities – would be prohibited on undisturbed desert pavement or well developed cryptogamic crusts.

Administrative Actions

- Update existing soils database on public lands that were formerly part of the BGR.
- Implement watershed improvement projects to increase ground cover to reduce erosion, sediment yield, and salinity contributions.

2.7.7. VEGETATION RESOURCES

Management of vegetation resources (VM) on public lands requires the management of a variety of resources, including watersheds, vegetative communities, wildlife habitat, livestock forage, priority plant species, and noxious weeds. The BLM Land Use Planning Handbook (H-1601-1) requires that land-use plans identify desired future conditions (DFCs) for vegetative resources, provide provisions for wildlife habitats and livestock forage, identify areas of ecological importance, and protect priority plant species and habitats. The list of priority plant species may be found at the end of Appendix J, *Wildlife & Plant Priority Species* (p. 1235).

The basis for managing vegetative communities and invasive or noxious weeds on public lands can be found in the following Federal and State laws, regulations, and policy guidance:

- The Federal Land Policy and Management Act of 1976
- Arizona Native Plant Law of 1993
- Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (S&Gs) (BLM 1997)
- Clean Water Act of 1977
- EO 11990 Protection of Wetlands
- EO 11988 Floodplain Management
- Title 43 Code of Federal Regulations Part 4100
- The Sikes Act of 1974, as amended (16 U.S.C. 670 et seq.)
- BLM Manual 6500 – Wildlife, Fish and Plant Resources
- BLM Manual 6840 – Special Status Species
- BLM MS 1740 Renewable Resource Improvements and Treatments
- BLM Manual 9011 Chemical Pest Control
- BLM Manual 4180- Rangeland Health Standards EO 13112 Invasive Species Control
- Federal Noxious Weed Act of 1974
- Federal Advisory Committee Act, (5 U.S.C. App. 1)
- Public Rangelands Improvement Act of 1978
- Taylor Grazing Act of 1934 Vegetation Treatments using Herbicides on BLM Lands in Seventeen Western States Final EIS (September 2007)

2.7.7.1. Existing Management Decisions, Alternative A (No Action)

The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the

entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila South Resource Management Plan (1989):

- Continue to issue woodcutting permits for the Lower Gila Resource Area on a case-by-case basis.
- Developed spring storage and adjacent riparian habitat will be fenced to exclude livestock.

Phoenix Resource Management Plan (1989):

- Maintain and improve habitat and viable wildlife populations. (VM-01)

Lower Gila South Resource Management Plan - Goldwater Amendment (1990):

- Give priority to protecting vegetation from disturbances during land-based activities. (VM-1)
- Prohibit woodcutting and wood collection for commercial or domestic use on Barry Goldwater Range (BGR) lands. (VM-7; also included in Section 2.8.4, "Recreation Management (RM)" (p. 158))
- No vegetation material is to be removed, with the exception of specific cases deemed appropriate and properly permitted. (VM-8)
- Permit campfires on BGR lands using dead and down wood. Wood cannot be collected in ACECs and other areas specifically closed to wood collection by this RMP amendment or subsequent activity planning. (RR-17; also included in Section 2.8.4, "Recreation Management (RM)" (p. 158))

Vegetation Treatments using Herbicides on BLM Lands in Seventeen Western States Final EIS (September 2007):

Implement an integrated vegetation-treatment program for BLM-administered public lands. The VM management priorities are as follows:

- Priority 1 – Take actions to prevent or minimize the need for vegetation control when and where feasible considering the management objectives for the site.
- Priority 2 – Use effective nonchemical methods of vegetation control when and where feasible.
- Priority 3 – Use herbicides after considering the effectiveness of all potential methods or in combination with other methods of control.
- Follow the Herbicide Treatment Standard Operating Procedures from Appendix B of Vegetation Treatments using Herbicides on BLM Lands in Seventeen Western States Final EIS (Sept. 2007).

Arizona Land Health Standards (1997):

The Arizona Land Health Standards were derived from the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (1997) (Appendix L, *Guidelines for Grazing Administration* (p. 1253)). All BLM activities and management practices should allow for achievement of the Arizona Land Health Standards (See Chapter 2, *Alternatives* (p. 27), ???). These standards describe conditions needed for healthy sustainable public land and must be maintained by all users of the public land. In accordance with BLM policy, activities on public land must be evaluated against indicators developed for each standard.

SDNM Current Management Guidance (2002):

- Unauthorized removal of living or dead native plant material is prohibited by the SDNM Proclamation. (Not numbered)
- native plants as the first priority for all restoration projects. Non-intrusive, non-native plants may be used in limited, emergency situations where they may be necessary to protect the resources or when taking no action will further degrade the resources. This use will be allowed if it complies with the vegetation objectives and other management goals and objectives. In these situations, short-lived species (i.e., nurse-crop species) will be preferentially used and will be combined with native species to facilitate the establishment of native species. (Not numbered)

2.7.7.2. Action Alternatives for Vegetation Resources (VM)

Within the Sonoran Desert National Monument, all of the vegetative communities are considered Monument objects as defined in Presidential Proclamation 7397. (See Table 1.3, "Land Use Planning Process" (p. 6). Plant communities are described in some form for Objects 1, 2, 3, 4, 5, 6, and 7 of the Presidential Proclamation.) Management and protection of vegetative resources in the Monument would also be provided under guidance from other resource management programs. The following vegetation communities and special status plants are specific biological objects (vegetative) that were identified in the Proclamation:

- Saguaro cactus forests (within palo verde-mixed cacti vegetation community)
- Woodlands (Sonoran mid-elevation desert scrub)
- Palo verde-mixed cacti vegetation community
- Acuña pineapple cactus
- Creosote bush-bursage vegetation community
- Desert washes (xero-riparian)

<u>Program Goals</u>

- **Goal 1:** Ensure that the natural diversity and abundance of native vegetation occurs as expected for landform and ecological site, and within the SDNM ensure protection of the vegetative objects of the Monument.

- **Goal 2:** Ensure that populations of endangered, threatened, and special status plants are stable or increasing and that suitable habitat is available for future establishment and maintenance of the populations.
- **Goal 3:** Ensure that noxious and undesirable plant species do not occur on the landscape or, if they occur, they make up a sufficiently small percent of the vegetative community that they do not affect ecological processes.
- **Goal 4:** Protect native plants from over-collecting and other uses.
- **Goal 5:** Ensure that native plants occur at a natural abundance and distribution.
- **Goal 6:** Ensure that the Fred J. Weiler Green Belt will be a productive and functioning riparian system supporting healthy, diverse, and abundant populations of wildlife and riparian dependent plant species with an emphasis on migratory game birds.

Management Actions and Allowable Uses

Goal 1 (Ecosystems): ***Ensure that the natural diversity and abundance of native vegetation occurs as expected for landform and ecological site, and within the SDNM, ensure protection of the vegetative objects of the Monument.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Maintain or restore vegetative communities to achieve desired future conditions (DFCs) as identified below:						
DFCs common to all vegetative communities: ● Vegetative communities will provide appropriate cover levels to protect soils from wind and water erosion. This will ensure properly functioning watersheds and ecological processes in order to sustain healthy biotic populations and communities (biological objects within the SDNM Planning Area). ● Each vegetation community will be maintained within its natural range of variation in plant composition, structure, and cover at the landscape level. Site potentials (soil, climate, topography) establish the natural limits on what can be produced in terms of vegetation and related resource values like forage, wildlife habitat, and watershed characteristics.						
DFCs by specific vegetative community: The DFCs described below are general descriptions of the expected plant community makeup. Site potentials (based on ecological sites) and the development of specific desired plant community objectives for each vegetation type should be determined through the use of the Natural Resource Conservation Service's (NRCS) ecological site descriptions, rangeland health reference sheets, or information collected from reference or comparison areas or a combination of the above. The ecological sites that correspond to each vegetation community are identified in ???. The vegetative communities listed below that occur within the SDNM are identified as biological objects of the Monument. Within the SDNM specific desired plant community objectives and site potentials were developed for each ecological site and corresponding vegetation type (biological object) through the land health evaluation process. These site potentials were determined through the use of a combination of the information collected from the BGR and Area A (comparison areas), the NRCS's ecological site descriptions, and the rangeland health reference sheets for the ecological sites. Achievement of these desired plant community objectives would ensure that the biological objects of the Monument are being protected. ● Creosote Bush–Bursage: (597,700 acres LS; 179,600 acres SDNM) The potential of this community is a shrub dominated site with desert scrub species, cacti and annual forbs and grasses. ● Palo Verde-Mixed Cacti: (312,000 acres LS; 303,300 acres SDNM) This vegetative community should consist of more diverse vegetative composition and structure than that of the creosote bush- bursage community. It includes vegetation varying from small shrubs to large trees (such as ironwood, palo verde, and mesquite)						

Goal 1 (Ecosystems): ***Ensure that the natural diversity and abundance of native vegetation occurs as expected for landform and ecological site, and within the SDNM, ensure protection of the vegetative objects of the Monument.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
interspersed with a variety of cacti, such as mammalaria (*Mammalaria spp.*), prickly pear (*Opuntia spp.*), cholla (*Opuntia spp.*), barrel cactus (*Ferocactus wislizenii*), hedgehog (*Echinocereus spp.*), and saguaro (*Carnegiea gigantea*). Where potential exists, saguaro cactus forests would support appropriate densities of saguaro, with all age classes represented to ensure recruitment. ● Riparian: (8,800 acres LS; 0 acres SDNM) Riparian habitats should contain a diversity of native riparian obligate trees (such as cottonwood [*Populus spp.*] and willow [*Salix spp.*]) of various age and size classes and herbaceous plants adapted to hydric soils to restore ecological conditions and function. ● Apacherian-Chihuahuan Upland Scrub: (3,400 acres LS; 400 acres SDNM) The potential for this community is a shrubland dominated community consisting of large desert scrub/trees including mesquites, acacias or junipers, and cacti. Perennial grass cover is typically low. ● Sonoran Mid-Elevation Desert Scrub (Woodlands): (1,800 acres LS; 2,000 acres SDNM) This vegetative community should consist of a diverse vegetative composition and structure, similar to that of the palo verde-mixed cacti community, but with an increase of perennial grasses, forbs and large shrub species (jojoba, crucifixion thorn, etc.) due to the increased precipitation. ● Mogollon Chaparral: (1,400 acres LS; 100 acres SDNM) This vegetative community should consist of woody species such as shrub live oak, mountain mahogany, desert ceanothus, and cliffrose interspersed with an understory of perennial grasses along with small shrub and forb species. ● Desert Grassland: (0 acres LS; 1,054 acres SDNM) Manage this plant community as a tobosa (*Pleuraphis mutica*)-dominated grassland while limiting the encroachment of mesquites and other shrubs. ● Desert Washes (xeroriparian): (1,658 miles in the LS; 970 miles in the SDNM*) This community should have a multi-layered vegetative structure, as provided by perennial vegetation. ● Diverse vegetative composition and structure would include such species as foothills palo verde (*Cercidium microphyllum*), blue palo verde (*Cercidium floridum*), desert willow (*Chilopsis linearis*), ironwood (*Olneya tesota*), mesquite (*Prosopis spp.*), smoke tree (*Psorothamnus spinosus*), and catclaw acacia (*Acacia greggii*) of various sizes and growth forms appropriate to the ecological site. ● Ensure sufficient bank and floodplain vegetation (including along braided channel floodplains) provides for hydrologic function of the site.						
* Based on USGS 1:100,000 scale topographic quadrangles						
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-1.1.1:** Activities would be evaluated on a case-by-case basis and impacts minimized, mitigated, or avoided to achieve land-health standards and vegetation community DFCs, and ensure protection of the vegetative objects of the Monument.
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-1.1.2:** Vegetation treatments could be conducted in order to make progress toward achieving land-health standards. Treatments would include, but would not be limited to, thinning, burning, seeding, transplanting, watering, seasonal closures, and seasonal use restrictions.

Goal 2 (Special Status Plants): *Ensure that populations of Priority Plants are stable or increasing and that suitable habitat is available for future establishment and maintenance of the populations.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Identify and protect occupied and potential habitats for maintenance, restoration, or reestablishment of Acuña pineapple cactus and other endangered, threatened, or special status plants. Maintain the diversity and properly functioning ecological processes of natural plant communities that support rare or special status plant species.						

LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-2.1.1:** Authorized surface-disturbing activities within occupied Acuña cactus habitat areas would be avoided. Currently the only known areas of location are within the Coffeepot-Batamote and the very southern portion of the SDNM.
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-2.1.2:** Authorized surface-disturbing activities within habitat areas of any Endangered, Threatened, or Special Status Plants would be avoided to ensure stable populations.

Goal 3 (Noxious Weeds): *Ensure that noxious and undesirable plant species do not occur on the landscape or, if they occur, they make up a sufficiently small percent of the vegetative community that they do not affect ecological processes.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 3.1: Control invasive species using an integrated weed-management approach including mechanical, chemical, biological control methods, and prescribed fire where appropriate.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-3.1.1:** Proposed projects would use practices that avoid the introduction and spread of invasive species.
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-3.1.2:** Priority would be assigned to the control of invasive species that have a substantial and apparent impact on native plant communities and wildlife. When infestations are identified, they would be evaluated for their potential threat and scheduled for removal accordingly.
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-3.1.3:** Monitoring for invasive species would focus on likely vectors of invasion such as linear features (roads, canals, railroads, utility corridors, etc.), disturbed areas (construction or development areas), and areas where water is available or may pond (water-control structures, etc.).
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-3.1.4:** Certified weed-free feed would be required for all equestrian and stock animal uses authorized under special recreation permits. The general public would be encouraged to provide weed-free feed for their equestrian and stock animals.

Goal 4 (Collection and Allowable Uses): ***Protect native plants from over-collection and other uses.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 4.1: Manage desert native vegetation for non-commercial uses in accordance with the Arizona Native Plant Law and BLM regulations.						
LS		**B**	**C**	**D**	**E**	**VM-4.1.1:** Collection of living or dead native plant material for commercial uses would be prohibited.
LS		**B**	**C**	**D**	**E**	**VM-4.1.2:** Collection of reasonable amounts of renewable native plant byproducts including flowers, leaves, fruit, seeds, nuts, cones, and berries, and dead and downed native vegetation for non-commercial, personal use would be allowed when conducted in accordance with the Arizona Native Plant Law.
LS		**B**	**C**	**D**	**E**	**VM-4.1.3:** Collection of living or dead native vegetation and byproducts that are Federally listed as threatened and endangered species or highly safeguarded native plants identified in the Arizona Native Plant Law would be prohibited.
LS		**B**	**C**	**D**	**E**	**VM-4.1.4:** Collection of saguaro cacti skeletons for personal use or campfire burning would be prohibited in the Planning Area.
LS				**D**		**VM-4.1.5:** Collection of all firewood would be prohibited at developed recreation sites. The collection of wood for on-site campfires is also addressed in the recreation ???.
LS		**B**	**C**	**D**	**E**	**VM-4.1.6:** Woodcutting would not be allowed for commercial or personal use. It may be authorized on a case-by-case basis as needed to meet management objectives, such as hazardous fuels reduction or native plant propagation.
LS		**B**	**C**	**D**	**E**	**VM-4.1.7:** The collection of other dead, down, and detached wood for personal campfire use while camping on public lands would be allowed unless specifically prohibited above.

Goal 4 (Collection and Allowable Uses): ***Protect native plants from over-collection and other uses.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**	**C**	**D**	**E**	**VM-4.1.8:** Removal of all other vegetation material not specifically provided for would be prohibited without written authorization. Examples of authorizations include vegetation removal for Native American traditional uses, scientific research, educational uses, salvage, or meeting management objectives. Authorizations must be in accordance with the Arizona Native Plant Law.
LS		**B**	**C**	**D**	**E**	**VM-4.1.9:** Removal of native vegetation for personal use or commercial landscaping may be allowed during authorized salvage operations where vegetation is destined to be destroyed, with written authorization from the BLM and a permit from the Arizona Department of Agriculture in accordance with the Arizona Native Plant Law. Priority would be given to utilizing salvage plants for restoration activities on public lands.
Objective 4.2: Protect SDNM vegetation by managing collection and uses consistent with the Monument proclamation.						
	SDNM	**B**	**C**	**D**	**E**	**VM-4.2.1:** Collecting or removing living or dead native vegetation including plant byproducts and woodcutting for commercial and personal uses would be prohibited within the SDNM without written authorization. Examples of authorizations include vegetation removal for Native American traditional uses, scientific research, educational uses, salvage, or meeting management objectives. Authorizations must be in accordance with the Arizona Native Plant Law.
	SDNM	**B**	**C**	**D**	**E**	**VM-4.2.2:** The collection of dead, down, and detached wood for personal campfire use while camping on public lands would be prohibited in the passage and front country recreation settings. The collection of wood for campfires is also addressed in the Section 2.8.4, "Recreation Management (RM)" (p. 158).

Goal 5 (Rehabilitation): Ensure that native plants occur at a natural abundance and distribution.						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 5.1: Rehabilitate native plant communities after land disturbing activities where appropriate. Rehabilitation will be designed to achieve vegetative conditions (cover, composition, etc.) necessary to stabilize the site.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-5.1.1:** Rehabilitation practices would be used to stabilize and rehabilitate sites impacted from new surface disturbing activities. Long-term restoration would occur through natural processes. In most cases, lands previously disturbed by historical uses would be allowed to recover through natural processes. Sites that may be appropriate for rehabilitation practices include: Recently disturbed sites that may respond quickly to rehabilitation practices, including damage caused by wildfire, immigrant traffic, or other illegal activities; ● Severely damaged, rapidly deteriorating, or rapidly expanding sites ● Placing adjacent resources at risk; ● Prone to invasion by non-native species; ● Heavily disturbed, such as mining sites; ● Capable of improving habitat for T&E species; ● Management priorities that require accelerated restoration to meet selected management objectives.

LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-5.1.2:** Native plants would be used as the first priority for all rehabilitation projects. Non-intrusive, non-native plants may be used in limited urgent situations where it may be necessary to protect the resources or when taking no action would further degrade the resources. In these situations, short-lived species (i.e. nurse crop species) would be preferentially used and would be combined with native species to facilitate the establishment of native species.
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-5.1.3:** Rehabilitation and reclamation plans that describe the site restoration goals, considering the starting condition of the site, and restoration methods would be required for all surface disturbing activities commensurate with the amount of surface disturbance.
LS	**SDNM**	**B**	**C**	**D**	**E**	**VM-5.1.4:** Preliminary success criteria for a site would be when soil conditions are stabilized and approximately 50 percent or more of the desired vegetation conditions are met based on reference sites or vegetation-community DFCs. Vegetation would be considered established when it has survived (without assistance, e.g., watering) for two consecutive years.

2.7.8. VISUAL RESOURCES (VR)

Outstanding scenic landscapes administered by the BLM provide a place to escape and enjoy the beauty of nature. They also are used for a multitude of other activities, including recreation, mining, grazing, and road development. Many of these activities have the potential to disturb the landscape and impact scenic values. Visual resource management (VRM) is a system for minimizing the visual impacts of surface-disturbing activities and maintaining scenic values for the future.

Federal laws requiring the protection of visual resources include the following stipulations:

- Public lands will be managed in a manner which protects the quality of the scenic (visual) values of these lands (43 U.S.C. 1701, Section 102 (a) (8)).

- Esthetically pleasing surroundings would be assured for all Americans (43 U.S.C. 4321, Section 101 (b)).

The BLM Visual Resource Program manages landscapes based on visual indicators defined in the Visual Resource Inventory Handbook H-8410-1. The handbook is used for guidance in activities related to management of visual resources.

According to the Visual Resource Inventory Handbook H-8410-1 the objectives of VRM management classes as:

- Class I: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

- Class II: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract attention from the casual observer.

- Class III: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer.

- Class IV: The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention.

The construction of campgrounds, energy and mineral development, vegetation treatments, and rights of way all will be evaluated for design to ensure consistency with the VRM classes. All permitted actions on public land are evaluated to minimize impacts on visual contrast with the landscape, including impacts on the night sky. VRM classes acknowledge existing visual contrasts, and more restrictive requirements would not be retroactively applied to existing projects.

2.7.8.1. Existing Management Decisions, Alternative A (No Action) for Visual Resources

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila North Management Framework Plan (1983):

- Recognize areas proposed as Class II visual resource management areas as being an area where a contrast may be seen but should not attract attention. Manage visual resources using existing utility corridors (see the Lands and Realty for further detail on decisions regarding existing utility corridors) (RR-01).
- Recognize areas proposed as Class III visual resource management areas as those in which contrasts may be evident and begin to attract attention. Manage visual resources using existing utility corridors (RR-02).
- Recognize areas proposed as Class IV visual resource management areas as those in which a contrast may attract attention and be a dominant feature in the landscape. Manage visual resources by using existing utility corridors (RR-03).

Lower Gila South Resource Management Plan - Goldwater Amendment (1990):

(Applies to the three relinquished Sentinel Plain, Sand Tank Mountains, and Ajo Airport parcels)

- Protect mountain vistas from visual intrusion by developing, during site or project specific activity planning, visual resource-management prescriptions needed to maintain appropriate visual resource management objectives (not numbered).
- Protect the visual resource quality on lands adjacent to the highways (Interstate 8 and State Route 85) by establishing portions of these roads as Scenic Byways in cooperation with Arizona Department of Transportation, the U.S. Air Force, and the U.S. Marine Corps; and 2) using the visual resource-management process during activity planning to maintain appropriate visual resource-management objectives established for these byways.

Lower Gila Resource Management Amendment (2005):

- Management of recreation opportunities and developments will be evaluated using two inventory and management tools called the Recreation Opportunity Spectrum and Visual Resource Management (RR-1).
- Existing visual resource inventory classes of the RMP will be adopted as management classes (RR-3).
- All MFP visual resource management classes will be brought forward (RR-4).

- Visual resource-management classes will be reviewed and refined during future interdisciplinary planning (RR-5).
- All unclassified lands of the MFP and RMP Planning Areas are established as Visual Resource Management Class I and II areas, subject to review and refinement during future interdisciplinary planning (RR-8).

2.7.8.2. Action Alternatives for Visual Resources (VR)

Goals and Objectives

- **Goal 1:** Manage public lands that would maintain scenic quality, maintain natural landscapes, undisturbed views, and other high-quality visual resources;
- **Goal 2:** Maintain night sky condition;
- **Goal 3:** The natural splendor for which the SDNM was designated shall be maintained

Land Use Allocations Summary

The proposed VRM classes by alternative are presented in Table 2.6, "VRM Classes by Alternative" (p. 99) below.

Table 2.6. VRM Classes by Alternative

VRM Class	Alternative (BLM Acres)				
	A (No Action)	B	C	D	E (Preferred)
The following VRM classes would be allocated for each alternative to support management objectives for the various resources, such as designated wilderness, areas with wilderness characteristics, NHT segments, ACECs, WHAs and back country recreation settings.					
Lower Sonoran					
Class I	91,800	91,800	91,800	91,800	91,800
Class II	116,300	64,900	387,800	622,400	71,900
Class III	279,600	551,900	385,600	192,000	548,400
Class IV	442,500	221,600	65,000	24,000	218,100
SDNM					
Class I	158,700	158,700	158,700	457,900	158,700
Class II	91,600	219,000	267,300	28,500	246,500
Class III	116,400	108,700	60,400	None	81,200
Class IV	119,700	0	0	0	0

2.7.8.3. Management Actions and Allowable Uses

Goal 1: ***Manage public lands that would maintain scenic quality, maintain natural landscapes, undisturbed views, and other high-quality visual resources.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Visual resources would be managed according to the class objectives set in the Visual Resource Inventory Handbook H-8410-1 and BLM Guidelines for a Quality Built Environment.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**VR-1.1.1:** Designated wilderness areas would be allocated as VRM class I.
LS		**B**	**C**	**D**	**E**	**VR-1.1.2:** All other public lands within the Lower Sonoran would be allocated to the VRM Classes as depicted by alternative in .

Goal 1: ***Manage public lands that would maintain scenic quality, maintain natural landscapes, undisturbed views, and other high-quality visual resources.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS	**SDNM**	**B**	**C**	**D**	**E**	**VR-1.1.3:** All surface disturbing projects or activities, regardless of size or potential impact, would incorporate visual design considerations consistent with the Visual Resource Contrast Rating Manual H-8431-1 to meet VRM class objectives for the area. Even activities in VRM class IV will consider designs that help reduce visual contrast between proposed e project and landscape settings (color, texture, line and form). Measures to mitigate potential visual impacts could include the use of natural materials, screening, painting, project design, location sighting, or restoration.
LS	**SDNM**	**B**	**C**	**D**	**E**	**VR-1.1.4:** Restoration projects would ensure that visual impacts are minimized in the short term (5 years) and that VRM objectives in the project area are met in the long term (life of the project) when such projects are a) considered essential for public safety, achieving DFCs, or reducing hazardous fuels buildups and b) expected to be visually prominent.
LS	**SDNM**	**B**	**C**	**D**	**E**	**VR-1.1.5:** The viewshed of the Juan Bautista de Anza NHT, Painted Rock, Agua Caliente and Ajo Scenic Loop roads, Highway 238 and Interstate 8 will be managed in a manner that exceeds or maintains the VRM objectives. VRM and scenic management prescriptions would be applied for their preservation and enhancement. The viewshed Anza NHT will be managed to maintain the historic landscape setting.

Goal 2: *Maintain current night sky conditions.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Manage activities and projects on public lands that would contribute light or air pollution to maintain or improve dark, clear skies for stargazing and nighttime military training.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**VR-2.1.1:** Permanent outdoor lighting would not be allowed in VRM Class I areas.
LS	**SDNM**	**B**				**VR-2.1.2:** The use of dark-sky-friendly technology would be emphasized when placing facilities on public lands. Measures may include, but not be limited to: directing all light downward, using shielded lights, using only the minimum illumination necessary, using lamp types such as sodium lamps (less prone to atmospheric scattering), using circuit timers, using motion sensors, or using flight proximity detectors.
LS	**SDNM**		**C**	**D**	**E**	**VR-2.1.3:** Development on public lands would be required to use dark-sky-friendly technologies in VRM classes I through IV and in the Sentinel Plain area to provide opportunities for stargazers and amateur astronomers and to maintain conditions favorable to nighttime military operations.

Goal 3: *The natural splendor for which the SDNM was designated shall be maintained.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 3.1: Visual resources of the SDNM would be managed to preserve or to retain the existing character of the landscape. The visual character of management activities will be managed according to the objectives described above and in VRM Handbook H-8410-1.						
	SDNM	**B**	**C**	**D**	**E**	**VR-3.1.1:** Public lands within the Monument would be allocated to the VRM Classes as depicted by alternative in to ensure visual landscapes as described in the Monument proclamation are protected.

Administrative Actions

- All surface-disturbing projects or activities, regardless of size or potential impact, will incorporate visual design considerations consistent with the Visual Resource Contrast Rating Manual H-8431-1 to meet VRM class objectives for the area.
- Participate in regional planning initiatives and comment on proposals for development on adjacent non-Federal lands to encourage future development to be compatible with VRM designations and protection of dark night skies on public lands.
- Develop user facilities (trailheads, non-motorized trails, campgrounds, roads, utilities, interpretive areas, etc.) to take advantage of views of scenic and historic landscapes in such a way that visual quality is protected.

2.7.9. WATER RESOURCES (WR)

Surface-water resources in the Planning Area are limited to the perennial flow of the Gila River and treated effluent discharges into the Gila basin. Surface flow often ends near Highway 85, although flow may continue as far as Painted Rock Reservoir during periods of high precipitation. This section of the river has impaired water quality. An Arizona Department of Water Quality (AZDEQ) plan for improving water quality is scheduled to be completed in 2011. The BLM will be the designated management agency carrying out this plan, and the agency will participate along with other landowners and managers with land that drains into this segment of the Gila River. Currently, the agency's primary management actions on the river consist of fuels and habitat management associated with tamarisk-dominated riparian areas.

Water use in the Planning Area must fulfill two primary responsibilities:

- Comply with laws and regulations that protect the nation's and the State's water resources, and
- Take all legal and resource-development steps necessary to provide a supply of water of sufficient quality and quantity to meet BLM management needs.

Groundwater is the sole source of drinking water for every community in the Planning Area outside metropolitan Phoenix. Arizona state law limits the use of groundwater within the Phoenix Active Management Area (AMA), which includes the Lower Sonoran Decision Area north of the Gila River and west of Apache Junction. According to the State's 1980 Groundwater Management Act, groundwater use by the BLM and other pumpers in the AMA must not interfere with existing wells, and users must meet requirements for proving an assured supply. Groundwater pumping outside of the AMA by the BLM or its permittees and lessees is limited to "reasonable" amounts for a given use.

The water program administers public lands within a framework set by the following Federal laws and regulations:

Federal Land Policy Management Act (FLPMA): authorizes the BLM to inventory and monitor the presence and condition of water resources on public land.

Clean Water Act of 1972, as amended: requires that all water sources meet quality standards developed by the states with authority delegated by the EPA; charges the BLM (and other land-management agencies) with developing and implementing best management practices for the control of non-point source pollution; and requires a number of other actions in coordination with other agencies, such as participating in permitting to protect wetlands, stream channels, etc.

Fundamentals of Rangeland Health (1995): . These require the BLM to apply for water rights in the name of the United States, where allowed by State law. These regulations, particularly those associated with grazing, also require public lands to meet or make progress toward land health standards, including meeting state water quality standards.

2.7.9.1. Existing Management Decisions, Alternative A (No Action) Water Resources (WR)

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions

are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Phoenix Resource Management Plan (1989):

- Maintain and enhance stream flows through activity plans in special management areas (WS-01).
- Ensure that all waters on public land meet or exceed Federal and state water quality standards. (WS-02)

Lower Gila South Resource Management Plan - Goldwater Amendment (1990):

[Applies to the three relinquished BGR parcels]

- Keep groundwater development and exploration to a minimum in Areas of Critical Environmental Concern (ACECs), other management areas, and other environmentally sensitive areas. (WS-1).
- Limit, all field activities relating to groundwater exploration and development to designated roadways and previously disturbed areas (WS-2).

2.7.9.2. Action Alternatives for Water Resources (WR):

Program Goals

- **Goal 1:** Assure physical and legal availability of water in sufficient quantity and quality to meet the management needs of the Lower Sonoran and Sonoran Desert National Monument Decision Areas.
- **Goal 2:** All surface water in the Planning Area will meet appropriate State water-quality standards or will have State-approved plans for water-quality improvement.

Goal 1 (Water Availability): ***Assure physical and legal availability of water in sufficient quantity and quality to meet the management needs of the Lower Sonoran and SDNM Decision Areas.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: New water source developments will not adversely affect existing sources and uses. This will be determined prior to any new development activity, including issuance of landowner's permission to drill required by the Arizona Department of Water Resources.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**WR-1.1.1:** All proposed new water uses and developments would be assessed to determine whether they will adversely affect springs, streams, tinajas, or seeps; decrease water availability at existing wells; or conflict with other resource management goals.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WR-1.1.2:** The only proposed water developments that would be approved would be those with no adverse affects on or conflicts with other uses or management objectives, and for which proponent has a demonstrated need.
LS	**SDNM**	**B**	**C**		**E**	**WR-1.1.3:** Groundwater exploration and development would be restricted and damage mitigated in areas with ecological or cultural resources that are sensitive to disturbance.

Goal 1 (Water Availability): ***Assure physical and legal availability of water in sufficient quantity and quality to meet the management needs of the Lower Sonoran and SDNM Decision Areas.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.2: The BLM will take necessary steps to acquire all water rights allowed by law to properly manage the Lower Sonoran Planning Area, including the SDNM, and to protect the natural resources of Planning Area and the objects of the SDNM. Inventory work and at least one-half of water-rights filings will be completed within 5 years of issuing this plan.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**WR-1.2.1:** Water would be inventoried and appropriate applications and claims filed for State water rights for all water sources and beneficial uses on public land in accordance with State law to ensure water availability to meet management needs and protect ecological functions.
	SDNM	**B**	**C**	**D**	**E**	**WR-1.2.2:** Inventory all water sources, including groundwater sources, within the three wilderness areas of the SDNM for quantification and assertion of Federal reserved water rights, and provide notice of these rights to ADWR.

Goal 2 (Water Quality): All surface water in the Planning Area will meet State water-quality standards or will have state-approved plans for water-quality improvement.						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1*:* Impaired water quality in stretches of the Gila River that run through the Planning Area will be improved or corrected within 5 years; the BLM will commit to the State schedule for water-quality improvement.						
LS		**B**	**C**	**D**	**E**	**WR-2.1.1:** The BLM would implement best management practices for grazing, mining, energy development, and other activities that have been specifically established to protect streams from non-point source pollution.
LS		**B**	**C**	**D**	**E**	**WR-2.1.2:** The BLM would be an active participant as the Arizona Department of Environmental Quality begins work on the Total Maximum Daily Load for the Gila River between the Salt River and Painted Rock Reservoir.
	SDNM	**B**	**C**	**D**	**E**	**WR-2.1.3:** No new water development that would divert water out of SDNM would be allowed.

Administrative Actions

- Identify, evaluate, and assign priorities for restoring disturbed areas considering the potential for soil erosion and loss, damage to cultural or ecologically sensitive sites, and effects on water quality and quantity.
- Evaluate proposals for groundwater withdrawals on BLM-administered lands within an Active Management Area (AMA) in coordination with the Arizona Department of Water Resources (ADWR) and incorporate any restrictions or guidelines for the AMA.
- Work with county, state, and Federal agencies to monitor surface and groundwater quantity and quality on public lands. Correct problems as they are identified.
- Coordinate with the Arizona Game and Fish Department (AGFD) to be sure all wells within the BGR are registered with Arizona Department of Water Resources (ADWR). Inventory all water sources on BGR and enter them into the BLM water data management system. Coordinate water rights filings for water sources with the U.S. Air Force and AGFD. Applicable to the three relinquished BGR parcels

Specific to the SDNM Decision Area.

- Work with county, state, and federal agencies and other partners to evaluate the quantity of groundwater available and predict the affect of future potential water withdrawals on the ability to provide adequate water availability for natural resource and multiple use goals within SDNM.
- Begin a dialogue with appropriate State of Arizona policy, legal, and water resources staff on the development of a cooperative agreement on the protection of water resources on SDNM.

2.7.10. WILD HORSE & BURRO MANAGEMENT (HB)

In 1971, Congress passed The Wild Free-Roaming Horses and Burros Act (WFRHBA, or "The Act," Public Law 92-195). It states, "It is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands."

After the passage of The Act, the BLM was required to survey public lands and delineate where wild horses and burros found habitat and forage, and designate these areas as "Herd Areas" (HAs). These Herd Areas established boundaries of where wild horses and burros were located at the passage of The Act. Later, Herd Management Areas (HMAs) were established within those Herd Areas to manage healthy, self-sustaining populations of wild horses and/or burros, in accordance with BLM land use plans (i.e. RMPs) and other decisions. Only one Herd Area, the Painted Rock Herd Area, is located in the Lower Sonoran Decision Area. No other HAs and no HMAs have been allocated within either Decision Area. The Herd Area is shown on Map 3-15.

The Painted Rock Herd Area has been administered as a herd area with a target population of zero wild horses and burros. This decision has been based on conflicts in the area with private landowners, agricultural interests, wildlife, such as bighorn sheep and other resources, and a lack of year-round water available for the wild horses and burros within the Herd Area. It is not possible to manage a healthy, self-sustaining horse or burro herd within the boundaries of a herd area that does not currently have a natural year-round source of water. A zero population requires removing all wild horses and burros from the herd area.

All previous planning documents, including the Lower Gila South RMP, referred only to wild burros in the area. However, in 1999, it was determined that horses were also present in the area in 1971 and subject to the protection by The Act. Protests and litigation of an RMP Amendment in the late 1990s resulted in a settlement agreement regarding the Painted Rock Herd Area. The BLM was instructed to conduct an analysis of the manageability of the Painted Rock herds and make a decision in the new RMP based on that analysis. The Painted Rock Herd Manageability Analysis can be found in Appendix M, *Painted Rock Burro Herd Manageability Analysis* (p. 1257) of this document, and the goals and objectives found below are based on that analysis.

In 1992, the BLM Lower Gila South Field Office determined through a review of the 1974 census and personal interviews that burros on the Barry Goldwater Range (BGR) had not used that area in 1971 at the passage of The Act, and therefore are not wild burros, but estrays or feral animals from the Tohono O'odham Reservation. Thus, the burros located on the BGR are not protected under the provisions of the WFRHBA. Likewise, none of the lands relinquished by the U.S. Air Force can be designated as a Herd Area, as defined by "The Act." Any burros (or other livestock) found on the BGR are considered in trespass and subject to 43 CFR 4720.2. Coordination with the Tohono O'odham Nation and other affected agencies, such as the State Land Department, Arizona Game and Fish Department, U.S. Fish and Wildlife, and the U.S. Border Patrol, and the military, will continue to stress proper management of these burros within the boundaries of the reservation.

2.7.10.1. Existing Management Decisions, Alternative A (No Action)

The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the

entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila South Resource Management Plan (Goldwater Amendment) (1990):

(Applies to the three relinquished BGR parcels.)

- Inventory the burro population to determine herd size and ownership. (HB-1)
- Prepare a burro capture-and-removal plan in coordination with the U.S. Air Force, Tohono O'odham tribe and other affected parties. (HB-2)
- Adopt captured burros through the adoption program or impound and sell, whichever is appropriate according to the determination of their ownership. (HB-3)

Approved Amendment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan and Decision (2005):

- This amendment deferred to subsequent resource management planning all decisions relating to the management of wild horses and burros that were proposed in the *Final Amendment and Environmental Assessment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan*.
- Prepare a burro capture plan in consultation with appropriate government agencies and interest groups. All burros would be removed from the Painted Rock Reservoir area. Details for the burro capture program would be outlined in a herd management plan (HMP). (HB-06).

2.7.10.2. Wild Horse & Burro (HB) Action Alternatives

Goal 1: *Manage the Painted Rock Herd Area in accordance with The Wild Free-Roaming Horses and Burros Act and applicable BLM regulation, policies, and guidance.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Manage the Painted Rock Herd Area as a Herd Area with a target population of zero wild horses and burros.						
LS		**B**	**C**	**D**	**E**	**HB-1.1.1:** In response to the manageability analysis (Appendix M, *Painted Rock Burro Herd Manageability Analysis* (p. 1257)), the Painted Rock HA will not be managed as a HMA. Neither reproducing nor non-reproducing herds of wild horses or burros will be permissible. Wild horses and burros will be removed from the HA as funding is available with the target of maintaining a population of zero. Wild horses and burros straying off the HA onto private lands will be treated as nuisance animals and removed, in accordance with 43 CFR 4720.2.

2.7.11. WILDERNESS CHARACTERISTICS (WC)

In order for an area to contain wilderness characteristics, it must exhibit sufficient size, naturalness, and outstanding opportunities for solitude and/or outstanding opportunities for primitive and unconfined recreation. Managing the wilderness resource is part of the BLM's multiple use mission. Consistent with FLPMA and other applicable authorities, the BLM will consider the wilderness characteristics of public lands when undertaking land use planning. Considering wilderness characteristics in the land use planning process may result in different outcomes across the Planning Area over the life of the plan, including:

- Emphasizing other multiple uses as a priority over protecting wilderness characteristics;
- Emphasizing other multiple uses while applying management restrictions, such as conditions of use or mitigation measures, to reduce impacts to some or all of the wilderness characteristics;
- Emphasizing the protection of some or all of the wilderness characteristics as a priority over other land uses.

Guidance used to inventory wilderness characteristics and consider wilderness characteristics in the Lower Sonoran/SDNM Draft RMP comes from BLM Land Use Planning Handbook (H-1601-1):

Identify decisions to protect or preserve wilderness characteristics (naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive and unconfined recreation). Include goals and objectives to protect the resource and management actions necessary to achieve these goals and objectives. For authorized activities, include conditions of use that would avoid or minimize impacts to wilderness characteristics.

Inventory is a process of gathering, identifying, and documenting information about the public lands and is not a decision to be proposed in the RMP. The existing inventory for wilderness characteristics is extensive, focused on wilderness characteristics, well documented, and includes years of public participation. The wilderness characteristics inventory is addressed further in Chapter 3, *Affected Environment* (p. 251).

The inventory, public scoping, and agency participation, contributed to development of a broad range of alternatives for lands managed to protect wilderness characteristics. The range of alternatives extends from no areas allocated to protect wilderness characteristics under Alternatives A and B, to Alternative D that proposes to allocate 429,500 acres as lands managed to protect wilderness characteristics. Alternative D includes an entire citizens' proposal. The remaining two alternatives propose portions of the Planning Area to be managed to protect wilderness characteristics: Alternative C (240,300 acres) and Alternative E (preferred alternative, 166,300 acres).

Alternative D is based on a citizen inventory. The citizen proposal presented in Alternative D overlaps and includes areas inventoried by BLM for Alternative C (240,300 acres), but also includes areas that have not yet received field inventory and a determination of the presence or absence of wilderness characteristics by the BLM. The entire citizens' proposal, including additional acreage inventoried by BLM, is analyzed as lands managed to protect wilderness characteristics under Alternative D (429,500 acres). Based on the BLM's knowledge of the

Planning Area, it may not necessarily be the case that all of the citizens' proposal in Alternative D contains wilderness characteristics as those characteristics are defined.

The preferred alternative or a new alternative in the Proposed RMP/Final EIS may be a combination of existing alternatives or an alternative within the spectrum of alternatives already analyzed.

The land use plan identifies a variety of measures to protect wilderness characteristics that will be carried forward as land use plan decisions for the life of the Resource Management Plan. Examples include establishing visual resource management (VRM) class objectives to guide analysis, placement or decisions (approval/disapproval) of features like roads, trails or facilities; identifying conditions of use for permitted uses; or designating lands as open, closed or limited to off highway vehicle (OHV) use.

Description of Alternatives

The LS-SDNM planning area has a total of approximately 42,640 acres that were within three released WSAs. Proposals for lands managed to protect wilderness characteristics are presented under Alternatives C, D and E that include lands within these former WSAs . These areas are identified under each alternative and their acreage is provided. Specific public input on whether these areas are appropriate to manage to protect wilderness characteristics is requested.

Alternative C contains lands with wilderness characteristics inventoried by the BLM with 240,300 acres to be managed to protect wilderness characteristics. Lands managed to protect wilderness characteristics include Batamote Mountains East/West, Black Mountain, Face Mountain, Palo Verde Hills, Saddle Mountain, Sand Tank Mountains East/West, Sauceda Mountains, South Maricopa Mountains Addition, White Hills, and Yellow Medicine Butte.

Alternative D contains lands with wilderness characteristics inventoried by the BLM and lands proposed by citizens as having wilderness characteristics. All 429,500 acres of these lands would be managed to protect wilderness characteristics under Alternative D. Lands managed to protect wilderness characteristics include Batamote Mountains East/West, Black Mountain, Butterfield Stage Memorial, Cortez Peak, Cuerda de Lena, Face Mountain, Gila Bend Mountains, Margie's Peak, Oatman Mountain, Palo Verde Hills, Pozo Redondo, Saddle Mountain, Sand Tank Mountains East/West, Sauceda Mountains, Sentinel Plain, South Maricopa Mountains Addition, White Hills, Why, and Yellow Medicine Butte.

Alternative E contains lands with wilderness characteristics inventoried by the BLM with 166,300 acres to be managed to protect wilderness characteristics. Lands managed to protect wilderness characteristics include Batamote Mountains East/West, Saddle Mountain, Sand Tank Mountains East/West, Sauceda Mountains, and White Hills.

The Butterfield Stage Memorial, Face Mountain, and Saddle Mountain areas were in WSAs released by Congress in the Arizona Desert Wilderness Act of 1990 from the requirement of FLPMA section 603(c) that WSAs be managed in a manner that does not impair their suitability for preservation as wilderness.

2.7.11.1. Existing Management Decisions, Alternative A – No Action for Wilderness Characteristics

There are no existing management decisions for wilderness characteristics

2.7.11.2. Action Alternatives for Wilderness Characteristics (WC)

Land Use Allocations Summary

Table 2.7. Acres of Lands Managed to Protect Wilderness Characteristics by Alternative

Decision Area	Alternative (BLM Acres Rounded to Nearest Hundred)				
	A	B	C	D	E
Lower Sonoran	0	0	128,100	276,500	55,400
SDNM	0	0	112,200	153,000	110,900
Total	0	0	240,300	429,500	166,400

Management Actions and Allowable Uses

Goal 1: ***Lands managed to protect wilderness characteristics should retain a high degree of naturalness where the imprint of humans on lands and resources is substantially unnoticeable. Furthermore, outstanding opportunities for solitude and primitive or unconfined types of recreation should be maintained or enhanced.***						
Applicable Decision Area		**Applicable Alternatives**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Lands managed to protect wilderness characteristics will have a high degree of naturalness and offer outstanding opportunities for solitude or primitive, unconfined recreation by reducing impacts to these values while considering manageability and competing resource demands.						
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.1:** Public lands would be managed to protect wilderness characteristics as shown in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110). (See Maps 2-4c, 2–4d and 2–4e).
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.2**: Private or state in-holdings, including subsurface, would be acquired when available from willing owners.
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.3:** Lands managed to protect wilderness characteristics would be managed as exclusion areas for placement of new utility scale renewable energy developments
LS	**SDNM**		**C**		**E**	**WC-1.1.4:** Lands managed to protect wilderness characteristics would be managed as avoidance areas for minor and nonlinear LUAs with the exception for law enforcement, public-safety or administrative purposes as approved by the authorized officer.
LS	**SDNM**			**D**		**WC-1.1.5:** Lands managed to protect wilderness characteristics would be managed as exclusion areas for minor and nonlinear LUAs with the exception for law enforcement, public-safety or administrative purposes as approved by the authorized officer.

Goal 1: ***Lands managed to protect wilderness characteristics should retain a high degree of naturalness where the imprint of humans on lands and resources is substantially unnoticeable. Furthermore, outstanding opportunities for solitude and primitive or unconfined types of recreation should be maintained or enhanced.***						
Applicable Decision Area		**Applicable Alternatives**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Lands managed to protect wilderness characteristics will have a high degree of naturalness and offer outstanding opportunities for solitude or primitive, unconfined recreation by reducing impacts to these values while considering manageability and competing resource demands.						
LS	**SDNM**		**C**		**E**	**WC-1.1.6:** Any potential new minor and nonlinear LUAs, and maintenance of existing facilities, would be evaluated and allowed under the following circumstances: ● When compatible with maintaining or enhancing wilderness characteristics or when needed to protect, manage, or improve natural or heritage resource conditions; ● When meeting law enforcement, agency, or public safety needs; ● When reconstruction, replacement, or major maintenance of existing facilities, or development of new projects, is consistent with this plan's objectives, VRM classes, and desired recreation, social, and managerial settings; ● When the project site can be restored to its previous condition after the project is completed.
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.7:** Existing facilities and projects no longer active would be removed if practicable.
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.8:** Sites and locales with human-caused disturbances would be rehabilitated if such actions protect or enhance wilderness characteristics and natural/heritage resources, are practicable, meet management prescriptions and SOPs, and are addressed in a restoration plan.
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.9:** Measurement standards would be developed and adopted for: ● Trail conditions, ● Facility conditions, ● Visitor-to-visitor encounters, ● Vegetation changes, ● Vegetation and wildlife DRCs, ● Other approved activities
LS			**C**	**D**	**E**	**WC-1.1.10:** Mineral materials sales and free-use authorizations would be prohibited. A mining plan of operation and reclamation plan with appropriate stipulations would be required for all surface-disturbing exploration and development activities conducted under locatable mining laws and regulations.

Goal 1: ***Lands managed to protect wilderness characteristics should retain a high degree of naturalness where the imprint of humans on lands and resources is substantially unnoticeable. Furthermore, outstanding opportunities for solitude and primitive or unconfined types of recreation should be maintained or enhanced.***						
Applicable Decision Area		**Applicable Alternatives**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Lands managed to protect wilderness characteristics will have a high degree of naturalness and offer outstanding opportunities for solitude or primitive, unconfined recreation by reducing impacts to these values while considering manageability and competing resource demands.						
LS			**C**		**E**	**WC-1.1.11:** Lands managed to protect wilderness characteristics would be designated and managed as limited OHV use areas. Motorized vehicle use on roads, primitive roads, and motorized trails would be limited to designated roads and routes established through subsequent travel management plans and subject to the four prescriptions below. When this planning is completed, motorized travel and non-motorized vehicles (e.g., bicycles, hang gliders, other devices for conveyance and stock drawn carts/wagons) would be restricted to designated roads, primitive roads and trails. ● Major arterial vehicle travel routes through wilderness character allocation areas would remain open for motorized travel. ● Vehicle routes to range and wildlife developments would remain open to public use under most circumstances. ● Vehicle spur roads and vehicle routes in washes would be closed to motorized travel and vehicle use. ● Vehicle routes within wilderness character allocations would be designated open, closed, or limited to motorized-vehicle use on a case-by-case prescribed by subsequent travel management plans. ● Until travel management plans are completed, motorized vehicle travel would be restricted to existing routes acknowledged by the BLM's current OHV route inventory.
LS				**D**		**WC-1.1.12:** Lands managed to protect wilderness characteristics would be designated closed OHV areas. Motorized, non-motorized and mechanized vehicles (with the exception of game carriers) would be prohibited. Until travel management plans are completed, vehicle travel would be restricted to existing routes acknowledged by the BLM's current OHV route inventory.
	SDNM		**C**		**E**	**WC-1.1.13:** Lands managed to protect wilderness characteristics would be designated limited OHV use areas. Motorized vehicles would be restricted to designated and primitive roads. Use by non-motorized and mechanical conveyances (with the exception of game carriers) would be restricted to designated trails.
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.14:** Lands assessed for wilderness characteristics, but not allocated for protection of these characteristics, would be available to contain designated roads, primitive roads and trail assets. These assets would be identified and managed in travel management plans as completed.
	SDNM			**D**		**WC-1.1.15:** Lands managed to protect wilderness characteristics would be designated closed OHV areas. Motorized, non-motorized and mechanized vehicles (with the exception of game carriers) would be prohibited.
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.16:** Public or commercial collection of plant and mineral materials would be prohibited.
LS	**SDNM**		**C**	**D**	**E**	**WC-1.1.17:** Wheeled game carriers would be allowed.
LS	**SDNM**		**C**		**E**	**WC-1.1.18:** Closed vehicle routes could be converted, where appropriate, for use as bicycle, equestrian, and/or hiking trails.

Goal 1: ***Lands managed to protect wilderness characteristics should retain a high degree of naturalness where the imprint of humans on lands and resources is substantially unnoticeable. Furthermore, outstanding opportunities for solitude and primitive or unconfined types of recreation should be maintained or enhanced.***						
Applicable Decision Area		**Applicable Alternatives**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Lands managed to protect wilderness characteristics will have a high degree of naturalness and offer outstanding opportunities for solitude or primitive, unconfined recreation by reducing impacts to these values while considering manageability and competing resource demands.						
LS	**SDNM**		**C**		**E**	**WC-1.1.19:** New bicycle, equestrian, and/or hiking trails would be established when consistent with this plan's objectives; desired recreation, social, and managerial settings; and VRM classes.
LS	**SDNM**		**C**		**E**	**WC-1.1.20:** Special recreation permits, commercial recreation and vending operations, guided hunts, and concession leases would be allowed when they are landscape- and wilderness-character resource-dependent activities consistent with this plan's objectives; desired recreation, social, and managerial settings, and VRM classes.
LS	**SDNM**			**D**		**WC-1.1.21:** Closed vehicle routes would not be converted for use as bicycle, equestrian, and/or hiking trails.
LS	**SDNM**			**D**		**WC-1.1.22:** Development of new bicycle, equestrian, and/or hiking trails would be prohibited.
LS	**SDNM**			**D**		**WC-1.1.23:** Special recreation permits, including commercial, organized group and competitive activities, vending operations and concession leases, would be prohibited.

Administrative Actions

Projects will employ the least impacting methods for development that can be reasonably applied:

- Use design methods that cause the facility to blend into the landscape, including consideration of site selection and use of a low profile;
- Design facilities that will require minimal maintenance;
- Use best management practices to minimize surface and vegetation disturbance during construction;
- Decrease the visual effect of existing facilities during reconstruction, replacement, or major maintenance;
- Establish baseline standards to protect proper levels of recreational and landscape disturbance to protect wilderness characteristics.

2.7.12. WILDLAND FIRE MANAGEMENT (WF)

Staff at the BLM's Lower Sonoran Field Office coordinates with other agencies to manage fire in accordance with the nationwide BLM fire policy and the National Fire Plan. This integrates fire and fuels management with other land and resource management activities to benefit natural resources and implement multiple-use on BLM-administered lands within Arizona that fall within the Planning Area. The Lower Colorado River subdivision of the Sonoran Desert is the predominant vegetation community within the Planning Area.

This vegetation community is neither fire-adapted nor fire-dependent. Historically, fire has never played a large role, in the development and maintenance of the ecosystem throughout the Planning Area. However, the invasion of non-native species has created areas that are now prone to high intensity fires with high rates of spread.

The Planning Area also contains wildland-urban interface (WUI) areas. These are places where manmade structures and infrastructure are intermingled with wildlands. Unplanned ignitions in WUIs could have adverse effects to the ecosystem and society unless some form of mitigation takes place. Wildfire management includes areas where mitigation and suppression are required to prevent direct threats to life or property. Mitigation may include mechanical, biological, chemical, or prescribed fire to maintain non-hazardous levels of fuels, reduce the hazardous effects of unplanned wildland fires, and to meet resource objectives.

When applying fuels treatment methods, BLM policies, procedures, and plans are to be followed in all cases. The manual, chemical, biological, and fire-treatment methods that may be used are described in ???. There are several treatment methods and standard operating procedures that would be used in a vegetation treatment program. BLM policies and guidance for public land treatments would be followed in implementing all treatment methods.

2.7.12.1. Existing Management Decisions (Alternative A - No Action)

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (2003):

Manage fire and fuels according to the current policies and requirements and to meet desired future conditions for other resource values.

Fire Management Plan, Phoenix District (2010 in press):

Assigns public lands in two Fire Management Zone categories (1 or 2) based on ecological conditions and ecological risk, and determined by contrasting current with historical conditions and ecological risks associated with those changes. Category 1 lands are ecologically adapted to fire and Category 2 lands are not ecologically adapted to fire. Almost all of the lands located within the Lower Sonoran Field Office Planning Area fall into the Category 2 classification.

2.7.12.2. Action Alternatives for Wildland Fire Management (WF))

Program Goals

- **Goal 1:** Ensure firefighter and public safety is the highest priority in every fire or fuels management activity.
- **Goal 2:** Wildland Fuels are managed to protect WUI areas and meet resource management objectives.
- **Goal 3:** Limit the extent of wildfires and the impact of fire suppression efforts on wildlife, plant communities, as well as natural and cultural features.

Management Actions and Allowable Uses

Goal 1: *Ensure firefighter and public safety is the highest priority in every fire or fuels management activity.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Set priorities among protecting residences, community infrastructure, and other manmade property and improvements.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-1.1.1:** Management Response (MR) for unplanned ignitions will be full suppression or modified suppression for all lands within the LFSO Planning Area.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-1.1.2:** Implement a hazardous fuels reduction program that creates conditions conducive for safe and effective firefighting.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-1.1.3:** With community partners implement the Pinal and Pima County Community Wildfire Protection Plans (CWPP).
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-1.1.4:** With community partners provide input into the development of the Pima and Gila County CWPPs.

Goal 2: ***Wildland fuels are managed to protect WUI areas and to meet resource management goals.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Fuels within WUI areas are proactively managed to improve the protection of life and property.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-2.1.1:** Hazardous fuels around communities at risk and utility infrastructure (e.g. roads, power lines, and communication sites) within the WUI are reduced using mechanical, chemical, biological, and prescribed fire treatments, where applicable.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-2.1.2:** Identify, prioritize, and implement WUI fuels treatments in the Planning Area. Fuel treatments to reduce wildland fire risk will focus on the WUI areas identified in the Planning Area CWPPs and those that are developed collaboratively with Planning Area partners.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-2.1.3:** In consultation with cultural resource specialists develop fuels treatments to protect cultural resources that are susceptible to damage from wildfire.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-2.1.4:** Analyze and implement where needed, hazardous fuels reduction in and around recreation sites to improve public and firefighter safety.

Goal 3: ***Limit the extent of wildfires and the impact of fire suppression efforts on wildlife, plant communities as well as natural and cultural features.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 3.1: Reduce the frequency of human caused wildland fires and minimize the total number of acres burned within the Planning Area.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.1.1:** Management Response (MR) for unplanned ignitions will be full suppression or modified suppression for all lands within the Planning Area.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.1.2:** Identify, prioritize, and implement non-WUI fuels treatments within the Planning Area. Prioritization will be given to fuels treatments that maintain areas in Fire Regime Condition Class 1 or have the ability to improve areas characterized as Fire Regime Condition Class II and III.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.1.3:** Implement fuels treatments, suppression activities and prevention activities that target reducing the size and number of human caused wildland fires.
Objective 3.2: Fire all fire management activities (wildfire suppression, prescribed fire, and mechanical, chemical, and biological vegetation treatments), a focus will be to maintain or improve habitat for Federally threatened, endangered, proposed, and candidate ("Federally protected") species.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.2.1:** Identify and implement post-fire stabilization and rehabilitation actions in burned areas to restore a functional landscape to meet the resource management objectives.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.2.2:** For fire suppression activities, a protocol for consultation has been developed as described in Appendix K, *Conservation Measures from Fish and Wildlife Service Biological Opinions* (p. 1239). This programmatic consultation contains conservation measures and prescriptions for use during fire suppression activities. Emergency consultation should only be needed in the futures, if suppression actions fall outside of these prescriptions/measures.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.2.3:** Use prescribed fire, chemical, mechanical, and biological treatments in areas of the Planning Area that fall in Fire Regimes 2 and 4 to reduce shrub and tree components.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.2.4:** Hazardous fuel reduction projects will be integrated with riparian restoration projects to reduce the frequency and the extent of fires along the Gila River as well as improve the quality and quantity of native riparian vegetation communities.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.2.5:** Utilize fuels management treatments including prescribed fire to manage decadent marsh vegetation improve habitat for Yuma Clapper Rail and other species that depend upon cattail and bulrush marsh for foraging and nesting habitat.
Objective 3.3: For all fire management activities efforts will be made to reduce the impacts on natural and cultural resources.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.3.1:** Conduct all fire management activities within the SDNM, ACECs and along the Anza Trail in a manner that will avoid or minimize degradation of these areas and values that have been identified in the respective legislative designations for these areas.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.3.3:** As part of an integrated vegetation resources management strategy, install fuel breaks and complete hazardous fuels reduction activities within the Fred J. Weiler Green Belt to protect and restore mesquite bosques and native riparian woodlands.
LS	**SDNM**	**B**	**C**	**D**	**E**	**WF-3.3.5:** Ensure fire management activities in wilderness areas are compatible with the applicable wilderness plan.

2.7.12.3. Administrative Actions

- Coordinate invasive-species management, monitoring, control, and education efforts with the appropriate Federal, state, county, municipal, and tribal agencies and other partners.

Efforts will be coordinated through the Borderlands Cooperative Weed Management Area and other similar groups.

- Conduct floristic surveys and monitoring for populations of sensitive, candidate threatened, endangered, rare, or unique species. *Applicable to the three relinquished BGR parcels.*
- Update the existing botanical resources database and vegetation map. *Applicable to the three relinquished BGR parcels.*
- Adhere to the intent of the Arizona Native Plant Law, Endangered Species Act (ESA), and all other applicable laws and regulations to protect vegetative resources.
- Focus invasive species monitoring efforts on likely vectors of invasion, such as linear features (roads, canals, railroads, utility corridors, etc.), disturbed areas (construction or development areas), and areas where water is available or may pond (water control structures, etc.).
- Control of noxious weeds required by law will not be subject to a benefit-cost analysis; however, the most economical and efficient method will be analyzed along with the safety of the proposed kind of treatment.
- Rehabilitation procedures will follow the Phoenix District Reclamation Plan.
- (Environmental Assessments) Conduct an environmental analysis at the time of the pretreatment survey. An interdisciplinary team will review any analysis needed on individual projects or group of projects.
- (Cost-Benefit Analysis) Subject land treatments proposed for livestock forage improvement to a cost-benefit analysis to ensure total benefits gained will equal or exceed the cost of the treatments.
- Develop effective interagency and community interactions and cooperation to meet wildland-fire and fuel-management strategies and landscape-scale resource condition objectives across administrative boundaries.
- Include wildfire hazard mitigation strategies in the Fire Management Plan for the Planning Area by identifying appropriate areas for prescribed fire use and mechanical, biological, or chemical treatments to reduce hazardous fuels to minimize the adverse effects of uncharacteristic wildland fires and meet resource objectives. The plan will also identify areas for exclusion from fire (through fire suppression), chemical, mechanical, and biological treatments.
- Protect human life (both firefighters' and the public) and communities, property, and the natural resources on which they depend are. Firefighter and public safety are the highest priority in all fire management activities.
- Improved public awareness of the role of fire in ecosystem restoration, wildfire risk and mitigation strategies, and wildfire safe community, preparedness, and response planning.

2.8. RESOURCE USES

2.8.1. LANDS & REALTY (LR)

The lands and realty program for the Planning Area consists of three distinct parts: (1) land use authorizations (LUAs), which includes ROWs for utility-scale renewable energy development proposals;, (2) land tenure (disposal and acquisition of lands); and (3) withdrawals, classifications, and segregations. The lands and realty program processes applications related to solar, wind, and biomass energy; while geothermal proposals are managed by the minerals program and are discussed in Section 2.8.3, "Minerals Management (MM)" (p. 151).

The lands and realty program administers uses on public lands within a framework of numerous laws and mandates, which are discussed below:

- The Federal Land Policy and Management Act of 1976 (FLPMA), as amended enables the BLM to accomplish a variety of lands actions, including but not limited to sales, withdrawals, acquisitions, exchanges, leases, permits, easements, and ROWs.
- Federal Land Exchange Facilitation Act (FLEFA) (102 Stat. 1087) established uniform rules for the resolution of appraisal disputes in the exchange process.
- Mineral Leasing Act of 1920 (MLA) (30 U.S.C. 185), as amended authorizes the BLM to process ROWs for pipelines for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced.
- Recreation and Public Purposes Act of June 14, 1926 (R & PP) (43 U.S.C. 869 et seq.), as amended authorizes the sale and/or lease of public lands for recreational and public service needs for parks and other related community buildings.
- Airway Improvement Act of 1982 (49 U.S.C. 2215) provides for the conveyance of public lands to public agencies for use as airports and airways.
- Various Federal Highway Acts codified in 23 U.S.C., Sections 17 and 317 established to build, improve, and maintain the Federal interstate highway system.
- Federal Land Transaction and Facilitation Act (FLTFA) (114 Stat. 613; 43 U.S.C. 2301 et seq.) of July 25, 2000 allows retention by the BLM of receipts received from the sale of or interests in land if a LUP was completed prior to July 25, 2000.
- Energy Policy Act of 2005 (42 U.S.C. 15801) encourages energy efficiency and conservation, promotes alternative and renewable energy sources, and encourages the expansion of nuclear energy.

2.8.1.1. Land Use Authorizations (LUAs)

This segment of the lands and realty program focuses on requests for rights-of-way (ROWs), permits, leases, and easements, which are all referred to as "land use authorizations (LUAs)" throughout this document. As a general rule, proponents need an LUA (grant, permit, or lease) whenever a surface disturbing activity takes place on public land. Some examples of land uses which require a LUA grant include: electric transmission lines, communication sites, roads,

highways, trails, telephone/fiber optic lines, canals, flumes, pipelines, reservoirs, and utility-scale renewable energy developments. Proponents do not need a LUA for so-called "casual uses." Examples of casual uses include driving vehicles over existing roads, sampling, surveying, or collecting data to prepare an application for a ROW, and performing certain activities that do not cause any appreciable disturbance or damage to the public land, resources, or improvements.

The objective of the LSFO is to meet the public land use demands on public lands, while also minimizing unnecessary impacts to resources. The LSFO will meet this objective by organizing the LUA types the Planning Area is accustomed to processing (or anticipates to receive in the next twenty years) into defined LUA category types (which are dictated by the size and intensity of the surface disturbance of the proposed LUA). Management allocations from other resource specific program areas (such as priority wildlife, special designations, and cultural resources) set restrictions on certain LUA types or state whether or not they are avoided or excluded. These allocations have been consolidated and renamed by the Lands and Realty program, so that the public, future utility proponents, and current LUA holders can easily comprehend what LUA type is allowed or prohibited within a certain location of the Planning Area.

These LUA types and the Lands and Realty designation in which the LUA type is managed (allowed or excluded in a certain area), have been defined in Table 2.8, "Description of LUA Types " (p. 119).

Table 2.8. Description of LUA Types

LUA Type	Description of LUA Type	Lands and Realty Designations managing the LUA type
Utility-scale Renewable Energy Development LUAs	Utility-scale renewable energy development ROWs where the proponent has signed a purchase power agreement with a utility company to sell power. These facilities typically produce more than 100MW of power and may include linear utility features such as access roads, transmission lines, and/or pipelines.	**Utility-scale Renewable Energy Development Exclusion Areas** (this type of LUA would be excluded in prohibited areas under all action alternatives) (refer to Map 2–7b, 2–7c, 2–7d, and 2–7e) **Utility-scale Renewable Energy Development Avoidance Areas** (this type of LUA would be avoided in high and moderate sensitivity conflicts areas under all action alternatives) (refer to Map 2–7b, 2–7c, 2–7d and 2–7e)
Major Linear LUAs	Linear LUAs that require a ROW width of more than 20 feet. These types of utilities include, but are not limited to: ● Transmission lines that are greater than 115 kV, ● Pipelines (water or gas) greater than 10 inches in diameter, and ● Primary paved roads (as defined by the Planning and Conducting Route Inventories Technical Reference Guide 9113-1 [2006]).	**Utility Corridors** (this type of LUA (excluding roads) would be routed through these corridors under the no action alternative) (refer to Map 2–5a) **Multiuse Utility Corridors** (this type of LUA would only be authorized within these corridors under all action alternatives) (refer to Map 2–5b, 2–5c, 2–5d and 2–5e)

LUA Type	Description of LUA Type	Lands and Realty Designations managing the LUA type
Minor Linear LUAs	Linear LUA lines that require a ROW width of no more than 20 feet. These types of utilities include: ● Transmission lines that are 115kV or smaller, ● Pipelines (water or gas) smaller than 10 inches in diameter, ● Roads other than primary paved roads as defined by the Planning and Conducting Route Inventories Technical Reference Guide 9113-1 [2006]), and ● Fiber optic or telephone lines	**LUA Exclusion Areas** (this type of authorization would be excluded in these areas under all action alternatives) (refer to Map 2–5b, 2–5c, 2–5d, and 2–5e) **LUA Avoidance Areas** (this type of authorization would be excluded in these areas under all action alternatives) (refer to Map 2–5b, 2–5c, 2–5d and 2–5e)
Nonlinear LUAs	LUAs that are not linear in fashion and typically do not exceed five acres of surface disturbance. These LUAs do not produce or store more than 100MW of power. These types of LUAs include: ● Oil, natural gas, or water wells, ● Cathodic protection utilities, ● Communication facilities, ● Meteorological devices (such as rain gauges), ● Apiaries, ● Wildlife waters, ● Geophysical exploration facilities, and ● Storage facilities.	**LUA Exclusion Areas** (this type of authorization would be excluded in these areas under all action alternatives) (refer to Map 2–5b, 2–5c, 2–5d and 2–5e) **LUA Avoidance Areas** (this type of authorization would be excluded in these areas under all action alternatives). **Communication Sites** (proposed communication facilities would be encouraged to be authorized in this site under all action alternatives) (refer to Map 2–5b, 2–5c, 2–5d and 2–5e)

Utility-Scale Renewable Energy Development

Proposals for the development of utility-scale renewable energy facilities on BLM administered public lands fall under the authority of FLPMA as a land use authorization for a ROW, which are subject to environmental analysis under NEPA. The high demand for utility-scale renewable energy development (primarily solar development in the Western U.S.) has led to three parallel processes within the agency to respond to this rapid demand: an agency wide programmatic process, an Arizona BLM process, and the process being analyzed in detail for this planning effort at the field office level. Regardless of when each of these processes become final decisions, this resource management plan will be amended to meet the decisions set forth by both the agency wide and state level decisions. However, the preferred alternative within this planning effort would more than likely not conflict with the agency wide or state wide efforts.

The management actions set forth in this Plan were crafted from methods which were adopted from the Western Governors' Association and local utility companies' planning efforts through the Western Renewable Energy Zones (WREZ) initiative. For the Plan, 2010 BLM GIS data was used to categorize public lands into four sensitivity categories (prohibited, high sensitivity, moderate sensitivity, and low known sensitivity areas). These four categories indicate the level of conflict that utility-scale renewable energy development proposals would encounter on public lands, in regards to existing resources and management goals and objectives.

This conflict analysis categorization method (which is described in detail in Appendix N, *Analysis for Renewable Energy Sensitivity* (p. 1263)) was used to identify locations within the Lower Sonoran Decision Area where utility-scale renewable energy development would encounter some level of conflict, based on known resources and the allocations set forth in this plan. Management actions were then guided by this analysis to decipher which areas of the Planning area would be excluded or avoided to utility-scale renewable energy development. Map 2-7a, 2–7b, 2–7c, 2–7d and 2-7e displays the lands that fall under each of these sensitivity categories. Under all of the action alternatives, public lands that fall under the "prohibited" category would be areas where utility-scale renewable energy development proposals would be excluded and proposals that fall under the "high and moderate sensitivity" categories would be areas where these types of developments would be avoided. Applications within the Decision Area would still need site-specific environmental analysis no matter where they are proposed in the Decision Area. The polygons depicted on Maps 2-7a through 2-7e do not imply a preauthorization for utility-scale renewable energy development, but are simply an RMP level depiction of where conflicts exists. Other conflicts may be revealed as site-specific analysis are conducted.

According to Appendix B of the Wind Energy Development Final Programmatic EIS (June 2005), there is little known potential for wind energy development on public lands in the Planning Area; therefore, no management actions were developed to manage such developments. Proposals for wind energy development would be entertained in low sensitivity areas of Planning Area and must comply with the best management practices that are identified in the Programmatic EIS Record of Decision (ROD) for Wind Energy Development.

Utility Corridors and Multiuse Utility Corridors

In order to minimize adverse environmental impacts and the proliferation of individual and isolated LUAs, utility corridors and multiuse utility corridors would be designated. Major linear LUA holders reserve to the BLM the right to grant additional major linear LUAs from other holders for compatible uses adjacent and at times within existing LUAs and designated utility corridors. Under existing management, there are ten designated utility corridors (now referred to as multiuse utility corridors in all four of the action alternatives, in an effort to stress that utilities, including transportation networks, are permitted in these corridors). Under current management, major linear transportation facilities are not required to be placed within the existing utility corridors. Multiuse utility corridor designations vary by each action alternative and are displayed on Map 2-5b, 2–5c, 2–5d and 2-5e, while the ten existing utility corridors are displayed on Map 2-5a.

Portions of the San Diego Gas and Electric, El Paso Natural Gas, and Tucson Electric Power multiuse utility corridors (which exist throughout all alternatives and can be identified on Maps 2-5a through 2-5e) will comply with the adopted interagency operating procedures (IOPs) and standards for Section 368 energy corridors, set by the Approved Resource Management Plan/Record of Decision (ROD) for Designation of Energy Corridors on BLM Administered Lands in 11 Western States. Sections 368 (of the Energy Policy Act of 2005) corridors are allocated for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors).

Land Use Authorization (LUA) Avoidance and Exclusion Areas

LUA Avoidance Areas are areas with sensitive resource values where minor linear LUAs and nonlinear LUAs (such as ROWs, permits, leases, and easements) would be strongly discouraged and therefore "avoided". Authorizations to be considered within avoidance areas must be compatible with the purpose for which the area was designated and not be otherwise feasible on lands outside the avoidance area. Authorizations approved within these areas would be required to meet additional mitigation measures set forth by individual program areas that manage the "avoided" designated allocation. For example, wildlife habitat areas (WHAs) call for the avoidance of LUAs. If LUAs are authorized within the WHA (or LUA Avoidance Area), the LUA would be required to meet the mitigation measures (or management actions) prescribed for that WHA in this Plan.

LUA Exclusion Areas are areas with sensitive resource values where minor linear LUAs and nonlinear LUAs (such as ROWs, permits, leases, and easements) would not be authorized. These areas have been determined to be unsuitable for a LUA because of (1) unique, highly valued, complex, or legally protected resources; (2) potentially significant environmental impacts resulting from conflicts with current land uses; or (3) areas posing substantial hazard to construction and/or operation of a linear facility (e.g., electric transmission line, pipeline, telephone line, fiber optic line). In these areas, LUAs would be granted only in cases where there is a legal requirement to provide such access or an immediate public safety concern.

LUA Avoidance and Exclusion Areas vary by alternative depending on the allocations established by other resources and program areas , BLM policy, or congressional/secretarial/presidential orders. These areas can be found on Maps 2-5a, 2–5b, 2–5c, 2–5d and 2-5e.

Communication Sites

Communications sites are generally limited to designated areas with existing facilities on mountain peaks. Communications sites (a nonlinear LUA type) on public lands accommodate the wireless systems referred to in the Telecommunications Act of 1996 as well as many other uses, including, but not limited to, AM/FM broadcast facilities, commercial mobile radios, private mobile radios, and microwaves on designated communications sites. There is currently one designated communication site in the Planning Area at Oatman Mountain (refer to Map 2-5a), in which all proposed communication facilities would be encouraged to be placed. Throughout all of the alternatives, communication facilities would be placed outside of LUA Exclusion Areas on a case-by-case basis.

2.8.1.2. Land Tenure

Land tenure focuses on disposing and acquiring lands or interests in lands. The land tenure segment of the lands and realty program specifies that BLM will (1) retain all public lands or interests in land that enhance multiple-use management, (2) acquire lands or interests in land that complement important resource values and further management objectives, and (3) dispose of lands or interests in lands that are difficult or uneconomical to manage or are no longer needed for Federal purposes.

Land Acquisition

The Secretary of the Interior is delegated with the authority from FLPMA to acquire non-Federal lands or interests in lands. Lands acquired by the LSFO must accomplish at least one of the following:

- Facilitate access to public lands and resources,
- Maintain or enhance public uses and values,
- Facilitate implementation of this RMP/EIS,
- Provide for a more manageable land ownership pattern,
- Include significant natural or cultural resource values,
- Eliminate split-estate by acquiring either the surface or subsurface rights, if acquisition of rights would be in the public interest,
- Assist in the consolidation of large tracks of BLM administered lands, and/or
- Facilitate proper management within congressionally designated NLCS management units.

Lands Suitable for Disposal

Disposal actions usually take place in response to a request from the public, or from an application that could result in a title transfer wherein the lands leave the public domain. Federal lands can be disposed of through sale, exchange, or Recreation and Public Purposes Act (R & P P) patent. Sales and exchanges are used for disposal in order to assure an optimum final land ownership pattern and provide better overall land management. The types of sales include direct, competitive, and modified-competitive. Lands identified as being suitable for disposal are displayed on Maps 2-6a, 2–6b, 2–6c, 2–6d and 2-6e in green. Lands that are shaded in blue on Maps 2-6b through 2-6e are currently leased under the R & PP Act and could potentially be patented to these lease holders.

Public lands selected for disposal typically are those lands that meet the following criteria:

- Isolated and fragmented from larger tracks of BLM managed lands,
- Adjacent to urbanizing private and state lands, which could be subject to future development,
- Currently leased under the R&PP Act and are eligible to be patented, and/or
- Present an economic and management challenge to retain under public ownership,

The BLM would not transfer from Federal ownership the following:

- Designated or proposed critical habitat for a listed or proposed threatened, endangered or special status species; and/or
- Lands supporting listed or proposed threatened, endangered, or candidate species if such transfer would be inconsistent with recovery needs, objectives, and conservation measures or would likely affect the recovery of the species.

Exceptions to the above could occur if the recipient of the lands agrees to protect the species or critical habitat under the ESA, such as disposal to a non-Federal governmental agency or private organization if conservation purposes for the species would still be achieved and ensured.

Disposal of lands would be made on a case-by-case basis and would be accomplished by the most appropriate disposal authority and after proper NEPA analysis. Should the authorizing official wish to dispose of lands not designated for disposal in this RMP, an RMP amendment would have to be made and the lands would need to meet the disposal criteria of the applicable laws and regulations.

No management actions related to land withdrawals, classifications are presented in this plan; therefore, each proposal would be analyzed on a case-by-case basis.

2.8.1.3. Withdrawals, Classifications & Segregations

Withdrawn lands where another public agency manages the surface estate are displayed on Maps 2-5a, 2–5b, 2–5c, 2–5d and 2-5e. Withdrawn lands from congressional designations (such as wilderness areas) and proposed withdrawn lands from program area allocations (such as ACECs and public use and conservation for future use sites) where the BLM still manages the surface are also displayed on these maps.

The BLM is delegated the authority to process withdrawal actions for the BLM and other Federal agencies. Most of the existing plans for the subject Planning Area do not specifically address withdrawals, however, the following items are generally considered consistent:

- Review existing withdrawals on a case-by-case basis. Determine whether the use is consistent with the intent of the withdrawal and whether the withdrawal should be continued, modified, revoked or terminated.
- If it is determined by a withdrawal review that a withdrawal should be revoked or terminated or a withdrawal expires, the land does not automatically open to operation of the laws(s) to which the land was closed. An opening order will be published to notify the public when and to what extent the land will be opened. An opening order may be incorporated in a public land order or termination order that revokes or terminates a withdrawal or may be published in the Federal Register as a separate document.
- Land on which a withdrawal has expired or has been revoked or terminated will be managed in a consistent manner with adjacent or comparable public lands within the Planning Area.
- New withdrawals may be completed when existing laws or regulations cannot adequately protect or preserve the integrity of resources of rarity, significance, fragility, or irreplaceability, or when valuable capital improvements are involved. They must be shown to be at risk by current land management practices. New withdrawals may also be completed when land is needed by another Federal agency. Proposed withdrawals will be the minimum acreage consistent with the demonstrated need.

Classification of lands is the process of determining whether the lands are more valuable or suitable for transfer or use under Federal ownership for management purposes. The classification process is currently used for potential disposals under the Recreation & Public Purposes Act (R&PP). The segregation of lands is an action such as a withdrawal or allowed application (R&PP) that suspends the operation to entry under all or portions of the public land laws, including the mining and mineral leasing laws. Similar to withdrawals, classifications and segregations are not specifically addressed in all the applicable current land use plans, but are generally considered consistent with the following actions:

- Review existing and subsequent segregations on a case-by-case basis to determine whether the segregation is appropriate and should be continued, modified or terminated. A notice of termination and opening order will be published to notify the public when and to what extent the land will be opened. Land on which a classification or segregation has been terminated will be managed in a manner consistent with adjacent or comparable public land within the Planning Area.

No management actions related to land withdrawals, classifications are presented in this Plan; therefore, each proposal would be analyzed on a case-by-case basis.

2.8.1.4. Existing Management Decisions (Alternative A — No Action) Lands & Realty

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila North Management Framework Plan (1983):

- Establish the following seven *multiple-use utility corridors along existing rights-of-way in Lower Gila North. In these corridors, all utility uses (including transportation, pipelines, and electrical transmission lines) will be allowed when the uses are compatible. (LR-07)
- Palo Verde-Devers*: 2 miles (restricted between Burnt Mountain and Big Horn Mountains)
- El Paso Natural Gas Company*: 2 miles (1 mile at Bill Williams River crossing) [*Only the two corridors located within the Lower Sonoran Planning Area and are listed above.]
- Continue to allow small-utility distribution systems to be developed on an “as needed” basis throughout the Lower Gila North Planning Area. These small distribution systems will include all uses such as electrical lines, gas and water pipelines, and roads. These distribution systems will be authorized when consistent with environmental and land use considerations. (LR-08)

Lower Gila South Resource Management Plan (1989):

- Designate 10 corridors within the Lower Gila South Planning Area (each one-mile-wide). (LR-13)

Phoenix Resource Management Plan (1989):

- All major utilities *in the Phoenix RMP Planning Area* would be routed through designated corridors. (LR-02)
- All the corridors in the *Phoenix RMP Planning Area* [except for the Black Canyon corridor] would be 1 mile in width. (LR-03)
- Retain 6,880 acres in the San Tan Mountains, outside the Resource Conservation Areas (RCAs), as a Cooperative Recreation Management Area with state or local agencies. (LR-20)

- Acquire 480 acres of state land in the San Tan Mountains Cooperative Recreation Management Area. (LR-21)

- Designate 391,803 (remainder thereof) acres of Federal surface outside the seven RCAs as suitable for disposal through state indemnity selection, R & P P patent, or state or private exchange. (LR-29) *This now refers to two RCAs (which are now within the Bradshaw Harquahala RMP Area) based on the redesignation of BLM Field Office management boundaries. Therefore, all public lands from the Phoenix RMP Planning Area that are now within the Lower Sonoran Planning Area have been identified as suitable for disposal.*

- Designate 45,000 (remainder thereof) acres of Federal surface outside the seven RCAs as suitable for disposal through state indemnity selection, state or private exchange or sale. (LR-30) *This now refers to two RCAs (which are within the Bradshaw Harquahala RMP Area) based on redesignation of BLM Field Office management boundaries. Therefore, all public lands from the Phoenix RMP Planning Area that are now within the Lower Sonoran Planning Area have been identified as suitable for disposal.*

- Identify for disposal all subsurface mineral estate underlying Federal surface designated for disposal outside the seven RCAs, Cooperative Recreation Management Areas and R & P P lands. (LR-31) *This now refers to two RCAs (which are within the Bradshaw Harquahala RMP Area) based on the redesignation of BLM Field Office management boundaries. Therefore, all public lands from the Phoenix RMP Planning Area that are now within the Lower Sonoran Planning Area have been identified as suitable for disposal.*

- Transfer 1,140 acres in the Goldfield Area to the City of Apache Junction for park development under R & P P leases. (LR-32)

- On land retained or acquired, communication facility development would be limited to designated sites. (LR-52)

- Land identified for disposal would generally be left open for communication site development on a case-by-case basis. (LR-53)

- Communication site applications will continue to be considered on land identified for disposal until such time as disposal takes place. (LR-54)

- Land use authorizations (right-of-way, leases, permits, easements) will continue to be issued on a case-by-case basis. (LR-55)

- Rights-of-way will be issued to promote the maximum utilization of existing right-of-way routes, including joint use whenever possible. (LR-56)

Lower Gila South Resource Management Plan (Goldwater Amendment) (1990):

- Restrict construction of overhead transmission lines to paralleling the existing Gila Bend to Ajo 69kV transmission line. Underground facilities must be constructed on the west side of the Tucson Cornelia and Gila Bend railroad. All rights-of-way are subject to U.S. Air Force concurrence. (LR-3) *Applies only to the relinquished Ajo Airport parcel.*

- Communicate promptly to the public and other agencies, as necessary, new designations for land use, resource protection, safety and security. (LR-6) *Applicable to the three relinquished BGR parcels.*

- Prohibit new ROWs and other land use authorizations except those installed in the established Interstate 8 utility corridors; encourage the installation of below ground utility services within the corridor south of Interstate 8 unless overhead facilities are required due to technical and/or operational circumstances (Not Numbered).

Lower Gila Resource Management Plan Amendment (2005):

- Approximately 33,459 acres of public lands within the Planning Area are identified for disposal (LR-1; identified on Map 2-6a).

- Public lands in the Gila Bend Management Area adjacent to the White Tanks County Regional Park, described as T.2 N., R. 3 W., sections 4,5,8,9,14,15,17 through 22, 26 through 29, and 33 through 35; T. 2 N., R. 4 W., section 1; and T. 3 N., R. 4 W., sections 1, 11 through 14, 24, 25, and 36 will be retained in Federal ownership and will only be available for disposal to local or state governmental entities for recreation/park purposes. (LR-2)

- The BLM will continue to dispose of Federal subsurface estate under non-Federal surface estate on a case-by-case basis. (LR-3)

- Exchanges to re-position lands within all the management areas may occur if it has been determined that it would be in the public interest. (LR-4)

- Lands identified for disposal may be retained if significant resource values are found during evaluation. The policy is not to dispose of lands occupied by proposed or listed threatened or endangered species. If other public uses outweigh the value of a parcel as Federally owned threatened or endangered species habitat, disposal could be considered on a case-by-case basis. If a listed or proposed threatened or endangered species would be affected by a land disposal action, consultation or conferencing with the U.S. Fish and Wildlife Service will be required. Exchange for other parcels of habitat will be encouraged. Compensation for loss of habitat value would be required where such a policy exists. Other mitigation may also be required. These determinations would be made during preparation of the site-specific environmental assessments required for every disposal action. Environmental documentation must be in compliance with the National Environmental Policy Act prior to the approval of any lands action. (LR-5)

- Approximately 3,043,900 acres not listed in Appendix 3 or identified for specific purposes in this amendment will be retained in public ownership unless needed for recreation or public purposes. Such disposal proposals on lands not identified for disposal will be considered on a case-by-case basis. (LR-6)

- All non-Federal lands with high resource values within the boundaries of the management areas may be considered for acquisition. Acquisitions will occur primarily through the land exchange process in accordance with 43 CFR 2200 and the Federal Land Exchange Facilitation Act. Acquisition by donation and purchase using Land and Water Conservation Funds will also be considered when willing parties or available funds exist. All acquisitions will be negotiated with willing landowners only and must be in the public interest. There are approximately 288,800 acres of non-Federal land within the four management areas. (LR-7)

- The BLM will continue to acquire non-Federal subsurface estate under Federal surface estate on a case-by-case basis. (LR-8)

Approved Resource Management Plan Amendments/Record of Decision (ROD) for Designation of Energy Corridors on BLM Administered Lands in 11 Western States (2009):

- Section 368 directs the Secretary of the Interior (the Secretary) to designate energy transport corridors under existing authorities, such as those provided by Section 503 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1763) (FLPMA). By signing this ROD, the ASLM amends the affected BLM land use plans under the authority of FLPMA and in accordance with BLM planning regulations (43 CFR Part 1600). The approved plan amendments are consistent with the requirements of Section 368 of the Energy Policy Act of 2005. The decision also adopts IOPs to meet the Section 368 requirement to improve the ROW application process and to meet NEPA requirements to provide practicable means to avoid or minimize environmental harm which may result from future ROW grants within the designated 3 corridors. The approved BLM plan amendments are presented in Appendix A of this ROD and the IOPs are presented in Appendix B of this ROD. *This decision reallocates the El Paso Natural Gas, San Diego Gas and Electric, and Tucson Electric Powers Utility Corridors (identified on Maps 2-5a, 2–5b, 2–5c, 2–5d and 2-5e in this Plan) as a Section 368 energy transport corridor.*

2.8.1.5. Action Alternatives for Lands & Realty (LR)

Program Goals

- **Goal 1:** Manage lands and realty actions to effectively support public needs and resource management objectives.
- **Goal 2:** Manage land tenure to meet natural resource management objectives, community needs, and to promote agency efficiency.

Land Use Allocations Summary

Table 2.9. Lands and Realty Allocations For the Lower Sonoran Decision Area

	Alt. A	Alt. B	Alt. C	Alt. D		Alt. E
LAND USE AUTHORIZATIONS						
Utility-scale Renewable Energy Avoidance and Exclusion Areas (Acres)						
Acres avoided (moderate and high sensitivity conflict areas)	-	744,600	639,900	413,700		511,100
Acres excluded (prohibited areas)	105,000	145,000	271,900	511,500		380,800
Utility Corridors (Miles)						
	Width/ Length	Width/ Length	Width/ Length	Width	Length	Width
El Paso Natural Gas	1.0/49.2	1.0/49.2*	1.0/34.8	1.0	34.8	1.0
Palo Verde to Devers	1.0/8.8	1.0/8.8	1.0/8.8	—	—	1.0

	Alt. A	Alt. B	Alt. C	Alt. D		Alt. E
San Diego Gas and Electric	1.0/22.3	1.0/22.3	1.0/21.5	1.0	21.5	1.0
Palo Verde-Kyrene	1.0/8.1	1.0/8.1	1.0/7.6	1.0	7.6	1.0
Liberty-Gila Bend	1.0/9.2	1.0/9.2	1.0/9.2	1.0	9.2	1.0
Gila Bend-Ajo	1.0/0.5	1.0/0.5	—	—	—	—
Santa Rosa-Gila Bend	10.0/0.1	1.0/0.1	1.0/0.1	—	—	—
Interstate 8	1.0/22.9	1.0/22.9	1.0/24.4	1.0	20.5	1.0
Tucson Electric Power	1.0/34.4	1.0/34.4	1.0/15.6	1.0	15.6	1.0
Interstate 10	1.0/1.0	1.0/1.0	1.0/1.0	1.0	1.0	1.0
Total Corridor Acres	134,328 acres	134,328 acres	95,203 acres	72,153 acres		82,301 acres
Multiuse utility corridor widths and lengths are measured as they cross BLM administered lands only. Multiuse utility corridors are simply referred to as utility corridors within Alternative A and would not include transportation facilities. *Indicates that the multiuse utility corridor will only permit underground facilities in a certain portion of the corridor.						
LUA Avoidance and Exclusion Areas (Acres)						
LUA Avoidance Area Acres	-	520,900	604,300	328,600		310,200
LUA Exclusion Area Acres	105,100	126,500	126,500	510,700		380,100
Communication Sites						
The Oatman Mountain Communication Site is allocated in all alternatives.						
LAND TENURE						
Disposal Acres	27,400	38,200	36,200	19,400		30,500
R & PP Leased Acres	3,400	3,400	3,400	3,400		3,400
Acquisition Acres	Lands would be acquired from willing sellers on a case-by-case basis.					
Retention Acres	899,400	888,600	890,600	907,400		896,300

Table 2.10. Lands and Realty Allocations For the SDNM Decision Area

	Alt. A		Alt. B		Alt. C		Alt. D		Alt. E	
LAND USE AUTHORIZATIONS										
Utility-scale Renewable Energy Avoidance and Exclusion Areas (Acres)										
The SDNM is excluded from any potential utility-scale renewable energy development within all alternatives.										
Utility Corridors (Miles)										
	Width	Length	Width	Length	Width	Length	Width	Length	Width	Length
Santa Rosa-Gila Bend	1	18.1	1.0	18.1	0.5*	17.9*	-	-	-	-
Interstate 8	1	21.1	1**	21.1	0.5*	21.1*	-	-	-	-
Tucson Electric Power	1	7.4	1.0	7.4	-	-	-	-	-	-
Total Corridor Acres	32,990		32,990		14,990		-		-	
Multiuse utility corridor widths and lengths are measured as they cross BLM administered lands only. Multiuse utility corridors are simply referred to as utility corridors within Alternative A and would not include transportation facilities. *Indicates that the multiuse utility corridor will only permit underground facilities. **Indicates that a portion of the multiuse utility corridor narrows to a ½ mile wide (south of the Interstate 8 highway centerline) as it passes along the length of the South Maricopa Mountains Wilderness (refer to Map 2-5b)										
LUA Avoidance and Exclusion Areas (Acres)										

Avoidance Area Acres	-	321,500	321,500	-	-
Exclusion Area Acres	164,900	164,900	164,900	486,400	486,400
Communication Sites					
No communication sites are designated in the SDNM.					
LAND TENURE					
Disposal Acres	No lands are designated as being suitable for disposal within the Monument. Exchanges for lands within the Monument for other private lands within the Monument's boundaries would be permitted if they further improve the management of Monument objects and present no net loss to existing objects that will be impacted by the exchange.				
R&PP Leases Acres	No lands are presently leased under the R&PP Act within the SDNM, therefore no acres were identified.				
Acquisition Acres	Lands would be acquired from willing sellers on a case-by-case basis.				
Retention Acres	All 486,400 acres of public land would be retained.				

Management Actions and Allowable Uses

Goal 1 (Land Use Authorizations)*: Manage lands and realty actions to effectively support public needs and resource management objectives.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1 (Utility-scale Renewable Energy Development LUAs): Authorize utility-scale renewable energy development LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) in locations that are found to be suitable due to limited conflicts with other management objectives.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**LR-1.1.1:** Utility-scale renewable energy development LUAs would be excluded on lands that fall under the "prohibited" area (refer to Map 2–7b, 2–7c, 2–7d, 2–7e and Appendix N, *Analysis for Renewable Energy Sensitivity* (p. 1263)).
LS		**B**	**C**	**D**	**E**	**LR-1.1.2:** Utility-scale renewable energy development LUAs would be avoided on lands that fall under the "high and moderate sensitivity" conflict areas (refer to Map 2–7b to Map 2–7e and Appendix N, *Analysis for Renewable Energy Sensitivity* (p. 1263)).
Objective 1.2 (Major Linear LUAs): Authorize major linear LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) in locations that utilize designated multiuse utility corridors effectively.						
LS		**B**				**LR-1.2.1:** Ten 1 mile wide multiuse utility corridors would be designated, in which all compatible major linear utility LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) would be allowed unless otherwise specified by the authorizing official. The corridors are listed below; also see Map 2-5b and Table 3.15, "Utility Corridors within the Lower Sonoran" (p. 308) for location descriptions*:* A. El Paso Natural Gas *(section from Ajo, AZ to the Tohono O'odham Nation would allow only underground facilities).* B. Palo Verde-Devers C. San Diego Gas and Electric D. Palo Verde-Kyrene E. Liberty-Gila Bend

Goal 1 (Land Use Authorizations)*: Manage lands and realty actions to effectively support public needs and resource management objectives.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
						F. Gila Bend-Ajo G. Gila Bend-Santa Rosa H. Interstate 8 I. Tucson Electric Power J. Interstate 10
LS			**C**			**LR-1.2.2:** Nine 1-mile wide multiuse utility corridors would be designated in which all compatible major linear LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) would be allowed unless otherwise specified by the authorizing official. The corridors are listed below; also see Map 2-5c: A. El Paso Natural Gas *(section from Ajo to the Tohono O'odham Nation would be removed).* B. Palo Verde Devers C. San Diego Gas and Electric D. Palo Verde-Kyrene E. Liberty-Gila Bend *F. Gila Bend-Ajo would be removed.* G. Gila Bend-Santa Rosa *(underground facilities only)* H. I-8 I. Tucson Electric Power *(section from Ajo, AZ to Tohono O'odham Nation would be removed)* J. I-10
LS				**D**		**LR-1.2.3:** Seven 1-mile wide multiuse utility corridors would be designated in which all compatible major linear LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) would be allowed unless otherwise specified by the authorizing official. The corridors are listed below; also see Map 2-5d: A. El Paso Natural Gas *(section from Ajo to the Tohono O'odham Nation would be removed).* *B. Palo Verde-Devers would be removed.* C. San Diego Gas and Electric D. Palo Verde-Kyrene E. Liberty-Gila Bend *F. Gila Bend-Ajo would be removed.*

Goal 1 (Land Use Authorizations)*: Manage lands and realty actions to effectively support public needs and resource management objectives.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
						G. Gila Bend-Santa Rosa would be removed. H. I-8 I. Tucson Electric Power *(section from Ajo, AZ to Tohono O'odham Indian Reservation would be removed)* J. I-10
LS					**E**	**LR-1.2.4:** Eight 1-mile wide multiuse utility corridors would be designated in which all compatible major linear LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) would be allowed unless otherwise specified by the authorizing official. The corridors are listed below; also see Map 2-5e: A. El Paso Natural Gas *(section from Ajo to the Tohono O'odham Nation would be removed).* B. Palo Verde Devers C. San Diego Gas and Electric D. Palo Verde-Kyrene E. Liberty-Gila Bend *F. Gila Bend-Ajo would be removed.* *G. Gila Bend-Santa Rosa would be removed.* H. I-8 I. Tucson Electric Power *(section from Ajo, AZ to Tohono O'odham Nation would be removed)* J. I-10
LS		**B**	**C**		**E**	**LR-1.2.5:** Major linear LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) may be authorized on case-by-case basis outside designated multiuse utility corridors if they are due and necessary in connecting a generating facility to the closest designated multiuse utility corridor.
LS		**B**	**C**	**D**	**E**	**LR-1.2.6:** Portions of the El Paso Natural Gas, San Diego Gas and Electric, and Tucson Electric Powers Multiuse Utility Corridors (as shown in Maps 2-5a to 2-5e) would adhere to the decisions and IOPs set forth in the Approved Resource Management Plan Amendments / Record of Decision (ROD) for Designation of Energy Corridors on BLM Administered Lands in 11 Western States (2009).

Goal 1 (Land Use Authorizations)*: Manage lands and realty actions to effectively support public needs and resource management objectives.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
	SDNM	**B**				***LR-1.2.7:*** Three 1-mile wide multiuse utility corridors would be designated in which all compatible major linear LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) would be allowed unless otherwise specified by the authorizing official. The corridors are listed below; also see Map 2-5b and Table 3.16, "Existing Utility Corridors within the SDNM" (p. 314) for location descriptions: G. Gila Bend-Santa Rosa H. I-8 I. Tucson Electric Power
	SDNM		**C**			***LR-1.2.8:*** Two ½-mile wide multiuse utility corridors would be designated in which all compatible major linear LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) would be allowed unless otherwise specified by the authorizing official. The corridors are listed below; also see Map 2-5c: G. Gila Bend to Santa Rosa *(underground facilities only)* H. I-8 *I. Tucson Electric Power would be removed.*
	SDNM			**D**	**E**	***LR-1.2.9:*** No existing or future multiuse utility corridors would be designated within the Monument (see Map2-5d and 2-5e).
Objective 1.3 (Minor Linear and Nonlinear LUAs): Authorize minor linear and nonlinear LUAs (as defined in Table 2.7, "Acres of Lands Managed to Protect Wilderness Characteristics by Alternative" (p. 110)) in locations that minimize resource impacts, are compatible with multiple use objectives, and do not compromise the existing rights of current holders.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**LR-1.3.1:** Proposed minor linear and nonlinear LUAs would be prohibited in areas designated as LUA Exclusion Areas, unless they allow for: ● Access to private property in holdings when there is no other reasonable access alternative across non-Federal land, ● Authorized emergency, public safety and administrative uses, and ● Authorized emergency, public safety and administrative uses, and ● Uses that would further enhance the goals and objectives of the allocation, as permitted by the authorizing official. Exclusion areas for minor linear and nonlinear LUAs include: ● The SDNM (Alternatives D and E only), ● Designated wilderness areas (all alternatives), ● The Juan Bautista de Anza National Historic Trail (all alternatives), ● The Fred J. Weiler Green Belt (PLO 1015 lands) (all alternatives), ● Sentinel Plain (military land relinquished to the BLM with restrictions related to public safety)(all action alternatives),

Goal 1 (Land Use Authorizations): ***Manage lands and realty actions to effectively support public needs and resource management objectives.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
						● Lands managed to protect wilderness characteristics (in Alternative D only) ● ACECs (Alternative D and E only), ● VRM Class I lands (all action alternatives) and ● High-potential segments of the Butterfield Overland Stage Route (Alternative D only).
LS	**SDNM**	**B**	**C**	**D**	**E**	**LR-1.3.2:** Proposed minor linear and nonlinear LUAs would be strongly discouraged in areas designated as LUA Avoidance Areas, unless they allow for / or are: ● Authorized emergency, public safety, and administrative uses. ● Uses that are compatible with the purpose for which the allocation was designated by meeting the restrictions set forth by the underlining program area allocation, an ● Are not feasible on lands outside the avoidance area. LUA Avoidance Areas for minor and nonlinear LUAs include: ● SDNM (Alternatives B and C only), ● ACECs (Alternatives B and C only), ● BLM threatened and endangered species habitats, including Sonoran desert tortoise habitats (all action alternatives), ● Lands managed to protect wilderness characteristics (in Alternatives C and E only), ● VRM Class II lands (all action alternatives), ● SCRMAs (Alternative D only), ● Fred J. Weiler Green Belt (non-PLO 1015 lands) (all action alternatives), ● Cultural sites allocated to a use category (such as public and conservation use sites)(all action alternatives), ● High-potential segments of the Butterfield Overland Stage Route (Alternatives B, C, and E only), and ● Back country recreation settings (Alternative D only).
LS		**B**	**C**	**D**	**E**	**LR-1.3.3:** Proposed minor linear and nonlinear LUAs would continue to be authorized on an "as needed" case-by-case basis in areas outside of LUA Avoidance and Exclusion areas.
LS		**B**	**C**	**D**	**E**	**LR-1.3.4:** Oatman Mountain would be designated as a communication site (see Map 2-5a through 2-5e).

Goal 1 (Land Use Authorizations): ***Manage lands and realty actions to effectively support public needs and resource management objectives.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**	**C**	**D**	**E**	**LR-1.3.5:** Communication facilities would be encouraged to be authorized within the designated Oatman Mountain Communication Site.
LS		**B**	**C**	**D**	**E**	**LR-1.3.6:**Apiary special-use permits (a nonlinear LUA) would not be authorized within ¼ mile of a developed recreation facility or water sources such as livestock waters and springs.

Goal 2 (Land Tenure): ***Manage land tenure to meet natural resource management objectives, community needs, and to promote agency efficiency.***						
Decision Area		**Alternative**				**Management Actions**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Determine interests in lands for consolidation, retention, disposal, and acquisition. Evaluate land tenure actions in accordance with the criteria established in the Arizona Land Tenure Adjustment Strategy (Appendix O, *Arizona Land Tenure Strategy* (p. 1267)).						
LS		**B**				**LR-2.1.1:** Approximately 41,600 acres would be suitable for disposal via any disposal method, including patent through the R&PP Act on a case-by-case basis (as shown on Map 2–6b).
LS			**C**			**LR-2.1.2:** Approximately 39,600 acres (including San Tan Mountain Regional Park) would be suitable for disposal via any disposal method, including patent through the R&PP Act on a case-by-case basis (as shown on Map 2-6c).
LS				**D**		**LR-2.1.3:** Approximately 22,800 acres (including San Tan Regional Park) would be suitable for disposal via any disposal method, including patent through the R&PP Act on a case-by-case basis (as shown on Map 2-6d).
LS					**E**	**LS-2.1.4:** Approximately 33,900 acres (including San Tan Regional Park) would be suitable for disposal via any disposal method, including patent through the R&PP Act on a case-by-case basis (as shown on Map 2-6e).
LS		**B**	**C**	**D**	**E**	**LR-2.1.5:** Land interests disposed of through the R&PP Act would be evaluated on a case-by-case basis. (Current R&PP leased lands are identified on Map 2-6b through 2-6e).
LS		**B**	**C**	**D**	**E**	**LR-2.1.6:** Disposal of 1,140 acres of R&PP leased lands near the City of Apache Junction to the City of Apache Junction would continue via any disposal method on a case-by-case basis.
LS		**B**	**C**	**D**	**E**	**LR-2.1.7:** Non-Federal interests for acquisition would be targeted on a case-by-case basis, with an emphasis on acquiring lands that adjoin or are near existing public lands that would increase the continuity of public lands, facilitate proper management, or protect an existing use.
LS		**B**	**C**	**D**	**E**	**LR-2.1.8:** Acquisition by donation and purchase would be considered when willing parties or available funds exist.
LS		**B**	**C**	**D**	**E**	**LR-2.1.9:** All acquisitions would be negotiated with willing landowners only and would have to be in the public interest.
LS		**B**	**C**	**D**	**E**	**LR-2.1.10:** Public lands bordering the Gila River Indian Reservation, which are identified as being suitable for disposal (as shown on Maps 2-6b, 2–6c, 2–6d and 2-6e), would only be available for disposal to local, state, federal, or tribal governmental entities.
LS	**SDNM**	**B**	**C**	**D**	**E**	**LR-2.1.11:** The BLM will continue to eliminate split estate situations by acquiring non-Federal subsurface estates that lies beneath Federal lands when there is a willing seller.
LS	**SDNM**	**B**	**C**	**D**	**E**	**LR-2.1.12:** The BLM will continue to eliminate split estate situations by disposing of Federal subsurface estates when there are no known mineral values.
LS	**SDNM**	**B**	**C**	**D**	**E**	**LR-2.1.13:** The BLM will not dispose of any subsurface mineral estates that lie under BLM managed surface estate.

Goal 2 (Land Tenure): ***Manage land tenure to meet natural resource management objectives, community needs, and to promote agency efficiency.***						
Decision Area		**Alternative**				**Management Actions**
LS	**SDNM**	**B**	**C**	**D**	**E**	
	SDNM	**B**	**C**	**D**	**E**	**LR-2.1.14:** The BLM would seek land owners who are willing to sell private land interests within the Monument and proceed with acquiring these inholdings (surface and subsurface) as funding opportunities arise.
	SDNM	**B**	**C**	**D**	**E**	**LR-2.1.15:** The BLM would seek landowners who are willing to sell partial private land interests (i.e., "easements") within the Monument in cases where the BLM cannot acquire fee-simple ownership in land interests, and proceed with securing the easements as funding opportunities arise.
	SDNM	**B**	**C**	**D**	**E**	**LR-2.1.16:** No lands are designated as being suitable for disposal within the Monument. Exchanges for lands within the Monument for other private lands within the Monument's boundaries would be permitted if they further improve the management of Monument objects and present no net loss to existing objects that will be impacted by the exchange.

Administrative Actions

- Continue to coordinate with the Maricopa County Department of Transportation (MCDOT), the Maricopa Association of Governments (MAG), Pinal County, Pima County, the Arizona Department of Transportation (ADOT), and the Federal Highway Administration for transportation activities that may affect public lands.
- Cooperate with the Western Utility Group and other industry groups to facilitate the exchange of information and coordinate planning efforts between federal agencies and utility providers through the western U.S.
- Whenever possible, promote energy transfer efficiency and support alternative energy sources such as the use of photovoltaic cells (solar energy) and wind power.
- Promptly communicate new designations for land use, resource protection, safety, and security to the public and other agencies, as necessary.
- Utility-scale renewable energy land use authorizations within designated multiuse utility corridors shall not conflict with existing and potential future linear facilities.

Specific to the SDNM Decision Area.

- Activities to maintain existing facilities will be evaluated on a case-by-case basis, and if SDNM resources can be protected, approved.

2.8.2. LIVESTOCK GRAZING (GR)

The livestock grazing program in the Planning Area is managed under Title 43 of the Code of Federal Regulations (CFR), section 4100, to carry out the intent of the Taylor Grazing Act of 1934, as amended and supplemented, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. Grazing permits or leases are valid for up to 10 years and authorize grazing within grazing districts on public land and other land administered by the BLM under Section 3 of the Taylor Grazing Act, and outside of grazing districts under Section 15 of the Taylor Grazing Act.

The BLM evaluates allotments when leases or permits are scheduled for renewal consistent with 43 CFR 4100 (subpart 4180) and the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration, IM-AZ-98-013. Terms and conditions are specified in grazing permits or leases, which require lessees to meet management objectives, provide for proper range management, and assist in the orderly administration of the public rangelands. These terms and conditions are contained in 43 CFR 4100 (subpart 4130).

In Arizona, BLM rangelands and grazing allotments are classified as perennial, ephemeral, or perennial-ephemeral. These classifications correspond to the following types of designated rangelands:

- Perennial rangeland: consistently produces perennial forage to support a year-round livestock operation;
- Ephemeral rangeland: does not consistently produce enough forage to sustain a year-round livestock operation but may periodically produce large amounts of annual forage to accommodate livestock grazing; and
- Perennial-ephemeral rangeland: produces perennial forage each year and periodically provides additional ephemeral vegetation. In a year of abundant moisture and favorable climatic conditions, annual forbs and grasses add materially to the total grazing capacity.

During the resource management planning process, *land use plan decisions* identify lands available or not available for livestock grazing. In contrast *implementation decisions* identify areas available for grazing, and then establish allotment-specific grazing management practices and livestock forage amounts, based on monitoring and assessment information. Grazing management practices and levels of livestock grazing use must achieve the desired outcomes outlined in the land use plan, including rangeland health standards (or comprehensive Land Health Standards), or must result in significant progress toward fulfilling rangeland health standards. They must also conform to the guidelines required under 43 CFR 4180.2(b).

Proposed Land Use Allocations for the Lower Sonoran Decision Area

For both LS Decision Area, the proposed land use allocations are provided in Proposed alternatives for grazing allotments are as follows:

- Alternative A (No Action): Grazing allotments would continue to be allocated as perennial, perennial/ephemeral, or ephemeral, as appropriate to allotment-specific characteristics. Season of use adjustments on perennial allotments would be considered.

- Alternative B: Ephemeral grazing applications would continue to be considered, but perennial stocking rates would be reduced.
- Alternative C: Grazing allotments designated as perennial/ephemeral would be reclassified as perennial only, with no supplemental ephemeral grazing applications considered. This alternative does not apply to ephemeral-only allotments. Season of use adjustments on perennial allotments would be considered.
- Alternative D: All allotments currently open to livestock grazing would become unavailable as permits expire.
- Alternative E (Preferred): Grazing allotments would be allocated as perennial, perennial/ephemeral, or ephemeral, as appropriate to allotment-specific characteristics. Season of use adjustments on perennial allotments would be considered. Alternative E incorporates elements from each of the other alternatives.

Once the RMP is adopted for the Lower Sonoran Decision area, the BLM will evaluate allotments when leases or permits are scheduled for renewal consistent with 43 CFR 4100 (subpart 4180) and the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration, IM-AZ-98–013. These decisions will be implemented as directed pursuant to 43 CFR 4100.

Proposed Implementation Decisions for the SDNM Decision Area

Within the SDNM Decision Area, the Proclamation for the Sonoran Desert National Monument requires the BLM to determine the compatibility of grazing "with the paramount purpose of protecting objects identified in this proclamation." A draft grazing Compatibility Analysis which represents the BLM's analysis of livestock grazing on 252,500 acres of public lands currently available for livestock grazing within the SDNM north of I-8, is available in Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039). The compatibility analysis is used to determine whether livestock grazing is compatible with the paramount purpose of the Monument, which is to protect the objects identified in the proclamation. Process steps for the compatibility analysis include:

- Identify the "objects" of the Monument.
- Conduct a literature review. The literature review helps identify potential effects of livestock grazing in the Sonoran Desert.
- Prepare a draft land health evaluation (LHE). The LHE documents if standards are achieved or not achieved, including causal factors for non-achievement.
- Analyze the effects of grazing on the biological and cultural Monument objects.
- Develop a draft grazing Compatibility Analysis.
- Develop a full range of Alternatives presented in this Resource Management Plan.

The results of the draft Compatibility Analysis indicate that, in some locations, current conditions on the SDNM's six allotments are not achieving all of the Arizona Standards for Rangeland Health. Where standards are not being achieved, and grazing has been determined to be a contributing factor, the BLM has determined that current grazing practices are not compatible with protection of the objects of the Monument. Current livestock grazing practices were

determined to be a contributing factor of non-achievement of Standards in areas where forage utilization exceeded 41% (or "moderate" to "severe" utilization). In areas that showed negligible to light utilization (0–40%), yet did not achieve Land Health Standards, other causal factors (such as fire, drought, historic livestock use patterns, OHV use, or combinations thereof) were considered to be the contributing factor(s). The draft Compatibility Analysis indicates that livestock grazing is a contributing factor for non-achievement of Standard 3 on 8,498 acres of the 252,500 (3.4%) acres north of I-8, and these areas will be considered unavailable for livestock grazing in all of the action alternatives for the SDNM considered.

The LHE and the Compatibility Analysis will not be final until the RMP's Record of Decision is approved.

For the SDNM Decision Area, implementation level allocations (see Table 2.13, "Proposed Permitted Animal Unit Months (AUMs) for the SDNM" (p. 143)) reflect the findings of the compatibility analysis. Based on the results of the compatibility analysis, livestock grazing has been determined to be compatible with protection of most biological and cultural objects of the Monument. The 8,498 acres determined to be incompatible with livestock grazing would be unavailable for grazing under all alternatives, except the no action alternative. This is to ensure that non-compatible areas are protected, per the Monument proclamation. Through this RMP/EIS process, a full range of alternatives and management actions will be considered that will allow for continued protection of the objects of the Monument and grazing management design features that will ensure continued compatibility.

The grazing Compatibility Analysis and Land Health Evaluation (Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039) and Appendix F, *Arizona Land Health Evaluation for the Sonoran Desert National Monument* (p. 1081), respectively) analyzed the effects of livestock grazing on the SDNM only. The alternatives presented are designed to provide the full range of the possible management scenarios for analysis.

The proposed alternatives and implementation decisions for the SDNM grazing allotment are summarized as follows:

- Alternative A (No Action Alternative): Livestock grazing permits south of I-8 are terminated. Livestock grazing north of I-8 would continue to be allocated as perennial, perennial/ephemeral, or ephemeral, as appropriate to allotment-specific characteristics, if determined to be compatible with protecting Monument resources. Season of use adjustments on perennial allotments would be considered.

- Alternative B: Stocking rates on grazing allotments north of I-8 would be allocated as perennial grazing and would be reduced by approximately 40 percent. Ephemeral grazing applications would continue to be considered. The approximately 8,500 acres determined to be incompatible with livestock grazing would be made unavailable for grazing by fencing off these specific areas.

- Alternative C: Grazing allotments in the SDNM north of I-8 would be allocated as perennial only, with no ephemeral grazing applications considered (this would not apply to the Arnold Allotment). Season of use adjustments on perennial allotments would be considered. Approximately 8,500 acres determined to be incompatible with livestock grazing, plus an additional 36,300 acres that connect and/or surround those 8,500 acres, would be made unavailable for grazing. Grazing management of these areas would be accomplished by using a combination of fencing and natural topographic barriers to make grazing exclosures,

rather than directly fencing off the incompatible areas. As part of the historic Anza NHT, approximately 10 acres around North Tank would be directly fenced.

- Alternative D: All allotments currently open to livestock grazing in the SDNM would become unavailable as permits expire.

- Alternative E (Preferred): Livestock grazing north of I-8 would continue to be allocated as perennial, perennial/ ephemeral, or ephemeral, as appropriate to allotment-specific characteristics. Grazing would be adjusted as needed, in accordance with grazing regulations and in response to the grazing determinations required by the Proclamation. This alternative reflects the fenced exclosures of Alternative C. Additionally, the SDNM portion of the Conley Allotment (which is the allotment with the largest departure from Standard 3 and has the most acreage found to be incompatible with grazing) would be unavailable for grazing.

2.8.2.1. Existing Management Decisions, Alternative A (No Action) Livestock Grazing

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila North Management Framework Plan (1983):

- Construct 21 reservoirs, 32 wells, and develop nine springs in areas of low forage production. (RM-1.5) Applies only to those present in the Saddle Mountain area.

- Allocate forage on all (33) allotments based on preference. Initiate monitoring studies that include actual use, utilization, trend in condition, and climate, using the Bureau's Selective Management Policy (Appendix 34 of the Decision Source) to set priorities. These studies will be used to adjust stocking rates, either upward or downward to meet multiple-resource management objectives (GR-13). Only a few allotments in the northwestern part of the Phoenix South Planning Area are addressed in the Decision Source.

Eastern Arizona Grazing Environmental Impact Statement and Rangeland Program Summary (1985):

- Land that is presently unleased for livestock use would remain unleased, with vegetation reserved for wildlife and non-consumptive use (GR-07). Applies only to those allotments in the eastern Lower Sonoran Planning Area covered by the Decision Source.

- Grazing management systems including rest rotation, deferred rotation, deferred, seasonal, short-duration or others which are various combinations of these would be implemented where needs are identified through monitoring (maintain and improve categorized allotments). On custodial allotments, grazing systems or season of use would be coordinated with the private landowners, State Land Department, or Soil Conservation Service (GR-11). Applies only to those allotments in the eastern Lower Sonoran Planning Area covered by the Decision Source.

- Fences would be needed to support grazing or land treatments and would be built to allow wildlife movement. Any fences that currently restrict wildlife movement would be modified to facilitate movement (GR-12). Applies only to those allotments in the eastern Lower Sonoran Planning Area covered by the Decision Source.
- Stocking additional animals would be allowed in the good ephemeral years where additional but unquantified animal-unit months (AUMs) of forage are available (GR-14). Applies only to those allotments in the eastern Phoenix South Planning Area covered by the Decision Source.
- Long-term target AUM figures (from increased vegetation production through revision of grazing systems already implemented, additional grazing systems and various land treatments) would be distributed on the basis of 40 percent to livestock and 60 percent to nonconsumptive uses (GR-18). Applies only to those allotments in the eastern Phoenix South Planning Area covered by the Decision Source.
- Grazing is authorized at the levels presented in the Range Program Summary (GR-19). Applies only to those allotments in the eastern Phoenix South Planning Area covered by the Decision Source.

Lower Gila South Resource Management Plan (1989):

- Institute grazing-management practices that would ensure perpetuation of botanical diversity within the Coffee Pot Botanical ACEC (GR-02).
- Livestock facilities will not be developed in Table Top area where that development would serve to increase livestock use within the area proposed for designation (GR-03).
- Improvement and maintenance of the rangeland will be accomplished through the construction of new rangeland developments (see Table 1 in Decision Source) and through livestock adjustments if needed (GR-05). The majority of allotments in the Lower Sonoran Planning Area are covered by this Decision Source.
- Livestock facilities will not be developed where that development would serve to increase livestock use within the Coffee Pot Botanical ACEC being proposed for designation (GR-07).

Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (1997):

- S&G Guideline 3-4: Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant-community objectives (GR-43).
- S&G Guideline 3-5: Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met (GR-44):
- Ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;
- Sufficient surface and subsurface soil moisture exists for continued plant growth;
- Serviceable waters are capable of providing for proper grazing distribution;

- Sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, Wild Horse & Burro); and
- Monitoring is conducted during grazing to determine if objectives are being met.

SDNM Current Management Guidance (2002):

- Laws, regulations, and policies followed by the BLM in issuing and administering grazing leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the Sonoran Desert National Monument;
- The grazing permits south of Interstate 8, in the SDNM, shall not be renewed at the end of their current term;
- Grazing in the SDNM north of Interstate 8 shall be allowed to continue only to the extent that the BLM determines that grazing is compatible with the paramount purpose of protecting the objects identified in the Proclamation (biological, scientific, and historic resources).

Cameron Allotment Amendment to the Lower Gila South Resource Management Plan (2004):

The above amendment approved decisions to protect the endangered Sonoran Pronghorn which affected grazing management for four allotments in the Ajo area, including the closure of the Cameron allotment in its entirety. See Section 2.7.5, "Priority Wildlife Species & Habitat (PS)" (p. 63) for specific decisions.

2.8.2.2. Action Alternatives for Livestock Grazing (GR)

Program Goals:

- **Goal 1:** Manage livestock grazing in the Lower Sonoran Decision Area to provide for multiple uses while maintaining healthy ecosystems.
- **Goal 2:** Manage livestock grazing in the SDNM Decision Area to provide for multiple uses while maintaining healthy ecosystems and protecting the Monument's biological and cultural resources.

Land Use Allocations Summary for the Lower Sonoran

Table 2.11. Proposed Livestock Grazing Allocations for Lower Sonoran Decision Area

Allocation by Decision Area	Alternatives (BLM Acres and Animal Unit Months)				
	A - No Action	B - Reduced Perennial	C - Perennial Only / No Ephemeral	D - Closed	E - Preferred
Available Acres	830,200	830,200	830,200	0	830,200
Unavailable Acres[1]	100,000	100,000	100,000	930,200	100,000
Total Acres	930,200	930,200	930,200	930,200	930,200

Total Proposed (AUMs)[3]	17,541	10,431[3]	17,541	0	17,541

[1] Cameron allotment closure; Fred J. Weiler Green Belt, Sentinel Plain, Ajo parcels, lands leases, and other areas currently unallocated or unavailable to grazing within the Decision Area.

[2] Animal unit month (AUM) means the amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month.

[3] Ephemeral AUMs are permitted on a case-by-case basis pursuant to the Special Ephemeral Rule. These AUMs are not included in the proposed perennial AUMs listed.

Table 2.12. Proposed Livestock Grazing Allocations for the SDNM

Allocation by Decision Area	Alternatives (BLM Acres and Animal Unit Months)				
	A - No Action	B - Reduced Perennial	C - Perennial Only / No Ephemeral	D - Closed	E - Preferred
Available Acres	252,500	244,000	207,700	0	157,210
Unavailable Acres[1] From RMP Decisions	233,900	8,500[2]	44,800[3]	252,500	95,290[4]
Unavailable Acres from Proclamation	155,900	155,900	155,900	155,900	155,900
Unavailable Acres from Area A[5]	78,000	78,000	78,000	78,000	78,000
Total Acres	486,400	486,400	486,400	486,400	486,400
Total Proposed AUMs[6]	8,703	5,321[7]	7,092	0	3,114

[1] In accordance with the Monument Proclamation the allotments or portions of allotments south of I-8, within SDNM, were made unavailable to livestock grazing when the permits expired.

[2] Acreage includes approximately 8,500 acres, or 3.4% of the area north of I-8 determined to be unavailable for livestock grazing through the compatibility analysis and would be fenced off (see Map 2-8b).

[3] Acreage includes the 8,500 acres found to be incompatible with Monument objects, plus 36,300 connected or surrounding acres, using a combination of fencing and topographic barriers and wilderness boundaries, for a total of 44,800 acres of unavailable acres under Alternative C (see Map 2-8c).

[4] Acreage includes all unavailable acreage identified in Alternative C (44,800 acres) plus the Conley Allotment (50,490 acres) from recommendations in the grazing Compatibility Analysis (Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)). All unavailable acres will remain unallocated for livestock grazing, and its forage and other vegetation will be reserved for wildlife habitat.

[5]Relinquished lands in Barry M. Goldwater Range south of I-8.

[6] In Alternative A, AUMs are prorated and reduced by 7,884 from the total permitted use due to the allotment closures south of I-8. In Alternative B, final AUM numbers were prorated from the Lower Gila South RMP Resource Protection Alternative to the acres within the Monument for each allotment. Acres are rounded to the nearest hundred.

[7] Ephemeral AUMs are permitted on a case-by-case basis pursuant to the Special Ephemeral Rule.

Table 2.13. Proposed Permitted Animal Unit Months (AUMs) for the SDNM

Allotments	Applicable Alternative					
	A - Permitted AUMs	B - Reduced Perennial	C - Perennial Only – No Ephemeral	D - Closed	E – Proposed Preferred	% Reduction from Alt. A
SDNM						
Big Horn[1]	2,812	2,031	2,278	0	1,633	42%

Beloat	776	541	936	0	552	29%
Conley[2]	3,403	1,572	2,212	0	0	100%
Hazen	886	531	873	0	400	55%
Lower Vekol	826	646	793	0	529	36%
Arnold	0	0	0	0	0	0
Total AUMs[3]	8,703	5,321	7,092	0	3,114	64%

[1] The AUM's for the Big Horn allotment in Alternative A reflect the reduction in permitted use due to the closure of the portion of the allotment south of Interstate-8.

[2] Acres within the SDNM portion of the Conley allotment are proposed to be made unavailable for the following reasons:

- It has the largest departure from achieving Land Health Standard 3 of all other SDNM allotments,
- It has the most acreage found incompatible with the Monument proclamation, and
- Future management options for the remaining available portion will be limited due to the amount and location of pasture fencing that will be required to be placed around the non-achieving acres.

[3] In Alternative A, the total prorated permitted use is reduced by 7,884 AUMs due to the allotment closures south of I-8. In Alternative B, AUM's were prorated from the Lower Gila South RMP Resource Protection Alternative to the acres within the Monument for each allotment.

Table 2.14. Proposed Livestock Grazing Acres for the SDNM North of Interstate 8 Only

Allotment	Alternatives (BLM Acres)[1]									
	A-No Action		B-Reduced Perennial		C - Perennial Only		D - Closed		E - Preferred	
	Avail.	Un-avail.	Avail.	Un-avail.[2]	Avail.	Un-avail.[3]	Avail.	Un-avail.	Avail.	Un-avail.
Big Horn	92,204	0	86,687	5,517	78,230	16,974	0	92,204	78,230	16,974
Beloat	33,600	0	33,600	0	33,600	0	0	33600	33,600	0
Conley	77,708	0	74,734	2,974	50,491	27,217	0	77,708	50,491	27,217
Hazen	31,926	0	31,926	31,926	31,926	0	0	31,926	31,926	0
Lower Vekol	15,409	0	15,402	7	14,802	607	0	15,409	14,802	607
Arnold	1,609	0	1,609	0	1,609	0	0	1,609	1,609	0
Total	252,456	0	243,958	8,498	207,658	44,798	0	252,456	207,658	44,798

[1] These numbers reflect the numbers from the Land Health Assessment and are estimated pending field GIS inventory verification. The totals shown in Table 2.12, "Proposed Livestock Grazing Allocations for the SDNM " (p. 143) were rounded up for the land use plan-level decisions.

[2] Alternative B unavailable numbers come from the acres determined to be incompatible with Monument objects from the Compatibility Analysis in Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039).

[3] Alternatives C and E unavailable numbers come from the acres determined to be incompatible with Monument objects from the Compatibility Analysis in Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039), and the acreage determined to become unavailable due to the projected boundary closures of the area based on fencing, topographic boundaries and wilderness boundaries.

Management Actions and Allowable Uses (GR)

Goal 1: *Manage livestock grazing to provide forage for multiple uses while maintaining healthy ecosystems.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Livestock grazing use and associated practices will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved. Management will achieve, or make significant progress toward achieving, Land Health Standards and produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.						
LS		**B**	**C**		**E**	**GR-1.1.1:** Public lands would be allocated and available for livestock grazing as shown in .
LS				**D**		**GR-1.1.2:** All public land acres currently available to grazing would become unavailable when current permits expire.
LS		**B**				**GR-1.1.3:** All perennial/ephemeral and perennial allotments available to grazing would receive a reduction in the authorized grazing preference as reflected in Table 2.11, "Proposed Livestock Grazing Allocations for Lower Sonoran Decision Area" (p. 142). Total proposed AUMs in the Lower Sonoran would be reduced by approximately 41%.
LS			**C**			**GR-1.1.4:** All perennial/ephemeral allotments that are available to grazing would be reclassified as perennial only. Ephemeral authorizations would not be permitted on these allotments or allotments currently classified as perennial.
LS				**D**		**GR-1.1.5:** No AUMs would be permitted for allotments currently available to grazing when permits expire.
LS					**E**	**GR-1.1.6:** All allotments that are currently available to grazing will remain open to grazing under their current classifications and permitted AUM's as reflected in . (also see Appendix P, *Grazing Allotment Information* (p. 1281)).
General Management Actions						
LS		**B**	**C**		**E**	**GR-1.1.7:** The portion of the Santa Rosa allotment outside of SDNM would remain available for livestock grazing if fencing is built to exclude SDNM from the allotment.
LS		**B**	**C**		**E**	**GR-1.1.8:** The portion of the Big Horn allotment south of I-8 and outside of the SDNM would remain available for livestock grazing if fencing is built to exclude SDNM from the allotment.
LS		**B**	**C**		**E**	**GR-1.1.9:** The portion of the Table Top allotment south of Interstate 8 and outside of SDNM, would be unavailable for livestock grazing.
LS		**B**			**E**	**GR-1.1.10:** The portion of the Table Top allotment north of I-8, outside SDNM, would be classified as Perennial/Ephemeral. The authorized grazing preference will be 148 AUM's.
LS	**SDNM**	**B**	**C**	**D**	**E**	**GR-1.1.11:** All existing water developments will be evaluated, and modified as necessary, to provide the maximum benefit and minimum impact to priority wildlife and special status species.
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.12:** Grazing management on allotments categorized as maintain and improve may include rest rotation, deferred rotation, deferred, seasonal, short duration or other management practices would be implemented where needs are identified through monitoring. On custodial allotments, grazing systems or season of use would be coordinated with the private landowners, Arizona State Land Department, or Natural Resource Conservation Service.
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.13:** If grazing availability or classification differs for the Big Horn, Conley, Lower Vekol, Hazen, Beloat, and Arnold allotments outside SDNM versus inside the Monument boundaries, fencing or other control mechanisms would be installed to allow for management of Monument lands separately from the rest of the allotment before grazing could continue.

Goal 1: *Manage livestock grazing to provide forage for multiple uses while maintaining healthy ecosystems.*						
Applicable Decision Area		Applicable Alternative				Management Actions and Allowable Uses
LS	SDNM	B	C	D	E	
Objective 1.1: Livestock grazing use and associated practices will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved. Management will achieve, or make significant progress toward achieving, Land Health Standards and produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.						
LS	**SDNM**	**B**			**E**	**GR-1.1.14:** Allotments may be reclassified as ephemeral in accordance with the Special Ephemeral Rule published December 7, 1968 through Rangeland Health Assessments. The BLM has established criteria based upon the Special Rule through which allotments can be classified as ephemeral. These criteria include: ● Rangelands are within the hot desert biome; ● Average annual precipitation is less than eight inches; ● Rangelands produce less than 25 pounds per acre of desirable forage grasses; ● The vegetative community is composed of less than five-percent desirable forage species; ● The rangelands are generally below 3,500 feet in elevation; ● Annual production is highly unpredictable and forage availability is of a short duration; ● Usable forage production depends on abundant moisture and other favorable climatic conditions; and ● Rangelands lack potential to improve existing ecological status and produce a dependable supply of forage through intensive rangeland management practices.
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.15:** The Arizona Guidelines for Grazing Administration, as approved in the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (1997), would apply where appropriate to all livestock grazing activities (Appendix L, *Guidelines for Grazing Administration* (p. 1253)).
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.16:** Land not currently allocated for livestock use would remain unallocated for this use and its forage and other vegetation would be reserved for wildlife and non-consumptive uses.
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.17:** If an evaluation of land health standards identifies an allotment where land health standards cannot be achieved under any level or management of livestock use and where current grazing use has been identified as the causal factor, then decisions identifying those areas as available for livestock grazing would be revisited.
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.18:** Should a livestock grazing permit be relinquished the allotment and associated resources, and other resources and public uses would be evaluated to determine the appropriate allocation of available forage.
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.19:** Within habitat for endangered species, livestock grazing allowable use would conform to the guidelines described in the "Not Likely to Adversely Affect" section of Guidance Criteria for Determinations of Effects of Grazing Permit Issuance and Renewal on T&E Species (BLM and USFWS, Arizona and New Mexico, 1999), or any subsequent agreed upon amendment to these guidelines. Livestock grazing permits will be updated, as needed, to conform to this guidance.

Goal 1: ***Manage livestock grazing to provide forage for multiple uses while maintaining healthy ecosystems.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Livestock grazing use and associated practices will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved. Management will achieve, or make significant progress toward achieving, Land Health Standards and produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.						
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.20:** One-time travel off designated routes may be approved with written authorization from the authorized officer to access sick or injured livestock.
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.21:** Construction of new livestock waters in Category I and Category II desert tortoise habitat and in bighorn sheep habitat will be addressed on a case-by-case basis.
LS	**SDNM**	**B**	**C**		**E**	**GR-1.1.22:** Range improvement permits and cooperative range improvement agreements shall specify the standards, design, construction and maintenance criteria for the range improvements and other additional conditions and stipulations or modifications deemed necessary. The extent, location and timing of such actions will be based on allotment-specific management objectives adopted through the evaluation process, interdisciplinary development and analysis of proposed actions, and funding.

Goal 2: ***Manage livestock grazing to provide for multiple uses while maintaining healthy ecosystems and protecting the Monument's biological and cultural resources.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.2: Public lands in SDNM north of I-8 available to livestock use will be managed to achieve or make significant progress toward achieving Land Health Standards to ensure that the health of the biological resources are maintained or improved. Livestock grazing use and associated practices will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved.						
	SDNM	**B**	**C**	**D**	**E**	**GR-1.2.1:** Pursuant to the Monument Proclamation grazing permits for allotments within SDNM south of I-8, were not renewed upon expiration. The public lands South of I-8, within SDNM, will remain unavailable for livestock use. The grazing preferences for permitted use on the allotments that are attached to the base properties will be cancelled. Forage previously allocated for livestock grazing (7,255 AUMs) will be available for other resource uses such as wildlife habitat, watershed values, recreation, etc.
	SDNM	**B**				**GR-1.2.2:** Domestic goats or sheep would not be permitted within nine miles of suitable bighorn sheep habitat or within allotments that contain suitable bighorn sheep habitat.
	SDNM		**C**	**D**	**E**	**GR-1.2.3:** Domestic goats or sheep would not be permitted.
Implementation Level Decisions for the SDNM						
Available Acres by Allotment						
	SDNM	**B**				**GR-1.2.3:** Acres would become unavailable to livestock grazing use within allotments north of Interstate 8 that were found to be incompatible with the objects of the Monument due to current livestock use as specified in the Draft Compatibility Analysis. They are as follows (see Map 2-8b and Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)): ● 5,520 acres within the Conley allotment, ● 2,970 acres within the Big Horn allotment, and ● 10 acres within the Lower Vekol allotment.

Goal 2: ***Manage livestock grazing to provide for multiple uses while maintaining healthy ecosystems and protecting the Monument's biological and cultural resources.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.2: Public lands in SDNM north of I-8 available to livestock use will be managed to achieve or make significant progress toward achieving Land Health Standards to ensure that the health of the biological resources are maintained or improved. Livestock grazing use and associated practices will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved.						
	SDNM		**C**			**GR-1.2.4:** Through a combination of fencing and natural barriers, 44,800 acres would become unavailable to livestock grazing use within allotments north of Interstate 8 that were found to be incompatible with the objects of the Monument due to current livestock use. They are as follows (see Map 2-8c and Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)): ● 27,220 acres within the Conley allotment, ● 16,970 acres within the Big Horn allotment, and ● 610 acres within the Lower Vekol allotment. ● (Total of 8,500 incompatible acres and 36,300 surrounding acres
	SDNM			**D**		**GR-1.2.5:** All public land acres currently available to grazing in the SDNM would become unavailable as current permits expire.
	SDNM				**E**	**GR-1.2.6:** Acreage as described in Alternative C would become unavailable to livestock grazing use through a combination of fencing and natural barriers. Additionally, the closure of the SDNM portion of the Conley allotment as specified in the Draft Compatibility Analysis, for a total of 95,290 acres north of I-8. Specific reductions are as follows: (see Map 2-8e and Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)): ● 77,710 acres within the Conley allotment, ● 16,970 acres within the Big Horn allotment, and ● 610 acres within the Lower Vekol allotment. ● (Total of 8,500 incompatible acres, 36,300 surrounding acres and the remaining 50,490 acres in Conley allotment)
Proposed AUMs by Allotment						
	SDNM	**B**			**E**	**GR-1.2.6:** All perennial/ephemeral and perennial allotments that are available to grazing within the SDNM would receive a reduction in the authorized grazing preference. Reduction in permitted use would reflect reduced available acreage and prorated AUM's from resource protection alternative from the Lower Gila South RMP. Actions result in approximate 39% AUM reduction in Alternative B and 64% AUM reduction in alternative E due to closure of Conley allotment. Rationale for this includes: ● Majority of desirable forage species are perennial browse species and winter/spring annuals; ● Reduces competition with special status wildlife species considered Monument objects (Sonoran desert tortoise, Desert bighorn sheep, etc.);

Goal 2: *Manage livestock grazing to provide for multiple uses while maintaining healthy ecosystems and protecting the Monument's biological and cultural resources.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.2: Public lands in SDNM north of I-8 available to livestock use will be managed to achieve or make significant progress toward achieving Land Health Standards to ensure that the health of the biological resources are maintained or improved. Livestock grazing use and associated practices will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved.						
						• Supported by inventory and monitoring data; and • Supported by the Arizona Land Health Evaluation for the SDNM and the Draft Compatibility Analysis: Livestock Grazing on the SDNM, Arizona, April 2011 (Appendices E and F).
	SDNM		**C**			**GR-1.2.7:** Perennial/ephemeral allotments that are available to grazing would be reclassified as perennial only and AUMs would be adjusted due to acreage reductions defined above (Map 2-8c). Ephemeral authorizations would not be permitted on any allotment classified as perennial. (See Table 3.13, " Historical Fire Regimes Based on Fire Frequency and Severity" (p. 304)in Chapter 3, *Affected Environment* (p. 251) for actual ephemeral use from 1998 to 2007.)
	SDNM			**D**		**GR-1.2.8:** No AUMs would be permitted for allotments currently available to grazing when permits expire.
	SDNM				**E**	**GR-1.2.9:** The period and level of use (approximately 65 percent of permitted use) would be adjusted to primarily fall-winter season (Oct. 1 – April 30) and reduced use levels (approximately 35 percent of permitted use) during the summer season (May 1 – Sept. 30). The rationale for this includes: • Bimodal precipitation pattern provides more consistent and widespread rainfall during winter season, when the majority of the forage is produced; • Majority of desirable forage species are perennial browse species and winter/spring annuals; • Provides for rest period for key browse species; • Reduces competition with wildlife during critical hot summer months; • Reflects general pattern of current grazing management practices; • Supported by inventory and monitoring data; and • Supported by the Arizona Land Health Evaluation for the SDNM and the Draft Compatibility Analysis: Livestock Grazing on the SDNM, Arizona, April 2011 (Appendices E and F).

Administrative Actions

- Existing range developments in areas not allocated for livestock use may be removed if not necessary for management of other resources.
- Develop a monitoring plan for allotments as needed to determine and track ecological condition and trend.

Specific to the SDNM Decision Area

Livestock management changes may be made based on assessment, inventory, or monitoring data. Except under Alternative D, develop and implement a monitoring plan on the SDNM to determine and track ecological condition and trend. The plan would include:

- Monitoring previously established study sites in allotments that will continue to be grazed, and establishing new key areas as needed. Data would be used to support grazing management decisions.
- Monitoring previously-established study sites in the allotments not to be grazed and establishing new sites as needed. Location of sites should be established based on resource management goals. Data would be used for comparison to grazed areas and historical data to track resource responses to management changes.
- Establish frequency and intensity of monitoring effort.

2.8.3. MINERALS MANAGEMENT (MM)

The BLM supports mineral exploration and development on public lands in keeping with its multiple-use mandate. Unless otherwise restricted, all Federal mineral estates administered within the Planning Area would be available for orderly and efficient development of mineral resources. Exploration and development would be conducted in accordance with applicable laws, regulations, and policies, and in conformance with the approved resource-management plan. Restrictions and stipulations would be applied on a case-by-case basis.

Identified mineral resources are classified according to the BLM's system as described in Manual 3031 (BLM 1985) and Manual 3060 (DOI BLM undated). Mineral and mining laws and policy are implemented through the BLM's minerals management regulations which are contained in the 3000 series of volume 43 of the Code of Federal Regulations. A mineral resource potential report was prepared for the Planning Area (URS Corporation, 2004). Mineral resources are categorized as follows:

- Locatable Minerals: metallic minerals including, but not exclusively, gold, silver, copper, lead, zinc, and uranium, as well as some non-metallic minerals such as allunite, asbestos, barite, gypsum, and mica, and also unique and uncommon varieties of stone and other construction materials (43 CFR 3800 and 43 CFR 3715).
- Leasable Minerals: mostly, but not exclusively, energy minerals, including fluid minerals such as oil and gas and geothermal resources, and some solid minerals such as coal, sodium, and potash (43 CFR 3100 and 43 CFR 3200).
- Mineral Material Disposals (saleables): common varieties of construction materials such as sand, gravel, cinders, decorative rock, and building stone (43 CFR 3600).

2.8.3.1. Existing Management Decision, Alternative A (No Action)

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila North Management Framework Plan (1983):

- Restrict any actions or withdrawal in the Planning Area that would "segregate" leasable minerals unless there is strong evidence that the area is not conducive to mineralization. Leave the Planning Area open to mineral leasing. (MM-03) Applicable to the northwestern Lower Sonoran Planning Area near Saddle Mountain.
- Leave Planning Area open to mineral location and development. (MM-05) Applicable to the northwestern Lower Sonoran Planning Area near Saddle Mountain.
- Leave Planning Area open to mineral leasing. (MM-06) Applicable to the northwestern Lower Sonoran Planning Area near Saddle Mountain.

Lower Gila South Resource Management Plan (1989):

- Mitigate mining practices that adversely impact unique botanical and animal habitat in Vekol Valley ACEC. (MM-15) Decision still applicable to area although not being carried forward as an ACEC.

- Demand for saleable minerals will be met by sales or free-use permits on a case-by-case basis. (MM-16)

Phoenix Resource Management Plan (1989):

- All land in the RMP/EIS area would remain open to leasing. Should exploration and/or development of leasable resources be pursued, special stipulations will be incorporated into the lease agreement after the results of site-specific environmental assessments for each action are known. (MM-02) Applies to the eastern Lower Sonoran Planning Area, including the Apache Junction and Globe/Miami areas.

- Mining activity within the Planning Area would continue to be administered on a case-by-case basis. (MM-09) Applies to the eastern Lower Sonoran Planning Area, including the Apache Junction and Globe/Miami areas.

- Sales of mineral materials to the public would continue to be administered on a case-by-case basis. (MM-10) Applies to the eastern Lower Sonoran Planning Area, including the Apache Junction and Globe/Miami areas.

- Free-use permits would continue to be issued to the state and local communities as the need arises. (MM-11) Applies to the eastern Lower Sonoran Planning Area, including the Apache Junction and Globe/Miami areas.

SDNM Current Management Guidance

- All Federal lands and interests in lands within the boundaries of the Monument are appropriated and withdrawn from all forms of entry, location, selection, sale, leasing, or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under mining laws, and from disposition under all laws relating to mineral and geothermal leasing. Unless otherwise specified in legislation or proclamation, all valid existing rights will be recognized in accordance with policy. Mining claims that predate the Monument designation have valid rights if those rights continue to be supported by a discovery. (Not numbered)

Lower Gila Resource Management Plan Amendment (2005):

- All lands in the Planning Area are considered open for oil and gas leasing unless specifically ruled closed. Approximately 375,000 acres of Federal minerals in wilderness are closed to oil and gas leasing. The approximately 1.6 million acres of Federal minerals remaining in the Planning Area are open to oil and gas leasing. Conditions of approval and special stipulations will be developed and incorporated as part of any operational permit after site-specific environmental analyses are completed and documented per the National Environmental Policy Act. Stipulations will mitigate impacts to special status species, cultural areas, and other resources affected by leasing-related activities. (MM-1)

2.8.3.2. Action Alternatives for Minerals Management (MM)

Land Use Allocations Summary

Table 2.15, "Acres of Public Lands Available for Mineral Activity by Alternative" (p. 153) enumerates the acreages available for minerals activities for each category (locatables, leasables, mineral material [saleables]) under each alternative. Lands with BLM Federal reserved mineral estate and non-Federal surface (state, local government, and private lands) are shown only for Alternative A but remain the same under all alternatives. The BLM has limited authority to manage non-BLM surface and there are no proposals for the withdrawal of BLM managed mineral estate under non-Federal surface.

Table 2.15. Acres of Public Lands Available for Mineral Activity by Alternative

	A	B		C		D		E	
	Acres	Acres	%	Acres	%	Acres	%	Acres	%
Locatable Minerals									
Existing Closed	625,000	625,000	47%	625,000	47%	625,000	47%	625,000	47%
Proposed Closures		2,350	<1%	2,350	<1%	381,500	28%	2,350	<1%
Total Closure		627,350	47%	627,350	47%	1,006,500	75%	627,350	47%
Open with standard stipulations		710,950	53%	710,950	53%	331,800	25%	710,950	53%
Total Available	713,300	710,950	53%	710,950	53%	331,800	25%	710,950	53%
Leasable Minerals									
Existing Closed	625,000	625,000	47%	625,000	47%	625,000	47%	625,000	47%
Proposed Closed		250	<1%	250	<1%	381,500	28%	53,700	4%
Total Closure		625,250	47%	625,250	47%	1,006,500	75%	678,700	51%
Open w/ NSO		7,100	<1%	61,400	5%	0	0%	15,400	1%
Open with mitigation		276,500	21%	356,000	27%	206,800	15%	259,500	19%
Open with Standard Stipulations		429,450	32%	295,650	21%	125,000	10%	384,700	29%
Total Available	713,300	713,050	53%	713,050	53%	331,800	25%	659,600	49%
Mineral Material (Saleables)									
Existing Closed	625,000	625,000	47%	625,000	47%	625,000	47%	625,000	47%
Proposed Closed		65,800	5%	184,800	14%	521,400	39%	192,300	14%
Total Closure		690,800	52%	809,800	72%	1,146,000	86%	817,300	5%
Open with Mitigation		0	0%	0	0%	0	0%	0	0%
Open with Standard Stipulations		647,500	48%	528,500	39%	191,900	14%	521,000	39%
Total Available	713,300	647,500	48%	528,500	39%	191,900	14%	521,000	39%
Total Acreage	1,338,300 acres (all alternatives)								
Acres of BLM Subsurface with Non-BLM Surface*									
Closed (Total)	71,000 (34%)								
Open (Total)	139,000 (66%)								
Total	210,000 acres (Alternative A)								

*Includes land in State, local, and private lands.

* Includes SDNM (461,000 acres), LS wilderness (89,200 acres) Sentinel Plain, Fred J Weiler Green Belt and Painted Rock Dam area (64,300 acres) and R&PP leases (10,500 acres).

Action Alternatives For Minerals Management (MM)

Goal 1: *Provide opportunities for exploration and development of energy and mineral resources.*						
Applicable Decision Area		Applicable Alternative				Management Actions and Allowable Uses
LS	SDNM	B	C	D	E	
Objective 1.1: Utilize mineral potential determinations (high, medium, and low) during the evaluation of all proposed actions for all resources. Reduce or mitigate hindrances to mineral development, particularly in areas of moderate to high potential. Mitigate impacts to other resource values.						
All Minerals						
LS		**B**	**C**	**D**	**E**	**MM-1.1.1:** Minerals activities would be managed to provide maximum protection for other resources while attempting to allow sufficient mineral development to occur to meet public demand.
LS		**B**	**C**	**D**	**E**	**MM-1.1.2:** Should lands now closed to mineral activity be opened, these lands, including the mineral estate, would be managed to be consistent with the decisions made in this plan.
LS		**B**	**C**	**D**	**E**	**MM-1.1.3:** On split-estate lands where the BLM manages the Federal mineral estate but the surface is not in Federal ownership, the BLM will manage the minerals in accordance with existing laws and regulations while providing the surface owner input into the management process and state law.
LS		**B**	**C**	**D**	**E**	**MM-1.1.4:** Within ACECs, WHAs, SCRMAs, SRMAs, and lands managed to protect wilderness characteristics, minerals-related actions would be approved in a manner and with mitigation that maintains the resource values for which the special designation or allocation was made while not denying valid existing rights for locatable minerals. Leasable or saleable minerals actions would be severely restricted or prohibited depending on the management allocation.
Locatable Minerals						
LS		**B**	**C**	**D**	**E**	**MM-1.1.5:** All public lands would be open to entry and location under the mining laws except lands with existing segregations or withdrawals as follows (Maps 2-9a, 2–9b, 2–9c, 2–9d, and 2–9e): Existing Segregations/Withdrawals (Alternative A): ● Designated wilderness areas, ● Fred J. Weiler Green Belt Resource Conservation Area, ● Painted Rock Dam power site withdrawal area, ● Sentinel Plain withdrawal area, ● San Tan Mountains RMZ/SMA. ● Proposed Withdrawals for all Alternatives unless otherwise noted: ● Juan Bautista de Anza National Historic Trail, ● Public Use and Conservation for Future Use Sites, ○ Sundad, ○ Butterfield West, ○ Painted Rock Petroglyph, ● Developed Recreation Sites, ● Painted Rock Campground and surrounding lands, ● Quartz Peak,

Goal 1: *Provide opportunities for exploration and development of energy and mineral resources.*						
Applicable Decision Area		Applicable Alternative				Management Actions and Allowable Uses
LS	SDNM	B	C	D	E	
Objective 1.1: Utilize mineral potential determinations (high, medium, and low) during the evaluation of all proposed actions for all resources. Reduce or mitigate hindrances to mineral development, particularly in areas of moderate to high potential. Mitigate impacts to other resource values.						
						● Gunsight Wash (Alternatives B, C and E), ● Ajo 40 acre open use OHV area (Alternatives B and E).
LS		**B**	**C**	**D**	**E**	**MM-1.1.6:** Notices and plans of operations would be processed according to the 43 CFR 3802 and 3809 regulations.
LS		**B**	**C**	**D**	**E**	**MM-1.1.7:** The use and occupancy of public lands would be managed to that which is reasonably incident to prospecting, mining or processing operations under the mining laws (43 CFR 3715).
LS				**D**		**MM-1.1.8:** The following lands are proposed for withdrawal or segregation from location (see Map 2-9d): ● Sentinel Plain SRMA, ● Cuerda de Lena ACEC, ● Saddle Mountain ACEC, ● Batamote-Coffee Pot ACEC, ● Gila River and Lower Gila Historic Trails ACEC, ● Lands Managed to Protect Wilderness Characteristics.
Leasable Minerals (Fluid energy minerals, including geothermal resources and sodium)						
LS		**B**	**C**	**D**	**E**	**MM-1.1.9:** All public lands would be open for mineral leasing in accordance with resource-management objectives except lands with existing segregations or withdrawals (Maps 2-10a, 2—10b, 2–10c, 2–10d and 2–10e). Lands that would be closed are the following: ● Sentinel Plain withdrawal area, ● Cuerda de Lena ACEC, ● Saddle Mountain ACEC, ● Batamote-Coffee Pot ACEC, ● Gila River and Lower Gila Historic Trails ACEC, ● Lands Managed to Protect Wilderness Characteristics
LS		**B**	**C**	**D**	**E**	**MM-1.1.10:** Leases would be issued for fluid energy minerals with appropriate stipulations. Site-specific actions would be addressed such as geophysical exploration, approval or disapproval of applications for permit to drill (APDs), well siting, tank-battery placement, and pipeline routing would be addressed on a case-by-case basis and include appropriate restrictions or conditions of approval.
LS		**B**	**C**	**D**	**E**	**MM-1.1.11:** Mineral-use authorizations for non-energy leasables would be issued for prospecting permits, exploration licenses, preference-right leases, competitive leases, lease modifications, and use permits subject to appropriate restrictions and stipulations to protect other resources.
Mineral Material Disposals (saleables)						

Goal 1: *Provide opportunities for exploration and development of energy and mineral resources.*						
Applicable Decision Area		Applicable Alternative				Management Actions and Allowable Uses
LS	SDNM	B	C	D	E	
Objective 1.1: Utilize mineral potential determinations (high, medium, and low) during the evaluation of all proposed actions for all resources. Reduce or mitigate hindrances to mineral development, particularly in areas of moderate to high potential. Mitigate impacts to other resource values.						
LS		**B**	**C**	**D**	**E**	**MM-1.1.12:** All public lands not withdrawn or segregated from minerals actions would be open to discretionary mineral materials disposal via sales or free-use permits on a case-by-case basis in accordance with resource-management objectives. Those lands unavailable for mineral materials disposal are as follows (for specific acreages for each alternative see above; see Maps 2-11a, 2—11b, 2–11c, 2–11d and 2–11e) ● Lands with existing segregations or withdrawals, ● Desert tortoise habitat; unless no net loss of habitat can be ensured, ● Washes deemed suitable to support cactus ferruginous pygmy-owl, ● Portions of the Gila River Terraces and Lower Gila Historic Trails SCRMAA and ACEC, ● Sentinel Plain withdrawal area, ● Cuerda de Lena ACEC, ● Saddle Mountain ACEC, ● Batamote-Coffee Pot ACEC, ● Lands managed to protect wilderness Characteristics.
LS		**B**	**C**	**D**	**E**	**MM-1.1.13:** Common-use areas and community pits would be established. Exploration for, and disposal of, mineral materials would also be allowed through exploration permits, free-use permits, and competitive and noncompetitive sales subject to appropriate restrictions and stipulations to protect other resources.

Administrative Actions

Specific to the SDNM Decision Area.

- Recognize the superior right to explore for and mine mineral resources on those split estate lands where the BLM manages the surface and the subsurface estate is owned by the state of Arizona or private entities. Develop a MOU with the state to establish procedures to protect SDNM resources from the effects of exploration and mining on SDNM to the greatest extent possible.

Locatable Minerals.

- The 43 CFR 3715 and 43 CFR 3809 regulations provide for the management of surface disturbance associated with mineral exploration and development including mining claim use and occupancy. The BLM reviews mining notices and plans in the time allotted as identified in the regulations. For notice-level operations, if time permits, a site visit would be conducted for land identified in a mining notice by the geologist, as well as an archeologist

and biologist if they are available. A site visit would generally be conducted by the BLM during the processing of a plan of operations.

- Mining plans and notice-level operations when mining claim occupancy is proposed are required to have the proper NEPA documentation prepared. The BLM will work with operators to ensure that notices and plans are processed efficiently and in a timely manner. Reclamation plans and bonds are required for each notice and plan per regulation. The amount of such bonds is for the full amount required to complete 100 percent of the required reclamation as if the BLM were required to hire independent contractors to do the work.

- In addition to the requirements of 43 CFR 3715 and 43 CFR 3809, State and Federal laws require numerous other permits including but not limited to an aquifer protection permit and a national pollutant discharge elimination system permit, both issued by the Arizona Department of Environmental Quality; a Section 404 permit issued by the U.S. Army Corps of Engineers; and a flood-control permit issued by the County. In addition, Arizona State law requires mining claimants to keep mining property in a safe condition. The State Mine Inspector's Office is responsible for enforcing this law. The BLM will cooperate with all interested agencies to ensure that operations conducted on BLM-administered lands are in full compliance with all Federal, State and local health, safety, and environmental laws as required by 43 CFR 3715.5.

- All occupancy of mining claims must meet the requirements of 43 CFR 3715 and must meet the specific requirements of 43 CFR 3715.2. At a minimum, all occupancies will meet the requirements and standard stipulations for occupancy contained in the BLM Arizona Programmatic Environmental Assessment for Mining Claim Use and Occupancy.

- Surface-disturbing activities at a level greater than casual use in wilderness areas, national Monuments, ACECs, and other areas identified in 43 CFR 3809.11 will require a plan of operations before mining can begin. Operations proposed for land that is withdrawn from mineral entry will cause the BLM to initiate a validity examination and will be allowed only on claims with a valid discovery and location existing before designation. Before the BLM can approve mining plans of operation submitted for work in areas withdrawn from mineral entry, a BLM mineral examiner must verify that a valid claim exists. The mineral examination and mineral report must confirm that minerals have been found and that the evidence is of such character that a person of ordinary prudence would be justified in the further expenditure of his labor and means with a reasonable prospect of success in developing a viable mine.

***Leasable Minerals*.**

- Lease applications will be considered on a case-by-case basis. Leases will be issued with needed restrictions to protect resources. Stipulations to protect important surface values will be based on interdisciplinary review of individual proposals and environmental analysis.

***Saleable Minerals*.**

- The sale of minerals is discretionary on the part of the BLM under 43 CFR 3600 regulations and will be considered on a case-by-case basis.

2.8.4. RECREATION MANAGEMENT (RM)

Recreation management in the BLM is guided by the allocation of recreation management areas (RMAs) and the corresponding decisions related to them. All BLM public lands are allocated to one of two types of RMAs: "extensive" or "special." The process used to allocate public lands to RMAs has changed substantially during recent years. In an approach known as "benefits-based-management," the BLM now integrates perceptions of visitor demand to produce market-based strategies for the provision of recreation opportunities and visitor services.

An extensive recreation management Area (ERMA) is an area of public land where the BLM has not identified a specific demand for structured recreation opportunities. In an ERMA, the BLM's management strategy for recreation resources is primarily custodial, and major recreation program investments will not be authorized except to resolve use conflicts, assure visitor safety, and provide for protection of other resources; the BLM will not be managing to produce specific recreational opportunities, experiences, or outcomes. All tracts of BLM public land that are not allocated as part of a SRMA are, by default, an ERMA.

In contrast, a sSRMA is an area of public land where the BLM has identified a specific demand for structured recreation opportunities. The BLM's management objective will be to produce the recreation opportunities, experiences, and outcomes indicated by this demand, which may be facilitated through major recreation program investments. These opportunities, experiences, and outcomes will be directed to a distinct recreation-tourism market for each SRMA.

Recreation-tourism markets can vary greatly; therefore, the strategies used to manage recreation resources in SRMAs also may vary greatly. The BLM uses three such strategies in response to recreation market demand:

- **Community:** The BLM intends to guide management decisions, actions, and recreation program investments to produce beneficial outcomes primarily for a community (or communities) that value the SRMA's public lands for recreation, tourism and growth;

- **Destination:** The BLM intends to guide management decisions, actions, and recreation program investments to produce beneficial outcomes primarily for national or regional visitors who value the SRMA's public lands as a recreation-tourism destination; and

- **Undeveloped:** The BLM intends to guide management decisions, actions, and recreation program investments to produce beneficial outcomes from the SRMA's undeveloped, frontier-like nature, primarily for recreation-tourism markets that come to the SRMA seeking a freedom to choose where to go for their own adventure, preferring little direction, few services, and very unnoticeable facilities.

Recreation-tourism markets may also consist of unique segments known as niches. For example, some destination-oriented visitors may come to a SRMA to hike over its mountains while others may come to the same SRMA to float a river winding down from its mountains. Satisfying both market niches requires different natural recreation resources, such as high, scenic places with great vistas for one and the flowing river canyon with fewer contacts between visitors for the other. To manage different areas with different objectives intended to produce different products for different niches, SRMAs may be separated into RMZs. The RMZs serve to delineate, define, and "match up" the kinds of recreation opportunities, experiences and outcomes available for the various customers of a primary market.

The LSFO and SDNM have identified a spectrum of four generalized settings that describe the unique physical, social, and administrative environment required to achieve the management objective(s) of RMZs. These settings have been termed "community interface," "passage," "front country," and "back country." Definitions of these settings and further descriptions of opportunities, experiences and outcomes may be found in Appendix Q, *Recreation Settings and Descriptions* (p. 1285). The definitions do not change from alternative to alternative; however, the combination of settings and the amount of each is prescribed individually for each RMZ to achieve the desired outcomes of each alternative (see Appendix R, *Benefits Based Recreation Worksheets* (p. 1295)).

Finally, a very important concept to remember as you read the following proposed decisions is that managing an SRMA for a primary market does not mean managing for an exclusive market. Other uses will be allowable in SRMAs. However, these other uses will only be allowed up to the point where they conflict with the desired management, or the production of desired beneficial outcomes, as described below for each SRMA.

The plan alternatives would have the following emphasis for the recreation program:

- Alternative A represents current management guidance. The recreation resource would not be targeted to specific markets, and recreation benefits and outcomes would be actively produced only in four existing SRMAs.
- Alternative B would emphasize the production of commodities from public lands. The recreation resource would be managed to produce the greatest amount and diversity of recreation benefits, particularly with respect to motorized recreation, across the largest scale of public lands.
- Alternative C would manage for a balance of motorized and non-motorized recreational benefits while minimizing or mitigating impacts on sensitive natural and cultural resources.
- Alternative D would emphasize resource conservation and protection over commodity production. The recreation resource would be managed to produce the greatest amount of benefits derived from natural, undeveloped setting prescriptions.
- Alternative E would balance the production of commodities with conservation and protection of natural public resources. The recreation resource would be managed to produce diverse recreation benefits, including the most extensive system of motorized access and travel that would be compatible with large areas of undeveloped public lands.

These alternatives attempt to address all approaches or alternatives for management of recreation that were brought forward through public scoping and internal management analysis.

2.8.4.1. Existing Management Decisions, Alternative A (No Action) For Recreation Management

The following list is a comprehensive compilation of land-use planning decisions (and their identifying planning decision number) currently in effect that constitutes the existing management situation for the Decision Areas. *Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives. They are restated as new action alternatives where applicable.* Decisions specific to travel management will be found in Section 2.8.5, "Travel Management (TM)" (p. 180).

Lower Gila South Resource Management Plan (Goldwater Amendment) (1990):

(Applicable to public lands in the Sand Tank Mountains, "Area A" within the SDNM, lands south of Interstate 8 referred to as the Sentinel Plain, and selected parcels near the Ajo airport.)

- Establish the Sentinel Plain Lava Flow SRMA and prepare a recreation area management plan. Implement management prescriptions to maintain recreation, geologic, and educational features associated with the Sentinel Plain Lava Flow (SM-1).
- In the Sentinel Plain Lava Flow SRMA, prohibit new rights-of-way (ROWs) and other land use authorizations (LUAs) except those installed in the established I-8 utility corridor; encourage the installation of below ground utility services within the corridor south of I-8 unless overhead facilities are required due to technical and/or operational circumstances (SM-4).
- In the Sentinel Plain Lava Flow SRMA, minimize visual impacts on the area's geologic formations (from ROWs construction in the I-8 utility corridor) by application of visual resource management guidelines (SM-5).
- Issue a special recreation use permit for specific recreation uses on the public lands of the BGR when required by the BLM's special recreation permit policy. Permits would be issued only with the concurrence of the U.S. Air Force when such activity does not impair or damage natural or cultural resources or interfere with military operations (RR-6).
- Establish ERMA and implement appropriate management actions to facilitate compatible recreation use of each ERMA. (RR-10).
- Survey sites for primitive or undeveloped campgrounds in the ERMA (RR-13).
- Allow camping on all lands open to the public in accordance with standard operating procedures for camping on public lands, permit self-contained or vehicle-based camping within 50 feet of designated or established roads (RR-16).
- Allow campfires using dead and down wood (RR-17).

Lower Gila North Management Framework Plan (1983):

(Applicable to public lands in the Saddle Mountain area.)

- No new land will be acquired in this area (former Saddle Mountain Wilderness Study Area). If Saddle Mountain is rejected as a wilderness area, no new roads will be allowed, but it will be designated as a recreation and rock-hound area. (LGN-MFP-3-R-4.1)

Lower Gila Resource Management Amendment (2005)::

(Applicable to a portion of lands in the LSFO and all lands within the SDNM Planning Areas)

- Management of recreation opportunities and developments will be evaluated using two inventory and management tools called the Recreation Opportunity Spectrum (ROS). and Visual Resource Management (RR-1).

- Recreation opportunity spectrum (ROS) classifications will be reviewed, refined, and adopted during interdisciplinary planning (RR-2).
- Four SRMAs are established (Ajo, Gila Trail, Saddle Mountain, and Vulture Mountains) and one is revised (Sentinel Plain) (RR-19).
- The Gila Trail SRMA, to include lands surrounding the Gila Trail, the Butterfield Overland Stage Route, the Anza National Historic Trail (NHT), the Southern Overland Trail, the Mormon Battalion Trail, the Oatman Massacre Site, the Painted Rock Mountains, and associated cultural and recreational features, is established (RR-26).
    - Facilities and maintenance to protect resource values and improve visitor safety and recreational opportunities are authorized in areas classified as rural, roaded-natural, or semi-primitive motorized (RR-27).
    - Single-use and multiple-use trails to meet the demand for hiking, equestrian, and mountain biking opportunities will be developed (RR-28).
    - Surface-disturbing activities within one-quarter mile of historic and prehistoric trail segments will be mitigated (RR-29).
    - All OHV routes will be inventoried and designated (RR-30).
    - Signing, regulations, and brochures will be provided as needed (RR-31).
- The Saddle Mountain SRMA, to include the public lands containing Saddle Mountain and the Palo Verde Hills, is established to emphasize provision of geologic, cultural, and wildlife interpretive sites; protection of the area's scenic landscapes and vistas; and promotion of recreational opportunities (RR-32).
    - Facilities and maintenance to protect resource values and improve visitor safety and recreational opportunities are authorized for the northern and northeastern portions of the area (RR-33).
    - Single-use and multiple-use trails to meet the demand for hiking, equestrian, and mountain biking opportunities will be developed (RR-34).
    - Signing, regulations, and brochures will be provided as needed (RR-35).
    - The southern and western portions of the area will be maintained as remote and mostly undeveloped (RR-36).
- The Ajo SRMA, to include the entire Ajo Management Area, is established (RR-37).
    - Facilities and maintenance to protect resource values and improve visitor safety and recreational opportunities are authorized (RR-38).
    - Single-use and multiple-use trails to meet the demand for hiking, equestrian, and mountain biking opportunities will be developed (RR-39).
    - Signing, regulations, and brochures will be provided as needed (RR-40).
- The Sentinel Plain Lava Flow SRMA is restricted to entry by permit only. Existing boundaries may be adjusted through interdisciplinary planning to respond to changing land uses (RR-41).

  - Existing prescriptions authorized by the Goldwater Amendment (BLM, 1990) will be brought forward without change (RR-42).
  - Facilities and maintenance to protect resource values and improve recreational opportunities and visitor safety are authorized (RR-43).
  - Single-use and multiple-use trails to meet the demand for hiking, equestrian, and mountain biking opportunities will be evaluated (RR-44).
  - Signing, regulations, and brochures will be provided as needed (RR-45).
- Project level planning for the ERMA will be conducted on a case-by-case basis (RR-46).
  - Primitive facilities are authorized where needed for resource protection, visitor safety, improvement of the recreation experience, or increasing recreational opportunities (RR-47).
  - Camping locations, camping stay limits, OHV and special recreation vehicle use, and utilization of the existing natural resources will be established (RR-48).
  - Long- and short-term camping areas, commercial or competitive OHV and special recreation vehicle use areas, scenic turnouts, cultural interpretive sites, hiking, equestrian or mountain bike trails, road and portal signage, and road maintenance will be evaluated (RR-49).
  - A "designated routes only" OHV and special vehicle classification will be established on a site-specific basis when needed for resource protection or to maintain consistency with ROS classifications (RR-50).
- The existing 14-day camping stay limit and all associated policy will be maintained throughout the Planning Area unless otherwise designated by the authorized officer or through project planning. Areas may be closed for resource protection, rehabilitation, or to reduce conflicts with other uses (RR-51).
- Camping facilities and length-of-stay limits may be established as prescribed below for dispersed camping, long-term visitor areas, extended camping areas, and short-term camping areas (RR-52).
- Self-contained or vehicle-based camping will be permitted within 50 feet of the centerline of designated or existing routes. Cross-country travel to campsites is not permitted (RR-54).
- Trailhead facilities will be closed to overnight camping upon written approval of the field manager (RR-55).
- Long-term visitor areas (LTVAs) will be defined on the ground with fences or signs. Each LTVA will include designated roads, designated campsites, and amenities to support long-term camping occupancy (RR-56).
- The following resource factors will be considered for implementation and development of LTVAs (RR-57):
  - Permitted only in rural or roaded-natural ROS classes.

  - Location on rocky or resilient soils.
  - Well-maintained ingress and egress routes.
  - Location within 30 miles of local community.
  - Location outside of Category I or II desert tortoise habitat.
  - Mitigation if located in Category III desert tortoise habitat.
  - Location with no cultural resource conflicts.
  - Location outside of burro HMAs.
  - Location of developments in a manner that "is not likely to adversely affect" threatened or endangered species and their habitats.
  - Location outside of riparian areas.
  - Location outside of areas of critical environmental concern and wild and scenic river areas
- The following operating rules will be considered for LTVA development and use (RR-58):
  - Long term camping will be restricted to the term of the permit.
  - Long term camping will be restricted to designated sites.
  - Services may be provided by contract or local vendor, but the costs of services (firewood, sanitation, trash, water, etc.) will be the responsibility of each occupant.
  - Users will be required to comply with all other LTVA regulations.
  - LTVA users must comply with all local, state and Federal laws.
  - LTVA supplementary rules may be enacted as needed.
- The following operating rules will be considered for extended camping area development and use (RR-63):
  - Camping restricted to designated sites.
  - Services may be provided by contract or local vendor, but the costs of services (firewood, sanitation, trash, water, etc.) will be the responsibility of each occupant.
  - Extended camping area visitors must comply with all local, state, and Federal laws.
  - Extended camping area supplementary rules may be enacted as needed.
- Other regulations and conditions for extended camping area use will be identified as required during interdisciplinary project planning. If, during the planning process, the interdisciplinary project planning team determines that modifications need to be made to the guidelines listed above those modifications may be made without the need for a planning amendment. Other regulations and conditions identified during ongoing operation of extended camping areas will require public notification (RR-64).

- Short-term camping areas will be designated only where such use promotes resource protection and where all conflicts can be mitigated. Short-term camping areas will be defined on the ground with fences or signs (RR-65).
- Interdisciplinary planning will evaluate short-term camping areas where historic use patterns equate to this type of use, and potential new areas are identified that would be suitable for short-term camping (RR-66).
- The following resource factors will be considered for implementation and development of short-term camping areas (RR-67):
    - Primitive ingress and egress routes.
    - Location on rocky or resilient soils.
    - Mitigation if located in category I, II or III desert tortoise habitat.
    - Location with no cultural resource conflicts.
    - Location outside of burro HMAs.
    - Location of developments in a manner that "is not likely to adversely affect" threatened or endangered species and their habitats.
    - Location outside of wildernesses.
    - Location outside of areas of critical environmental concern and wild and scenic river areas.
- The following operating rules will be considered for short-term camping area development and use (RR-68):
    - Camping will be restricted to the terms and conditions of that campground.
    - Camping will be restricted to designated sites.
    - Services may be provided by contract or local vendor, but the costs of services (firewood, sanitation, trash, water, etc.) will be the responsibility of each occupant.
    - Camping area users must comply with all local, state and Federal laws.
    - Specific supplementary rules may be enacted as needed.
- Other regulations and conditions for short-term camping area use will be identified as required during interdisciplinary project planning. If, during the planning process, the interdisciplinary project planning team determines that modifications need to be made to the guidelines listed above those modifications may be made without the need for a planning amendment. Other regulations and conditions identified during ongoing operation of short-term camping areas will require public notification (RR-69).
- Interdisciplinary planning will evaluate and authorize development of special use areas within the management areas (RR-70).

Sonoran Desert National Monument

- Current management guidance for the Sonoran Desert National Monument is the same as for current management guidance for the Lower Sonoran Decision Area (presented above), except as modified by Presidential Proclamation 7397 as identified below.
- In order to protect the public during operations at the adjacent BGR and to continue management practices that have resulted in an exceptionally well preserved natural resource, the current procedures for public access to the portion of the Monument depicted as Area A shall remain in full force and effect except to the extent that the U.S. Air Force agrees to different procedures which the BLM determines are compatible with the protection of the objects identified in this proclamation.
- Unauthorized persons cannot appropriate, injure, destroy, or remove any feature of this Monument.

2.8.4.2. Action Alternatives for Recreation Management (RM)

Program Goals

To provide a diverse array of recreation settings, opportunities and experiences; manage recreation activities and settings consistent with other resource goals; enhance recreation quality and reduce conflicts amongst various users, the following goals were developed:

Lower Sonoran Decision Area:

- **Goal 1:** Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.
- **Goal 2:** Balance the provision of recreation opportunities and experiences with other resource uses.

Sonoran Desert National Monument Decision Area:

- **Goal 3:** Recreation opportunities and experiences are derived from the objects and resource values for which the SDNM was established.

Land Use Allocation Summary

Table 2.16. Recreation Management Area and Zone Allocations

SRMA	Alternative (BLM Acres)			
	B	C	D	E
Lower Sonoran SRMAs				
Ajo SRMA	177,800	174,800	-	177,800
Ajo Desert RMZ	132,500	155,300	-	155,700
Gateway RMZ	42,800	19,800	-	20,200
Gunsight Wash RMZ	2,500	2,500	-	2,500
Arlington Trails SRMA	60,600	-	-	60,600
Buckeye Hills SRMA	47,900	47,900	47,900	47,900
East RMZ	25,800	25,800	25,800	25,800
West RMZ	22,100	22,100	22,100	22,100

SRMA	Alternative (BLM Acres)			
	B	C	D	E
Gila Bend Mountains SRMA	253,800	314,800	-	259,800
Lower Gila Historic Trails SRMA	52,300	52,300	52,300	52,300
Gila River RMZ	42,300	42,300	42,300	42,300
Painted Rock RMZ	10,000	10,000	10,000	10,000
Painted Rock Mountains SRMA	41,300	-	-	-
Saddle Mountain SRMA	47,500	47,500	-	47,500
San Tan Mountains SRMA	6,800	-	-	-
Lower Sonoran ERMAs				
San Tan Mountains ERMA	-	6,800	6,800	6,800
Sentinel Plain Lava Flow ERMA	20,800	20,800	20,800	20,800
SDNM SRMA				
Sonoran Desert SRMA	486,400	486,400	486,400	486,400
Desert Back Country RMZ	433,600	433,600	-	433,600
Anza National Historic Trail RMZ	52,800	52,800	-	52,800

Management Actions and Allowable Uses by Alternative

Goal 1: ***Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Manage at least one destination location or area to attract regional or national tourism demand.						
Lower Gila Historic Trails SRMA						
LS		**B**	**C**	**D**	**E**	**RR-1.1.1:** The Lower Gila Historic Trails SRMA would be established (52,300 acres), and would have a "Destination" primary strategy targeted to a regional/national market. The BLM would invest in facilities and visitor assistance, recognizing that national and regional visitors and constituents value the SDNM as a recreation-tourism destination.
LS		**B**	**C**	**D**	**E**	**RR-1.1.2:** The Gila River RMZ would be established (42,300 acres) for regional and national visitors seeking to discover, tour, and learn about the Juan Bautista de Anza National Historic Trail, Arizona history, and natural history of the Sonoran Desert.
LS		**B**	**C**	**D**	**E**	**RR-1.1.3:** The Painted Rock RMZ would be established (10,000 acres) for winter season camping, petroglyph viewing and interpretation of area history and as a portal to cultural attractions of regional and national interest.
LS		**B**	**C**	**D**	**E**	**RR-1.1.4:** Physical, social and administrative settings would be established as 100 percent front country for both RMZs.
Management Actions and Allowable Uses for Gila River RMZ						
LS		**B**	**C**	**D**	**E**	**RR-1.1.5:** When designated, the motor vehicle travel system would consist primarily of primitive roads maintained at levels 1 to 3, with up to 10 percent of the route network (approximately 16 miles) maintained at level 5 to provide two-wheel-drive passenger car access to public use cultural sites, day-use, and camping facilities.
LS		**B**	**C**	**D**	**E**	**RR-1.1.6:** Visitor and management infrastructure would respond to demand for facilities and access to the Juan Bautista de Anza NHT, Butterfield Overland Stage Route and other high-intensity trail segments and cultural properties.
LS		**B**	**C**	**D**	**E**	**RR-1.1.7:** Visitor and management infrastructure would generally be modest in scope and scale, but may include fully developed facilities with paved access, water, and sewer.
LS		**B**	**C**	**D**	**E**	**RR-1.1.8:** Activities, vehicles, and group sizes would be limited to designated sites and lengths of stay; types and speeds; and numbers as deemed necessary to provide access in balance with conservation of natural and cultural resources.

Goal 1: ***Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**	**C**		**E**	**RR-1.1.9:** Facilities may be developed as needed for visitor use or public safety at public use sites.
Management Actions and Allowable Uses for Painted Rock RMZ						
LS		**B**	**C**	**D**	**E**	**RR-1.11:** The Painted Rock Petroglyph Site and Campground would be retained as a fee site per FLREA. Camping would remain limited to designated campsites. Fees would be adjusted or established as needed to meet business plan objectives.
LS		**B**	**C**	**D**	**E**	**RR-1.1.12:** The designated travel system would consist of roads suitable for two-wheel drive maintained at levels three to five. Routes away from the immediate vicinity of the Painted Rock Campground Petroglyph Site would be maintained at levels one to three.
LS		**B**	**C**	**D**	**E**	**RR-1.1.13:** At Painted Rock Campground, the camping-stay limit would be 14 days except Oct. 1 to April 30, when the stay limit would be increased to 90 days provided the campground does not remain at 100 percent capacity for three (3) consecutive nights. If this limit is reached, the 14 day limit will be placed into effect for the remainder of the fiscal year.
LS		**B**	**C**	**D**	**E**	**RR-1.1.14:** Public lands adjacent to Painted Rock Petroglyph Campground (T4S, R7W, Sections 30-32; T4S, R8W, Sections 13, 14, 24, 25; T5S, R7W, Sections 5-8, 17, 20; and T5S, R8W, Sections 1-3, 10-12; approximately 10,000 acres) would remain closed to camping and motorized access.
LS		**B**	**C**	**D**	**E**	**RR-1.1.15:** The Painted Rock Petroglyph Campground and public use site (approximately 300 acres) would be closed to all locatable minerals exploration and development, geophysical exploration, and mineral material sales. Public lands would be recommended for withdrawal to all mineral location and entry.
LS		**B**	**C**	**D**	**E**	**RR-1.1.16:** Public lands adjacent to Painted Rock Petroglyph Campground (T4S, R7W, Sections 30-32; T4S, R8W, Sections 13, 14, 24, 25; T5S, R7W, Sections 5-8, 17, 20; and T5S, R8W, Sections 1-3, 10-12; approximately 10,000 acres) would be closed to seismic exploration and mineral material sales.
LS		**B**	**C**	**D**	**E**	**RR-1.1.17:** The Painted Rock Petroglyph Campground and surrounding area (approximately 10,000 acres) would remain open to all non-renewable leasable minerals actions (including geothermal and sodium), but any lease would contain a No surface occupancy stipulation
Objective 1.2: In areas with recreation-dependant economies, manage recreation resources in cooperation with local communities.						
Ajo SRMA (Alternatives B, C and E)						
LS		**B**	**C**		**E**	**RR-1.2.1:** The Ajo SRMA would be established (177,800 acres) with a "Community" market strategy. The market is local and seasonal residents who use this rural southwest Arizona locale as a gateway to public lands, other Federal lands and Mexico.
LS		**B**	**C**		**E**	**RR-1.2.2:** The Ajo Desert RMZ would be established (155,500 acres) for self directed opportunities for motorized and non-motorized exploration of the Sonoran Desert.
LS		**B**	**C**		**E**	**RR-1.2.3:** For the Ajo Desert RMZ, the physical, social and administrative settings would be 14 percent front country, 3 percent passage and 83 percent back country.
LS		**B**	**C**		**E**	**RR-1.2.4:** The Gateway RMZ would be established (19,900 acres) for local attractions and opportunities that highlight the surrounding public lands.
LS		**B**	**C**		**E**	**RR-1.2.5:** For the Gateway RMZ, the physical, social and administrative settings would be 100 percent community interface.
LS		**B**	**C**		**E**	**RR-1.2.6:** The Gunsight Wash RMZ would be established (2,500 acres) for remote winter camping and portal to adjacent public lands.

Goal 1: ***Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**	**C**		**E**	**RR-1.2.7:** For the Gunsight Wash RMZ, the physical, social and administrative settings would be 100 percent front country.
LS				**D**		In Alternative D, recreation of the Ajo Block would be managed as an ERMA; see**RR-2.1.1.**
Management Actions and Allowable Uses for Ajo Desert RMZ						
LS		**B**	**C**		**E**	**RR-1.2.8:** The designated travel system would predominately consist of roads maintained at levels 1 to 3. Major access roads and pullouts could be maintained at level 5.
LS		**B**	**C**		**E**	**RR — 1.2.9:** A maximum camping stay would be established of seven days per party. Persons may occupy any one site or multiple sites within a 25 mile radius on public lands not closed or otherwise restricted to camping for a total period of not more than seven (7) days within a 28 day period. When the seven (7) day limit has been reached, the party must move 25 miles from site of last occupation, or off of public land. The authorized officer may give written permission for extension of the seven (7) day limit.
LS		**B**	**C**		**E**	**RR-1.2.10:** Competitive motorized speed events would not be authorized.
Management Actions and Allowable Uses for Gateway RMZ						
LS		**B**	**C**		**E**	**RR-1.2.11:** The designated travel system would predominately consist of roads suitable for two wheel drive maintained at levels 1 to 3, with up to 5 percent (6 to 9 miles) of the route network maintained at level 5 to provide access for dispersed camping and motorized sightseeing and hiking opportunities.
LS		**B**	**C**		**E**	**RR-1.2.12:** Visitor and management infrastructure would generally be moderate in scope and scale, but may include developed facilities which would include a system of primitive roads and trails that meet the desired recreation setting.
LS		**B**	**C**		**E**	**RR-1.2.13:** A 40-acre open area to accommodate motorized opportunities, such as unrestricted motocross bike riding, would be established with the provision that local partners would be sought to monitor and provide on-site management and educate users in environmental stewardship.
LS		**B**	**C**		**E**	**RR-1.2.14:** The Ajo Scenic Loop road would be established to interpret and educate local and seasonal visitors on adjacent public lands with the provision that local partners would be sought to monitor and provide on-site management and educate users in environmental stewardship.
LS		**B**	**C**		**E**	**RR-1.2.15:** Competitive motorized speed events would be authorized in the 40-acre open area.
LS		**B**	**C**		**E**	**RR-1.2.16:** The 40-acre open use motocross site would be closed to mineral material sales and recommended for withdrawal from mineral location.
LS		**B**	**C**		**E**	**RR-1.2.17:** The 40-acre open use motocross site would remain open to all non-renewable leasable minerals actions, but any lease would contain a No Surface Occupancy stipulation with no exceptions, waivers, or modifications geothermal resources and sodium.
Management Actions and Allowable Uses for Gunsight Wash RMZ						
LS		**B**	**C**		**E**	**RR-1.2.18:** The Gunsight Wash area (T14S, R5W, Sections 2-4 and 9-11; approximately 2,500 acres) would be developed as a managed campground. Camping would be limited to designated sites. Fees could be established as needed per the FLREA to meet objectives that would be addressed in a subsequent activity/business plan.
LS		**B**				**RR-1.2.19:** The designated travel system would predominately consist of roads suitable for two-wheel-drive access for RVs with at least 90 percent (8 miles) maintained at levels 3 to 5 to provide access for dispersed camping and motorized sightseeing and hiking opportunities.

Goal 1: *Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**				**RR-1.2.20:** At the Gunsight Wash Campground, the camping stay limit would be 14 days except during October 1 – April 30 when the stay limit would be increased to 120 days provided the campground does not remain at 100 percent capacity for three (3) consecutive nights. If this limit is reached the 14-day limit will be placed into effect for the remainder of the fiscal year.
LS		**B**	**C**		**E**	**RR-1.2.21:** The Gunsight Wash Campground would be closed to locatable minerals exploration and development, geophysical exploration, and mineral material sales. Public lands would be recommended for withdrawal to all mineral location and entry.
LS		**B**	**C**		**E**	**RR-1.2.22:** The Gunsight Wash Campground would remain open to all non-renewable leasable minerals but any lease would contain a No Surface Occupancy stipulation.
LS		**B**	**C**		**E**	**RR-1.2.23:** Controlled access, such as a center turning lane on Highway 85, would be secured with ADOT.
LS		**B**				**RR-1.2.24:** Standard and expanded amenity infrastructure would be provided.
LS			**C**		**E**	**RR-1.2.25:** At the Gunsight Wash Campground, the camping stay limit would be 14 days except during October 1 – April 30 when the stay limit would be increased to 60 days provided the campground does not remain at 100 percent capacity for three (3) consecutive nights. If this limit is reached the 14-day limit will be placed into effect for the remainder of the fiscal year.
LS			**C**		**E**	**RR-1.2.26:** Infrastructure would be limited to standard amenities.
LS			**C**		**E**	**RR-1.2.27:** The designated travel system would predominately consist of roads suitable for two-wheel-drive access for RVs with at least 40 percent (4 miles) maintained at levels 3 to 5 to provide access for dispersed camping and motorized sightseeing and hiking opportunities.
Buckeye Hills SRMA						
LS		**B**	**C**	**D**	**E**	**RR-1.2.28:** The Buckeye Hills SRMA would be established (47,900 acres) with a "Community" market strategy for residents of western Maricopa County.
LS		**B**				**RR-1.2.29:** The Buckeye Hills East RMZ would be established (25,800 acres) with an emphasis on motorized recreation opportunities adjacent to the communities of Buckeye, Avondale and Goodyear.
LS			**C**		**E**	**RR-1.2.30:** The Buckeye Hills East RMZ would be established (25,800 acres) for a balanced mix of motorized and non-motorized recreation opportunities adjacent to the communities of Buckeye, Avondale and Goodyear.
				D		**RR-1.2.31:** The Buckeye Hills East RMZ would be established (25,800 acres) with an emphasis on non-motorized recreation opportunities adjacent to the communities of Buckeye, Avondale, and Goodyear.
LS		**B**			**E**	**RR-1.2.32:** The physical, social, and administrative settings for the Buckeye Hills East RMZ would be 100 percent community interface.
LS			**C**	**D**		**RR-1.2.33:** The physical, social, and administrative settings for the Buckeye Hills East RMZ would be 100 percent front country.
LS		**B**	**C**		**E**	**RR-1.2.34:** The Buckeye Hills West RMZ would be established (22,100 acres) for dispersed recreational opportunities adjacent to the Buckeye Hills Recreation Area Regional County Park and the nearby Robbins Butte State Wildlife Area. The RMZ would be managed in partnership with Maricopa County and Arizona Game and Fish Department.
LS				**D**		**RR-1.2.35:** The Buckeye Hills West RMZ would be established (22,100 acres) for dispersed recreational opportunities and would be managed by the BLM in cooperation with Maricopa County and Arizona Game and Fish Department.
LS		**B**			**E**	**RR-1.2.36:** Physical, social and administrative settings for the Buckeye Hills West RMZ would be 100 percent front country.

Goal 1: *Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS			**C**		**E**	**RR-1.2.37:** Physical, social and administrative settings for the Buckeye Hills West RMZ would be 40 percent front country, 58 percent back country and 2 percent passage zone.
LS				**D**		**RR-1.2.38:** Physical, social and administrative settings for the Buckeye Hills West RMZ would be 96 percent back country and 4 percent passage zone.
Management Actions and Allowable Uses for Buckeye Hills East RMZ						
LS		**B**	**C**		**E**	**RR-1.2.39:** The RMZ would be established as a Special Management Area (SMA) and an Individual Special Recreation Permit (ISRP) program may be established to allow for special management and protection of the SMA in partnership with Maricopa County and the Arizona Game and Fish Department. Through a Cooperative Management Agreement, partners may be authorized to share in the collection and management of fees.
LS		**B**	**C**		**E**	**RR-1.2.40:** The designated travel system would predominately consist of roads maintained at levels 1 to 3. Access roads could be maintained at level 5.
LS		**B**				**RR-1.2.41:** Up to six staging/parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables, and fire rings (up to 30 acres). Up to two large staging areas could be developed not to exceed 10 acres each.
LS			**C**		**E**	**RR-1.2.42:** Up to six staging/parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables, and fire rings (up to 30 acres). One large staging area could be developed not to exceed 10 acres.
LS				**D**		**RR-1.2.43:** Up to four staging/parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables, and fire rings (up to 20 acres).
LS		**B**	**C**	**D**	**E**	**RR-1.2.44:** Vehicle-based camping would be limited to existing or designated sites.
LS		**B**	**C**		**E**	**RR-1.2.45:** Primitive roads or trails, especially connector and loop routes, would be developed for a diversity of users
LS				**D**		**RR-1.2.46:** Up to 50 percent of the primitive roads (approximately 63 miles) would be converted to non-motorized trails. Trails could be developed to provide connector and loop opportunities for non-motorized users.
Management Actions and Allowable Uses for Buckeye Hills West RMZ						
LS		**B**	**C**		**E**	**RR-1.2.47:** The RMZ would be established as a Special Management Area (SMA) and an Individual Special Recreation Permit (ISRP) program may be established to allow for special management and protection of the SMA in partnership with Maricopa County and the Arizona Game and Fish Department. Through a Cooperative Management Agreement, partners may be authorized to share in the collection and management of fees.
LS		**B**	**C**		**E**	**RR-1.2.48:** Fees may be established as needed to meet activity or business plan objectives in accordance with the FLREA.
LS		**B**	**C**		**E**	**RR-1.2.49:** The designated travel system would predominately consist of roads maintained at levels 1 to 3.
LS		**B**	**C**		**E**	**RR-1.2.50:** Primitive roads or trails, especially connector and loop routes, would be developed for a diversity of users.
LS			**C**		**E**	**RR-1.2.51:** Overnight camping would be prohibited unless specifically authorized.
LS				**D**		**RR-1.2.52:** An SMA and ISRP program would not be established.
LS				**D**		**RR-1.2.53:** The designated travel system would predominately consist of primitive roads maintained at level 1.
Saddle Mountain SRMA (Alternatives B, C and E)						

Goal 1: *Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**	**C**		**E**	**RR-1.2.54:** The Saddle Mountain SRMA would be established (47,500 acres) with a "Community" market strategy for the community market strategy for residents of Maricopa County.
LS		**B**				**RR-1.2.55:** The Saddle Mountain RMZ would be established (47,500 acres) for motorized and non-motorized recreation opportunities.
LS		**B**				**RR-1.2.56:** For the Saddle Mountain RMZ, the physical, social and administrative settings would be 5 percent community interface, 83 percent front country, 10 percent back country and 1 percent passage.
LS			**C**		**E**	**RR-1.2.57:** The Saddle Mountain RMZ would be established (47,500 acres) for non-motorized recreation opportunities.
LS			**C**			**RR-1.2.58:** For the Saddle Mountain RMZ, the physical, social and administrative settings would be 0 percent community interface, 54 percent front country, 45 percent back country and 1 percent passage.
LS					**E**	**RR-1.2.59:** For the Saddle Mountain RMZ, the physical, social and administrative settings would be 5 percent community interface, 83 percent front country, 11 percent back country and 1 percent passage.
LS				**D**		**RR-1.2.60:** In Alternative D, recreation for Saddle Mountain would be managed as an ERMA; see **RR-2.1.1.**
Management Actions and Allowable Uses for Saddle Mountain RMZ						
LS		**B**				**RR-1.2.61:** The designated travel system would predominately consist of primitive roads maintained at levels 1 to 3 with up to 5 percent maintained at level 5 (approximately 5 miles) to provide access for motorized recreation opportunities.
LS			**C**		**E**	**RR-1.2.62:** The designated travel system would emphasize primitive access to non-motorized trail opportunities. Roads would predominately be maintained at level 1 with up to 10 percent maintained at level 3 (approximately 9 miles).
LS		**B**				**RR-1.2.63:** Primitive roads and trails would be developed to provide sustainable opportunities for motorized and non-motorized trail opportunities.
LS			**C**		**E**	**RR-1.2.64:** Non-motorized trails would be developed, or converted from motorized roads, to meet demand for hiking, equestrian, and mountain biking. Primitive roads would only be developed if needed to redirect motorized use from the Saddle Mountain.
LS			**C**		**E**	**RR-1.2.65:** Vehicle-based camping would be limited to existing or designated sites.
LS			**C**		**E**	**RR-1.2.66:** SRPs would not be authorized for motorized or non-motorized competitive events.
LS			**C**		**E**	**RR-1.2.67:** Motorized technical and specialized uses, such as rock-crawling and rock-hopping, would be prohibited.
San Tan Mountains SRMA						
LS		**B**				**RR-1.2.68:** The San Tan Mountains SRMA would be established (6,800 acres) with a "Community" market strategy. The market is residents and visitors to Pinal and eastern Maricopa counties.
LS		**B**				**RR-1. 2.69:** The San Tan Mountains RMZ would be established (6,800 acres) for non-motorized trails and associated outdoor recreation activities.
LS		**B**				**RR-1.2.70:** For the San Tan Mountains RMZ, the physical, social and administrative settings would be 69 percent front country and 31 percent back country.
LS				**D**		**RR-1.2.71:** In Alternatives D, recreation for San Tan Mountains would be managed as an ERMA; see **RR-2.1.1**.
San Tan Mountains RMZ						

Goal 1: ***Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**				**RR-1.2.72:** The RMZ would be established as a Special Management Area (SMA) and an Individual Special Recreation Permit (ISRP) program would be established to allow for special management and protection of the SMA in partnership with Maricopa and Pinal Counties. Through a Cooperative Management Agreement, partners would be authorized to share in the collection and management of fees.
LS		**B**				**RR-1.2.73:** Fees would be established as needed to meet activity or business plan objectives in accordance with the FLREA.
LS		**B**				**RR-1.2.74:** The designated travel system would predominately consist of roads maintained at levels 3 to 5 based on visitor expectations.
Objective 1.3: Manage 70 percent or more of the Lower Sonoran Planning Area recreation opportunities dependent on vast, open and undeveloped public lands.						
Gila Bend Mountains SRMA						
LS		**B**			**E**	**RR-1.3.1:** The Gila Bend Mountains SRMA would be established (253,800 acres), and would have an "Undeveloped" primary strategy targeted to desert explorers from western Maricopa County. To better manage dispersed recreation opportunities the BLM may provide major investments in visitor services however investments in visitor facilities would be minor.
LS			**C**			**RR-1.3.2:** The Gila Bend Mountains SRMA would be established (314,300 acres), and would have an "Undeveloped" primary strategy targeted to desert explorers from western Maricopa County. To better manage dispersed recreation opportunities the BLM may provide major investments in visitor services however investments in visitor facilities would be minor.
LS		**B**			**E**	**RR-1.3.3:** The Gila Bend Mountains RMZ would be established (253,700 acres) for visitors primarily seeking non-motorized dispersed recreation experiences in a remote back country setting.
LS			**C**			**RR-1.3.4:** The Gila Bend Mountains RMZ would be established (314,300 acres) for visitors primarily seeking non-motorized dispersed recreation experiences in a remote back country setting.
LS		**B**	**C**		**E**	**RR-1.3.5:** Physical, social and administrative settings would be established, with 15 percent front country, 82 percent back country, and 3 percent passage.
LS				**D**		**RR-1.3.6:** In Alternative D, recreation for the Gila Bend Mountains would be managed as an ERMA; see **RR-2.1.1**.
Gila Bend Mountains RMZ						
LS		**B**	**C**		**E**	**RR-1.3.7:** To provide a rugged primitive motorized experience, 90 percent of the designated motor vehicle travel system (324 – 465 miles) would consist of primitive roads maintained at level 1, but up to 3 percent (11-16 miles) could be maintained at level 3-5 to allow for two-wheel-drive access.
LS		**B**	**C**		**E**	**RR-1.3.8:** Standard camping amenities, interpretive displays, and improved access would be constructed at the Sundad public use site to facilitate visitation.
LS		**B**	**C**		**E**	**RR-1.3.9:** Areas of disturbance greater than 2 acres would be rehabilitated back to natural condition and group limits may be established to prevent further resource degradation.
Arlington SRMA						
LS		**B**			**E**	**RR-1.3.10:** The Arlington SRMA would be established (60,600 acres), and would have a "Destination" primary strategy targeted to visitors primarily seeking dispersed motorized recreation or a family oriented riding experience in a remote Sonoran desert landscape.
LS		**B**			**E**	**RR-1.3.11:** The Arlington RMZ would be established (60,600) for visitors primarily seeking dispersed motorized recreation or a family oriented riding experience in a remote Sonoran desert landscape.

Goal 1: ***Provide quality recreation opportunities and experiences that are derived from public land resource values and responsive to visitor demand.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**			**E**	**RR-1.3.12:** Physical, social and administrative settings for the Arlington RMZ would be comprised of 100 percent front country.
Arlington RMZ						
LS		**B**			**E**	**RR-1.3.13:** The designated motor vehicle travel system would consist of primitive roads maintained at level 1 with up to 10 percent of the network (19 miles) maintained at level 3 and up to 30 percent (60 miles) maintained at level 5 to allow for two-wheel-drive access.
LS		**B**			**E**	**RR-1.3.14:** Up to 25 miles of new roads may be constructed as needed to connect loop routes to provide opportunities for a family riding experience. Existing roads could be re-aligned to improve resource management or public safety.
LS		**B**			**E**	**RR-1.3.15:** Up to two staging areas would be developed with standard amenity facilities and limited to a maximum of 10 acres each.
Painted Rock Mountains SRMA						
LS		**B**				**RR-1.3.16:** The Painted Rock Mountains SRMA would be established (approximately 41,300 acres), and would have an "Undeveloped" primary market strategy targeted to the local/regional communities. The BLM would invest in visitor services but make minimal investment in facilities, recognizing that visitors value recreational opportunities of the Painted Rock Mountains that are produced by the vast undeveloped and remote character of the landscape.
LS		**B**				**RR-1.3.18:** Physical, social and administrative settings would be established with front country comprising 100 percent of the SRMA.
LS		**B**				**RR-1.3.19:** The designated motor vehicle travel system would consist primarily of primitive roads maintained at levels 1 to 3, but up to 5 percent of the route network could be maintained at level 5 to provide two-wheel-drive passenger car access to public use cultural sites, day-use, and camping facilities.
LS		**B**				**RR-1.3.20:** One parking / staging area, not exceeding five acres in size, would be constructed.
LS			**C**	**D**	**E**	**RR-1.3.21:** In Alternatives C, D, and E, recreation for Painted Rock Mountains would be managed as an ERMA; see **RR-2.1.1.**

Goal 2: ***Balance the provision of recreation opportunities and experiences with other resource uses.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions & Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Upon entry to the LSFO area, 75 percent of visitors will become aware they are on public lands and 95 percent of visitors will be satisfied with their recreation opportunities and experiences.						
LS				**D**		**RR-2.1.1:** Recreation of the Ajo, Gila Bend Mountains, Arlington, Painted Rock Mountains, and Saddle Mountain areas would be managed as an ERMA. Recreation opportunities and amenities would not be proactively managed and developed except in the case of conflict with other resource uses.(for example a campground would not be developed at Gunsight Wash unless a biological opinion indicated continued dispersed camping was harming a priority wildlife species)
LS			**C**		**E**	**RR-2.1.2:** The San Tan Mountains area would be managed for recreation resources by Maricopa County.
LS		**B**	**C**	**D**	**E**	**RR-2.1.3:** The Sentinel Plain area would be established and managed as a special management area within an ERMA. Access to the area would require the Barry M. Goldwater Air Force Range entry and public safety permit (for the BLM, these are managed as Individual Special Recreation Permit.

Goal 2: *Balance the provision of recreation opportunities and experiences with other resource uses.*						
Applicable Decision Area		Applicable Alternative				Management Actions & Allowable Uses
LS	SDNM	B	C	D	E	
LS				D		**RR-2.1.4:** The designated travel system would predominately consist of roads maintained at levels 1 to 3. Major access roads and pullouts could be maintained at level 5.
LS				D		**RR-2.1.5:** Public lands within the Cuerda de Lena ACEC near Ajo would be closed to public access for all recreation uses including SRPs, during March 15 – July 15 or as determined by the Sonoran Pronghorn Recovery Team.
General Recreation Management Actions and Allowable Uses						
Camping						
LS		B	C	D	E	**RR-2.1.6:** Camping on all lands open to the public would be allowed in accordance with 43 CFR 8365.
LS		B	C	D	E	**RR-2.1.7:** Except as otherwise provided, camping would continue to be limited to no more than a period of 14 days within any period of 28 consecutive days and, after the 14th day of occupation, the camper would be required to move outside of at least a 25-mile radius of the previous location until the 29th day since initial occupation.
LS		B	C	D	E	**RR-2.1.8:** Self-contained or vehicle-based camping would be permitted within 100 feet of the centerline of designated or existing routes. Cross-country travel to campsites would not be permitted.
LS		B	C	D	E	**RR-2.1.9:** LTVAs would not be allocated.
LS		B	C	D	E	**RR-2.1.10:** Camping facilities and length-of-stay limits may be developed and adjusted to sustain the prescribed settings and attain the desired objectives of the RMA(s) for dispersed camping, extended camping areas, and short-term camping areas.
LS		B	C	D	E	**RR-2.1.11:** Collection of saguaro cacti skeletons for personal use or campfire burning would be prohibited.
LS		B	C	D	E	**RR-2.1.12:** Collection of dead, downed and detached ironwood and mesquite for any use would be limited to three pieces at any one time unless otherwise restricted.
LS				D		**RR-2.1.13:** Collection of firewood would be prohibited at developed recreation sites.
Target Shooting						
LS		B	C	D	E	**RR-2.1.14:** Discharge of firearms would be allowed on BLM public lands except as specifically restricted in this land use plan or prohibited by state law. This activity may be restricted or prohibited in specific areas where public safety and resource conflicts exist.
Special Recreation Permits (SRPs)						
LS		B	C	D	E	**RR-2.1.15:** At the discretion of the authorized officer, special recreation permits (SRPs) would be authorized on a case-by-case basis as outlined in 43 CFR 2930.5. See Appendix R, *Benefits Based Recreation Worksheets* (p. 1295) for general permit guidance.
LS		B	C	D	E	**RR-2.1.16:** Certified weed-free feed would be required for all equestrian and stock animal uses authorized under SRPs.
LS		B	C	D	E	**RR-2.1.17:** Except as otherwise provided, motorized competitive speed events would not be permitted.
Paintball Activities						
LS		B	C		E	**RR-2.1.18:** Paintball activities would not be allowed in WA's, ACECs and SRMAs. Paintball activities will be allowed beyond 0.25 miles of any established facility or site, campground, residence, trailhead, road, staging area, Special Designation and other areas as posted. Paintball activities would be restricted in accordance with any applicable local and state law.
LS				D		**RR-2.1.19:** Paintball activities would be prohibited.
Geocaching Activities						

Goal 2: *Balance the provision of recreation opportunities and experiences with other resource uses.*						
Applicable Decision Area		Applicable Alternative				Management Actions & Allowable Uses
LS	SDNM	B	C	D	E	
LS		B	C		E	**RR-2.1.20:** An SRP would not be required if the geocaching activity is non-commercial, complies with land use decisions and designations, does not award cash prizes, is not publicly advertised, poses minimal risk for damage to public land or related water resource values, and generally requires no monitoring.
LS				D		**RR-2.1.21:** Geocache activities would be prohibited.

Goal 3: *Recreation opportunities and experiences are derived from the objects and resource values for which the SDNM was established.*						
Applicable Decision Area		Applicable Alternatives				Management Actions & Allowable Uses
LS	SDNM	B	C	D	E	
Objective 3.1: Upon entry to the SDNM, all visitors realize they are in an important natural and historic landscape.						
Sonoran Desert National Monument (SDNM) SRMA						
	SDNM	B	C		E	**RR-3.1.1:** The SDNM SRMA would be established (approximately 486,400 acres) and would have a "Destination" primary market strategy targeted to a regional/national market. The BLM would invest in facilities and visitor assistance, recognizing that national and regional visitors and constituents value the SDNM as a recreation-tourism destination.
	SDNM	B	C		E	**RR-3.1.2:** The Anza NHT RMZ would be established within the SDNM SRMA (approximately 52,800 acres). This management zone would be directed at visitors seeking to discover, tour, and learn about the Anza National Historic Trail, Arizona history, and natural history of the Sonoran Desert.
	SDNM	B	C		E	**RR-3.1.3:** A "desert back country" RMZ would be established within the SDNM SRMA (approximately 433,600 acres). This management zone would be directed at visitors seeking an undeveloped, back country experience with resource-dependent activities such as hunting, camping, hiking, sightseeing, and four-wheel-drive touring.
	SDNM			D		**RR-3.1.4:** The SDNM would be established as a SRMA (approximately 486,400 acres) and would have an "Undeveloped" primary market strategy targeted to a regional/national market. The BLM would invest in visitor assistance but make only minimal investments in facilities, recognizing that national and regional visitors and constituents value recreational opportunities of the SDNM that are produced by the vast, undeveloped, and remote character of the landscape.
	SDNM			D		**RR-3.1.5:** Separate zones of management for the Juan Bautista de Anza National Historic Trail and remainder of the SDNM would not be established. The SDNM SRMA would be managed in its entirety as a RMZ for visitors seeking an undeveloped, back country experience along a historic trail, and for resource-dependent activities such as hunting, camping, hiking, sightseeing, and four-wheel-drive touring.
	SDNM	B				**RR-3.1.6:** Physical, social and administrative settings would be established for the Anza National Historic Trail RMZ, with front country comprising approximately 27 percent, back country 72 percent, and passage 1 percent.
	SDNM		C			**RR-3.1.7:** Physical, social, and administrative settings would be established for the Anza National Historic Trail RMZ, with front country comprising approximately 31 percent, back country 67 percent, and passage 2 percent.
	SDNM				E	**RR-3.1.8:** Physical, social, and administrative settings would be established for the Anza National Historic Trail RMZ, with front country comprising approximately 45 percent, back country 55 percent, and passage 1 percent.
	SDNM	B				**RR-3.1.9:** Physical, social, and administrative settings would be established for the Desert back country RMZ, with front country comprising approximately 16 percent, back country 84 percent, and passage 3 percent.

Goal 3: ***Recreation opportunities and experiences are derived from the objects and resource values for which the SDNM was established.***						
Applicable Decision Area		**Applicable Alternatives**				**Management Actions & Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
	SDNM		**C**			**RR-3.1.10:** Physical, social, and administrative settings would be established for the Desert back country RMZ, with front country comprising approximately 9 percent, back country 91 percent, and passage 3 percent.
	SDNM				**E**	**RR-3.1.11:** Physical, social, and administrative settings would be established for the Desert back country RMZ, with front country comprising approximately 13 percent, back country 87 percent, and passage 2 percent.
	SDNM			**D**		**RR-3.1.12:** Physical, social, and administrative settings would be established for the Sonoran Desert National Monument RMZ, with front country comprising approximately 8 percent of the SRMA. The back country setting would comprise approximately 92 percent and passage 2 percent of the remainder of the Monument.
Anza National Historic Trail RMZ						
	SDNM	**B**	**C**		**E**	**RR-3.1.11:** The motor vehicle travel system would consist primarily of primitive roads maintained at levels 1 to 3, but up to 20 percent of the route network would be maintained at level 5 to provide two-wheel-drive passenger car access to public use cultural sites, day-use, and camping facilities.
Desert Back Country RMZ						
	SDNM	**B**	**C**		**E**	**RR-3.1.12:** The motor vehicle travel system would consist primarily of primitive roads maintained at levels 1 to 3, but up to 5 percent of the route network would be maintained at level 5 to provide two-wheel-drive passenger car access to public use cultural sites, day-use, and camping facilities.
Sonoran Desert National Monument RMZ						
	SDNM			**D**		**RR-3.1.13:** The designated motor vehicle travel system would consist entirely of primitive roads maintained at levels 1 to 3. Maintenance would not be provided for two-wheel-drive passenger car access.
Objective 3.2: Impacts to Monument objects resulting from recreation use do not exceed 2001 levels.						
General Recreation Management Actions & Allowable Uses						
Camping and Facilities						
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.1:** Unless otherwise regulated, camping length-of-stay is limited to no more than 14 days within any period of 28 consecutive days. After the 14th day of occupation, the camper would be required to move at least 25 miles from the previous location.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.2:** Collection of native vegetation as firewood would be prohibited in front country and passage settings.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.3:** Visitor and management infrastructure would be constructed and maintained to achieve the primary market strategy and outcome objective(s).
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.4:** Visitor and management infrastructure would be constructed and maintained to accommodate visitation in balance with protection of Monument objects; would be modest in scope and scale; and would be designed to blend with the dominant features of the landscape.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.5:** Visitor and management infrastructure would be placed on non-Monument lands, where possible.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.6:** Activities, vehicles, and group sizes would be limited to designated sites and lengths of stay; types and speeds; and numbers as deemed necessary to protect Monument objects.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.7:** The designated non-motorized travel system would consist primarily of existing vehicle routes; however, construction of short segments of new vehicle routes to provide experience opportunities consistent with the outcome objective(s) of management zones would be allowed.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.8:** Standards for the management of recreation impacts to objects of the SDNM will be established and monitored by the limits of acceptable change (LAC) method.

Goal 3: ***Recreation opportunities and experiences are derived from the objects and resource values for which the SDNM was established.***						
Applicable Decision Area		**Applicable Alternatives**				**Management Actions & Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Special Recreation Permits (SRPs)						
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.9:** At the discretion of the authorized officer, SRPs would be authorized on a case-by-case basis as outlined in 43 CFR 2930.5 as well as the decisions below and as described in Appendix Q, *Recreation Settings and Descriptions* (p. 1285).
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.10:** Competitive motor sports would not be allowed in the SDNM SRMA.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.11:** Organized groups numbering greater than 25 participants will require a special recreation permit.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.12:** To assure protection of Monument objects, permits will not be issued for organized groups of more than 200 participants at one site.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.13:** All commercial, other competitive, and vendor activities would be permitted on a case-by-case basis if Monument objects are protected.
	SDNM	**B**	**C**		**E**	**RR-3.2.14:** A SRP is not required for geocaching if the activity is not commercial, complies with land use decisions and designations, does not award cash prizes, is not publicly advertised, poses minimal risk for damage to public land or related water resource values, and generally requires no monitoring.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.15:** Certified weed-free feed would be required for all equestrian and stock animal uses authorized under SRPs.
	SDNM	**B**	**C**	**D**	**E**	**RR-3.2.16:** The Sand Tanks Mountains area of the SDNM commonly known as "Area A" would continue to be managed as a special management area that requires a Barry M. Goldwater Air Force Range entry and public safety permit for access (for the BLM, these are managed as Individual Special Recreation Permit).
Paintball Activities						
	SDNM	**B**	**C**		**E**	**RR-3.2.17:** Paintball activities would be prohibited on the SDNM.
Geocaching Activities						
	SDNM			**D**		**RR-2.1.18:** Geocache activities would be prohibited on the SDNM.

Recreation Management Implementation Actions for the SDNM						
Recreational Target Shooting						
	SDNM	**B**				**RR-3.2.18:** Recreational target shooting would be prohibited on approximately 389,989 acres, or 80.2 percent, of the SDNM determined to be unsuitable for this activity due to a prevalence of Monument objects. Recreational target shooting would continue on approximately 96,411 acres, or 19.8 percent, of the SDNM where Monument objects are not prevalent. Hunting would be allowed in accordance with applicable federal, state and local laws. See Map 2–13b and Appendix G, *Sonoran Desert National Monument Recreational Target Shooting Analysis* (p. 1183).
	SDNM		**C**			**RR-3.2.19:** Recreational target shooting would be prohibited on approximately 485,264 acres, or 99.8 percent, of the SDNM determined to be unsuitable for continued recreational target shooting. Recreational target shooting would continue in five areas totaling 1,136 acres, or 0.2 percent, of the SDNM where it was found to be potentially moderately or highly suitable. Hunting would be allowed in accordance with applicable federal, state and local laws. (See Map 2–13c and Appendix G, *Sonoran Desert National Monument Recreational Target Shooting Analysis* (p. 1183).)
	SDNM			**D**	**E**	**RR-3.2.20:** Recreational target shooting would not be allowed in the SDNM SRMA. Hunting would be allowed in accordance with applicable federal, state and local laws.

Allocation Summaries

Summaries of allocations, by market strategy and setting character, of SRMAs and ERMAs for the Planning Areas are shown in Table 2.17, "Recreation Allocations by Decision Area for LSFO and SDNM" (p. 178) and Table 2.18, "Recreation Settings by Decision Area" (p. 178). While existing land use plans allocated public lands to SRMAs (Alternative A), these allocations were not made to specific market strategies and thus are described as "undefined."

Table 2.17. Recreation Allocations by Decision Area for LSFO and SDNM

Recreation Market Strategy	Alternative (BLM Acres)				
	A	B	C	D	E
LSFO					
Undefined SRMA	285,000 (30%)	-	-	-	-
Destination	0	112,900 (12%)	52,300 (6%)	52,300 (6%)	112,900 (12%)
Community	0	280,000 (30%)	273,200 (29%)	47,900 (5%)	273,200 (29%)
Undeveloped	0	253,700 (27%)	314,300 (34%)	-	253,700 (27%)
ERMA	645,200 (70%)	283,600 (31%)	290,400 (31%)	830,000 (89%	290,400 (31%)
SDNM					
Undefined SRMA	146,600 (30%)	-	-	-	-
Destination	-	486,400 (100%)	486,400 (100%)	-	486,400 (100%)
Undeveloped	-	-	-	486,400 (100%)	-
ERMA	339,800 (70%)	-	-	-	-

Table 2.18. Recreation Settings by Decision Area

Setting	Alternative (BLM Acres)			
	B	C	D	E
LSFO				
Community Interface	71,300 (9%)	19,900 (3%)	-	48,600 (8%)
Front Country	263,300 (34%)	186,300 (29%)	78,100 (78%)	244,000 (38%)
Back Country	347,200 (45%)	423,100 (66%)	21,600 (22%)	345,100 (53%)
Passage	98,000 (13%)	11,000 (2%)	500 (0.005%)	8,800 (1%)
SDNM				
Community Interface	-	-	-	-
Front Country	107,200 (22%)	55,500 (11%)	39,000 (8%)	78,700 (16%)
Back Country	377,600 (78%)	429,000 (88%)	446,200 (92%)	406,500 (84%)
Passage	1,600 (2%)	1,600 (3%)	1,300 (2%)	1,200 (2%)

Administrative Actions

- Coordinate with partners and nearby land owners/managers to develop joint campgrounds on and off public lands to provide for public camping needs.
- Develop partnerships and volunteer opportunities with local clubs, organizations, and communities to maintain and monitor routes, recreation sites, and other areas.
- Develop brochures, maps, and information sheets to disseminate recreation use information to the public
- Coordinate with adjoining landowners; Maricopa, Pima, and Pinal counties; and local communities to enhance visitor and resident safety, improve resource protection, and manage recreation use and access that is compatible with protecting resources.

- Plan, designate, and develop recreation areas, routes, trails, tours, and management strategies through interdisciplinary plans with community and user input. Project plans will establish use indicators and standards for monitoring and evaluation. All development must be compatible with SRMAs, RMZs, VRM classes, and resource management objectives. Areas may be developed as needed for the following purposes:
    - Protecting resources,
    - Improving visitor safety,
    - Maintaining desired recreational setting and experiences.

Specific to the SDNM Decision Area.

- Coordinate with partners and nearby land owners/managers to develop regional shooting ranges outside the SDNM boundaries to support concentrated recreational target-shooting activities.
- Coordinate with partners and nearby land owners/managers to develop joint campgrounds outside the SDNM boundaries to provide for public camping needs.

2.8.5. TRAVEL MANAGEMENT (TM)

Comprehensive travel management (TM) strives to provide manageable access to public lands while balancing resource protection. The allocation of areas as open, closed or limited to OHV, also described as "off-road vehicles" in 43 CFR 8340-8342, directs the management approach for vehicular travel on public lands. Implementation-level actions such as designating routes as part of a planned network help create a balance between human use and resource protection. Administrative uses of vehicles such as military, fire, or police actions are expressly defined as not being an off-road vehicle and are therefore exempt from vehicle regulations 43 CFR 8342.

Open-area allocation, where cross-country travel is allowed, is largely unused in central Arizona due to resource constraints presented by efforts to protect Sonoran Desert Tortoise, other wildlife disturbance; and concerns about public safety, such as those presented by abandoned mines. Several policies issued by national and Arizona State Office BLM direct local offices to be sensitive to resources/resource uses that may be affected by route designation. These policies include direction to:

- Complete route designation within 5 years of RMP completion (BLM Land Use Planning Handbook 1600-1).
- Follow archaeological and biological policies to ensure land health and compliance with protection laws. Specifically, IM-2007-030 and State manual supplements address National Historic Preservation Act Section 106 compliance for archaeological survey requirements where the Federal action of designating the route network would have an effect on cultural resources.
- Not designate routes within wilderness study areas or lands managed to protect wilderness characteristics. Specifically, IM 2009-132 addresses the designation of routes in these areas, indicating that routes will not be designated as roads, trails or primitive roads and would remain as "routes" with no maintenance requirements compiled by the BLM's Facilities and Asset Management System (FAMS) for future funding or specific management would occur.
- Implement travel management (IM-2008-014) by addressing all routes, motorized and non-motorized, for designation for public or administrative use.
- Designate transportation assets as roads, primitive roads, and trails using the travel-management process (IM 2006-014). (See Appendix U, *Definition of Transportation Asset Type, Functional Class, Maintenance Intensity* (p. 1321)).

In this plan, the inventoried routes in the SDNM would be the basis for transportation assets designations as roads, primitive roads, or trails as defined in Appendix U, *Definition of Transportation Asset Type, Functional Class, Maintenance Intensity* (p. 1321). Routes in the Lower Sonoran Decision Area, outside the SDNM, would be designated within 5 years of RMP approval. Currently, all routes in the Lower Sonoran have been evaluated for potential conflict with the goals and objectives of resource programs and for their necessity for public use. Model route networks have been created for Alternatives B and D to assess the possible impacts to the resource programs when the actual route designations are completed. No individual route designations have been enacted, not even for ACECs or special wildlife management areas.

Current Temporary Closure on the SDNM:

A temporary closure is currently in place in the SDNM to restore damaged lands predominately located north of SR 238 in the vicinity of the Anza NHT. No camping or vehicle use is permitted on 54,817 acres, including 89 miles of existing primitive roads. This temporary closure began on June 13, 2008 and is now under a court ordered settlement agreement. It is to remain in effect until the RMP is approved or when the damaged lands are restored-whichever is later.

2.8.5.1. Existing Management Decisions, Alternative A — No Action For Travel Management

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Goldwater Amendment – Lower Gila South Resource Management Plan (1990):

(Applicable to public lands in the Sand Tanks Mountains "Area A" within the SDNM and lands south of Interstate 8 named the Sentinel Plains.)

- Maintain and enforce public access permit requirements for visitation into Area A (Sand Tank Mountains) and other areas as required under Public Law 99-606.
- Designate the Sand Tank Mountains (Area A) and Sentinel Plain areas, and other lands under BLM jurisdiction, as limited off-road vehicle use areas, with vehicle use restricted to designated routes in ACECs and established roads elsewhere.
- Develop transportation plan for Area A.
- Permit no open or unrestricted OHV use areas or competitive OHV use or events.
- Prohibit public off-road travel or cross-country vehicle use in all areas.
- Adopt the US.S. Air Force General Vehicle Operating Rules.

Lower Gila North Management Framework Plan (1983):

(Applicable to public lands in the Saddle Mountain area.)

- No new roads would be allowed in the Saddle Mountain block of public land. About 5,500 acres area's center encompassing Saddle Mountain would be established as a recreation and rock hound area if Congress did not designate the lands as wilderness (RR-12).

Lower Gila Resource Management Plan Amendment (2005):

(Applicable to a portion of lands in the LSFO and all lands within the SDNM Planning Areas.)

- The Vekol Valley Grassland and Coffee Pot Botanical Area ACECs will be closed to recreational OHV use in accordance with 43 CFR, Part 8340, and Subpart 8342. (Not numbered)
- All public lands described in the MFP and RMP are designated as "limited" except wilderness, which is closed to motor vehicles, and relinquished portions of the BGR, which remain restricted to entry by permit only. OHV and special-recreation vehicles are limited to existing designated roads and vehicle routes. No unauthorized cross-country vehicle travel is permitted. Creation of unauthorized new trails, as well as widening or extension of existing trails, is not permitted (RR-9).
- Single- or multiple-use OHV and special-recreation vehicle areas, routes, and management strategies will be designated and developed through interdisciplinary plans. Planning shall address limits of acceptable change indicators and standards, conflicts, issues, and solutions to vehicle-management problems (RR-10).
- Roads and trails used as race courses will be evaluated for no action, closure, rehabilitation, or modification and authorization as race courses (RR-11).
- Site-specific inventories will be conducted to delineate existing roads and vehicle routes as requested by the authorized officer (RR-12).
- Approved hiking and equestrian trails are closed to unauthorized motorized use (RR-13).
- Road or area closures will be enacted where OHV or special-recreation vehicle use is determined to be inconsistent with established ROS classifications or such use is causing harm to natural or cultural resources (RR-14).
- Cross-country vehicle travel will be permitted only when specifically authorized to complete a task requiring such use, and only in areas where such use will not cause unnecessary or undue resource impacts (RR-15).
- OHV designations for relinquished portions of the BGR are retained – a permit is required for entry to these lands, and motorized travel is limited to designated, established routes (RR-16).
- Wilderness is closed to mechanized use. The provisions of existing wilderness-management plans and wildlife operations and maintenance plans pertaining to motorized and mechanized administrative uses in wilderness will remain in effect (RR-17).
- Self-contained or vehicle-based camping will be permitted within 50 feet of the centerline of designated or existing routes. Cross-country travel to campsites is not permitted (RR-54).

Phoenix Resource Management Plan (1989):

(Applicable to public lands in the extreme eastern part of the Planning Area.)

- The RMP presented both area designations and included language for route designations.
- The 6,800-acre San Tan Mountains Regional Park was retained as a Cooperative Recreation Management Area in association with Maricopa County Parks and Recreation. (Travel management decisions were addressed subsequently in the San Tan Mountains Regional Park Master Plan). This agreement expires in 2013.

SDNM Current Management Guidance (2002):

(Applicable to lands in the Sonoran Desert National Monument)

- For the purpose of protecting Monument objects, all motorized and mechanized vehicle use off road will be prohibited, except for emergency or authorized administrative purposes.
- In order to protect the public during operations at the adjacent BGR and to continue management practices that have resulted in an exceptionally well preserved natural resource, the current procedures for public travel and access to the portion of the Monument depicted as Area A shall remain in full force and effect, except to the extent that the USAF agrees to different procedures which the BLM determines are compatible with the protection of the objects identified in this proclamation.

2.8.5.2. Action Alternatives for Travel Management (TM)

Program Goals

- **Goal 1:** All public land should be classified as open, closed or limited per 43 CFR 8342.1.
- **Goal 2:** Public use, resource management, and regulatory needs are met by development of a travel management plan and implementation of a travel management system.
- **Goal 3:** Protect Monument objects and purposes from human impacts associated with motorized and non-motorized travel within the SDNM.
- **Goal 4 :** Protect Monument objects and resources, meet conservation and restoration goals, ensure sustainable public use and enjoyment, and satisfy public safety and regulatory requirements by developing a travel management plan and implement a sustainable and compatible travel management system.
- **Goal 5:** Manage the travel management system for the LSFO area to protect resources and maintain desired recreation experiences.

Land Use Allocations Summary

Table 2.19. Off-Highway Vehicle Area Designations by Alternative

Classification		Alternative (BLM Acres)			
	A	B	C	D	E
LSFO					
Open	0	40	0	0	40
Closed	110,700	101,800	101,800	378,300	152,800
Limited to existing roads and trails	819,500	0	0	0	0
Limited to Designated Routes	0*	828,360	828,360	551,900	777,360
Totals	*930,200*	*930,200*	*930,200*	*930,200*	*930,200*
SDNM					
Open	0	0	0	0	0
Closed	161,200	157,700	157,700	310,700	157,700

Limited to existing roads and trails	325,200	0	0	0	0
Limited to Designated Routes	0*	328,700	328,700	175,700	328,700
Totals	*486,400*	*486,400*	*486,400*	*486,400*	*486,400*
*The amount of closed lands is less in B-D alternatives than in alternative A because the Vekol ACEC, which is currently closed to motorized use, is not proposed to be carried forward, thereby adding the total of lands in the limited classification category.					

Table 2.20. Proposed Route Designation Table by Alternative

	Applicable Alternative				
	A	B	C	D	E
Total Route Inventory (Miles)	631.5	631.5	631.5	631.5	631.5
Total Proposed Route System (Miles)[1]	624.9	567.5	456.6	261.2	432.9
Road Closures (Miles)[2]	6.6	72	174.9	370.3	206.6
Route Closure Percentage[3]	1.0%	11.4%	27.7%	58.6%	32.7%
Current Asset Type	**(miles)**	**(miles)**	**(miles)**	**(miles)**	**(miles)**
Road - Maintained	17.7	32.6	24.6	24.6	32.6
Open	17.7	24.2	24.2	24.2	24.2
Limited to Admin Use Only	0	0.4	0.4	0.4	0.4
Closed	0	0	0	0	0
New	0	8	0	0	8
Primitive Road – Unmaintained	576.8	569.9	569.9	570.1	569.9
Open	570.2	494.4	358.1	200.0	331
Seasonally Limited (Closed April 1 to Sept. 15)	0	0	0	0	32.7
Seasonally Limited (Closed Feb. 1 to Sept.15)	0	0	37.3	0	0
Limited to vehicles 50” wide or less	0	3.9	0	0	0
Limited to Non-Motorized Use4	0	2.1	7.2	11	8.3
Limited to Admin Use Only	0	0	17.1	36.9	4.3
Closed	6.6	69.5	150.2	322	193.6
Trail	37	37	37	37	37
Open to non-motorized/ non-mechanized travel (wilderness trails)	37	37	37	37	37

[1] Total Proposed Route System (Miles) equals the sum of open roads, primitive roads, trails (including those limited by season, width, and non-motorized use), and new roads. The total excludes roads and primitive roads limited to administrative use. See Maps 2–15a, 2–15b, 2–15c, 2–15d, and 2–15e.

[2] Road Closures (Miles) equals the sum of closed roads, primitive roads, trails, primitive roads limited to administrative use, and primitive roads limited to non-motorized use.

[3] Route Closure Percentage equals the miles of road closure divided by the total route inventory (631.5 miles). Note: Primitive roads limited to non-motorized use are included here because no vehicular use would be permitted.

[4] Applies to the Anza NHT, where bicycles and handcarts would be allowed, but not motor vehicles.

Management Actions and Allowable Uses

Goal 1: *All public land should be classified as open, closed or limited per 43 CFR 8342.1.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Manage areas to sustain experiences of unstructured travel throughout the life of the plan using the OHV area allocation open.						
LS		**B**			**E**	**TM-1.1.1:** 40 acres would be designated as an open motorized and mechanized vehicle-use area in the Ajo SRMA (T12S R6W Sec4; Map 2-14b). Within this area, vehicles would not be restricted to vehicle routes. The area would be signed and fenced. Local partners would be sought to monitor use, provide on-site management, and educate users in environmental stewardship.
LS		**B**			**E**	**TM-1.1.2:** Within the 40-acre open area described under TM-1.1.1, campsite access would be allowed by any travel mode to any location.
Objective 1.2: Manage areas for resource protection, conservation, restoration, and public safety using the OHV area allocation closed.						
LS		**B**	**C**			**TM-1.2.1:** Approximately 101,800 acres would be closed to motorized use. These areas would include designated wilderness, an area around Painted Rock Campground and dam, and the Coffeepot Botanical ACEC.
LS				**D**		**TM-1.2.2:** Approximately 378,300 acres would be closed to motorized use. These areas would include designated wilderness areas, an area around Painted Rock Campground and dam, and allocated lands managed to protect wilderness characteristics.
LS					**E**	**TM-1.2.3:** Approximately 152,800 acres would be closed to motorized use. These areas would include designated wilderness, an area around Painted Rock Campground and dam, and allocated lands managed to protect wilderness characteristics.
LS	**SDNM**	**B**	**C**	**D**	**E**	**TM-1.2.4:** Camping would be allowed in closed areas when accessed by non-motorized, non-mechanized means.
LS	**SDNM**	**B**	**C**	**D**	**E**	**TM-1.2.5:** The use of wheeled game carriers would be prohibited in wilderness areas. Elsewhere, non-motorized, hand-powered, wheeled game carriers would be permitted to travel cross-country for the purpose of retrieving downed game. Retrieval of downed game by cross-country motor vehicle use is prohibited.
Objective 1.3: Manage areas by structuring travel for visitor use and enjoyment, resource protection, conservation, and restoration using the OHV area allocation limited over the lifetime of the plan.						
LS		**B**	**C**			**TM-1.3.1:** Approximately 828,360 acres would be limited to existing roads and trails (based on current BLM route inventories) until such time as route designations are completed. When this is completed, travel would be restricted to designated roads, primitive roads and trails. Non-motorized vehicles (e.g., bicycles, hang gliders, other devices for conveyance and stock drawn carts/wagons) would be limited to designated roads, primitive roads and trails.
LS			**C**			**TM-1.3.2:** The 40-acre parcel in the Ajo SRMA (T12S, R6W, Sec.4) used for motocross riding would be managed the same as the surrounding area where motorized and mechanized vehicles would be restricted to designated routes. The "motocross experience" area would be signed and fenced. A "motocross experience" primitive road would be designated within the fenced area. Local partners would be obtained to monitor use and provide training in environmental stewardship to users of the area and provide on-site management.
LS				**D**		**TM-1.3.3:** Same as alternative C except 551,900 acres would be limited to existing roads and trails until such time as route designations are completed. When this is completed, travel would be restricted to designated roads, primitive roads and trails.
LS				**D**		**TM-1.3.4:** The "motocross experience" primitive road in the 40-acre parcel (T12S, R6W, Sec.4) would be closed and rehabilitated. Motorized use in the 40-acre area would be limited to existing roads and trails until such time as route designations are completed. At that time, travel would be limited to designated primitive roads.

Goal 1: ***All public land should be classified as open, closed or limited per 43 CFR 8342.1.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS					**E**	**TM-1.3.5:** Same as Alternative B except motorized use of 777,360 acres would be limited to existing roads and trails until such time route designations are completed, at which time travel would be restricted to designated roads, primitive roads and trails.
LS		**B**	**C**		**E**	**TM-1.3.6:** One-time travel off of designated routes may be approved with written authorization from the authorized officer to access sick or injured livestock. Use of vehicles for livestock herding in a cross-country manner is prohibited.
LS		**B**	**C**	**D**	**E**	**TM-1.3.7:** The use of motorized or mechanized vehicles off designated routes would be prohibited in OHV areas designated as limited to designated routes, closed for motorized vehicles, and in all travel-management areas designated for non-motorized vehicles except as noted below: ● Motorized vehicles would be allowed to pull off 100 feet on either side of the centerline of a designated route for the purpose of camping as long as soils, drainages, and woody vegetation are not damaged. This use shall be monitored on a continuing basis. If monitoring results show effects that exceed limits of acceptable change, motorized vehicles will not be allowed to pull off a designated route 100 feet on either side of the centerline. ● Motorized uses would be required to stay within the designated route, with reasonable use of the shoulder and immediate roadside allowing for vehicle passage, emergency stopping, or parking unless otherwise posted. ● Outside of wilderness, hand-powered, non-motorized wheeled game carriers would be allowed to travel cross-country for the purpose of retrieving downed game. ● Motorized cross-country use will only be permitted with written authorization from the BLM authorized officer, or when necessary for emergency situations involving public health and safety.
LS		**B**	**C**	**D**	**E**	**TM-1.3.8:** Retrieval of downed game by cross-country motor vehicle use is prohibited.
Objective 1.4: Secure legal access to public lands at all designated entry points to public land within ten years of completing route designations.						
LS		**B**	**C**	**D**	**E**	**TM-1.4.1:** The BLM would enter into access agreements for long-term legal access.
LS		**B**	**C**	**D**	**E**	**TM-1.4.2:** The BLM would acquire easements or real property from private land owners or other jurisdictions as necessary to maintain or reestablish access to public lands.
LS		**B**	**C**	**D**	**E**	**TM-1.4.3:** Access to public lands along urban interface areas would be limited to designated legal access routes as established by travel management planning.

Goal 2: ***Public use, resource management, and regulatory needs are met by development of a Travel Management Plan and implementation of a travel management system.***						
Applicable Decision Area		**Applicable Alternative**				**Management Action and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Complete the designation of roads, primitive roads, and trails within 5 years of plan completion.						
LS		**B**	**C**	**D**	**E**	**TM-2.1.1:** A standardized method for identifying uses and impacts to routes and areas would be employed following established selection criteria and proposing route designations. An example of such a process is shown in Appendix S, *Route Evaluation Methodology & Impact Analysis* (p. 1311).

Goal 2: ***Public use, resource management, and regulatory needs are met by development of a Travel Management Plan and implementation of a travel management system.***						
Applicable Decision Area		**Applicable Alternative**				**Management Action and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**	**C**	**D**	**E**	**TM-2.1.2:** Criteria to guide route designations would be established based on management actions for recreation wildlife, vegetation, cultural resources, lands/realty, mining, and other resources or resource uses as appropriate. (See Section H.2.5, "Travel Management" (p. 1225)).
LS		**B**	**C**	**D**	**E**	**TM-2.1.3:** Mitigation strategies would be identified and used to reduce the impacts of travel routes and their use on the resources. Examples of typical actions are shown in Appendix T, *Route Mitigations* (p. 1319).
LS		**B**	**C**	**D**	**E**	**TM-2.1.4:** Route-designation decisions would be incorporated into planning for all resources or resource uses and would be based on the route networks portrayed on final designation maps and written guidance contained within travel management plans.
Objective 2.2: Delineate areas where community interests or a manageable geographic boundary exists and address landscape issues in a programmatic manner.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**TM-2.2.1:** The following travel management areas (TMAs) would be created. (See Maps 2-14b, 2—14c, 2–14d and 2–14e.)

Table 2.21: Travel Management Areas (Acres)

TMA	Total	BLM
Ajo	190,200	177,800
SDNM	496,400	486,400
Gila Bend Mountains	744,900	517,500
Globe/Miami	119,600	5,600
Rainbow Valley	349,100	108,400
Buckeye Hills	219,700	55,500
East Valley	497,700	15,000
Saddle Mountain	184,100	50,400

Goal 3: ***Protect Monument objects and purposes from human impacts associated with motorized and non-motorized travel within the SDNM.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 3.1: Close areas of the SDNM to motorized-vehicle activities for the purposes of protecting Monument objects and resources; and meeting associated conservation, restoration, and public safety goals over the lifetime of the plan.						
	SDNM	**B**	**C**		**E**	**TM-3.1.1:** Approximately 157,700 acres of designated wilderness would remain closed to motorized use.
	SDNM			**D**		**TM-3.1.2:** Approximately 310,700 acres would be closed to motorized use. These acres include designated wilderness and lands managed to protect wilderness characteristics.
Objective 3.2: Limit motorized vehicle use in certain SDNM areas to designated roads, primitive roads to minimize impacts to Monument objects; other resources; and to reduce or eliminate resource, visitor, and behavior-based conflicts over the lifetime of the plan.						
	SDNM	**B**	**C**		**E**	**TM-3.2.1:** Approximately 328,700 acres would be limited to designated roads, primitive roads and trails. All other vehicles (e.g., bicycles, hang gliders, stock drawn carts/wagons, and other devices for conveyance) would be limited to primitive roads designated as open for such use.
	SDNM			**D**		**TM-3.2.2:** Same as Alternative C except motorized travel and bicycle use in 175,700 acres would be limited to designated, primitive roads.

Goal 3: ***Protect Monument objects and purposes from human impacts associated with motorized and non-motorized travel within the SDNM.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
	SDNM	**B**	**C**	**D**	**E**	**TM-3.2.3:** Motorized vehicles would be required to be "street legal" (licensed and registered), display a valid Arizona OHV sticker, be compliant with current or future state, county or local licensing, certification or authorization requirements, and be operated by licensed drivers.
	SDNM			**D**		**TM-3.2.4:** The following vehicle types: all-terrain (ATV, UTV and quad), motorcycle (dirt and dual-sport), and vehicles weighing less than 1,800 pounds, would be prohibited on primitive roads.

Goal 4: ***Provide a comprehensive travel management system that supports protection of Monument objects, facilitates resource protection, and provides sustainable public use and enjoyment.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 4.1: Pursue and secure legal access when possible over the lifetime of the plan.						
	SDNM	**B**	**C**	**D**	**E**	**TM-4.1.1:** Legal or permissive access would be secured to all identified access points to designated routes within 10 years of final route designation.
	SDNM	**B**	**C**	**D**	**E**	**TM-4.1.2:** Access to public lands would be restricted along urban interface as needed to protect Monument values and objects or at the request of adjoining land owners.
Objective 4.2: Assign BLM road maintenance intensity levels on designated roads as a part of travel management planning and make adjustments as needed as maintenance of the travel management plans.						
	SDNM	**B**	**C**	**D**	**E**	**TM-4.2.1:** Roads and primitive roads could be redeveloped to meet either Level 5 maintenance intensity (the highest BLM standard) or the Level 3 standard as necessary to satisfy Objective 4.2 and prescriptions in TM-4.2.2 or TM-4.2.3. Level 1 roads are primitive and would not be maintained except to correct safety hazards or resource problems such as erosion.
	SDNM	**B**	**C**			**TM-4.2.2:** Over the life of the plan, up to 20 percent of designated Monument roads/primitive roads could be assigned to Level 5 maintenance standards (passenger-car access) or Level 3 maintenance standards. Level 5 and 3 maintenance level assignments would be adjusted or assigned as necessary to ensure that motorized travel routes: ● Are compatible with protection of Monument objects and resources; ● Achieve the Monument's desired social and managerial recreation settings; ● Meet established limits of acceptable change indicators and standards; ● Satisfy biological and ecological land health standards; ● Protect or mitigate effects on cultural resources; ● Ensure visitor and agency staff safety; ● Resolve erosion, air quality or resource-damage issues; ● Offer sustainable access to popular Monument features, as well as recreation and national historic trail attractions; and ● Meet water-quality standards for influenced drainages and watersheds. See Table 2.22: SDNM Road Maintenance Intensity Level Model (p. 189) for a model of potential maintenance level assignments for each alternative.

Goal 4: ***Provide a comprehensive travel management system that supports protection of Monument objects, facilitates resource protection, and provides sustainable public use and enjoyment.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
	SDNM			**D**	**E**	**TM-4.2.3**: Over the life of the plan, up to 10 percent of designated Monument roads/primitive roads could be assigned to Level 5 maintenance standards (passenger-car access) or Level 3 maintenance standards. Level 5 and 3 maintenance level assignments would be adjusted or assigned as necessary to ensure that motorized travel routes: (1) are compatible with protection of Monument objects and resources; (2) achieve the Monument's desired social and managerial recreation settings; (3) meet established limits of acceptable change indicators and standards; (4) satisfy biological and ecological land health standards; (5) protect or mitigate effects on cultural resources; (6) ensure visitor and agency staff safety; (7) resolve erosion, air quality or resource-damage issues; (8) offer sustainable access to popular Monument features, as well as recreation and national historic trail attractions; and (9) meet water-quality standards for influenced drainages and watersheds. See Table 2.22: SDNM Road Maintenance Intensity Level Model (p. 189) for a model of potential maintenance level assignments for each alternative.
	SDNM	**B**	**C**		**E**	**TM-4.2.4:** One-time travel off of designated routes may be approved with written authorization from the authorized officer to access sick or injured livestock. Use of vehicles for livestock herding is prohibited.
	SDNM	**B**	**C**	**D**	**E**	**TM-4.2.5:** Roads and primitive roads could be redeveloped to meet either Level 5 maintenance intensity (the highest BLM standard) or the Level 3 standard as necessary to satisfy Objective 4.2 and prescriptions described in TM-4.2.1 or TM-4.2.2. Level 1 roads are primitive and would not be maintained except to correct safety hazards.

Table 2.22: SDNM Road Maintenance Intensity Level Model & Potential BLM Road Maintenance Intensity Levels/Maximum Miles By Alternative

Maintenance Intensity Levels	**A**		**B**		**C**		**D**		**E**	
	5 or 3	**1**	**5 or 3**	**1**	**5 or 3**	**1**	**5 or 3**	**1**	**5 or 3**	**1**
Road miles maintained	18	0	106	0	81	0	27	0	41	0
Primitive road miles (not maintained)	0	578	0	423	0	355	0	246	0	363
*Total road miles available for travel**	568		531		403		235		404	

*From *Table 2.20: Proposed Route Designation Table by Alternative* (p. 184): the Total Proposed Route System minus Trail Miles equals the Total Road Miles Available for Travel.

Objective 4.3: Minimize the effects of the route system on the Monument and its objects and implement mitigation strategies as needed to resolve conflicts.						
	SDNM	**B**	**C**	**D**	**E**	**TM-4.3.1:** Mitigation strategies would be identified and required to reduce the effects of routes and their use. Examples of typical actions are shown in Appendix S, *Route Evaluation Methodology & Impact Analysis* (p. 1311).

Goal 5: ***Manage the travel management system to protect resources and maintain desired recreation experiences.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions & Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 5.1: Determine the compatibility of emerging issues such as new vehicle technology or new or proposed recreation uses or use areas such as technical vehicle-use sites or motorcycle-observed traills. Proposals for using new recreation technologies or activities would be evaluated and a decision made to proceed or deny the use or proposal as funding and staffing allows.						
LS		**B**	**C**	**D**	**E**	**TM-5.1.1:** Technical vehicle use sites or other specialized recreation sites would be delineated through activity level planning.

Goal 5: *Manage the travel management system to protect resources and maintain desired recreation experiences.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions & Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS		**B**	**C**	**D**	**E**	**TM-5.1.2:** Technical vehicle use sites would be evaluated and established on a case-by-case basis with community and user input. Sites would be developed as needed to ensure visitor safety, meet enthusiast needs, improve recreation experiences, and increasing recreation opportunities. Site plans would establish limits of acceptable change indicators and standards. All sites would be compatible with social and managerial recreation settings and VRM standards; would satisfy biological and ecological land health standards; would protect or mitigate cultural resources; and would meet water-quality standards for influenced drainages and watersheds.
LS	**SDNM**	**B**	**C**	**D**	**E**	**TM-5.1.3:** Travel Management assets or their maintenance intensity shall not be changed without NEPA and a travel plan amendment. Road maintenance activities can only be completed with approval of the authorized BLM officer. This includes all permitted activities that use designated routes such as ranching, mining and other authorized activities.
Objective 5.2: Proposals for new recreation technologies and activities would be evaluated when presented to determine impacts on Monument objects and resources. Such uses would be prohibited until research and analysis determines the use is fully compatible with Monument objects and resources. The BLM would respond to proposals immediately upon detection and determine their compatibility with Monument objects and resources as funding and staffing allows.						
	SDNM	**B**	**C**	**D**	**E**	**TM-5.2.1:** New travel technologies and uses would be evaluated on a case-by-case basis with community and user input. Compatibility evaluations would be developed as needed to ensure protection of Monument objects and resources, provide compatible and sustainable experiences based on Monument Objects and resources, and visitor safety. The compatibility analysis would establish limits of acceptable change indicators and standards. All uses would be compatible with protection of Monument objects, the Monument's social and managerial recreation settings and VRM standards; the Monuments biological and ecological land health standards; protection of cultural resources; and water-quality standards for influenced drainages and watersheds.

Goal 6: *Protect Monument objects and resources, meet conservation and restoration goals, ensure sustainable public use and enjoyment, and satisfy public safety and regulatory requirements by developing a travel management plan and implementing a sustainable and compatible travel management system.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 6.1: Plan and implement a networked system of roads, primitive roads and trails within 1 year of plan completion.						
	SDNM	**B**	**C**	**D**	**E**	**TM-6.1.1:** The use of motorized or mechanized vehicles off designated roads or primitive roads would be prohibited with the following management restrictions: ● Motorized and mechanized use would be limited to areas within the designated route with reasonable use of the shoulder and immediate roadside allowing for vehicle passage, emergency stopping, or parking unless otherwise posted. For the purposes of this plan, a reasonable use will be defined as up to 25 feet. ● Motorized and mechanized vehicles would be allowed to pull off a designated route 25 feet either side of centerline for the purpose of camping as long as soils, drainages, or woody vegetation are not damaged. This use shall be monitored on a continuing basis and if monitoring results show effects that exceed limits of acceptable change the 25 feet distance may be reduced.

Goal 6: ***Protect Monument objects and resources, meet conservation and restoration goals, ensure sustainable public use and enjoyment, and satisfy public safety and regulatory requirements by developing a travel management plan and implementing a sustainable and compatible travel management system.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
						● Non-motorized, hand-powered wheeled game carriers would be permitted to travel cross-country (except in wilderness areas) for the purpose of retrieving downed game on public lands.
	SDNM	**B**	**C**	**D**	**E**	**TM-6.1.2:** A travel management plan would be developed and implemented upon plan approval, including designating roads, primitive roads and trails that are open, closed or limited by use type or time, and allocating maintenance class.
Travel Management Implementation Actions for the SDNM						
	SDNM	**B**	**C**	**D**	**E**	**TM-6.1.3:** A network of routes would be designated upon plan approval to include roads, primitive roads and trails that are open, closed or limited in their use as specified in Table 2.20, "Proposed Route Designation Table by Alternative" (p. 184). (For route locations, refer to the route maps on the CD, web site, or hard copies by request to the LSFO.)
	SDNM	**B**	**C**	**D**	**E**	**TM-6.1.4:** Prepare and implement a travel management plan, including designating routes within five years of the SDNM's Record of Decision (ROD).
	SDNM	**B**	**C**	**D**	**E**	**TM-6.1.5:** Legal or permissive access will be secured to all designated routes within 10 years of final designation.
Note: Any additional implementation-level actions will be considered and addressed in the TMP.						

Administrative Actions

General.

- The development of standards for monitoring the route system will be directed by compliance with laws, regulations, and travel management plan goals and objectives
- Areas affected by legal off-route travel, such as law enforcement-pursuit and wildfire suppression, will be restored within one year of the incident.
- Agreements with local interest groups and communities will be established for long-term route maintenance and community support.
- Participate in regional or municipal transportation planning and promote appropriate legal access consistent with the land-use plan.
- Establish a framework for reviewing the travel management program and make necessary changes to meet land health standards, area management, and recreation goals.
- Casual and authorized recreational uses of the travel system will be addressed when authorizing actions. Where major arteries in the recreational route network would be truncated or considerably altered by the authorization, mitigation will be required
- Consider adjustments to route designations, including adding, removing, and redeveloping routes and access, when necessary. Criteria for route designation adjustments can be found in Section H.2.5, "Travel Management" (p. 1225).

- Develop brochures, maps, access guides, and information sheets to disseminate targeted recreation opportunity information to the public.
- Develop and maintain a monitoring system to support implementation and management of motorized and non-motorized use of the public lands, including routes and access points.
- Create an acquisition plan including a list of parcels where legal access needs to be secured.
- Implement route-mitigation techniques when designing and implementing the route system.
- Identify and manage for a wide range of issues in travel management areas.
- In areas where access permits are required, coordinate with other agencies that issue use permits on public lands to provide reasonable access for their permitted activities. For example, the BLM and AGFD will coordinate hunter access into permit-required access areas for hunters with valid hunting licenses for the affected hunting unit.
- Promote the establishment of additional areas open to motorized and/or non-motorized vehicle use outside of public lands if regional public demand for off-road motorized and/or non-motorized vehicle recreation would support such activities.
- Support the development and implementation of regional or municipal transportation plans that protect or promote appropriate legal access to public lands and are consistent with resource and use objectives.
- Establish relationships and enter into agreements with local OHV groups and other groups and communities for long-term route maintenance and community support.
- Respect valid existing rights.

Specific to the Lower Sonoran Decision Area.

- Publish a map of the approved travel system depicting the route designation and associated access points for public access.
- Sign routes and associated access points as needed to identify public lands and disseminate information.
- Partner with neighboring BLM offices, counties, municipalities and user groups to identify, plan, implement, and maintain long-distance motorized routes and non-motorized trail systems.
- Apply route-mitigation techniques when designing and implementing the route system.
- Assess the level of success in managing designated access points and unauthorized routes at least bi-yearly.
- Conduct condition assessments of designated and unauthorized routes and associated access points relative to the standards prescribed by the travel management plan.
- Identify use patterns, including the types, frequency, intensity, and distribution of authorized and unauthorized travel and transportation activities.
- Improve visitor compliance with outdoor ethics through education.

- Identify public-safety issues related to the travel system.
- Publish policies and procedures for travel-system administration.
- Establish the travel system as an asset and consider its values when authorizing land-use actions and other activities. All land-use authorizations, permits, and other activities would be required to use designated routes. The BLM would authorize new roads or cross-country use for land-use authorizations only as a last resort.
- As part of the TMP implementation, develop fences, signs, gates, and other methods to manage access, address public safety concerns, and eliminate use of vehicles off of designated routes.

Specific to the SDNM Decision Area.

- Support development and implementation of regional and municipal transportation plans that protect or provide appropriate legal access to the SDNM and protect its resources and management objectives.
- Where needed, the SDNM boundary should be identified with appropriate fencing, signs, and other structures.
- Portions of the SDNM may be closed as needed to accommodate safety, climate, resource protection, specific projects, or staffing constraints.

2.9. SPECIAL DESIGNATIONS

2.9.1. AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)

Areas of critical environmental concern (ACECs) are sections of public land that require special management to prevent irreparable damage to important historic, cultural, or scenic values; wildlife resources; other natural systems or processes; and to protect life and provide safety from natural hazards.

Authority to designate ACECs is provided for in FLPMA and in Title 43 CFR, Part 1610.7. Not only must ACECs require special management; they must meet relevance and importance criteria. In accordance with FLPMA, to qualify as ACECs areas must have substantial significance and value, including qualities "of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern." These values are considered the highest and best use for those lands, and protecting them takes precedence over the BLM's mandate to manage public lands for multiple uses.

According to law, areas with the potential for designation and associated management protection actions must be identified during the land-use planning process. In the preferred action (Alternative E) this plan proposes to designate four new ACECs in the Lower Sonoran, carry forward one existing ACEC, and withdraw the existing Vekol Valley Grasslands ACEC. Evaluations for all ACECs can be found in Appendix V, *Areas of Critical Environmental Concern (ACEC) Evaluations* (p. 1325).

2.9.1.1. Existing Management Decisions, Alternative A (No Action)

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the current Planning Area, very few of these decisions are being carried forward. Instead they are restated as new action alternatives where applicable.

Lower Gila South Resource Management Plan (1989):

- Closes Vekol Valley ACEC to recreational off-road vehicle use in accordance with 43 CFR, Part 8340, and Subpart 8342. (RR-08)
- Closes the Coffee Pot ACEC to recreational off-road vehicle use in accordance with 43 CFR, Part 8340, and Subpart 8342. (RR-09)
- Requires the BLM to place special emphasis on the protection of four significant botanical areas important in studying the original plant communities in the Sonoran Desert: Eagletail Mountains, Coffee Pot Botanical, Table Top area, and Sierra Estrella area. (SM-17)
- Does not designate the Sierra Estrella area as an ACEC. (SM-18)
- Does not designate Table Top area as an ACEC. (SM-19)

- Designates two areas within the Lower Gila South Planning Area boundaries as ACECs: Vekol Valley grassland and the Coffee Pot Botanical area. The purpose is to provide more intensive management and protection for existing and potential resource values. Management plans, which are to identify specific resource management practices, are required for each ACEC. (SM-20)

Lower Gila South Resource Management Plan (Goldwater Amendment) (1990) (Applies to the three relinquished Sentinel Plain, Sand Tank Mountains, and Ajo Airport parcels):

- Prohibits woodcutting and collection of dead and down wood in ACECs. (no number)

Table 2.21. ACEC Acres Based on Alternative

ACEC Name	Alternative (BLM Acres)				
	A	B	C	D	E
Lower Sonoran					
Coffeepot Botanical	8,900	8,900	Not designated		
Coffeepot-Batamote	Not designated		63,300	77,600	61,300
Cuerda de Lena	Not designated			58,500	58,500
Lower Gila Terraces & Historic Trails	Not designated			82,500	82,500
Saddle Mountain ONA	Not designated			48,500	48,500
SDNM					
Vekol Valley Grasslands	3,500	Withdrawn from ACEC designation			

2.9.1.2. Action Alternatives for Areas of Environmental Concern (AC)

Goal 1: ***Provide increased protection for cultural resources, outstanding and scenic features, and priority and special status species while continuing to provide the public access to enjoy these resources.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Common to All Unless Otherwise Noted in Specific ACEC Section						
LS			**C**	**D**	**E**	**AC-1.1.1**: All public lands within the ACEC would be retained and available private and state lands would be acquired.
LS			**C**	**D**	**E**	**AC-1.1.2:** Core roadless areas would be maintained for wildlife while new facilities, including motorized routes, non-motorized trails, and trailheads that concentrate or increase use in these areas would be avoided.
LS			**C**	**D**	**E**	**AC-1.1.3:** Maintaining and managing the biological, geological, and cultural resources would be emphasized and given priority.
LS			**C**	**D**	**E**	**AC-1.1.4**: Areas would be managed to protect the natural landscape and visual values that provide the visitor with an opportunity to appreciate the character of the area.
LS			**C**	**D**	**E**	**AC-1.1.5:** Opportunities for recreation would be provided with an emphasis on undeveloped, dispersed recreation, where it is compatible with protecting the natural and cultural resources.
LS			**C**	**D**	**E**	**AC-1.1.6:** The visual and scenic values of the area would be managed to maintain the natural character, including designating appropriate visual resource management (VRM) classes.
LS			**C**	**D**	**E**	**AC-1.1.7:** Treatments of invasive species would be allowed within the ACECs if they can be designed to have a minor or negligible impact to resource values within the ACEC.

Goal 1: *Provide increased protection for cultural resources, outstanding and scenic features, and priority and special status species while continuing to provide the public access to enjoy these resources.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS				**D**	**E**	**AC-1.1.8:** The construction of non-motorized trails would be permitted if they are consistent with ACEC and resource objectives and do not conflict with botanical resources or wildlife and T&E management.
LS			**C**			**AC-1.1.9:** All LUAs, including utility-scale renewable energy development, would be avoided, mitigated, and otherwise managed to be consistent with management objectives. Recreation developments may be allowed if necessary to manage public use or provide for public safety.
LS				**D**	**E**	**AC-1.1.10:** ACECs would be exclusion areas for utility-scale renewable energy development and exploration, and multiuse utility corridors
LS				**D**	**E**	**AC-1.1.11:** New major linear LUAs would be excluded outside of the corridors. Utilities would be required to be installed underground within the existing multiuse utility corridors to retain the viewshed.
LS				**D**		**AC-1.1.12:** ACECs would be closed to all locatable and leasable minerals exploration and development and mineral material disposals including free-use permits. Public lands in the ACECs would be recommended for withdrawal.
LS					**E**	**AC-1.1.13:** ACECs would be open to all locatable and leasable minerals exploration and development unless otherwise restricted. (Lower Gila Terraces and Historic Trails ACEC is open with No Surface Occupancy and Cuerda de Lena is closed February 1 to September 15).
LS					**E**	**AC-1.1.14:** ACECs would be closed to mineral material disposals including free use permits, except for the former free use site in the Saddle Mountain ACEC (see AC-1.1.46).
Coffeepot Botanical ACEC						
LS		**B**				**AC-1.1.15**: The Coffeepot Botanical ACEC designation of approximately 8,900 acres would be retained to protect the outstanding botanical diversity of the native and rare plant communities such as the Acuña cactus (Map 2-16b). All management actions (including remaining open to lands and minerals actions) would be the same except the ACEC would not be closed to OHV use.
LS		**B**				**AC-1.1.16:** Livestock facilities would not be developed where they would increase livestock use within the area.
LS			**C**	**D**	**E**	**AC-1.1.17:** In alternatives C, D and E the Coffee Pot Botanical ACEC would not be designated. Instead, this area would be incorporated into the Coffee Pot-Batamote ACEC. (See below.)
Coffeepot-Batamote ACEC						
LS			**C**			**AC-1.1.18:** An area of approximately 63,400 acres would be designated as the Coffeepot Botanical ACEC to protect for outstanding botanical diversity of the native and rare plant communities (including the Acuña cactus); lesser long-nosed bat, cactus ferruginous pygmy-owl and desert bighorn sheep habitat; and other wildlife populations along with unique landscape and scenic features (Map 2-16c).
LS			**C**			**AC-1.1.19:** The route system would be designated to limit wildlife habitat fragmentation, wildlife disturbance, and vegetation damage. Motorized vehicle routes that conflict with maintenance of wildlife habitat and cultural resources would be closed, limited, or mitigated. New route construction would not be allowed except for resource protection.
LS			**C**			**AC-1.1.20:** Routes within washes would be prohibited.
LS				**D**		**AC-1.1.21:** The ACEC would be open to leasable exploration and development but closed to mineral materials disposals including free-use permits.

Goal 1: *Provide increased protection for cultural resources, outstanding and scenic features, and priority and special status species while continuing to provide the public access to enjoy these resources.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS				**D**	**E**	**AC-1.1.22:** Motorized vehicle use would be prohibited in washes that contain, or are found to contain cactus ferruginous pygmy-owls habitat to protect pygmy-owls during the breeding, nesting, and dispersal season.
LS				**D**		**AC-1.1.23:** Recreational development would be limited to the minimum required to protect resources and provide for public safety.
LS					**E**	**AC-1.1.24:** Motorized vehicle use would be restricted in washes that are known to be occupied or found to be occupied, cactus ferruginous pygmy-owls habitat from February 1 to September 15 to protect pygmy-owls during the breeding, nesting, and dispersal season. All other areas would be limited to existing or designated routes.
LS					**E**	**AC-1.1.25:** Livestock facilities could be developed to improve natural resource conditions by improving livestock distribution. Adaptive management and best management practices would be utilized to avoid conflicts with wildlife resources.
LS					**E**	**AC-1.1.26:** The ACEC would be open to leasable minerals exploration and development however surface disturbance would be minimized through mitigation measures and special stipulations.
Cuerda de Lena ACEC						
LS				**D**	**E**	**AC-1.1.27:** An area of 58,500 acres would be designated as the Cuerda de Lena ACEC. Its purpose would be to protect the endangered Sonoran pronghorn; habitat for other wildlife species, including the cactus ferruginous pygmy-owl; and to protect cultural resources (Maps 2-16d and 2–16e).
LS				**D**	**E**	**AC-1.1.28:** In addition to the exclusions addressed in the common to all section, the ACEC would be closed to the public for general recreational use during pronghorn fawning between March 15 and July 15 or as determined annually by the Sonoran pronghorn antelope recovery team. Minor non-linear LUAs would also be prohibited unless deemed necessary by the authorized officer. Federal, State and local government employees and permit holders operating within the scope of their authorizations would be exempt from the closure.
LS				**D**	**E**	**AC-1.1.29:** Camping would be limited to dispersed and undeveloped sites.
LS				**D**	**E**	**AC-1.1.30:** Developed recreational sites would be prohibited within the ACEC except for small, non-intrusive-information, and interpretation facilities.
LS				**D**	**E**	**AC-1.1.31:** Tertiary, single-track, and reclaimed vehicle routes that fragment habitat would be closed; however, access would be provided for administrative use and public safety.
LS				**D**	**E**	**AC-1.1.32:** Routes in washes would be prohibited except to provide legal access for law enforcement and other authorized use. New travel routes in washes would be prohibited. New routes would only be considered if deemed necessary for emergency or other authorized administrative uses.
Lower Gila Terraces and Historic Trails ACEC						
LS				**D**	**E**	**AC-1.1.33:** An area of 79,100 acres would be designated as the Lower Gila Terraces and Historic Trails ACEC.
LS				**D**		**AC-1.1.34:** Additional public use sites would not be allocated.
LS				**D**		**AC-1.1.35:** Scientific research would be permitted only if it is not ground disturbing.

Goal 1: *Provide increased protection for cultural resources, outstanding and scenic features, and priority and special status species while continuing to provide the public access to enjoy these resources.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
LS				**D**		**AC-1.1.36:** Existing developments and disturbed areas that are damaging or incompatible with the trail integrity would be evaluated and removed, rehabilitated or mitigated, or otherwise managed to diminish the overall disturbance area.
LS					**E**	**AC-1.1.37:** Public use sites would be allocated if they could be designed to have negligible or minor impacts.
LS					**E**	**AC-1.1.38:** The ACEC would remain open to all leasable minerals actions but any lease would contain a No Surface Occupancy stipulation.
LS					**E**	**AC-1.1.39:** Portions of the ACEC would be closed to seismic exploration and mineral material disposals. The remaining portion of the ACEC would be open to mineral material disposals however surface disturbance would be minimized where possible through mitigation measures and special stipulations.
LS					**E**	**AC-1.1.40:** Selected parcels along the historic trails corridor within the ACEC, would be closed to locatable mineral exploration and development.
LS					**E**	**AC-1.1.41:** Scientific research, including excavation, that enhances our understanding of the cultural resources would be permitted and encouraged if approved research design and qualified researcher by BLM standards.
Saddle Mountain ACEC						
LS				**D**	**E**	**AC-1.1.42:** An area of 48,500 acres would be designated as the Saddle Mountain ACEC.
LS				**D**	**E**	**AC-1.1.43:** Sites containing natural or cultural resources or geological and wildlife resources would be developed for interpretation and environmental education when research opportunities and resource values can be protected.
LS					**E**	**AC-1.1.44:** Vehicle-based camping would be limited to existing or designated sites..
LS					**E**	**AC-1.1.45:** The ACEC would be open to leasable minerals exploration and development. Surface disturbance would be minimized where possible through mitigation measures and special stipulations.
LS					**E**	**AC-1.1.46:** The ACEC would be closed mineral material disposals with the exception of the former free use permit site (Courthouse Pit; T2N, R7W, Sec. 31). A new permit could be allowed provided the proposed disturbance area remains within the previously authorized area.
Vekol Valley Grasslands ACEC						
LS	**SDNM**		**C**	**D**	**E**	**AC-1.1.47:** The 3,500-acre Vekol Valley Grasslands ACEC would be withdrawn from ACEC status because Monument designation provides adequate protection for the resources of the grassland.

Administrative Actions

Inventory.

- Perform proactive cultural inventories on ACECs, with a special emphasis on the Lower Gila Terraces and Historic Trails ACEC and the Saddle Mountain ACEC and thoroughly document the cultural resources.

Monitoring.

- Continue to work with and support the Arizona Site Steward Program to assure adequate monitoring of the sites on the ACECs.
- Implement procedures for systematic monitoring of selected cultural sites within the ACEC's.

Restoration.

- Perform mitigation and / or landscape restoration in priority areas of the ACECs, where incompatible activities have altered the natural and cultural landscape and visual settings.

Research.

- Complete documentary research and oral histories to gain a better understanding of the cultural history of the ACEC's, relates to homesteading, mining, ranching, and prehistoric archaeological occupations.

Interpretation and Education.

- Develop interpretive materials and facilities for selected sites and topics.
- Provide educational materials and opportunities to the public pertaining to the ACEC resources.

Tribal Consultation.

- Continue to consult with the Gila River Indian Community, the Ak-Chin Indian Community, the Salt River Pima-Maricopa Indian Community, the Tohono O'odham Nation, the Hopi Tribe, Fort Yuma – Quechan Tribe, and other interested Indian tribes to identify places of traditional importance and to collaborate on issues and projects affecting the ACEC's.

Partnerships.

- Coordinate with partner groups, interest groups, interested individuals, local communities, and other stakeholders on ACEC issues and projects.

2.9.2. NATIONAL BYWAYS (NB)

The National Byways program was established by the U.S. Department of Transportation/Federal Highway Administration under the Intermodal Surface Transportation Efficiency Act of 1991 and reauthorized under the Transportation Equity Act for the 21st Century in 2003. The BLM Back Country Byway system is a component of the National Byway System and guidance is found in BLM Handbook H-8357-1. In accordance with the handbook, BLM Back Country and Scenic Byway designations are approved by the State Director within the parameters established for the State byway program.

The primary objectives of the program are to showcase the BLM's multiple-use mission and potential contributions to local or regional economies through increased travel and tourism.

To be eligible for designation, a road must have attractions that are important on a State and national basis. Attractions may include historical, recreational, cultural, archaeological, scientific, and/or natural features. Cooperation with all local, State, and Federal agencies that have jurisdiction over road segments and legal access for any private land segments is also necessary.

2.9.2.1. Existing Management Decisions, Alternatives A (No Action) National Byways

Decisions are listed in chronological order by plan. The following decisions are extracted from the existing land use plans and amendments and are listed in chronological order. Because none of these current land use plans encompass the entire Planning Area, very few of these decisions are being carried forward as common to all alternatives and are restated as new action alternatives where applicable.

Lower Gila Resource Management Plan Amendments (2005):

- Scenic corridors and potential back country byways will receive priority evaluation of visual resources to determine appropriate future classifications. (RR-6)

Lower Gila South Resource Management Plan - Goldwater Amendment (1990):

[Applies to the three relinquished BGR parcels]:

- Protect the visual resource quality on lands adjacent to the highways (I-8 and SR-85) by:
- Establishing portions of these roads as scenic byways in cooperation with the Arizona Department of Transportation, the USAF, and the U.S. Marine Corps
- Use the VRM process during activity planning to maintain appropriate visual resource-management objectives established for these byways. (Not numbered)

2.9.2.2. Action Alternatives for National Byways (BY)

Program Goals:

- **Goal 1:** Provide opportunities for the American public to see and enjoy unique scenic and historic landscapes on public lands deemed to have State or national significance.
- **Goal 2:** Promote regional development of eco- and recreational tourism through designation of BLM National Scenic and Back Country Byways and by managing public lands along potential byway corridors to protect the quality of scenic values.

Land Use Allocations Summary

Potential byways to be evaluated by alternative are presented in Table 2.22, "Potential Byway Designations by Alternative" (p. 201) below.

Table 2.22. Potential Byway Designations by Alternative

Proposed Byway	BLM Miles by Alternative				
	A (No Action)	B	C	D	E (Preferred)
Lower Sonoran					
Agua Caliente (not paved)	0	21	21	0	21
SDNM					
Interstate 8 (paved)	0	21	0	0	21
H-238-Maricopa Road (paved)	0	18	18	0	18

Management Actions & Allowable Uses

Goal 1: Provide opportunities for the American public to see and enjoy unique scenic and historic landscapes on public lands deemed to have State or national significance.						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Use Allocations**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Identify and evaluate potential roads that meet nomination criteria for BLM National Scenic or Back Country Byway designation.						
LS		**B**	**C**		**E**	**NB-1.1.1:** Approximately 21 miles of Agua Caliente Road would be evaluated as a potential BLM national back country byway (Maps 2-16b and 2–16c).
	SDNM		**C**	**D**	**E**	**NB-1.1.2:** Approximately 18 miles of Highway 238 (Maricopa Road) would be evaluated as a scenic byway (Maps 2-16c, 2–16d and 2–16e).
	SDNM			**D**	**E**	**NB-1.1.3:** Approximately 21 miles of I-8 would be evaluated as a scenic byway (Maps 2-16d and 2–16e).

Goal 2: Promote regional development of eco- and recreational tourism through designation of BLM National Scenic and Back Country Byways and by managing public lands along potential byway corridors to protect the quality of scenic values.						
Applicable Decision Area		**Applicable Alternative**				**Management Actions**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1.1: Maintain open space and the undeveloped natural character of landscapes within the specified byway corridor. Desert landscapes provide visitors with unique scenic and back country experience while traversing the diverse Sonoran Desert, including saguaro cactus stands, rugged mountains, and vast valleys. These landscapes also offer glimpses of traditional western uses, including historic trail corridors, mining, agriculture, and ranching.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**NB-1.1.1:** Surface disturbing uses and activities along byways would exceed or at minimum maintain the visual quality consistent with the established VRM setting through project design or mitigation.

LS	**SDNM**	**B**	**C**	**D**	**E**	**NB-1.1.2:** Protective measures would be provided in wildlife-movement corridors to protect wildlife. Measures may include setting speed limits, installing speed bumps or other speed-limiting devices, and installing cautionary signs.
LS	**SDNM**	**B**	**C**	**D**	**E**	**NB-1.1.3:** No motorized competitive speed events would be authorized on the byways.
LS		**B**	**C**		**E**	**NB-1.1.4:** Road design and maintenance would be coordinated with the county to retain the character of the byway and ensure it remains suitable for passenger car- and truck-based sightseeing. Prescriptions would include: ● No paving ● No widening beyond existing widths unless required for public safety ● Stabilize road surfaces to maintain air quality ● Install speed-limit, directional, and vehicle-safety signs where appropriate.

2.9.3. NATIONAL TRAILS (NT)

The National Trails System Act, 16 USC 1241, was enacted in 1968 to bring the national scenic, historic, and recreational trails into one unified system. The Juan Bautista de Anza National Historic Trail (Anza NHT) was established in 1990. It is one of 30 national scenic and historic trails designated by Congress to "provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass" (P.L. 90-543, as amended through P.L. 109-418). The national historic trails are "extended trails which follow as closely as possible and practicable the original trails or routes of travel of national historical significance" (ibid.).

The National Park Service (NPS) administers the trail but works in partnership with Federal, state, and local government agencies, as well as private landowners who manage or own lands along the trail route. Because the Anza expedition moved along the trail on horses and pack animals more than 200 years ago, no reliable trail signature remains to be seen in the modern era. Historians have studied the diaries and journals of Juan Bautista de Anza and Father Font and have determined a wide corridor through which the trail route originally passed. Today we face the challenge of conserving the natural visual setting along the trail corridor and constructing a recreational retracement route for non-motorized use in the future.

In the SDNM Presidential Proclamation 7397, the Anza NHT corridor and its natural historic landscape settings are named as Monument objects to be protected. The Butterfield Overland Stage Route and the Mormon Battalion Trail both lie within portions of the same corridor and are Monument objects as well. These national trails enjoy a special designation that highlights the importance of the trails as connections to communities and our history as a nation. Protection of the Monument objects is critical as we strive to share the story through interpretive developments.

2.9.3.1. Existing Management Decisions, Alternative A (No Action)

No specific management prescriptions for National Trails are included in the existing LUPs.

2.9.3.2. Management Actions for National Trails (NT) Action Alternatives

Goal 1: Manage the Juan Bautista de Anza National Historic Trail corridor through the LSFO through focused management strategies.						
Applicable Decision Area		**Applicable Alternative**				**Management Actions**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 1. 1: Manage the historic trail corridor on the Lower Sonoran to enhance the experience of visitors, maintain the integrity of the historic trail and associated trail sites, and the visual setting throughout the life of the plan.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**NT-1.1.1:** The Juan Bautista de Anza NHT would be managed in concert with the Southern Trail SRMA. Management would be consistent with the National Park Service (NPS) management plan and in cooperation with the NPS (Map 2-16a).
LS	**SDNM**	**B**	**C**	**D**	**E**	**NT-1.1.2:** The Painted Rock Petroglyph Site and the adjacent segment of Anza NHT would be allocated to public use for heritage tourism and interpretation.
LS		**B**	**C**		**E**	**NT-1.1.3:** The Anza NHT corridor would remain open to leasable minerals exploration and development actions but any proposed action would contain a No Surface Occupancy stipulation.
LS		**B**	**C**	**D**	**E**	**NT-1.1.4:** The Anza NHT corridor would be closed to all mineral material disposals.

Goal 1: Manage the Juan Bautista de Anza National Historic Trail corridor through the LSFO through focused management strategies.						
Applicable Decision Area		Applicable Alternative				Management Actions
LS	SDNM	B	C	D	E	
LS				D		**NT-1.1.5:** The Anza NHT corridor would be closed to all mineral activities including locatables, leasables, mineral materials exploration and development actions including free use permits.
	SDNM	B	C	D	E	**NT-1.1.6:** The Anza NHT corridor would remain closed to all minerals actions.
LS	SDNM	B	C	D	E	**NT-1.1.7:** The Anza NHT corridor would be an exclusion area for major utility-scale renewable energy development and new major linear LUAs. In the Lower Sonoran, utility development could continue on a case-by-case basis in existing utility multiuse corridors and only of impacts are determined to have a negligible to minor effect to resources.
LS	SDNM	B	C	D	E	**NT-1.1.8:** The Anza NHT corridor would be an exclusion area for all minor linear and nonlinear LUAs except as described in the Lands & Realty section (See Section 2.8.1, "Lands & Realty (LR)" (p. 118)). LUAs would be mitigated to be consistent with management objectives and prescriptions, and only if impacts are determined to have a negligible to minor effect to resources.
LS	SDNM	B	C	D	E	**NT-1.1.9:** Cultural sites along the NHT would be identified and developed as allocated in the appropriate use categories and according to management actions and prescriptions identified in the Cultural & Heritage Resources section for all use categories. (See Section 2.7.3, "Cultural & Heritage Resources" (p. 52))
LS	SDNM	B	C	D	E	**NT-1.1.10:** Recreation opportunities would be provided consistent with the ANZA NHT. Facilities would be developed and placed outside the corridor when feasible to protect resource values, provide for visitor safety, and support selected use opportunities. Facilities would be developed within the trail corridor only when needed to protect trail integrity and resources.
LS	SDNM	B	C	D	E	**NT-1.1.11:** The management corridor would be managed in concert with the Lower Gila Terraces and Historic Trails SCRMA, the Sonoran Desert SCRMA and the Anza Historic Trail RMZ as identified in the Cultural & Heritage Resource and Recreation Management sections (See Section 2.7.3, "Cultural & Heritage Resources" (p. 52) and Section 2.8.4, "Recreation Management (RM)" (p. 158)).
LS	SDNM	B	C	D	E	**NT-1.1.12:** The historic landscape and visual values would be protected to provide the visitor with an opportunity to appreciate the historic character of the area.
LS	SDNM	B	C	D	E	**NT-1.1.13:** Vegetation would be rehabilitated and restored consistent with the natural resource restoration objectives to restore or maintain the integrity of the landscape.
LS	SDNM	B	C	D	E	**NT-1.1.14:** A strategy would be developed to encourage scientific and historical research as appropriate with management prescriptions and only if designed to have a negligible or minor affect to resources.
LS	SDNM	B	C	D	E	**NT-1.1.15:** Scientific and historical studies of cultural landscapes, sites, historic trails, and other resources, including excavation, would be allowed by qualified researchers on a case-by-case basis and with written authorization from the BLM.
LS	SDNM	B	C	D	E	**NT-1.1.16:** Heritage tourism would only be allowed at the Painted Rock Petroglyph Sites and along the Anza NHT auto route when such use is compatible with protecting the cultural and historical resources and visual values.

Goal 1: Manage the Juan Bautista de Anza National Historic Trail corridor through the LSFO through focused management strategies.						
Applicable Decision Area		Applicable Alternative				Management Actions
LS	SDNM	B	C	D	E	
LS	SDNM	B	C		E	**NT-1.1.17:** The Anza NHT auto route would be marked and promoted as appropriate and consistent with Cultural & Heritage Resource and Travel Management actions designations and prescriptions identified in this plan. (See Sections Section 2.7.3, "Cultural & Heritage Resources" (p. 52) and Section 2.8.5, "Travel Management (TM)" (p. 180))
LS	SDNM			D		**NT-1.1.18:** The Anza NHT auto route would be marked, but not promoted, as appropriate and consistent with Cultural & Heritage Resource and Travel Management actions designations and prescriptions identified in this plan (See Section 2.7.3, "Cultural & Heritage Resources" (p. 52) and Section 2.8.5, "Travel Management (TM)" (p. 180)).
	SDNM	B	C	D	E	**NT-1.1.19:** The management corridor of the Anza NHT within the SDNM would be managed to retain, and restore where appropriate, the physical integrity of the sites and trails through inventory, evaluation, rehabilitation and restoration of vegetation.

Administrative Actions:

Inventory.

- Perform field inventories, document, and map historic trail resources and associated cultural resources along the Anza NHT.
- Perform recreational inventories along the Anza NHT to identify high potential sites and segments. Make determinations of suitability for installation of recreational trail tread and interpretive developments.
- Perform viewshed analysis on selected Anza NHT segments with priority given to high potential route segments.
- Collect GPS data to BLM standards on the Anza NHT resources and use GIS mapping (BMP).
- Identify and apply for rights-of-way on selected areas of the Anza NHT corridor.

Monitoring.

- Perform condition assessments on selected segments of the Anza NHT, with a priority on the high potential route segments.
- Identify important access routes into the Anza NHT.
- Implement procedures for systematic monitoring of the Anza NHT management corridor, including associated sites and trail resources.

Restoration.

- Perform mitigation and/ or landscape restoration in priority areas along the Anza NHT, where incompatible activities have altered the historic landscape and visual setting of the trail.

Research.

- Perform archival research on the history and subsequent uses of the Anza NHT.
- Establish collaborative partnerships with academic institutions, professional and non-profit organizations, individual scholars, tribes, and other entities to perform research on Anza NHT related topics.

Interpretation and Education.

- Develop interpretive materials and facilities for selected sites.
- Provide educational materials and opportunities to the public pertaining to the Anza NHT
- Identify auto tour route segments and mark with official NPS Anza NHT auto route signage.

Tribal Consultation.

- Continue to consult with the Gila River Indian Community, the Ak-Chin Indian Community, the Salt River Pima-Maricopa Indian Community, the Tohono O'odham Nation, the Hopi Tribe, Fort Yuma – Quechan Tribe, and other interested Indian tribes to identify places of traditional importance.

Partnerships.

- Coordinate with partner groups, interest groups, interested individuals, local communities, and other stakeholders on Anza NHT issues and projects.
- Consult and collaborate with the NPS, the administrator of the Anza NHT.

2.9.4. FRED J. WEILER GREEN BELT RESOURCE CONSERVATION AREA (GB)

The Fred J. Weiler Green Belt along the Gila River was established as a resource conservation area (RCA) in 1970 and allocated for management of wildlife, recreation, and cultural resources. The parts of the green belt that fall within the Planning Area include 45,978 acres of the Gila River channel and floodplain from Sierra Estrella Park on the east to the Planning Area boundary on the west. Approximately 20,000 additional acres fall within the BLM's Yuma Field Office for a total of approximately 63,000 acres in the green belt. Only the acres that fall within the Planning Area will be discussed further in this document.

Within the area now known as the Green Belt, Public Land Order 1015 (PLO 1015) withdrew 6,896 acres of land from the Department of the Interior (DOI) to the USFWS in 1954. At this time, the USFWS entered into a cooperative management agreement with the AGFD to manage these withdrawn lands for wildlife, notably waterfowl and migratory birds. These lands were segregated from all forms of appropriation under the public land laws, including the mining laws but not the mineral leasing laws. Grazing and existing withdrawals for power purposes were specifically exempted from the segregation.

In 1967, approximately 63,000 acres in the Gila River floodplain, including the PLO 1015 lands, were studied, and it was determined that they would be retained under the Classification for Multiple Use Act of 1964. A classification for multiple use was placed on the subject lands, segregating the 63,000 acres from appropriation under the public land and mining laws. Mineral leasing, however, was not excluded. The multiple-use classification was established to allow for the management of nesting areas for white-winged dove, mourning dove, and songbirds; public recreation; historical significance; and flood and erosion control. In 1970, the 63,000 acres were designated as the Fred J. Weiler Green Belt Resource Conservation Area.

Since the Green Belt was designated in 1970, the AGFD has continued to manage the PLO 1015 lands within the Green Belt as part of their Lower Gila River Wildlife Management Area Complex. However over the past 30 years new laws have been enacted, along with the implementation of new policy and guidance, and the cooperative agreements between the BLM, USFWS and AGFD have not been updated accordingly. The jurisdictional management responsibility remains unclear for certain resources and uses, such as cultural resources and travel management. The BLM believes that management of some of these still belong to the BLM and certain management decisions have been made in this Draft RMP with that assumption. Between the writing of the draft and the proposed RMP, a legal opinion will be requested from the Federal Solicitors Office and any proposed management actions that need to be changed will be done so in the proposed RMP. The BLM will work in cooperation with the AGFD to ensure that access to, and management of, their wildlife management complex will not be impacted by designations or management actions in the final RMP.

2.9.4.1. Existing Management Decisions, Alternative A (No Action)

No specific management prescriptions the Fred J. Weiler Green Belt RCA are in existing LUPs.

2.9.4.2. Management Actions for Resource Conservation Area (RCA) Action Alternatives

Goal 1: *Ensure that the Fred J. Weiler Green Belt is a productive and functioning riparian system supporting healthy, diverse, and abundant populations of wildlife and riparian dependent wildlife and plant species with an emphasis on migratory birds.*						
Applicable Decision Area		**Applicable Alternative**				**Management Actions**
LS		**B**	**C**	**D**	**E**	
Objective 1.1: Manage the Fred J. Weiler Green Belt to support migratory birds and other native wildlife and plant species.						
LS		**B**	**C**	**D**	**E**	**GB.1.1:** The Fred J. Weiler Green Belt would continue to be managed as a Resource Conservation Area (RCA) as designated in 1970 (63,000).
LS		**B**	**C**	**D**	**E**	**GB-1.2:** The Green Belt would be managed consistent with the Lower Gila Terraces and Historic Trails SCRMA.
LS		**B**	**C**	**D**	**E**	**GB.1.3:**: The use of mechanical, chemical, and biological treatment methods would be coordinated with AGFD and USFWS to remove invasive plants such as tamarisk in the Green Belt for the purpose of restoring ecological conditions and function and reducing fuel hazards.
LS		**B**	**C**	**D**	**E**	**GB.1.4:** The Green Belt would be managed with an emphasis on protection and restoration, and treatments would focus on reestablishment of willows and cottonwoods, as well as other riparian vegetation, to support migratory game birds and other wildlife species.
LS		**B**	**C**	**D**	**E**	**GB-1.5:** The existing withdrawal for locatable mineral entry and all public land laws within the PLO 1015 portions of the Green Belt would remain in effect.
LS		**B**	**C**	**D**	**E**	**GB-1.6:** The Green Belt would be closed to mineral leasing and mineral material disposals including sales and free use permits. The three inactive free use community pits (Buckeye Hills in T1S, R3W. Secs. 20 &30; T1S, R4W, Sec. 25) would be terminated, and the former free use site (Narramore Pit in T1S, R3W, Sec. 24) would not be available for reauthorization.
LS		**B**	**C**	**D**	**E**	**GB-1.7:** The Green Belt would be an exclusion area for utility-scale renewable energy development and exploration, and multiuse utility corridors.
LS		**B**	**C**	**D**	**E**	**GB-1.8:** The Green Belt would be an avoidance area for minor LUAs and utility-scale renewable energy development and exploration, and multiuse utility corridors.
LS		**B**	**C**	**D**	**E**	**GB-1.9:** The Green Belt would be an exclusion area for utility-scale renewable energy development and exploration and major linear LUAs (multiuse utility corridors).
LS		**B**	**C**	**D**	**E**	**GB-1.10:** The portions of the Green Belt outside of the PLO 1015 lands would be an avoidance area for minor linear and nonlinear LUAs. Permits would be approved on a case-by-case basis if management objectives of the area are mitigated.

2.10. TRIBAL INTERESTS, PUBLIC SAFETY, & SOCIAL AND ECONOMIC CONDITIONS

2.10.1. HAZARDOUS MATERIALS & PUBLIC SAFETY

There are many Federal, state and local laws and regulations, in addition to bureau policies and guidance which govern public safety, hazardous materials and solid wastes. Federal laws and regulations include:

- The Comprehensive Environmental Response Compensation & Liability Act (CERCLA; 42 USC 9601 et seq.);
- Federal Aid Highways Act (23 USC 317);
- Federal Compliance with Pollution Control Standards (EO 12088, October 13, 1978);
- Federal Compliance with Right to Know Laws and Pollution Prevention Requirements (EO 12856, August 3, 1993);
- Federal Environmental Pesticide Control Act (7 USC 136); Pollution Prevention Act (42 USC 13101 et seq.);
- Resource Conservation and Recovery Act (42 USC 6901 et seq.);
- Solid Waste Disposal Act (42 USC 6901 et seq.);
- Superfund Implementation (EO 12580, January 23, 1987) and
- Toxic Substances control Act (15 USC 2601 et seq.)

The BLM has to address many public health and safety concerns within the LSFO-SDNM. The primary concerns in the Planning Area are: Abandoned Mines, Unexploded Ordnance (UXO), International Border issues and Hazardous Materials and Solid Waste. See Chapter 3, *Affected Environment* (p. 251) for a full discussion of these issues. The BLM will continue to respond to all known, or reports of, illegal activities related to these issues and evaluate all proposed actions to minimize impacts to public health and safety and future occurrences of hazardous materials and dumping on public lands.

2.10.1.1. Existing Management Decisions, Alternative A (No Action) for Hazardous Materials & Public Safety

Since most actions are governed by existing laws and regulations, there were no valid existing management decisions from previous land use plans.

2.10.1.2. Action Alternatives for Hazardous Materials & Public Safety (PS)

Program Goals

- **Goal 1:** Manage hazards and public use to protect public health and safety.

Land Use Allocations Summary

Not applicable.

2.10.1.3. Management Actions and Allowable Uses

Goal 1: *Manage hazards and/or public use to protect public health and safety.*						
Applicable Decision Area		Applicable Alternative				Management Actions and Allowable Uses
LS	SDNM	B	C	D	E	
Objective 1.1: Identify naturally occurring or manmade public safety hazards on public lands and take appropriate action to protect public health and safety.						
LS	SDNM	B	C	D	E	**PS-1.1.1:** Priorities for remediation of physical safety hazards will be set using the following criteria: ● Where a death or injury has occurred; ● Where site is on or in immediate proximity to a recreation site or a known high use area; ● Where a formal risk assessment has determined a high or extremely high risk level. ● The site is eligible for listing in the Abandoned Mines Cleanup Module of Protection and Response Information System
LS	SDNM	B	C	D	E	**PS-1.1.2:** Priorities for remediation due to water quality issues will be set using the following criteria: ● The State has identified the watershed as a priority based on: water laws or regulations, threat to public health or safety, threat to environment; ● The project is a collaborative effort among multiple agencies or jurisdictions.
LS	SDNM	B	C	D	E	**PS-1.1.3:** Post signs to identify hazardous situations when warranted to protect public safety. Emphasize the risks to visitors of entering public lands and taking responsibility for their own safety.
LS	SDNM	B	C	D	E	**PS-1.1.4:** If illegal activities threaten the safety of the public or BLM employees, or damage Monument objects, areas can be closed to access by the authorized officer. The area can be closed for up to 90 days pending a study or review of the level of impacts and longer term actions may be necessary to provide public safety
LS		B	C	D	E	**PS-1.1.5:** The Sentinel Plain area south of I-8 is restricted to entry by permit only to protect the public from possible unexploded ordinances.
	SDNM	B	C	D	E	**PS-1.1.6:** The Sand Tank Mountains south of I-8, formerly known as "Area A," is restricted to entry by permit only.

Goal 2: ***Protect public safety by dealing appropriately with all hazardous materials and solid wastes on public lands.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 2.1: Investigate all reported hazardous-materials and solid-wastes sites. Plan necessary containment and/or cleanup responses on a case-by-case basis as soon as possible upon report.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-2.1.1:** Establish priorities for investigating releases and planning/implementing responses based on the order in which releases are discovered unless other factors, such as the immediacy of the public-health threat, elevate the response urgency.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-2.1.2:** Identify the probable scope of needed containment and clean-up efforts.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-2.1.3:** Rank all sites according to relative priority for treatment planning and action. Priorities to consider include: ● High levels of heavy metals in waste, ● Ground- or surface-water quality degradation, ● Ongoing, active resource damage, ● Safety hazards near established recreation areas or other areas frequented by public land users, ● Other site-specific factors
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-2.1.4:** Inspect mining and milling sites to determine appropriate management for hazardous materials.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-2.1.5:** Conduct active investigations to identify potentially responsible parties and recover planning, containment, cleanup, monitoring, investigation, and enforcement costs associated with spill/release responses.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-2.1.6:** Complete site-specific inventories when lands are being disposed or acquired. It is departmental policy to minimize potential liability of the DOI and its bureaus by acquiring property that is not contaminated unless directed by Congress, court mandate, or as determined by the Secretary.

Goal 3: ***Minimize or eliminate the potential for intentional or accidental releases of hazardous materials or wastes and solid waste.***						
Applicable Decision Area		**Applicable Alternative**				**Management Actions and Allowable Uses**
LS	**SDNM**	**B**	**C**	**D**	**E**	
Objective 3.1: Pursue locations of solid waste and wildcat dumpsites. Remove hazardous materials and solid waste, remediate, and, if appropriate, restore sites.						
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-3.1.1:** Investigate all reported hazardous-materials and solid-waste sites.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-3.1.2:** Establish a reporting system and encourage other agencies and citizens to report suspected spill and dump sites or suspected dumping activities.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-3.1.3:** Establish an inventory of known historic and active mining sites and other areas on public lands where hazardous materials or solid wastes are known or suspected to be present.
LS	**SDNM**	**B**	**C**	**D**	**E**	**PS-3.1.4:** Evaluate all BLM actions (including land use authorizations, mining and milling activities, and unauthorized land uses) for their potential to prevent production or dumping of hazardous or solid wastes on public lands. Minimize releases of hazardous materials through compliance with current regulations. Identify appropriate mitigation for activities associated with all types of hazardous materials and waste management and all types of fire management.

Administrative Actions

- Provide public safety information through BLM visitor-use brochures, websites, the BGR/Cabeza Prieta NWR/Sand Tank Mountains visitor-entry permit system, and various direct contacts with members of the public. Include information on hazards associated with abandoned mines, recreational shooting, unexploded ordnance, smuggler and undocumented alien (UDA) traffic, other criminal activities, natural resource conditions, or other conditions.

- Post signs in the field to identify certain hazardous situations when warranted to protect public safety. Emphasize visitor acceptance of the risks of entering public lands and responsibility for their own safety.

- To reduce human-caused fires, the BLM will undertake education, enforcement, and administrative fire-prevention measures. Education measures will include various outreach efforts, including a signing program, information as to the natural role of fire within local ecosystems, and participation in fairs, parades, and public contacts. Enforcement will be accomplished by providing training opportunities for employees interested in fire cause determination. Administration includes expanded prevention and education programs with other cooperator agencies.

2.11. SCIENTIFIC RESEARCH, EDUCATION & PUBLIC OUTREACH

2.11.1. SCIENTIFIC RESEARCH

The BLM will partner with agencies and the academic and scientific community to develop a strategy for orderly scientific research of public lands. Scientific research will be evaluated and approved on a case-by-case basis. A priority will be placed on research likely to enhance management and understanding of public land resources and public uses. Researchers will be required to coordinate with the BLM, including providing a research plan, on proposed research and provide reports and supporting data that describe the outcome of the research.

Approved scientific research will contribute to management of natural and cultural resources and achieving desired future conditions. The collection of any objects in the Monument is authorized only by permit for scientific research or use to ensure compatibility and reporting of results. A reasonable amount of disturbance to soils and/or vegetation may occur during approved research activities in order to meet the research goals. Effects of disturbance are likely to be transient or may require mitigation or rehabilitation of sites.

Collaborative research partnerships will be established with interested organizations, such as local scientific museums or organizations, agencies, academic institutions, professional and nonprofit organizations, vocational organizations, and other entities, for an orderly process of research, recordation, and education about public land resources and uses. These partnerships will support survey, evaluation, recordation, mitigation, protection, and management of various resources, including biological, cultural, scenic, paleontological, geologic, and caves, and public uses including recreation, grazing, mining, and others.

By developing a strategy to encourage scientific research and inventory, the understanding of resources and management needs will improve. A priority will be placed on the development and implementation for inventory, recording, and evaluation of the Monument, ACECs, and other sensitive areas and resources.

Increased monitoring of public use, vegetation and wildlife habitat, cultural sites, and other resources, with particular focus on sensitive resources and easily accessible and regularly visited areas, would help to ensure the integrity of resources are maintained. Monitoring of public uses, wildlife, and other resources would be enhanced by the use of volunteers, scientific and academic organizations, and other interested groups.

2.11.2. INTERPRETATION, ENVIRONMENTAL EDUCATION & OUTREACH

The BLM will work with partners in agencies, academia, and other organizations to develop an effective environmental education and outreach strategy to enhance public understanding and appreciation of public land resources, and help the BLM achieve its mission and the desired outcomes of this DRMP.

The BLM will support existing educational and interpretive programs and initiatives such as Project Archaeology, Leave No Trace, Tread Lightly!™, Project Learning Tree, and other proven

national, State, regional, and local programs. An emphasis will be placed on reuse of existing educational materials.

Additionally, the BLM will work with partners to pursue interpretation and environmental education opportunities, outreach, development, and implementation of on site and off-site programs for adults and children. The office will work with willing staff from schools, school districts, and other learning institutions to develop curricula that incorporate various learning styles in program design and delivery and focus on the BLM's mission.

To help disseminate information to the public, websites, brochures, maps, access guides, and information sheets would be developed. BLM personnel would also participate in public events, such as fairs and open houses, with information and displays showing public land management. Information would emphasize Leave No Trace and Tread Lightly!™ practices.

Topics may include:

- Resource protection and management,
- Recreational access,
- Use etiquette,
- OHV rules and regulations,
- Public safety,
- Fire,
- OHV and special recreation vehicle information,
- Other information as needed.

2.11.2.1. Resources Education

Throughout the area, (with particular focus sensitive resource areas, including the Monument, ACECs, WHAs, SCRMAs, and T&E species habitat), emphasis would be placed on resource importance through interpretation, education, signing, and/or brochures.

A public education program would accomplish the following:

- Provide information about resources and their importance,
- Provide information directly related to procedures to be followed if sensitive resources are found,
- Provide safety information to the public and identify any resource protection actions required for public use,
- Specify any pertinent fines for resource damage.

2.11.2.2. Public Uses and Visitor Information

Visitor information would be developed to guide recreational uses in the Decision Areas. Information could include identifying recreational opportunities, locations where certain uses are or are not appropriate, an appreciation and respect for other public land users and uses, and methods to avoid conflict.

2.11.2.3. Public Safety and Fire Education

Educational material would be available regarding public safety, definitions of hazardous materials and solid wastes, and regulations controlling the use and disposal of hazardous materials and solid wastes on public lands. Methods to disseminate information may include brochures at recreational sites, websites, signs at known or likely dumping sites, BGR/Cabeza Prieta NWR/Sand Tank Mountains visitor entry permit system, and various types of direct contact with visitors. Information on hazards associated with abandoned mines, recreational shooting, unexploded ordnance, smuggler and UDA traffic, natural resource or other conditions also may be included.

To protect public safety, when warranted, signs will be posted to identify certain hazardous situations.

Visitor acceptance of the risks of entering public land and responsibility for their own safety would be emphasized.

The BLM will undertake education, enforcement, and administrative fire prevention mitigation measures to reduce human-caused fires. Education measures may include various media, including signs, information on the natural role of fire within local ecosystems, participation in fairs or parades, and other public contacts. Enforcement would be accomplished by providing training opportunities for employees interested in fire caused determinations. Administration includes expanded prevention and education programs with other cooperating agencies.

2.12. IMPLEMENTATION, ADAPTIVE MANAGEMENT & MONITORING

2.12.1. IMPLEMENTATION & PARTNERSHIPS

Many LUP decisions are implemented or become effective upon approval of the RMP's record of decision (ROD). These decisions include:

- Goals and objectives,
- Land use allocation decisions,
- All special designations, such as ACECs.

Management actions that require more site-specific project planning would require further environmental analysis. Decisions to implement site-specific projects are subject to administrative review when such decisions are made.

To succeed in achieving the goals, objectives, and actions of this plan, the BLM, along with other agencies, organizations, and the public, must make a long-term commitment of working together.

Implementation of this plan will require the involvement of many partners. The BLM invites citizens to help the implementation of this plan and achieve the goals laid out. The BLM will continue to involve and collaborate with the public while implementing this plan. Opportunities to become involved in the plan implementation and monitoring will include development of partnerships and community-based citizen working groups. The BLM and citizens can collaboratively develop site-specific implementation plans that mutually benefit public land resources, local communities, and the people who live, work or play on public lands.

To succeed in achieving the goals, objectives, and actions of this plan, the BLM, along with other agencies, organizations, and the public, must make a long-term commitment of working together. Implementation of this plan will require the involvement of many partners. The BLM invites citizens to help the implementation of this plan and achieve the goals laid out. The BLM will continue to involve and collaborate with the public while implementing this plan. Opportunities to become involved in the plan implementation and monitoring will include development of partnerships and community-based citizen working groups. The BLM and citizens can collaboratively develop site-specific implementation plans that mutually benefit public land resources, local communities, and the people who live, work or play on public lands.

- Motorized route and non-motorized trail maintenance and monitoring;
- Development, maintenance, and monitoring of recreational facilities;
- Development of interpretive materials;
- Restoration of wildlife habitat;
- Monitoring of biological and cultural resources;
- Prevention and restoration of areas impacted by litter/dumping;
- Development of community support;
- Delivery of environmental and resource education.

Collaborative efforts may help ensure consistent management between partners, enhance the public experience, maintain open space, provide use opportunities, and protect natural and cultural resources. By engaging a diverse group of stakeholders in a collective effort to conserve and manage the ecological, cultural, open space, recreation, and other use values, resources can be sustainably managed for the long-term, and the area remain a place where people want to live, work, and recreate.

2.12.2. ADAPTIVE MANAGEMENT

Adaptive management is a formal, systematic, and rigorous approach to learning from the results of management actions, accommodating change, and improving management. It involves synthesizing existing knowledge, exploring alternative actions, and making explicit forecasts about their results. Management actions and monitoring programs are carefully designed to generate reliable feedback and clarify the reasons underlying results. Actions and objectives are then adjusted based on this feedback and improved understanding to try to achieve the desired outcomes. In addition, decisions, actions, and results are carefully documented and communicated to others so that knowledge gained through experience is passed on, rather than

lost when individuals move or leave the organization. Desired outcomes (goals and objectives), as well as the boundaries of land use allocations or special designations are not adaptable and require an RMP amendment to change. Actions to achieve the desired outcomes may be adapted to achieve the desired outcomes. Implementation or activity level decisions also may be adapted.

This DRMP recommends an adaptive management strategy. This process is flexible and generally involves four phases: planning, implementation, monitoring, and evaluation. As the BLM works with partners to obtain new information, it is able to evaluate monitoring data and other resource information to periodically refine and update management decisions and actions. This allows for the continual refinement and improvement of management prescriptions and practices.

2.12.3. MONITORING & PARTNERSHIPS

Monitoring of actions related to implementing LUPs is an important part of adaptive management because it provides information on the relative success of strategies. Monitoring is the collection and analysis of repeated observations to track the status of a variable or system, and can be used to determine whether management actions are being implemented as written (implementation monitoring) or to evaluate success in achieving desired outcomes (effectiveness monitoring).

Adaptive management relies on monitoring that is sufficiently sensitive to detect relevant ecological changes. Ongoing monitoring helps to adjust management decisions and strategies related to implementing LUPs. The BLM monitors many activities and events; grazing utilization and vegetation trends are measured to support decisions on allotment Standards and Guidelines evaluations. OHV events are monitored to determine if permit stipulations are followed and necessary site rehabilitation undertaken.

This DRMP recognizes that many monitoring needs will require further design and planning. There are several ways to design an effectiveness-monitoring program. Model-based approaches rely on a small number of sites to represent an ecosystem class; however, it can be exceedingly difficult to find these, and it sometimes is difficult to draw broad conclusions from those sites. Design-based approaches rely on a carefully planned sampling. In this approach, the sample size must be large enough to make reliable references, which may be costly. A significant challenge in designing a program to monitor ecological conditions is integrating habitat monitoring with the species of special interest. Additionally, the BLM faces the challenge of monitoring uses on public lands. The BLM invites citizens and partners to help it develop an effective monitoring and evaluation plan for implementation decisions on public land resources, local communities, and users.

2.13. REQUIREMENTS FOR FURTHER ENVIRONMENTAL ANALYSIS

This Draft RMP/EIS is a programmatic statement describing the impacts of implementing the LUP decisions and management actions described for the Planning Area.

Decisions that are implemented upon approval of the RMP do not require any further environmental analysis or documentation. Whenever implementation-level plans (e.g., ACEC management plans) are prepared, more environmental analysis and documentation is required. Individual management actions or projects requiring more site-specific project planning require more environmental analysis.

Site-specific environmental analysis and documentation, including the use of categorical exclusions and determinations of NEPA adequacy, where suitable, may be prepared for one or more individual projects in accordance with management objectives and decisions established in the approved LUP. In addition, the BLM will ensure that the environmental review process includes evaluation of all critical elements to include cultural resources and T&E species, and completes required USFWS Section 7 consultations and coordination with SHPO in accordance with the BLM Cultural Resources National Programmatic Agreement and Arizona's BLM-SHPO Protocol.

Interdisciplinary impact analysis will be based on this and other applicable EISs. If the analysis prepared for site-specific projects finds potential for significant impacts not already described in an existing EIS, another EIS or supplement may be warranted.

Upon providing public notice of a decision, supporting environmental documentation will be sent to all affected interests and made available to other publics on request. Decisions to implement site-specific projects are subject to administrative review when such decisions are made.

2.14. INTERRELATIONSHIPS

The BLM conducts many activities that require coordination between itself and State or other Federal agencies. Coordination has been ongoing throughout this planning effort. Coordination is required when implementing LUP decisions through project development and site-specific activities.

As a part of this planning effort and implementing on-the-ground activities, the BLM conducts Section 7 consultation with the USFWS, as prescribed under the ESA. In 2003, the BLM and USFWS finalized a consultation agreement to establish an effective and cooperative Section 7 consultation process. The agreement defines the process, products, actions, schedule, and expectations of the BLM and USFWS on project consultation. One biological assessment (BA) will be prepared to determine the effect of the preferred alternative on all relevant listed, proposed, and candidate species and associated critical habitat. The BA will disclose all expected environmental effects, conservation actions, mitigations, and monitoring, including analysis of all direct and indirect effects of plan decisions and any interrelated and interdependent actions. As this plan's decisions are implemented, actions determined through environmental analysis to potentially affect listed or candidate species would initiate more site-specific consultation on those actions.

Consultation with the Arizona SHPO is also conducted in compliance with Section 106 of the NHPA. The BLM's actions would also comply with other Federal environmental legislation, existing programmatic environmental analyses, LUPs, and vegetation treatment documents, such as the Clear Air Act, Clean Water Act, Safe Drinking Water Act, and with State and local government regulations (Appendix B, *Applicable Laws, Regulations, and Policies* (p. 1003)).

The Sikes Act (16 USC 670 et seq.) authorizes the DOI, in cooperation with State agencies responsible for administering fish and game laws, to plan, develop, maintain, and coordinate programs for conserving and rehabilitating wildlife, fish, and game on public lands within its jurisdiction. The plans must conform to overall land use and management plans for the land involved. The plans could include habitat-improvement projects and related activities, and adequate protection for species of fish, wildlife, and plants considered endangered or threatened.

The BLM must also coordinate with suitable State agencies in managing State-listed plant and animal species when the State has formally made such designations.

The BLM is responsible for managing wildlife habitats on public lands, while AGFD is responsible for managing wildlife populations and game harvest. Proclamation 7397 states, "Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Arizona with respect to fish and wildlife management." Continued efforts would be made to coordinate with AGFD to enhance wildlife habitat, species diversity, and riparian health. Coordination occurs between the agencies on management plans and activities to achieve the optimum health of wildlife species and populations. Currently, coordination efforts are conducted consistent with a statewide MOU. In addition, an MOU has been signed giving AGFD cooperating agency status on RMP efforts in Arizona. To further promote interagency coordination, a cooperative agreement was signed between the agencies, establishing a liaison position in the AGFD. This liaison is assigned coordination responsibility on all ongoing LUPs and spends a portion of his/her work schedule in the Arizona State Office.

Regional transportation planning and construction of roadways and highways is generally conducted by State or regional agencies, such as ADOT, county departments of transportation, and city transportation departments. Coordination efforts will be consistent with MOUs (e.g., ADOT, BLM, or FHWA MOUs) or other documents in effect at the time of the project. When these agencies plan and develop roadways that cross public lands, the BLM is involved in their design and contributes to environmental impact analysis. In that process, the BLM would coordinate with the responsible agency to develop design features that minimize the fragmenting effect of the planned roadway. It would work with the responsible agency to evaluate and incorporate safe and effective wildlife crossings to ensure long-term species viability and maintain habitat connectivity. Where planned roadways potentially fragment other resources, such as but not limited to recreation routes, grazing allotments or mining operations, the BLM will work with the responsible agency to provide continued connectivity for those purposes as well. The BLM also would work with the agency to provide continued safe access to public land from any developed roadway for recreation and other public uses.

2.15. COMPARISON OF IMPACT INTENSITIES

In an effort to demonstrate the intensity of an impact, a range of qualitative terms have been created to summarize impacts from one management program on another. Some programs have specifically defined these terms for their managed resource or resource use with clearly outlined thresholds. Program specific intensity definitions can be found in the beginning of each program's impacts analysis in Chapter 4, *Environmental Consequences* (p. 371), while the general definitions of these terms can be found in Section 4.1.5, "Qualitative Terms for the Intensity of Impacts" (p. 375). Table 2.23, "Comparison of Impact Intensities" (p. 219) compares the intensities by alternative. *For impacts that reach the major intensity level, a summary of those impacts is provided within the tables.*

Table 2.23. Comparison of Impact Intensities

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
IMPACTS ON AIR RESOURCES					
Air Quality	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: None; SDNM: None				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran Negligible; SDNM: Negligible				
Soil Resources	Lower Sonoran: None; SDNM: None				
Vegetation Resources	Lower Sonoran: None; SDNM: None				
Visual Resource Management	Lower Sonoran: Negligible; SDNM: Negligible				
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None				
Wildland Fire Management	Lower Sonoran: Minor; SDNM: Minor				
Lands and Realty	Lower Sonoran: Minor; SDNM: Minor			Lower Sonoran: Negligible to Minor; SDNM: Negligible	
Livestock Grazing Management	Lower Sonoran: Minor; SDNM: Minor			Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor
Minerals Management	Lower Sonoran: Minor; SDNM: Negligible				
Recreation Management	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate		Lower Sonoran: Minor; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Negligible
Travel Management	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate			Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate
Special Designations	Lower Sonoran: Negligible; SDNM: Negligible				
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
IMPACTS ON CAVE RESOURCES					
No caves and cave resources have been identified in the Decision Areas, though Paleozoic limestone outcrops and lava tubes do exist.					
IMPACTS ON CULTURAL AND HERITAGE RESOURCES					
Air Quality	Lower Sonoran: None; SDNM: None				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible to Minor; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible to Minor
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor		Lower Sonoran Negligible; SDNM: Negligible		Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor
Soil Resources	Lower Sonoran Negligible; SDNM: Negligible				
Vegetation Resources	Lower Sonoran: Minor; SDNM: None	Lower Sonoran: Negligible to Minor; SDNM: None			
Visual Resource Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate		Lower Sonoran: Negligible to Major; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate		Lower Sonoran Negligible; SDNM: Negligible		
Wildland Fire Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Lands and Realty	Lower Sonoran: Minor to Major; SDNM: Minor to Moderate				
Livestock Grazing Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate	Lower Sonoran: Minor to Moderate; SDNM: Negligible to Minor	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate
Minerals Management	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate			Lower Sonoran: Negligible to Minor; SDNM: Minor to Moderate	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate
Recreation Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate		Lower Sonoran: Minor; SDNM: Negligible to Moderate	Lower Sonoran: Minor; SDNM: Negligible to Minor	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate
Travel Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Negligible to Moderate		Lower Sonoran: Negligible; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Negligible to Moderate
Special Designations	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible	
Public Safety and Hazardous Materials	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate				
IMPACTS ON PALEONTOLOGICAL RESOURCES					
Limited paleontological resources have been found in the Planning Area; therefore impacts on these resources are not discussed in detail.					
IMPACTS ON PRIORITY WILDLIFE SPECIES AND HABITAT MANAGEMENT					
Air Quality	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: None; SDNM: None				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate		Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor.	
Soil Resources	Lower Sonoran: None; SDNM: None				
Vegetation Resources	Lower Sonoran: None; SDNM: None				
Visual Resource Management	Lower Sonoran: None; SDNM: None				
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Negligible to Minor ; SDNM: Negligible		
Wildland Fire Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Major				
Lands and Realty	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor.	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor		Lower Sonoran: Negligible to Minor; SDNM: Negligible	
Livestock Grazing Management	Lower Sonoran: Negligible to Major. SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Minor; SDNM: Minomer	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Negligible to Major; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor
Minerals Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor				Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Recreation Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Moderate		Lower Sonoran: Negligible to Major ; SDNM: Negligible to Minor		
Travel Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor
Special Designations	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor	Lower Sonoran: Negligible to Minor; SDNM: None			
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				
IMPACTS ON SOIL RESOURCES					
Air Quality	Lower Sonoran: None; SDNM: None				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: None; SDNM: None				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Negligible to Minor; SDNM: Negligible	Lower Sonoran: Negligible; SDNM: Negligible			
Soil Resources	Lower Sonoran: None; SDNM: None				
Vegetation Resources	Lower Sonoran: Minor; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible		Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible
Visual Resource Management	Lower Sonoran: None; SDNM: None				
Water Resources	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None				
Wildland Fire Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Major				
Lands and Realty	Lower Sonoran: Major: Blading of large acreages for solar energy facilities, estimated at greater than 150,000 acres over the life of the plan, is likely to disrupt drainage patterns, and cause surface disturbance and soil compaction over a large enough area to be a moderate impact. Use of large quantities of ground water, may be needed for renewable energy production and may affect soil resources by causing subsidence in localized areas. Assuming that the solar energy development proposals to be built under this plan are mostly the solar energy concentration facilities, the overall impact of ROWs for this use would be moderate, although it would be major in the localized construction area. SDNM: Minor to Major			Lower Sonoran: Major (same impacts as discussed in Alternatives B through C). SDNM: Negligible to Major	Lower Sonoran: Major (same impacts as discussed in Alternatives B through C). SDNM: Minor to Major
Livestock Grazing Management	Lower Sonoran: Minor; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Minor to Major; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible to Minor
Minerals Management	Lower Sonoran: Major: Impacts of mineral development on soil resources include potential disturbances including soil displacement and loss or burial of upper soil horizons. This would reduce water holding capacity (possibly permanently), loss of vegetation leading to increased erosion, and new roads. If a large mine with leach pads, open pits and tailings piles were developed, major impacts on soils would occur. Much of the mine footprint would experience a long-term loss of soil productivity. SDNM: Negligible to Major			Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Major	Lower Sonoran: Negligible to Major; SDNM: Negligible to Major
Recreation Management	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Minor	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Minor to Moderate; SDNM: Minor

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Travel Management	Lower Sonoran: Major: Overall impacts on soils from travel on mostly unsurfaced roads would be moderate with some areas of sensitive soils or higher road densities having major impacts. As road density increases, soil surface and vegetation disturbance, including disturbance to the 100 foot parking area on each side of the road prism, and total compacted surface area exposed to erosion during storm water runoff all increase. SDNM: Minor to Major				
Special Designations	Lower Sonoran: Negligible; SDNM: Negligible				
Public Safety and Hazardous Materials	Lower Sonoran: Major: Soils affected by a spill of hazardous materials are usually removed. Delays in cleanup could result in infiltration of hazardous materials into groundwater, possibly causing major impacts and costly groundwater treatment. SDNM: Negligible to Major				
IMPACTS ON VEGETATION RESOURCES					
Air Quality	Lower Sonoran: None; SDNM: None				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Negligible; SDNM: Negligible to Minor		
Soil Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Vegetation Resources	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor				
Visual Resource Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Negligible to Minor; SDNM: Negligible		Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Negligible; SDNM: Negligible		Lower Sonoran: Minor; SDNM: Negligible
Wildland Fire Management	Lower Sonoran: Moderate to Major; SDNM: Moderate to Major				
Lands and Realty	Lower Sonoran: Negligible to Major; SDNM: Negligible to Minor		Lower Sonoran: Negligible to Major; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible	
Livestock Grazing Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Minor		Lower Sonoran: Negligible to Minor; SDNM: Negligible	Lower Sonoran: Negligible to Moderate; SDNM: Negligible Minor
Minerals Management	Lower Sonoran: Negligible to Major; SDNM: None			Lower Sonoran: Negligible; SDNM: None	Lower Sonoran: Negligible to Major; SDNM: None
Recreation Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor		Lower Sonoran: Negligible to Minor; SDNM: Negligible	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor
Travel Management	Lower Sonoran: Minor; SDNM: Negligible to Moderate		Lower Sonoran: Minor; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible
Special Designations	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				
IMPACTS ON VISUAL RESOURCES MANAGEMENT					
Air Quality	Lower Sonoran: None; SDNM: None				
Cave Resources	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Cultural and Heritage Resources	Lower Sonoran: None; SDNM: None				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: None; SDNM: None				
Soil Resources	Lower Sonoran: None; SDNM: None				
Vegetation Resources	Lower Sonoran: None; SDNM: None				
Visual Resource Management	Lower Sonoran: Negligible to Moderate; SDNM: Moderate	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor;	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor	Lower Sonoran: Negligible to Minor; SDNM: Negligible	Lower Sonoran: Negligible to Major; SDNM: Negligible to Minor
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Characteristics	Lower Sonoran: None; SDNM: None				
Wildland Fire Management	Lower Sonoran: Minor; SDNM: Minor				
Lands and Realty	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor		Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor		
Livestock Grazing Management	Lower Sonoran: Minor; SDNM: Minor				
Minerals Management	Lower Sonoran: Minor to Moderate; SDNM: None				
Recreation Management	Lower Sonoran: Moderate to Major; SDNM: Minor			Lower Sonoran: Negligible to Major; SDNM: Minor	
Travel Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Major	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor		
Special Designations	Lower Sonoran: None; SDNM: None				
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
IMPACTS ON WATER RESOURCES					
Air Quality	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: None; SDNM: None				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Negligible to Minor; SDNM: None	Lower Sonoran: Negligible; SDNM: None			
Soil Resources	None				
Vegetation Resources	Lower Sonoran: Minor; SDNM: None			Lower Sonoran: Negligible to Minor; SDNM: None	
Visual Resource Management	Lower Sonoran: None; SDNM: None				
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None				
Wildland Fire Management	Lower Sonoran: None; SDNM: None				
Lands and Realty	Lower Sonoran: Negligible to Minor; SDNM: Minor to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Negligible to Minor; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible
Livestock Grazing Management	Lower Sonoran: Minor to Moderate; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor to Moderate; SDNM: Negligible to Minor

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Minerals Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible	Lower Sonoran: Negligible to Moderate; SDNM: Negligible
Recreation Management	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Negligible to Minor; SDNM: Minor		Lower Sonoran: Minor; SDNM: Negligible
Travel Management	Lower Sonoran: Negligible to Moderate; SDNM: Minor	Lower Sonoran: Minor; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible to Minor; SDNM: Minor	Lower Sonoran: Moderate; SDNM: Moderate
Special Designations	Lower Sonoran: Minor; SDNM: Minor			Lower Sonoran: Negligible; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Minor
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				
IMPACTS ON WILD HORSE & BURRO MANAGEMENT					
The intent of the existing decisions and proposed alternative decision is to remove all wild horses and burros from the Painted Rock Herd Area, and any impacts from other program areas on the Wild Horse & Burro program would be negligible. Therefore, impacts from other resources will not be discussed in detail.					
IMPACTS ON WILDERNESS CHARACTERISTICS					
Air Quality	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor			Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Minor to Moderate; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Negligible to Minor		Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible to Minor

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Soil Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Vegetation Resources	Lower Sonoran: Minor to Moderate; SDNM: Negligible		Lower Sonoran: Minor; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible	
Visual Resource Management	Lower Sonoran: Moderate; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Negligible	Lower Sonoran: Minor to Moderate; SDNM: Negligible to Minor
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: Negligible to Major; SDNM: Negligible to Major		Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Minor
Wildland Fire Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Major				
Lands and Realty	Lower Sonoran: Major: In subject areas with wilderness characteristics, naturalness and opportunities for solitude and primitive and unconfined recreation could be subject to major impacts, potentially completely foregone due to the development of renewable energy facilities. These impacts would be located in the lower elevations of the Gila Bend Mountains and Saddle Mountain, with the effects mainly occurring on the lower desert plains and bajadas (areas with 5% elevation slope or less). Permanent transportation and associated right-of-way corridors within or next to lands with wilderness characteristics could prospectively cause major degradation of wilderness characteristics. These impacts would mainly be found in wilderness characteristics areas within the Gila Bend Mountains		Lower Sonoran: Negligible; SDNM: Negligible to Minor	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible; SDNM: Negligible to Minor

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
	and Saddle Mountain areas, with road corridors sited in less mountainous terrain, and probably impinging on the same lands subject to the solar and energy developments described previously. SDNM: Moderate				
Livestock Grazing Management	Lower Sonoran: Minor to Moderate; SDNM: Negligible to Moderate		Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor to Moderate; SDNM: Negligible to Moderate
Minerals Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate			Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate
Recreation Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate		Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Minor
Travel Management	Lower Sonoran: Moderate; SDNM: Moderate		Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate
Special Designations	Lower Sonoran: None; SDNM: None				
Public Safety and Hazardous Materials	Lower Sonoran: Negligible; SDNM: Negligible				
IMPACTS ON WILDLAND AND FIRE MANAGEMENT					
Air Quality	Lower Sonoran: None; SDNM: None				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: None; SDNM: None				
Paleontological Resources	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Priority Wildlife Species and Habitat	Lower Sonoran: None; SDNM: None				
Soil Resources	Lower Sonoran: Minor; SDNM: Minor				
Vegetation Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Visual Resource Management	Lower Sonoran: Negligible; SDNM: Negligible			Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor		
Wildland Fire Management	Lower Sonoran: Minor; SDNM: Minor				
Lands and Realty	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor			Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible to Minor; SDNM: Minor
Livestock Grazing Management	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor		Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible
Minerals Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible			Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible
Recreation Management	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate		Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Travel Management	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Moderate; SDNM: Moderate	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate
Special Designations	Lower Sonoran: None; SDNM: None				
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				
IMPACTS ON LANDS AND REALTY MANAGEMENT					
Air Quality	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Cave Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Cultural and Heritage Resources	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor; SDNM: Minor	
Paleontological Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Priority Wildlife Species and Habitat	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Moderate; SDNM: Negligible		
Soil Resources	Lower Sonoran: Negligible; SDNM: Minor				
Vegetation Resources	Lower Sonoran: Negligible; SDNM: Minor				
Visual Resource Management	Lower Sonoran: Negligible to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Minor	Lower Sonoran: Minor; SDNM: Moderate	Lower Sonoran: Minor to Moderate; SDNM: Moderate
Water Resources	Lower Sonoran: Minor; SDNM: Minor				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Moderate; SDNM: Moderate		
Wildland Fire Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Lands and Realty	Lower Sonoran: Negligible to Major; SDNM: Minor to Major	Lower Sonoran: Minor to Major; SDNM: Minor to Major	Lower Sonoran: Major: Under Alternatives D, over half of the Decision Area would be excluded or avoided to LUA and utility-scale renewable energy development and the least amount of multiuse utility corridors would be allocated, possibly increasing the amount of LUAs rejected from being processed within the Decision Area. SDNM: Major: The entire Monument would be an exclusion area to all LUAs, including utility-scale renewable energy development, and no multiuse utility corridors would be allocated, thus forcing all proposed applications for LUAs to be rejected within the Monument.	Lower Sonoran: Moderate to Major; SDNM: Major: The entire Monument would be an exclusion area to all LUAs, including utility-scale renewable energy development, and no multiuse utility corridors would be allocated, thus forcing all proposed applications for LUAs to be rejected within the Monument.	
Livestock Grazing Management	Lower Sonoran: Negligible; SDNM: Negligible				
Minerals Management	Lower Sonoran: Negligible; SDNM: Minor				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Recreation Management	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Moderate; SDNM: Minor		Lower Sonoran: Minor; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor
Travel Management	Lower Sonoran: Minor to Moderate; SDNM: Minor	Lower Sonoran: Moderate; SDNM: Moderate		Lower Sonoran: Major: Alternative D would be the most restrictive alternative to LUAs, due to the fact that the most amount of acres are closed to vehicle use, potentially increasing the access limitations in certain areas of the Lower Sonoran. SDNM: Negligible	Lower Sonoran: Moderate to Major; SDNM: Negligible
Special Designations	Lower Sonoran: Minor to Moderate; SDNM: Negligible	Lower Sonoran: Moderate to Major; SDNM: Negligible		Lower Sonoran: Major: All special designations would be exclusion areas for all LUAs and would restrict all uses to designated multiuse utility corridors, thus increasing the amount of rejected LUA applications within the Decision Area. SDNM: Negligible	Lower Sonoran: Minor to Moderate; SDNM: Negligible
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				
IMPACTS ON LIVESTOCK GRAZING MANAGEMENT					
Air Quality	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Cave Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Cultural and Heritage Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor		Lower Sonoran: Minor; SDNM: Negligible to Minor	Lower Sonoran: Negligible; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Negligible to Minor
Paleontological Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Priority Wildlife Species and Habitat	Lower Sonoran: Negligible to Minor; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible		Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible
Soil Resources	Lower Sonoran: Minor; SDNM: None				
Vegetation Resources	Lower Sonoran: Negligible; SDNM: Minor				
Visual Resource Management	Lower Sonoran: Minor; SDNM: Negligible to Major			Lower Sonoran: Negligible; SDNM: Negligible to Major	Lower Sonoran: Minor; SDNM: Negligible to Major
Water Resources	Lower Sonoran: Minor; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor
Wildland Fire Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Major				
Lands and Realty	Lower Sonoran: Negligible to Major; SDNM: Negligible to Moderate	Lower Sonoran: Minor to Major; SDNM: Negligible		Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor to Major; SDNM: Negligible

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Livestock Grazing Management	Lower Sonoran: Negligible to Major; SDNM: Negligible to Moderate	Lower Sonoran: Major: Managing perennial grazing allotments with a reduction in the authorized grazing preference could have a major impact by reducing the long-term viability of some livestock operations. The reduction in livestock numbers could leave some operators with herd sizes too small to support their current operations. Operators would have to acquire additional lands in order to support a viable operation. SDNM: Major (Impacts would be the same as described under the Lower Sonoran)	Lower Sonoran: Moderate to Major; SDNM: Moderate to Major	Lower Sonoran: Major: All allotments would be closed to grazing when current permits expire. This would eliminate livestock grazing, which would be a major impact to permittees who would be required to turn to other means to sustain their herds. SDNM: Major (Impacts would be the same as described under the Lower Sonoran)	Lower Sonoran: Negligible to Major; SDNM: Negligible to Major
Minerals Management	Lower Sonoran: Minor; SDNM: Negligible			Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Negligible

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Recreation Management	Lower Sonoran: Minor to Moderate; SDNM: Minor	Lower Sonoran: Negligible to Moderate; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor to Moderate; SDNM: Minor
Travel Management	Lower Sonoran: Minor; SDNM: Minor			Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor
Special Designations	Lower Sonoran: Minor; SDNM: Minor				
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				
IMPACTS ON MINERALS MANAGEMENT					
Air Quality	Lower Sonoran: Minor; SDNM: Minor				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Minor to Moderate; SDNM: Minor		
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Minor to Moderate; SDNM: Minor	Lower Sonoran: Moderate to Major; SDNM: Moderate to Major	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate
Soil Resources	Lower Sonoran: None; SDNM: None				
Vegetation Resources	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate				
Visual Resource Management	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Moderate to Major; SDNM: Moderate to Major	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate
Water Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Moderate; SDNM: Moderate	Lower Sonoran: Moderate to Major; SDNM: Moderate to Major	Lower Sonoran: Moderate; SDNM: Moderate
Wildland Fire Management	Lower Sonoran: None; SDNM: None				
Lands and Realty	Lower Sonoran: Negligible; SDNM: Negligible				
Livestock Grazing Management	Lower Sonoran: None; SDNM: None				
Minerals Management	Lower Sonoran: None; SDNM: None				
Recreation Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Travel Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Special Designations	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Moderate; SDNM: Moderate		
Public Safety and Hazardous Materials	Lower Sonoran: Minor; SDNM: Minor				
IMPACTS ON RECREATION MANAGEMENT					
Air Quality	Lower Sonoran: Moderate to Major; SDNM: Moderate to Major				
Cave Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Cultural and Heritage Resources	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Major; SDNM: Major	Lower Sonoran: Moderate; SDNM: Moderate	Lower Sonoran: Minor; SDNM: Minor	
Paleontological Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Priority Wildlife Species and Habitat	Lower Sonoran: Minor to Major; SDNM: Minor to Major				
Soil Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Vegetation Resources	Lower Sonoran: None; SDNM: None				
Visual Resource Management	Lower Sonoran: Negligible; SDNM: Negligible				
Water Resources	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Minor; SDNM: Minor		
Wildland Fire Management	Lower Sonoran: Minor; SDNM: Minor				
Lands and Realty	Lower Sonoran: Minor; SDNM: Minor				
Livestock Grazing Management	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate
Minerals Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible				
Recreation Management	Lower Sonoran: Negligible to Minor; SDNM: Moderate	Lower Sonoran: Moderate; SDNM: Minor to Major	Lower Sonoran: Moderate; SDNM: Moderate	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Moderate; SDNM: Moderate
Travel Management	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor; SDNM: Negligible to Moderate			
Special Designations	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Moderate; SDNM: Negligible		Lower Sonoran: Moderate to Major; SDNM: Negligible	Lower Sonoran: Moderate; SDNM: Negligible
Public Safety and Hazardous Materials	Lower Sonoran: Minor; SDNM: Minor				
IMPACTS ON TRAVEL MANAGEMENT					
Air Quality	Lower Sonoran: Negligible to Moderate; SDNM: Minor	Lower Sonoran: Negligible to Major; SDNM: Minor to Moderate		Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible to Major; SDNM: Minor

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Cave Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Cultural and Heritage Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Moderate	Lower Sonoran: Minor; SDNM: Moderate	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Minor; SDNM: Minor to Moderate	Lower Sonoran: Minor; SDNM: Minor
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Moderate; SDNM: Negligible to Major	Lower Sonoran: Moderate; SDNM: Moderate	Lower Sonoran: Moderate to Major; SDNM: Minor
Soil Resources	Lower Sonoran: Negligible to Moderate; SDNM: Minor	Lower Sonoran: Moderate; SDNM: Moderate		Lower Sonoran: Moderate; SDNM: Moderate to Major	Lower Sonoran: Moderate; SDNM: Moderate
Vegetation Resources	Lower Sonoran: Minor; SDNM: Minor to Moderate		Lower Sonoran: Moderate; SDNM: Moderate		
Visual Resource Management	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor			Lower Sonoran: Negligible; SDNM: Minor
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor to Moderate; SDNM: Major: This alternative creates the maximum amount of solitude and unconfined recreation of all the alternatives through the closure of existing primitive roads and trails, having a major effect by greatly restricting vehicular access to areas around the Sand Tank Mountains, Javelina Mountain, and Margie's Peak.	Lower Sonoran: Negligible to Minor; SDNM: Minor
Wildland Fire Management	Lower Sonoran: None; SDNM: None				
Lands and Realty	Lower Sonoran: Minor; SDNM: None	Lower Sonoran: Minor; SDNM: Minor to Moderate	Lower Sonoran: Minor to Moderate; SDNM: Negligible	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible; SDNM: Minor
Livestock Grazing Management	Lower Sonoran: Negligible to Moderate; SDNM: Minor	Lower Sonoran: Minor; SDNM: None			Lower Sonoran: Negligible to Moderate; SDNM: None
Minerals Management	Lower Sonoran: Minor; SDNM: Moderate				Lower Sonoran: Minor; SDNM: Negligible

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Recreation Management	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Minor; SDNM: Minor to Moderate	Lower Sonoran: Moderate to Major; SDNM: Moderate	Lower Sonoran: Minor; SDNM: Minor to Moderate
Travel Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate	Lower Sonoran: Minor; SDNM: Minor to Major	Lower Sonoran: Minor to Major; SDNM: Minor to Major	Lower Sonoran: Negligible; SDNM: Major: Allocating 175,700 acres as limited to designated routes and allocating 310,700 acres to OHV closed area would have a major effect on the travel system, by closing areas greater than 10,000 acres to vehicular use. Conversely, large areas for non-motorized access are dramatically increased in size, having a major effect on this travel mode as well. As compared to the No-Action Alternative, where 161,200 acres are closed, this alternative closes much more area to vehicular access.	Lower Sonoran: Minor to Major; SDNM: Minor to Major
Special Designations	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Negligible; SDNM: Moderate	Lower Sonoran: Major; SDNM: Moderate	Lower Sonoran: Negligible; SDNM: Moderate

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Public Safety and Hazardous Materials	Lower Sonoran: Negligible; SDNM: Negligible				
IMPACTS ON SPECIAL DESIGNATIONS					
Air Quality	Lower Sonoran: None; SDNM: None				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: None; SDNM: None				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: None; SDNM: None				
Soil Resources	Lower Sonoran: None; SDNM: None				
Vegetation Resources	Lower Sonoran: None; SDNM: None				
Visual Resource Management	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Moderate; SDNM: Moderate	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Minor to Negligible; SDNM: Minor to Negligible	Lower Sonoran: Minor; SDNM: Minor
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None		Lower Sonoran: Negligible; SDNM: Negligible		
Wildland Fire Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate				
Lands and Realty	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Moderate; SDNM: Moderate	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor
Livestock Grazing Management	Lower Sonoran: Minor; SDNM: Minor			Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor
Minerals Management	Lower Sonoran: Negligible to Moderate; SDNM: Minor				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Recreation Management	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Moderate; SDNM: Moderate		Lower Sonoran: Minor; SDNM: Minor	
Travel Management	Lower Sonoran: Minor; SDNM: Minor	Lower Sonoran: Moderate; SDNM: Moderate		Lower Sonoran: Minor; SDNM: Minor	
Special Designations	Lower Sonoran: None; SDNM: None				
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				
IMPACTS ON HAZARDOUS MATERIALS & PUBLIC SAFETY					
Air Quality	Lower Sonoran: None; SDNM: None				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: None; SDNM: None				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: None; SDNM: None				
Soil Resources	Lower Sonoran: None; SDNM: None				
Vegetation Resources	Lower Sonoran: None; SDNM: None				
Visual Resource Management	Lower Sonoran: None; SDNM: None				
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: None; SDNM: None				
Wildland Fire Management	Lower Sonoran: Major: Fires kill and remove native vegetation, allowing disturbed landscapes to be easily invaded by opportunistic non-native invasive plants and weeds like buffelgrass. This is a potentially severe and permanent impact if Sonoran Desert fires convert fire-intolerant native desert habitats to non-native fire tolerant grasslands. In summary, all the actions described can degrade or diminish naturalness over the long term and are considered major both in scope, scale and severity. SDNM: Major (Impacts are the same as those discussed in the Lower Sonoran.)				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Lands and Realty	Lower Sonoran: Minor; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Minor		Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Minor; SDNM: Minor
Livestock Grazing Management	Lower Sonoran: Minor; SDNM: Minor			Lower Sonoran: Negligible; SDNM: Negligible	Lower Sonoran: Minor; SDNM: Minor
Minerals Management	Lower Sonoran: Minor to Major; SDNM: Minor to Major				
Recreation Management	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate				
Travel Management	Lower Sonoran: Moderate; SDNM: Moderate				
Special Designations	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Public Safety and Hazardous Materials	Lower Sonoran: Minor to Major; SDNM: Moderate.				
IMPACTS ON SOCIOECONOMICS					
Air Quality	Lower Sonoran: Negligible; SDNM: Negligible				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Minor; SDNM: Minor				
Soil Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Vegetation Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Visual Resource Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible to Moderate		Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor		
Water Resources	Lower Sonoran: Negligible; SDNM: Negligible				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wilderness Characteristics	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate		Lower Sonoran: Negligible to Moderate; SDNM: Minor to Moderate	Lower Sonoran: Negligible to Minor; SDNM: Minor to Moderate	Lower Sonoran: Negligible to Moderate; SDNM: Minor to Moderate
Wildland Fire Management	Lower Sonoran: Negligible; SDNM: Negligible				
Lands and Realty	Lower Sonoran: Negligible to Major; SDNM: Negligible to Minor				
Livestock Grazing Management	Lower Sonoran: Negligible; SDNM: Negligible to Minor	Lower Sonoran: Negligible; SDNM: Minor	Lower Sonoran: Negligible; SDNM: Negligible		Lower Sonoran: Negligible; SDNM: Negligible to Minor
Minerals Management	Lower Sonoran: Negligible to Moderate; SDNM: Negligible				
Recreation Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor	Lower Sonoran: Moderate; SDNM: Negligible to Minor			
Travel Management	Lower Sonoran: Negligible; SDNM: Negligible to Minor	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor			
Special Designations	Lower Sonoran: Negligible; SDNM: Negligible				
Public Safety and Hazardous Materials	Lower Sonoran: Negligible; SDNM: Negligible				
IMPACTS ON TRIBAL INTERESTS					
Air Quality	Lower Sonoran: None; SDNM: None				
Cave Resources	Lower Sonoran: None; SDNM: None				
Cultural and Heritage Resources	Lower Sonoran: Minor; SDNM: Minor				
Paleontological Resources	Lower Sonoran: None; SDNM: None				
Priority Wildlife Species and Habitat	Lower Sonoran: Minor; SDNM: Minor				
Soil Resources	Lower Sonoran: None; SDNM: None				

From:	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Vegetation Resources	Lower Sonoran: Minor; SDNM: Minor				
Visual Resource Management	Lower Sonoran: Minor to Moderate; SDNM: Minor to Moderate				
Water Resources	Lower Sonoran: None; SDNM: None				
Wild Horse & Burro Management	Lower Sonoran: None; SDNM: None				
Wilderness Characteristics	Lower Sonoran: Negligible; SDNM: Negligible				
Wildland Fire Management	Lower Sonoran: Negligible; SDNM: Negligible				
Lands and Realty	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Livestock Grazing Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Minerals Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Recreation Management	Lower Sonoran: Negligible; SDNM: Negligible				
Travel Management	Lower Sonoran: Negligible to Minor; SDNM: Negligible to Minor				
Special Designations	Lower Sonoran: Minor; SDNM: Minor				
Public Safety and Hazardous Materials	Lower Sonoran: None; SDNM: None				

Chapter 3. Affected Environment

3.1. INTRODUCTION

This chapter describes the environment within the Lower Sonoran Planning Area that would potentially be affected by actions proposed under the alternatives described in Chapter 2, *Alternatives* (p. 27). While the Bureau of Land Management (BLM) is only responsible for managing BLM-administered public lands (public lands) within the Planning Area (i.e. the Lower Sonoran and Sonoran Desert National Monument [SDNM] Decision Areas), proposed decisions may affect environmental components outside the Decision Areas. Therefore, unless indicated otherwise, discussion and analysis in this section encompasses the Planning Area as a whole.

The environmental components potentially impacted consist of resource and management activities listed below. The foreseeable environmental effects of the alternatives on these same resource and management activities are described in Chapter 4, *Environmental Consequences* (p. 371).

Resources

Air Quality

Cave Resources

Climate Change

Cultural and Heritage Resources

Geology

Paleontological Resources

Priority Wildlife Species and Habitat Management

Soil Resources

Vegetation Resources

Visual Resources

Water Resources

Wild Horse & Burro Management

Wilderness Characteristics

Wildland Fire Management

Resource Uses

Lands and Realty

Livestock Grazing Management

Minerals Management

Recreation Management

Travel Management

Special Area Designations

National Landscape Conservation System

Administrative Designations

Other Special Designations

Social and Economic

Tribal Interests

Hazardous Materials and Public Safety

Social and Economic Conditions

The data and descriptions of these categories are drawn from the Analysis of the Management Situation (AMS) (BLM 2005) and subsequent, completed resource assessments on several of the environmental components occurring within the Planning Area. The AMS is available for public review at the BLM's Phoenix District Office.

3.2. RESOURCES

3.2.1. AIR QUALITY

3.2.1.1. Clean Air Act Land Classifications

The BLM's role in air-resource management is to ensure that agency activities comply with applicable air-quality standards and that BLM-authorized leases and permits include conditions and stipulations that require compliance with applicable air quality rules and standards. This is done through interagency coordination, participation in State implementation plans, environmental impact analyses as required by NEPA, and adaptive management practices as outlined in BLM Handbook H-1601-1.

Under the Federal Clean Air Act (CAA), national parks 6,000 acres or larger and wilderness areas 5,000 acres or larger existing in 1977 were designated as Class I. The class 1 designation gives Federal land managers the opportunity to impose the strictest rules protecting air quality. The Planning Area includes one wilderness area with a Class I air quality designation, Superstition Wilderness, located east of Phoenix. Undeveloped, remote areas deserving of natural or scenic resource preservation could be designated as Class II. Other wilderness areas and national parks, including those designated after 1977, are classified as Class II, and land managers are limited to less strict protection of air quality. State and local air quality planning and permitting agencies give such places special consideration under the CAA through Prevention of Significant Deterioration criteria even though they do not qualify as Class I. Within the Planning Area, nine wilderness areas have been designated Class II for air quality. These include three areas containing designated wilderness outside the Decision Areas (Organ Pipe Cactus National Monument, Cabeza Prieta National Wildlife Refuge (NWR), and Four Peaks wildernesses), three within the Lower Sonoran (Woolsey Peak, Signal Mountain, and Sierra Estrella wildernesses), and three within the SDNM (Table Top, North Maricopa Mountains, and South Maricopa Mountains wildernesses).

The CAA requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants harmful to public health or the environment. It also establishes two types of national standards: primary standards to protect health and secondary standards to protect welfare. The EPA sets NAAQS for six principal or "criteria" pollutants. The pollutants are carbon monoxide (CO), lead, nitrogen dioxide (NO_2), one-hour ozone (O_3), sulfur dioxide (SO_2), and particulate matter smaller than 10 micrometers in effective diameter (PM_{10}).

Geographic areas are designated as attainment, nonattainment, or unclassified for each of the criteria pollutants with respect to NAAQS. An area is designated as "attainment" if pollutant concentrations meet the NAAQS, "nonattainment" if pollutant concentrations exceed the NAAQS, or "unclassified" if the status of attainment has not been verified through data collection. For planning and permitting purposes, unclassified areas are treated as attainment areas. All counties making up portions of the Planning Areas, with the exception of Yuma County, contain some areas that are designated as nonattainment with respect to specific criteria pollutants that include PM_{10}, SO_2, CO, and O_3 (Arizona Department of Environmental Quality [ADEQ] 2006). The air-pollution nonattainment areas are shown in Map 3-1: Air Pollutant Nonattainment Areas.

3.2.1.2. Emission Sources

Diverse emission sources within the Planning Area collectively affect air quality on a local and regional scale, including major, minor, non-permitted, mobile, and fugitive emission sources. For permitting purposes, a major source is defined as an emission that has the potential to emit 100 tons or more per year of any single criteria pollutant, 10 tons per year of any single hazardous air pollutant, or 25 tons per year of any combined hazardous air pollutants. Major sources include industrial facilities such as gas-fired power plants, natural gas pipeline compressor stations, landfills, mineral processing facilities, and various manufacturing plants with large fuel combustion equipment or use substantial quantities of volatile organic materials, typically in application of finishes and coatings.

A minor source is defined as an emission that has the potential to emit pollutants at a level greater than the "significance" threshold, but less than a major source. The significance threshold provides an emission baseline for criteria pollutants that determines which facilities must obtain permits. Minor sources include industrial and commercial facilities of many kinds, especially in the more developed portions of the Planning Area. Although minor emission sources vary outside the metropolitan Phoenix area, common sources are rock-product plants that produce crushed and screened materials, and hot-mix asphalt and concrete plants. These plants can be found in the Lower Sonoran and are often portable, which means that they can be moved as the local demand for their product moves. The primary emissions from these sources are particulate matter; however, nitrogen dioxide (NO_2) can also be significant if any equipment operates using fuel-fired generators.

Many small, stationary emission sources, such as agricultural operations and large-scale construction projects, do not produce air pollution levels that would substantially affect regional air quality, and are not required to have an operating permit. Such sources may occur in the Decision Areas on occasion. However, emissions from these facilities, mostly in the form of particulates, can affect local air quality due to the arid soil conditions. While non-permitted sources are not tracked as closely as permitted sources, these must also comply with applicable Federal, State, and local regulations.

Vehicle travel on paved roads, especially in the metropolitan Phoenix area, represents the largest single emission source in and surrounding the Planning Area. When CO from vehicle emissions combines with the extreme desert heat, O_3 is created. Other major contributors in the Planning Area include traffic on interstates and other major thoroughfares, including Interstates 10, 17, and 8 (I-10, I-17, and I-8); U.S. Highways 60 and 89 (U.S. 60 and U.S. 89); and State Highway 87 (SR 87). In a similar fashion, railroad corridors can be significant emissions contributors in the Planning Area's central portions. Particulate matter carried onto paved roadways from wind and rain events and soil tracked onto highways by vehicles entering from unpaved roads are common sources of PM_{10} pollution.

Most vehicle routes in the Decision Areas are unpaved. Travel on unpaved routes results in particulate emissions, or fugitive dust. Although fugitive dust is not included in air quality evaluations, it can affect local air quality, especially in areas of concentrated travel on unpaved roads and during periods of high winds.

The largest source of particulate matter emissions in the Planning Area is surface-disturbing activities, including construction, mining, and off-highway (recreation-related) travel, all of which occur in the Decision Areas. State and local nonpoint-source rules guide these activities.

Maricopa County recommends best management practices (BMPs) such as applying water or chemical dust suppressants to reduce particulate matter emissions.

The northern part of the Lower Sonoran is most likely to be affected by automobile emissions, including CO, CO_2, SO_2, and PM_{10} due to road density and proximity to the Phoenix metropolitan area. Such emission sources could also affect the northern-most portion of SDNM. Traffic on I-8 and State Highways 85 and 238 (SR 85 and SR 238), as well as the railroad corridor, are significant contributors of emissions in the Monument's central and southern portions. Travel on unpaved roads also results in fugitive dust emissions.

3.2.1.3. Quantifiable Indicators

Quantifiable indicators associated with air quality include criteria air pollutants, conditions, and observed levels of visibility. Criteria air pollutants associated with NAAQS, as identified in the CAA and regulated by the EPA, include NO_2, CO, SO_2, O_3, PM_{10}, and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Visibility varies with the levels of criteria air pollutants in the atmosphere.

Pollutants

A review of air monitoring data required by Arizona Revised Statutes (ARS) 49-424.10 indicates considerable progress has been made in reducing airborne pollutants throughout the state. The most drastic change has occurred in CO concentrations in the highly urbanized areas of Tucson and Phoenix. Such concentrations, which regularly exceeded standards in neighborhoods and near busy intersections in Phoenix (and to a lesser extent in Tucson), are now well below the eight-hour CO NAAQS of 9 parts per million (ppm). Ozone concentrations have shown slight decreases in the metropolitan areas of Tucson and Phoenix, though a very slight increase has been observed in some rural areas. In comparison with CO, O_3 concentrations may prove to be more difficult to curb due to its relatively high background levels. Trends in PM_{10} are quite variable and location dependent. Long-term trend sites in Phoenix show a slight decrease in PM_{10} concentrations for most areas, though there may be localized, unimproved areas. The Tucson metropolitan area, on the other hand, has seen a general increase in PM_{10} concentrations, but their magnitude is significantly less than in Phoenix. Monitoring of $PM_{2.5}$ is a new program begun in the late 1990s. While there is insufficient data to assess $PM_{2.5}$ trends confidently, the variability in concentration of these fine particles over time appears to be relatively constant, with Phoenix and Nogales, Arizona, having the greatest magnitudes.

A substantial number of air-quality monitors, scattered in and around the Planning Area, measure and record ambient air concentrations for criteria air pollutants (i.e. CO, NO_2, O_3, SO_2, PM_{10}, and $PM_{2.5}$). In 2004, all monitors with recorded data indicated compliance with the NAAQS for all pollutants except O3 (8-hour standard) and PM_{10} (24-hour and annual standards). Such data allow a review of historic trends for certain pollutants. Data trends for criteria air pollutants measured and recorded at various monitors were evaluated based on data obtained from annual Air Quality Reports issued by ADEQ.

A small portion of the SDNM, about 3,500 acres downwind from the City of Phoenix, is within the nonattainment area of the Maricopa Intrastate Air Quality Control Region. The 3,500 acres encompasses sections of Woolsey Peak, North Maricopa Mountains, and the Sierra Estrellas. It should be noted that ozone production in the lower atmosphere is mostly an inner-city condition. Ground-level ozone is caused by, among other things, motor-vehicle exhaust, industrial

emissions, and gasoline vapors, as well as natural sources that emit nitrogen oxides and volatile organic compounds.

A portion of the Monument is within the area designated by Maricopa County as "Area A" for PM_{10}. All projects and program components within this area must comply with Section 176 (c) of the CAA, as amended, and regulations under 40 Code of Federal Regulations (CFR) part 93 subpart W, concerning conformity of general Federal actions to the applicable State Implementation Plan (SIP) for nonattainment and maintenance areas. Under those authorities, "no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan." Therefore, a Federal agency must determine that a Federal action conforms to the applicable implementation plan before it is done.

For all pollutants, PM_{10}, SO_2, CO, and O_3, no standards were violated in the Planning Area's western region, which encompasses most of the Lower Sonoran (e.g. Ajo Block and Saddle and Gila Bend Mountains). Most areas where standards are exceeded are in the immediate vicinity of, and to the northeast of, metropolitan Phoenix (see Map 3-1: Air Pollutant Nonattainment Areas), which includes the northernmost portion of the Lower Sonoran. Trends here have been variable. The Ajo and Globe-Miami areas historically were designated nonattainment for SO_2, primarily due to emissions related to the large copper mines; however, in 2004, Ajo was re-designated as in attainment, and Miami-Globe has been recommended for attainment status. The Ajo PM_{10} nonattainment area has been recommended for attainment because it has not exceeded the standard since 1998 (EPA 2006; EPA 2007; ADEQ 2007; Maricopa County Air Quality Department [MCAQD] 2006)

Carbon Monoxide, Nitrogen Dioxide, and Sulfur Dioxide. With few exceptions in the Planning Area, CO-monitoring data indicate a general decrease in pollutant levels since 1997, with none exceeding air quality standards. In January 2005, the Phoenix metropolitan area was in attainment with CO standards. Nitrogen dioxide showed a general increase for hourly and daily measurements from 1998 to 2000, then decreases in pollutant levels since 2001. Overall, the annual pattern of emissions has remained steady and within standards. Sulfur dioxide shows variable 3-hour and daily concentrations, but overall concentrations are steady or decreasing and within standards. The Ajo and Globe-Miami areas historically were nonattainment areas for SO_2, primarily due to emissions related to the mines; however, in 2004, Ajo was re-designated in attainment, and Miami-Globe has been recommended for attainment status.

Ozone. Ozone is measured under a 1-hour and an 8-hour standard. In May 2005, EPA changed the Phoenix metropolitan area designation to attainment of the 1-hour ground level O_3 standard. This change was based on not exceeding the 1-hour O_3 standard for the prior eight years. For O_3 on an 8-hour average, the 3-year average of the fourth highest value recorded must be below 0.08 ppm. Nine monitors exceeded this value in and around the Planning Area, with values ranging from 0.08 to 0.085 ppm; the majority are located in the metropolitan Phoenix area. In January 2005, the EPA designated the Phoenix metropolitan area as nonattainment for the 8-hour O_3 standard. Air-quality agencies are now working on control measures that are more stringent to attain the O_3 standard (EPA 2006; EPA 2007; ADEQ 2005; ADEQ 2007; MCAQD 2006).

In the Phoenix metropolitan area and the northeast portion of the Planning Area, O_3 levels have been variable with no prominent trends since 1998. The Gila Bend Mountains and Saddle Mountain area has had a decreasing trend in O_3 over this same period.

Particulate Matter. Particulate matter is monitored for both PM_{10} and $PM_{2.5}$. In both sizes, the Phoenix area, including much of Maricopa and Pinal counties, are exceeding standards. The 24-hour PM_{10} NAAQS is 150 µg/m3; the annual PM_{10} NAAQS is 50 µg/m3. In 2004, the 24-hour standard was exceeded 41 times at 12 sites in the metropolitan Phoenix area, and five sites exceeded the annual standard. Primary pollution sources contributing to this nonattainment are windblown dust from construction sites, agricultural fields, unpaved roads and parking lots, and disturbed vacant lots.

Based on 1997 air quality standards, the entire state of Arizona is in attainment of the $PM_{2.5}$ standard. In 2006, however, the EPA created standards that are more stringent and expects to issue new designations in 2010 based on data collected in 2007-2009 (EPA 2007). As a result, the ADEQ and county departments of environmental quality have been looking closely at $PM_{2.5}$ emissions. Air-quality agencies are working on control measures that are more stringent to decrease particulate matter, both PM_{10} and $PM_{2.5}$, with a goal to decrease $PM_{2.5}$ emissions by 5 percent per year.

For all pollutants, no standards were exceeded in the Planning Area's western region, which encompasses most of the public lands, including the SDNM, Ajo Block, Saddle Mountain, and Gila Bend Mountains. Most exceeded-standard areas are in the immediate vicinity of, and to the northeast and southeast of, the metropolitan Phoenix area. Emission sources located within or near the Decision Areas could potentially contribute to exceeding the PM_{10}NAAQS standard, although insufficient data is available to identify specific causes or sources except (in some cases) high winds.

For PM_{10}, annual averages have been stable in most locations since 2000; however, hourly and daily standards occasionally have been exceeded. Rolling three-year data for the annual PM_{10} standard analyzed by the EPA show that for the years 2001 through 2006, the Phoenix nonattainment area averages 62 µg/m3, while the standard is 50 (EPA 2006). The 24-hour PM_{10} NAAQS is 150 µg/m3. EPA data analysis shows that the rolling three-year data indicates an average of 256 µg/m3 (EPA 2006). In October 2010, the EPA proposed a new PM_{10} nonattainment area comprised of western Pinal County.

Particulate matter less than 2.5 microns in diameter is collected in only a few locations and shows no clear trend except that concentrations have been relatively stable. Neither EPA current evaluations nor future projections indicate that any areas in Arizona will be out of compliance with the new $PM_{2.5}$ standards. The Ajo PM_{10} nonattainment area has been recommended for attainment status because it has not exceeded the standard since 1998 (EPA 2006, 2007; ADEQ 2007; MCAQD 2006).

Visibility Conditions

Visibility and regional haze conditions in the Planning Area are a function of the nature and emission height of certain air pollutants and meteorological conditions. The Cooperative Institute for Research in the Atmosphere operates a network of monitoring stations and publishes Integrated Monitoring of Protected Visual Environments (IMPROVE) data to identify and evaluate patterns and trends in regional visibility. Data pertaining to the Planning Area show that visible haze patterns measured in the Sonoran Desert characterize typical sites in the Southwest. The monitoring results revealed:

- Fine and coarse particulate concentrations were the largest contributors to poor visibility in the spring, then summer and fall, and lowest in the winter.

- Contributions to visibility degradation consisting of sulfates, organics, and soil in the fine particulate mass measurements were highest in the summer, and then fall, spring, and again lowest in the winter (IMPROVE 2000).

Based on the above observations, the haziest days in the Sonoran Desert occur in the summer and the best visibility occurs in the winter.

In 2004, the visibility conditions at the Tonto National Monument IMPROVE monitor, which is located northeast of the Superstition Class I Wilderness Area, were 110, 155, and 220 kilometers for the worst, typical, and best visual range values, respectively (Visibility Information Exchange Web System [VIEWS] 2006). For example, on the worst days, someone could identify a dark object against the horizon up to 110 kilometers away. Downtown Phoenix visibility also has been measured in recent years. Preliminary data from 2004 and 2005 indicates that approximately 50 percent of the days were considered good or excellent and 50 percent were considered fair, poor, or very poor (Arizona Department of Environmental Quality 2006). In recent years, Phoenix area parks had five cameras installed to monitor visibility conditions, including Superstitions Mountains and Estrella Mountain County and South Mountain parks within the Planning Area. These could be used to assess visibility trends in the future. Limited trend data is available on visibility in the Planning Area, due primarily to a single IMPROVE monitor located to the northeast of Phoenix. Based on data available from 1991-2001, there was an improvement in visibility and standard visible range. Visibility distances on the worst days ranged from 87 to 103 kilometers and on the best days from 176 to 199 kilometers (VIEWS 2003a, 2003b). Actions to decrease O_3 and particulate matter are likely to improve visibility.

Meteorological Conditions

The Planning Area is typical of the Sonoran Desert (i.e. warm and dry), and air quality is closely linked to an area's meteorological conditions.

- Average annual maximum temperatures vary across the Planning Area. Long-term data indicates an average annual maximum temperature of 89ºF in the western portion to 76ºF at the eastern edge, and from 79ºF in the north to 84ºF in the south. Minimum temperatures range from 56ºF in the western side to 47ºF in the east, and from 61ºF in the north to 59ºF in the south (Western Regional Climatic Center [WRCC] 2006a). Average monthly temperatures in the western part of the Planning Area, where most of the Decision Areas' lands are located, range from the mid 40s in the winter to the mid 90s in the summer.

- Annual average mean precipitation levels range from 6-16 inches west to east, with rainfall ranging from 6-10 inches in the west and south, and higher rainfall levels to the northeast (WRCC 2006a). Precipitation is almost entirely in the form of rain and is unevenly distributed throughout the year, with, on average, more rain in July and August during the summer monsoon season.

- The average annual wind speeds range from 5.5 to 7.7 miles per hour (mph), with the average monthly wind speed ranging throughout the year from 4.0 to 8.9 mph (WRCC 2006b).

These climate and meteorological factors often contribute to the generation of fugitive dust, especially from vehicular travel on unpaved roads, earthmoving activity, and mineral material handling.

3.2.2. CAVE RESOURCES

The BLM is required to comply with the Federal Cave Resources Protection Act (FCRPA) regarding caves in the Planning Area. Caves on Federal lands are managed under 43 CFR, Part 37. These regulations provide guidance for identifying, nominating, evaluating, and designating significant cave resources. According to FCRPA, a cave is "any naturally occurring void, cavity, recess, or system of interconnected passages which occurs beneath the surface of the earth or within a cliff or ledge and which is large enough to permit an individual to enter, whether or not the entrance is naturally formed or manmade. Such term shall include any natural pit, sinkhole, or other feature, which is an extension of the entrance."

The Planning Area contains Paleozoic sedimentary deposits and Tertiary volcanic rocks known to contain caves elsewhere in Arizona. While Paleozoic limestone occurs in the Sand Tank Mountains, no caves or cave resources have been found in the Decision Areas; however, two lava tubes are known to occur in Sentinel Plain. Small rock overhangs and shallow openings are present in some rock units; however, these are not deep enough to meet the criteria to be considered a cave. Two lava tubes have been identified in the Decision Areas as cave resources. There may be additional undocumented caves located in geologically suitable areas. Any newly discovered caves would be evaluated for scientific, educational, and recreational value according to the FCRPA.

3.2.3. CLIMATE CHANGE

Climate is the composite of a region's generally prevailing weather conditions throughout the year, averaged over a series of years. Historical weather patterns within the Planning Area are characterized by mild winters, hot summers, and low levels of rainfall consistent with the Sonoran Desert's arid climate. Temperatures in the Planning Area show a consistent warming trend since recording began in 1896 (National Weather Service Forecast Office 2009), and recent warming in the Southwest has been "among the most rapid in the nation" (United States Global Change Research Program 2010). Across the West, the increase in average temperature during the past five years has been 70 percent higher than in the world as a whole (Saunders, et al. 2008). In Arizona, average-temperature increases during winter and spring months have been greater than during the summer or fall, and increases in daily minimum temperatures have been more common than increases in daily maximum temperatures. Winter minimum temperatures in the Sonoran Desert now are higher, and freeze-free periods are longer, than at any time during the 20th century, a trend likely to continue into the future (Weiss and Overpeck 2005). Climate models' projections for the future of the western U. S. consistently show higher temperatures to come. Increases of 3.6ºF (2ºC) in both summer and winter are likely by 2050, as are annual increases of 7.2-9ºF (4-5ºC) by 2099 (Garfin, Crimmins and Jacobs 2007).

3.2.3.1. Emission Sources

Ongoing scientific research has identified the rise of greenhouse-gas (GHG) emissions as a major contributor to this increase in the global average temperature. Evidence that GHGs affect climate is "unequivocal," according to hundreds of scientists working with the United Nations

Intergovernmental Panel on Climate Change (IPCC 2007). GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N20), water vapor, and several trace gases. Through complex interactions on a regional and global scale, they cause average temperatures at the Earth's surface to rise, primarily by decreasing the amount of heat energy radiated back into space. Although GHG levels and corresponding variations in climatic conditions have varied for millennia, industrialization and burning of fossil carbon sources have caused GHG concentrations to increase significantly and contribute to overall climatic changes, typically referred to as global warming or climate change.

Some GHGs, such as CO2, occur naturally and are emitted into the atmosphere through both natural process and human activities, while others are created and emitted solely through human activities. The GHGs that enter the atmosphere due to human activities include CO2 from the burning of fossil fuels, solid waste, and trees and wood products; CH4 emitted during the production and transport of coal, natural gas, and oil, as well as by livestock, deforestation, and agricultural practices; N2O from agricultural and industrial activities and the combustion of fossil fuels and solid waste; and fluorinated gases that result from a variety of industrial processes (EPA 2008).

Total U.S. GHG emissions have risen by 14.7 percent from 1990 to 2006. The primary GHG emitted by human activities in the United States was CO2. It totals approximately 84.8 percent of all GHG emissions, with the largest source being fossil fuel combustion. According to the EPA Inventory of U. S. Greenhouse Gas Emissions and Sinks (2008), CO2 emitted in the United States totaled 7,054.2 teragrams in 2006. These GHG emissions are partly offset by carbon sequestration in forests, trees, urban areas, and agricultural soils, which, in aggregate, offset 12.5 percent of total U.S. emissions in 2006 (EPA 2008).

3.2.3.2. Global Effects

The Earth's global mean surface temperature rose 1.3ºF (0.74°C) from 1906 to 2005 (IPCC 2007). In 2007, the Intergovernmental Panel on Climate Change (IPCC) indicated that by the year 2100, global average surface temperatures would rise 2.0-11.5°F (1.1-6.4°C) above 1990 levels. Increasing concentrations of GHGs are likely to accelerate the rate of climate change in the future, and there is evidence of this happening already (IPCC 2007). However, uncertainties remain as to how climate change will affect different regions. Computer model predictions indicate increases in temperature will not be equally distributed but are likely to be accentuated at higher latitudes. Data collected by the Goddard Institute for Space Studies (2007) indicate that northern latitudes have exhibited temperature increases of nearly 2.1°F since 1900, with a nearly 1.8°F increase since 1970.

3.2.3.3. Regional Effects

The average temperature in the Southwest has already increased approximately 1.5ºF (0.83ºC) above a baseline period of 1960-1990 and is projected to rise a total of 4.0-10.0ºF (2.2ºC-5.6ºC) by the end of the century (Justus and Fletcher 2007). It is not possible to predict with certainty the effects of climate change on local- or regional-scale ecosystems, but climate change is certain to affect natural and human systems within the Planning Area and is likely to have a large impact on BLM management strategies. The 2007 U. S. Government Accountability Office (GAO) Report on Climate Change states, "Federal land and water resources are vulnerable to a

wide range of effects from climate change, some of which are already occurring. These effects include, among others:

- Physical effects such as droughts, floods, glacial melting, and sea level rise;
- Biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and
- Economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses" (GAO 2007, 2).

In the Sonoran Desert, the most likely effects of climate change include:

- Higher average temperatures, particularly at night;
- Scarcer water supplies due to lower overall rainfall and earlier melting of upstream snowpack resulting in earlier peak stream flows in the Salt, Verde, Gila, and Colorado rivers in spring and potentially reduced flows in summer;
- Precipitation patterns that are more variable than what is observed currently, including longer, more frequent droughts and more intense storms bringing increased flooding;
- Higher rates of soil erosion;
- Growth in invasive plant species, particularly non-native annual grasses;
- Increased frequency and intensity of wildfires;
- Shifting habitats for wildlife, including the development of "novel" ecosystems in which species that have been geographically separate in the past begin to share habitat.

The most important way climate change is likely to affect the Planning Area is by decreasing already scarce water resources. Drought and flood cycles lasting months, years, or even decades already are a regular occurrence in the Sonoran Desert. An extended drought has gripped Arizona since the 1990s, and the total amount of water available for all uses — including wildlife and plants, ecosystem services, and human needs — is expected to decline as climate change advances (United States Global Change Research Program 2010).

Currently, yearly precipitation in Phoenix, which is adjacent to the Planning Area, averages 7.63 inches, with wide seasonal variations. Historically, most rain falls during the summer monsoon and winter rainy seasons, while spring and fall "shoulder" seasons may see no rain at all. The monsoon season, typically mid-July to mid-September, is defined by a shift in wind patterns that brings moisture up from the Gulf of California, the Gulf of Mexico, and the eastern Pacific. Average rainfall increases during this time from just over a tenth of an inch in June to an inch or more in July (0.97"), August (1.03"), and September (0.84") (National Weather Service Forecast Office 2009). The other half of the region's rain typically falls from December through March, when the winter rainy season brings in storms from the west and northwest. On average, these storms drop between three-quarters to one inch of rain per month, with December posting the highest monthly average (0.93") from 1896-2008 (National Weather Service Forecast Office 2009). However, yearly rainfall is highly variable and rarely fits the "average" pattern (Sheppard, et al. 2002). Under most climate-change scenarios, storm intensity and attendant flooding are likely to become more common as the timing, location, and potentially the amount of precipitation

shifts (Archer and Predick June 2008). Nonetheless, the effect climate change will have on the overall amount of precipitation in Arizona is not clear.

The effect that higher temperatures, both observed and projected, will have on the region's water supplies is much clearer. Snowpack currently supplies some 70 percent of all water in the West (Saunders, et al. 2008) and almost all the water to the rivers that flow into the Planning Area. The timing and capacity of these supplies are dependent on overall precipitation and temperature, which determines when the snowpack melts. Recent years have seen snowmelt push the timing of peak stream flows in spring as much as a month earlier than normal, thereby reducing flows in the summer and fall when demand typically peaks (Saunders, et al. 2008; United States Global Change Research Program 2010). Reduced stream flows in the summer will leave ecosystems more dependent on increasingly uncertain summertime rains. Further exacerbating this vulnerability is the increasing tendency of rain to fall during infrequent, large-scale events that drain quickly and cause flooding and erosion. Such changes to the hydrologic cycle of the Sonoran Desert could have massive impacts on the region's wildlife and vegetation.

Climate change-related shifts from desert to grassland ecosystems will also increase the risk of wildfire throughout the Sonoran Desert (GAO 2007; Archer and Predick 2008). Higher winter temperatures and earlier peaks in spring snowmelt runoff already have led to increases in both the frequency and intensity of wildfires in higher elevations of the Rocky Mountains (Westerling, et al. 2006). Current conditions in the Sonoran Desert represent the extreme range for many plant species, and the combination of increasing temperatures and decreasing water availability is likely to shift the range of many plants and animals northward or even cause them to go extinct (Saunders, et al. 2008; Weiss and Overpeck 2005). Increasing CO2 concentrations also lead to fertilization and growth of specific plant species. Such shifts could bring the woody, herbaceous plants common to northern Mexico into areas now dominated by iconic succulents such as the saguaro cactus and native grasses (Saunders, et al. 2008; Weiss and Overpeck 2005). The "novel" ecosystems created by climate change-induced habitat shifts also could lead to significant management challenges as plants and animals that once were geographically distinct combine in new ways.

3.2.4. CULTURAL & HERITAGE RESOURCES

Cultural and heritage resources within the Planning Area represent evidence of more than 10,000 years of human occupation of the region. There are many thousands of historic districts, buildings, and structures within the Planning Area, but the great majority of these are located in urban areas not managed by the BLM. Most of the cultural resources on public lands are archaeological sites reflecting both pre-Columbian and post-contact occupation. The BLM estimates that about 80 percent of the sites on public lands reflect aboriginal occupation and 13 percent Euro-American occupation, with a high percentage of sites of unknown age or cultural affiliation.

Because cultural resources are abundant within the Decision Areas, it is a major challenge to inventory and evaluate them. Densities of 5-15 archaeological sites per square mile are common. Available information indicates that between 5 and 6 percent of the Planning Area has been surveyed for cultural resources, and more than 6,300 archaeological and historical sites have been recorded (see Table 3.1, "Estimated Extent of Cultural Resources Survey and Recorded Resources" (p. 264)). Only 4 percent of the Lower Sonoran has been surveyed, with 588 sites recorded, while 6 percent of the SDNM has been surveyed, with more than 300 sites recorded. These statistics suggest there could be more than 100,000 archaeological sites within the Planning Area, with 13,000 in the Lower Sonoran and 5,000 within the SDNM. Because these estimates

are based on incomplete and sometimes ambiguous data collected over many decades, they are subject to an unknown margin of error; however, they do indicate that only a small percentage of cultural resources have been found and recorded.

Table 3.1. Estimated Extent of Cultural Resources Survey and Recorded Resources

	Planning Area (including Private Inholdings and Non-BLM Land)			Applicable Decision Areas (BLM-Administered Public Land Only)		
	Lower Sonoran	SDNM	Entire Planning Area	Lower Sonoran	SDNM	Both Decision Areas
Size (acres)	8,371,400	496,600	8,868,000	932,000	486,600	1,418,600
Percentage of total area	94%	6%	100%	66%	34%	100%
Surveyed for cultural resources (acres)	466,578	29,826	496,404	36,804	29,708	66,512
Percentage of all surveys	94%	6%	100%	55%	45%	100%
Percentage of total area that has been surveyed	5.6%	6.0%	5.6%	4.0%	6.1%	4.7%
Number of recorded cultural resources	6,038	307	6,345	588	291	879
Density (sites/mile)	8.3	6.5	8.2	10.1	6.3	8.5
Projected number of resources	99,800	5,000	104,800	12,800	4,800	17,600
SOURCE: AZSITE Cultural Resource Inventory (supplemented with additional information from BLM files) 2003						

Evaluating the significance of archaeological and historical sites recorded on public lands is an ongoing aspect of BLM's cultural resource management program. The criteria for inclusion in the National Register of Historic Places (NRHP) are used for evaluating the significance of archaeological and historical sites. Approximately 70 percent of currently evaluated sites are NRHP eligible, most often under Criterion D of 36 CFR 60, which is an evaluation of the potential of the site to yield information important in history or prehistory. The BLM also allocates prehistoric and historic sites to various use categories when developing a management strategy for cultural resources. These use categories include conservation for future use and traditional, public, scientific, and experimental uses. If cultural resources lack significant value, they may be discharged from management. A majority of the currently recorded archaeological sites within the Planning Area are allocated to the scientific use category.

Other forms of allocation and protection for cultural resources include designation as national monuments, NHTs, and cultural areas of critical environmental concern (ACECs). There are a total of 322 individual properties and 17 districts within the Planning Area listed in the NRHP.

The Juan Bautista de Anza NHT is one of 19 congressionally designated national scenic and historic trails in the U.S. and the only NHT within the Decision Areas. Approximately 165 miles of the Anza NHT runs through the Planning Area, with 32.5 miles situated within the Lower Sonoran and 16.75 miles within the SDNM. The setting of the trail through the SDNM probably has been altered less since its original use than any other segment of the entire 1,200 mile route (National Park Service [NPS]1996). Historic documents indicate the Anza Expedition camped 10 times along the Trail within the Planning Area, including one camp in the SDNM. Although no physical evidence of these camps has been found to date, these locations have public interpretation potential. In the 1840s, the Mormon Battalion built a wagon road along the same corridor. In the late 1850s and early 1860s, the Butterfield Overland Stage improved the route, and subsequently, tens of thousands of immigrants traveled west along this route to California.

Factors threatening the historical integrity of cultural resources include disturbance or destruction by various development projects or land uses, natural erosion, route proliferation, and unauthorized excavation and artifact collecting by vandals or uninformed recreational users. Available data indicate that approximately 40 projects, on average, have been reviewed annually since 1980, and an average of eight sites annually have been affected by development projects. Some sites were avoided by project modifications, but archaeological data recovery studies were conducted at an average of five sites annually to mitigate project impacts. Reviews and treatment plans associated with these data-recovery projects were conducted in consultation with the State Historic Preservation Office (SHPO) and concerned Native American tribes.

Roughly 5 percent of monitored archaeological and historical sites on public lands are being damaged by erosion. Intentional vandalism and unauthorized collection of artifacts have damaged cultural resources, but there is little quantified information about the extent of this threat. Proliferation of unauthorized travel routes within the Decision Areas has increased over the last 10 years to the point that some cultural resources, formerly considered to be in remote locations with difficult access, have become quite easy to access by vehicle. In many cases, routes were discovered leading to sites or cutting through site areas. These additional routes, and the overall increases in all-terrain vehicle (ATV) use, have led to far higher rates of vehicle damage to many sites and increased site visitation.

The BLM has responded to these threats with several different strategies. One of the most successful is providing systematic site monitoring through the statewide Site Steward Program. Physical protection measures are employed when damage or threats are perceived. Barriers to limit access and signs to inform visitors about laws protecting sites are installed as needed. Administrative measures, such as road closures, or special management designations, such as the Monument, also are used to protect cultural resources. One other way to provide protection to selected sites is to develop them for public interpretation. Interpretive site development includes intensive planning and installation of protective measures and interpretive media that enhances visitor experiences.

An examination of historical inventory data allows for a projection of future cultural resource work in the Planning Area to be an annual average of 10 to 15 square miles surveyed and 70 to 90 sites recorded. These projections cover roughly the next 10 years. At this projected rate of coverage, the vast majority of sites in the Decision Areas would still be unrecorded by 2020. Most previous cultural resource inventory was done for project compliance reviews under Section 106 of the National Historic Preservation Act. In recent years, some Federal funds have been allocated to document and research the archaeological and historical sites on public lands, but Section 106 surveys for major development projects (funded by project proponents) will undoubtedly continue to be the primary source of inventory information in the foreseeable future.

The scope and scale of development projects on public lands and the level of cultural resource threats they pose, vary widely, but the historical trend indicates an increasing number of projects on BLM-administered public lands are being reviewed each year. This trend suggests an average of 60 to 80 reviewed projects on public lands annually within the next 10 to 15 years. Recent years witnessed a substantial increase over the historical trend, and could indicate an even faster growth in the level of threats from various developments. The number of resources threatened but avoided by projects each year has fluctuated considerably from year to year. The historical trend suggests 10 to 20 sites threatened annually, but avoided by project modifications over the next 10 to 15 years. Similarly, the number of archaeological sites studied to mitigate project impacts is increasing, and could double to about 10 sites annually over the next 10 to 15 years. This

represents a small fraction of the estimated 17,000 to 18,000 archaeological and historical sites on the Lower Sonoran and SDNM.

Historical trend data indicates that 20 to 30 sites might be protected annually over the next 10 to 15 years through various administrative and physical measures. Installation of physical measures such as signs, fences, and gates are common responses to specific instances of resource damage. The historical data indicate annual monitoring of 50 to 80 sites is likely over the next 10 to 15 years.

Over the last decade, the BLM's cultural resource management program has devoted more effort to public interpretation, and this trend is likely to receive more emphasis in the future. Interest in cultural resource-based heritage tourism is expected to increase, particularly within the Monument.

3.2.5. PALEONTOLOGICAL RESOURCES

Paleontological resources include vertebrate and invertebrate animal fossils, plant fossils, and trace fossils. The latter are preserved indicators that an animal was present (e.g. footprints, burrows, borings, and waste droppings). These resources are a fragile and nonrenewable scientific record of the history of life on earth. Fossils have been found in many parts of Arizona and in almost all of the geologic deposits from Cambrian through the Quaternary. In the Planning Area, vertebrate fossils are typically found in unconsolidated Quaternary silt, sand, and gravel deposits and Tertiary sedimentary rocks. Various invertebrate marine fossils, including coral, trilobites, brachiopods, cephalopods, and bryozoans have been found in Cretaceous sedimentary rocks.

While paleontological resources in central and south-central Arizona generally are considered less abundant or less scientifically significant as those found in northern or southeastern Arizona, the BLM considers any discovery of vertebrate fossils and noteworthy occurrences of invertebrate and plant fossils as important. Within the Planning Area, such fossils are most likely to be found during ground disturbing activities in Quaternary sedimentary deposits, while others may also be found in Paleozoic and Mesozoic deposits. Increased ground-disturbing activities in these deposits may increase the threat to noteworthy fossils.

No significant paleontological resources are known to occur in either the Lower Sonoran or SDNM. It is the scarcity of fossils in these Decision Areas that makes subsequent finds that much more significant. Fossils of mammals, birds, and fish are present but not common in unconsolidated Quaternary and Tertiary sedimentary rocks. Although not significant or abundant, invertebrate marine fossils occur in Paleozoic limestones in southwest Pinal and southeast Maricopa counties, and are found in Cretaceous sedimentary rocks in the Decision Areas.

3.2.6. PRIORITY WILDLIFE SPECIES & HABITAT

In Arizona, the BLM manages habitat for many different categories of priority wildlife species:

- Special status species, including species listed as threatened or endangered, or those proposed for listing (candidate species) under the Endangered Species Act (ESA) and BLM sensitive species (BLM Manual 6840);
- Bats;

- Migratory birds, including birds of conservation concern;
- Raptors;
- Game species;
- Species for which there is a signed conservation agreement or strategy.

A number of priority animal species inhabit the Planning Area. A priority species list for wildlife and fish can be found in Appendix J, *Wildlife & Plant Priority Species* (p. 1235). The BLM focuses most of its wildlife-management efforts on the habitats of priority species as required by a variety of laws, regulations, policies, plans, manuals, and agreements. This is especially the case for species listed under the ESA and candidate species for listing. Because the priority species label covers many different types of wildlife species, the following discussion on habitat requirements for priority species is pertinent to most, if not all, wildlife species in the Planning Area. Therefore, there will not be a separate "general wildlife" discussion in this chapter.

BLM sensitive species are those species that require special management consideration to avoid listing under the ESA and are designated as sensitive by a BLM state director, usually in cooperation with the State agency responsible for its management. The BLM sensitive species designation normally is given to species on public lands whose conservation status can be significantly affected by BLM management. Instead of maintaining a list of State threatened and endangered species, the AGFD identifies certain species as "species of greatest conservation need" (AGFD 2006).

In general, wildlife populations have declined over the last 10 years. This is likely due to a combination of causes including drought, habitat loss due to urban development, habitat degradation and fragmentation from roads and other developments, and increased recreational use. Few species have been tracked closely enough to determine specific trends; however, AGFD does track game species such as bighorn sheep and mule deer.

Generally, mammal populations are expected to diminish without active management due to extended drought conditions, urban expansion, and habitat loss and fragmentation. Small mammal populations are cyclical and become depressed during years of below-normal precipitation when forage plants, water, and seeds are scarce or less nutritious. Predator populations will eventually follow and are expected to drop due to fewer prey species and other factors. Human-wildlife interactions are expected to increase under drought conditions because wildlife could potentially be forced farther from their home ranges into urban areas to find food and water.

3.2.6.1. Wildlife Habitats

While the BLM keeps abreast of wildlife-population trends and takes appropriate steps to conserve or improve the habitats that sustain species, responsibility for animal-population management is delegated to the State, specifically the AGFD. For federally listed species, population-management responsibility falls to the U.S. Fish and Wildlife Service (USFWS), which collaborates with State agencies, academics, and other recognized technical experts. The USFWS also regulates hunted migratory species.

Vegetation resources management provides the foundation for wildlife and habitat management on public lands. Wildlife typically occupies or avoids habitats in predictable ways based on life history requirements of individual species. The Planning Area supports a variety of natural

vegetative communities and landscape features that offer a diversity of wildlife habitat types. While these habitat types correspond with the associated vegetative communities, they are also defined by a number of distinct landscape features such as rock outcrops and hillsides, cliffs and taluses, mesquite bosques, and mines. All such features contribute to the diversity and abundance of wildlife in the Planning Area as they generally provide a microhabitat for wildlife uniquely adapted to, or dependent upon, these features. To maintain diverse, viable, and abundant populations of wildlife, a mosaic of biologically and structurally diverse habitat types is thus necessary.

Habitat Connectivity/Fragmentation

While maintaining patches of diverse habitats is important, ensuring connectivity of these habitat patches also is important to provide plants and wildlife the ability to move along elevation gradients and between habitat areas. As climatic conditions change, both wildlife and plants must be able to adapt to their associated changing niches by expanding and contracting their range; however, developments related to human population growth such as subdivisions, highways, and related infrastructure create barriers to wildlife and plant movement, resulting in what is known as habitat fragmentation.

While the Planning Area includes numerous isolated tracts of public lands that are interspersed with other Federal, State, tribal, and private lands, most of the public lands consist of large, consolidated areas that have the potential to provide connectivity between important habitat patches for various wildlife species, habitats on public lands are fragmented. This is due to the existing transportation network crisscrossing public lands (including one interstate highway, several state highways, and numerous paved and unpaved county and secondary roads) and utility and energy rights-of-way (ROWs). Certain large tracts of public land also are separated from nearby public lands by population centers, agricultural areas, and other such developments.

Wildlife Movement Corridors

In order to reduce habitat fragmentation and ensure connectivity in important areas, the BLM took into consideration recommendations from the Arizona's Wildlife Linkages Workgroup (AWLW) strategy of 2006 to develop movement corridors that maintain habitat connectivity. The AWLW is a collaborative effort between public- and private-sector organizations formed to address habitat fragmentation through a comprehensive, systematic approach. Through this partnership and commitment, a statewide assessment was conducted to identify large blocks of habitat, potential wildlife-movement corridors between and through these habitats, and factors that could threaten linkage zones for wildlife. The AWLW took the first step in a process to identify areas of importance for wildlife movement throughout the State. As a part of the workgroup, the BLM embraces the ideology of linkage corridors and is proposing movement corridors for wildlife to migrate from one habitat area to another, especially within priority species habitats where the BLM has management authority.

Wildlife Water Developments

While most wildlife species within the Planning Area are adapted to drought conditions and limited sources of permanent water, approximately 45 wildlife-water catchments and spring developments occur on public lands within the Planning Area. These catchments and spring developments provide intermittent or perennial sources of water that support wildlife diversity.

Few, if any, new wildlife-water developments have been constructed in the past 10 years as it is more cost effective to modify and enlarge existing catchments. Modifying and expanding existing developments reduces the need for maintenance and water to replenish the catchments.

The location of wildlife-water catchments varies depending on the priority wildlife species under consideration and the distance to other water sources. For example, wildlife-water sources constructed in lower elevations, primarily for collared peccary (*javelina*) (*Pecari tajacu*) and mule deer (*Odocoileus crooki*), would be placed primarily in the creosote bush-bursage, palo verde-mixed cacti, or xeroriparian communities. By contrast, higher elevation water sources for use by bighorn sheep (*Ovis canadensis mexicana*) are constructed primarily in the palo verde-mixed cacti and Sonoran Desert mountain communities or in the creosote bush-bursage community adjacent to mountains used by bighorn sheep. Numerous livestock waters have been modified to accommodate wildlife use. Many wildlife species use these water sources and return to them regularly. Bats also forage over water developments as they are attracted by the increased abundance of flying insects. Resident bird species may nest and forage in or near water developments year-round, while migratory bird species may forage and rest in these areas during their migration.

3.2.6.2. Threatened, Endangered, and Candidate Wildlife Species

This section focuses on species on public lands within the Planning Area that are addressed in Manual Section 6840 (see footnote1 above) and species listed under the ESA (1973) as threatened or endangered, proposed for listing (candidate species), species of special concern, and those within five years of being delisted. Federally listed species were identified through the USFWS Arizona Ecological Service Office website on June 12, 2009 (USFWS 2009).

Five special status species that occur or potentially occur on public lands in the Planning Area are federally listed under the ESA: the lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), Sonoran pronghorn antelope (*Antilocapra americana sonoriensis*), Sonoran Desert population of the bald eagle (*Haliaeetus leucocephalus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and Yuma clapper rail (*Rallus longirostris yumanensis*). Two species occurring or potentially occurring on public lands are listed as candidate species: the yellow-billed cuckoo (*Coccyzus americanus*) and the Tucson shovel-nosed snake (*Chionactis occipitalis klauberi*).

Lesser Long-nosed Bat. The endangered lesser long-nosed bat is a nectar-, pollen-, and fruit-eating bat that migrates seasonally from Mexico to southern Arizona and southwestern New Mexico (Arita 1991). The species typically arrives in Arizona in early April, inhabits mainly desert scrub habitats, and departs in mid to late September. The bats roost in caves, abandoned mines, and unoccupied buildings at the base of mountains where agave, saguaro, and organ pipe cacti are present, and fly long distances from their day roosts to forage each night. Potential foraging habitats, in the form of columnar cacti (e.g. saguaros and organ pipe cacti) or agave stands, occur in the Decision Areas (Map 3-3: Federally Protected Plant & Animal Species). There are no documented lesser long-nosed bat roost sites or maternity colonies within the Decision Areas; however, four known maternity colonies do occur near the Arizona-Mexico border on lands not administered by the BLM.

The most significant threat to the survival of the lesser long-nosed bat is habitat loss. The species must have suitable roosts in proximity to adequate food sources both in the southwestern United States, where the young are born during the summer, and at their wintering grounds throughout the arid areas of Mexico (USFWS 1995). While many roost sites in the United States and

Mexico receive some legal protection and are relatively safe because their locations are remote and unknown to the general public, even very slight human disturbance to roosts can displace the species. For example, Fleming (1993) has documented bats temporarily abandoning their roost after only one brief visit by humans. In Mexico, some roosts are severely threatened by efforts to control the vampire bat, which is often confused with other species by farmers and other stakeholders (53 FR 38456).

Threats to food plants also indirectly threaten the lesser long-nosed bat. There is a complex, mutually beneficial relationship between columnar cacti, agaves, and long-nosed bats (Fleming et al. 1995). As native vegetation is increasingly removed for development, other projects, and through grazing, food sources become less and less available near roost sites and along migration routes. The over-harvesting of agave for the legal and illegal manufacture of tequila is particularly detrimental to food sources for the lesser long-nosed bat (53 FR 38456).

There is no widespread consensus on the current status of the overall population of this bat species. Disagreements about the validity of census techniques have kept estimations, even to a higher order of magnitude, from being made (USFWS 1995). Because surveys in Arizona and Mexico conducted between the mid-1970s and 1985 failed to document large numbers of lesser long-nosed bats, it was federally listed as endangered in 1988. Since listing, the species appears to be much more abundant than previously thought, but is still vulnerable because of its gregarious roosting behavior. As many as 150,000 adults and sub-adults may forage in southwestern Arizona on any given summer night. In 1992-1993, a census of 17 roosts in Arizona and Mexico produced estimates of 200 to 130,000 individuals living in any particular roost (USFWS 1995). Ten years of monitoring data (1996-2005) from one known maternity roost within the boundaries of the Lower Sonoran Planning Area (but not on public lands) indicates a general increase in population size.

Sonoran Pronghorn Antelope. The Sonoran pronghorn antelope is listed as a federally endangered subspecies of the American pronghorn that was found over much of southwestern Arizona, northwestern Mexico, and southeastern California in the late 1800s. By the mid-1900s, its numbers and distribution were greatly reduced from historic norms.

Estimates of the Sonoran pronghorn population in Arizona have been collected since 1925. Although these estimates are not directly comparable because of the variety of methods used and geographical areas studied, they all indicate that relatively low numbers of pronghorn (50 to 150 animals) were present in southwestern Arizona within an increasingly small area of distribution. Hunting contributed to the decline of the Sonoran pronghorn before the 1930s but has since been banned (Wright and deVos 1986).

In more recent years, fragmentation, human disturbance, disease, and loss of habitat have been the major factors threatening the subspecies. The most significant habitat fragmentation occurs along the Mexico/United States border, particularly with the installation of the border fence, which inhibits the population's movement between the two countries. Sonoran pronghorn management is further complicated by differing recovery efforts on either side of the border.

The U.S. population primarily is limited to the Barry M. Goldwater Range (BGR), Cabeza Prieta NWR, Organ Pipe Cactus National Monument, and public lands in the Ajo area west of SR 85 in the Lower Sonoran. This animal also is found periodically in the Sentinel Plain south of I-8. Although recovery of the Sonoran pronghorn antelope is an important management priority on public lands where it occurs, these lands constitute less than 4 percent of this animal's current range in the United States (USFWS 2003b).

The area of the Ajo Block in which Sonoran pronghorn occurs lies within the Coyote Flat, Childs, and Cameron grazing allotments (Map 3-4: Sonoran Pronghorn Classification Areas). The Cameron allotment is the only allotment on which this species has been observed in recent years. Although the Ajo Block and Sentinel Plain are both minor components of this animal's active habitat, of the two areas, the Ajo Block currently appears to be more important to the species. In 1997, the USFWS issued a biological opinion (BO) for the Ajo Block allotments and concluded that the proposed grazing activities were not likely to jeopardize the continued existence of the pronghorn (USFWS 1997). In response to a sharp decline in the U.S. Sonoran pronghorn population in 2002 and the continuing severe drought conditions, the BLM amended the Lower Gila South Resource Management Plan (RMP) in 2004 to close the Cameron allotment to livestock grazing and acquire range improvements from the permit holder.

Emergency recovery actions were initiated in an attempt to reverse the recent decline in the status of the U.S. sub-population of the Sonoran pronghorn. The construction of a semi-captive breeding facility in Cabeza Prieta NWR and of water sources and forage enhancement plots in the Planning Area are expected to temper the effects of drought. The U.S. population was at an all-time low in 2002 with drought eliminating all but 22 animals, down from 135 animals the previous year. In 2008-09, the U.S. Sonoran population was estimated at approximately 68 wild animals with another 73 animals in the semi-captive breeding enclosure. Surplus animals are released from the pen annually.

While drought was the direct cause of the Sonoran pronghorn antelope's decline during 2002, the high level of human activities and disturbance on the U.S. side of the antelope's range has intensified the effects of drought. The U.S. sub-population of Sonoran pronghorn antelope has been and is subject to myriad human activities that have the potential to adversely affect the species and its habitat. Such activities include livestock grazing, recreation, military activities on the BGR, and an increasing influx of undocumented aliens (UDAs) and smugglers and corresponding response from the U.S. Border Patrol and other law-enforcement agencies. Further, the range of the U.S. pronghorn subpopulation is limited by highways, fences, canals, railroads, vehicle barriers, and towns that act as physical barriers to movement and prevent pronghorn antelope from accessing foraging areas (USFWS 2003c). Historically, these animals were able to travel many tens of miles across barrier-free habitat to seek out more favorable forage and water (USFWS 2003). Livestock and ROW fences can be a significant cause of pronghorn mortality when they restrict the animals' movements to procure food and water or to escape predation (Yoakum 1978). The species have difficulty jumping over or going through fences; however, fences can be modified to allow safe passage for the pronghorn antelope, as was done within the Cameron, Coyote Flat, and Why grazing allotments (USFWS 1997).

Bald Eagle. The bald eagle is a large bird with a wingspan of 6 to 7.5 feet. Adults are dark brown with a white head and tail and a large yellow beak. Immature eagles are dark with mottled white under the wings and at the base of the tail. The feet of both adults and immatures are bare of feathers.

The USFWS classified the bald eagle in 1978 as endangered in 43 states (including Arizona) and threatened in five other states. The species was not listed in Alaska and it does not occur in Hawaii. In 1995, the species was downlisted to threatened in all recovery regions of the lower 48 states. In 1999, the USFWS proposed to remove the bald eagle from the Federal threatened and endangered species list nationwide. The USFWS removed the bald eagle from federally threatened and endangered species list in August 2007, except for the population in the Sonoran

Desert of Arizona, south of the Mogollon Rim, where it remains with threatened status. This includes the bald eagle population within the Planning Area.

In Arizona, bald eagles typically place their nests within a mile of a creek, lake, or river, although there are some rare exceptions. Nests are placed mostly on cliff edges, rock pinnacles, and in cottonwood trees; however, nests have been found in artificial structures, junipers, pinion pines, sycamores, willows, ponderosa pines, and snags.

Within the Planning Area, a pair of bald eagles has successfully nested near the confluence of the Gila and Salt Rivers in an area referred to as the Pee Posh Wetlands in 2009. These eagles likely forage up and down the rivers and on the adjacent uplands, including portions of the Decision Areas.

Southwestern Willow Flycatcher. The southwestern willow flycatcher is a small (5.75 inches), olive-colored or grayish-brown, neotropical migratory bird that is federally listed as an endangered species. This flycatcher is a riparian obligate species found throughout the Southwest, where it breeds in dense riparian habitats along rivers, streams, or wetland areas where trees and shrubs are adjacent to or near surface water.

Throughout its range, the southwestern willow flycatcher has shown both historic and recent population declines. Its breeding range once extended across southern California, extreme southern Nevada, southern Utah, Arizona, New Mexico, southwestern Colorado, western Texas, and northernmost Sonora and Baja California del Norte (Hubbard 1987; Unitt 1987; Browning 1993). Historically, the southwestern willow flycatcher was widespread in riparian areas throughout the Southwest. Its current range is similar to the historical range, but the quantity of suitable habitat within that range is much reduced from historical levels (USFWS 2002).

The most significant factor in the cause of these declines is the extensive loss, fragmentation, and adverse modification of riparian breeding habitat, particularly cottonwood-willow associations (Katibah 1984; Johnson et al. 1987; Unitt 1987; USFWS 1995). These losses have occurred in connection with urban and agricultural development, fire, water diversion and impoundment, channelization, livestock grazing, off-road vehicle use and recreation, replacement of native habitats by introduced plant species, and hydrological changes resulting from these and other land uses (USFWS 1993; Tibbitts et al. 1994). Brood parasitism by the brown-headed cowbird (Molothrus ater) is another major threat to the southwestern willow flycatcher (Brown 1988; Sogge, 1995a and 1995b; USFWS, 1993 and 1995; Whitfield and Strong 1995).

In 2002, approximately 1,153 southwestern willow flycatcher territories were located among 243 sites in suitable riparian areas throughout the Southwest (Sogge et al. 2003). Currently, there are approximately 430 pairs of southwestern willow flycatchers documented at 37 sites within Arizona. The AGFD has conducted periodic flycatcher surveys along the Gila River within the Planning Area since 2002. One flycatcher was detected once in 2002 in a thin strip of salt cedar that was judged to be marginal habitat. No southwestern willow flycatchers have been detected in the Planning Area since that time (AGFD unpublished).

Critical habitat was formally designated for the species on Oct. 19, 2005, which includes 15 management units totaling 737 miles of river in Arizona, California, Nevada, Utah, and New Mexico (70 FR 60886). No critical habitat for the southwestern willow flycatcher lies in the Decision Areas.

Yuma Clapper Rail. The Yuma Clapper Rail is a chicken-sized bird about 14 inches long. It is listed as endangered (32 FR 4001, March 11, 1967) without critical habitat. It is a marsh bird with long legs and a short tail. Its bill is long, slender, and curved downward slightly. Its anterior coloration is mottled brown with a gray background. Its flanks and underside are dark gray with narrow vertical white stripes that produce a barred effect.

Associated with dense riparian and marsh vegetation, the Yuma Clapper Rail inhabits freshwater or brackish stream sides and marshlands under 4,500 feet in elevation. It requires a wet substrate, such as a mudflat, sandbar, or slough bottom that supports cattail and bulrush stands of moderate to high density adjacent to shorelines.

Historic occupation is uncertain. Yuma Clapper Rail may have occurred in the marshes of the Lower Colorado River and its tributaries in Mexico and the United States. There are no records of the species in U.S. before 1902. A type specimen was taken near Laguna Dam in 1921 in Yuma County, Arizona.

The Yuma Clapper Rail is known to occur along the Colorado River (Yuma, La Paz, and Mohave counties, Arizona), from Lake Mead to Mexico; on the Gila and Salt rivers upstream to the area of the Verde confluence (Maricopa and Pinal counties, Arizona); at Picacho Reservoir (Pinal County, Arizona); and on the Tonto Creek arm of Roosevelt Lake (Gila County). The Yuma Clapper Rail may be expanding into other suitable marsh habitats in western and central Arizona.

Yellow-Billed Cuckoo. The Western yellow-billed cuckoo is a medium sized neotropical migratory bird considered a candidate species by the USFWS. In 2001, the species was determined to warrant listing under the ESA but was precluded by other, higher-priority listing actions (66 FR 38611).

As recently as the 1990s, cuckoo pairs were observed along the Gila River in Maricopa County (Corman 2005). In 1999, 168 pairs and 80 single birds were located in Arizona, based on preliminary results from a statewide survey that covered 265 miles of river and creek bottoms (USFWS 2004). From these results, it is evident that cuckoo numbers in 1999 are substantially less than some previous estimates for Arizona, including a 1976 estimate of 846 pairs for the lower Colorado River and five major tributaries (Groschupf 1987). According to information in the Heritage Data Management System (HDMS) (AGFD 2006), there has not been a single detection of yellow-billed cuckoos in the Decision Area.

The yellow-billed cuckoo historically ranged from southern British Columbia to northern Mexico (Bent 1940). Arizona is believed to contain the largest remaining population of yellow-billed cuckoos. Breeding pairs are found in south, central, and extreme northeast Arizona. Within the Planning Area, cuckoos may be found in riparian woodlands, particularly along the Salt and Gila rivers (Corman 2005).

Habitat loss, degradation, and fragmentation from groundwater pumping, surface-water impoundment, agricultural and urban conversion, invasive species, and overgrazing are the main threats to survival of the western yellow-billed cuckoo (USFWS 2001). Fragmentation effects include the loss of patches large enough to sustain local populations, leading to local extinctions and the potential loss of migratory corridors affecting the birds' ability to recolonize habitat patches (Hunter 1996). Losses have been greatest at lower elevations (below about 3,000 feet) along the Lower Colorado River and its major tributaries, which have been strongly affected by upstream dams, flow alterations, channel modification, and clearing of land for agriculture

(Groschupf 1987). Habitat conservation efforts are ongoing in Arizona outside the Planning Area (USFWS 2004).

Tucson Shovel-Nosed Snake. The Tucson shovel-nosed snake was listed as a candidate species in March 2010 (75 FR 16050). It was recently petitioned for listing as an endangered species; however, its listing is precluded by higher priority actions. The Tucson shovel-nosed snake is a subspecies of shovel-nosed snakes that is considered regionally vulnerable due to habitat loss, which has restricted its range (The Nature Conservancy [TNC 2004]). Much of the lowland valley floor habitat within the species' restricted range has been cleared or severely impacted by agricultural and urban development. The snake's distribution is currently limited to portions of Pinal, Maricopa, and Pima counties, with its greatest abundance believed to be west of Mobile in the SDNM (P. Rosen, personal comm.).

The shovel-nosed snake is found in areas with soft, sandy loams; loose soil; fine, wind-blown sands (such as in washes); or occasionally on rocky hillsides with pockets of sand among rocks (Stebbins 1985, Pima County 2001, TNC 2004). The snake requires these deep valley fill soils for burrowing and nesting. The western shovel-nosed snake utilizes the soil substrate around creosote bushes as foraging habitat (Pima County 2001). Creosote bushes also serve as escape habitat (Stebbins 1985, Pima County 2001).

The Tucson shovel-nosed snake was found at sites with soils that have a high percentage (ranging from 49 to 85 percent) of fine sand, silt, and clay (classified as sandy loams, loamy sands, gravelly-sandy loams, and silty-sandy loams (TNC 2004). The species was found in areas of the SDNM that correspond to creosote bush-bursage Desert Scrub and Valley Xeroriparian Scrub (i.e. ephemeral wash) communities.

Sonoran Desert Tortoise. There are two populations of desert tortoise: the Mojave and the Sonoran. The Mojave population is federally listed as a threatened species and inhabits the area north and west of the Colorado River. The Sonoran population includes tortoises south and east of the Colorado River in Arizona and extends south into Mexico (Arizona Interagency Desert Tortoise Team 2000. Under Arizona State Law, it is unlawful to collect wild desert tortoises or release captive desert tortoises into the wild (ARS 17-101).

Only the Sonoran population occurs in the Planning Area, and in December of 2010, the Sonoran population was added to the USFWS's candidate species list (FR Vol. 75, No. 239, page 78094). The Sonoran population is vulnerable to habitat loss and degradation, habitat fragmentation, genetic contamination, collection, and disease (AGFD 1996). The BLM has a disproportionate responsibility for the conservation of desert tortoise because the agency manages the majority of desert tortoise habitat across the species' entire range (BLM 1990). To address its management responsibilities, the BLM has developed a management plan for desert tortoise on public lands and a strategy for carrying out the plan in Arizona, Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona: A Rangewide Plan (BLM 1990). The BLM characterizes tortoise habitat on their managed lands into three categories (see Map 3-3: Federally Protected Wildlife & Plant Species). Category I desert tortoise habitat includes habitat that is necessary to maintain populations with the highest densities, which are stable or increasing, and experiences the fewest conflicts with current land uses. Category II habitats may support stable populations and/or are contiguous with medium to high-density habitat. Category III habitats are the least manageable and contain medium to subpar habitats; however, these areas do exist between Category I and II habitats and should be managed for dispersal between Category I and II habitats. The goal of the BLM is to maintain stable and viable populations with no net loss

of habitat in Category I and II habitats and to limit population declines to the extent possible in Category III habitats by mitigating impacts.

The Decision Areas are regionally significant for desert tortoise conservation as they contain a large portion of the total Category I habitat in Arizona, including a portion of the largest contiguous Category I habitat (238,790 acres) in the Sand Tank and Sauceda mountains. As delineated by the BLM, the majority of desert tortoise habitat in the Decision Areas occurs on rocky slopes where tortoises are free from most human impacts and associated disturbance. Paved and secondary roads dissect desert tortoise habitat and may represent a mortality risk or an impediment to movement across otherwise suitable habitat.

Regional trends in land use and other human activities potentially threaten the Sonoran population of desert tortoise. Sustained urban expansion in the Phoenix and Tucson areas continues to lead to loss of habitat for the tortoise. In addition to habitat loss, other correlates of human development potentially affect the desert tortoise in the region, which include tortoise collection, release of pet tortoises that introduce diseases into native desert tortoise populations, feral animals that prey on tortoises, and removal of habitat components such as boulders desert tortoises use for shelter sites. While desert tortoise are long lived, they typically have low recruitment rates. As a result, increases in mortality rates above natural rates may not be offset (Arizona Interagency Desert Tortoise Team 2000). The habitat preference for the Sonoran populations of the desert tortoise consists of palo verde-mixed-cacti vegetation communities on rocky or bouldery slopes below 4,000 feet in elevation.

Cactus Ferruginous Pygmy-Owl. The cactus ferruginous pygmy-owl is a small, non-migratory bird approximately 6.75 inches in length. Its diet includes other birds, lizards, insects, and small mammals (USFWS 2003a). The pygmy-owl is primarily diurnal but can be active at dawn and dusk, as well. Fledging and dispersal occurs from June through August *(Federal Register 2002)*.

Although the cactus ferruginous pygmy-owl was federally listed in 1997 as endangered in the Arizona portion of its range (62 FR 10730), the USFWS delisted the species in 2006 (71 FR 19425) following litigation. While pygmy-owls are currently not listed, the species has been petitioned for listing under the ESA. The USFWS issued a 90-day finding on the petition, finding it was valid and presented substantial evidence that listing of the pygmy-owl may be warranted (73 FR 31418). The USFWS currently is working on the status review of this species to determine if listing is warranted. Until such review is completed and a final decision is made, the pygmy-owl is not protected under the ESA. The species continues to receive Federal protection under the Migratory Bird Treaty Act.

A significant threat to the pygmy-owl in Arizona is the loss and fragmentation of habitat. The complete removal of vegetation and natural features, as well as the infrastructure required for many large-scale residential developments, directly and indirectly influences pygmy-owl survival and recovery. In addition, livestock grazing may threaten the pygmy-owl through the destruction or modification of its habitat (BLM 1988).

In 2002, the USFWS issued a BO for the five grazing allotments near Ajo. The opinion concluded that grazing activities may, but are not likely to, adversely affect the pygmy-owl when implementing the conservation measures and applying the "Not Likely to Adversely Affect" criteria identified in the Guidance Criteria for Determinations of Effects of Grazing Permit Issuance and Renewal on Threatened and Endangered Species (USFWS 1999).

3.2.6.3. BLM Sensitive and Other Priority Wildlife Species

With the exception of the federally listed and candidate species discussed above, the main groups of priority species are discussed below. Fish species are not discussed due to the limited amount of water and suitable habitat available for management on public lands within in the Planning Area.

Reptiles and Amphibians

In addition to desert tortoise, the Planning Area supports a variety of reptiles, including priority species, due to a diversity of vegetation communities and habitat types. Some reptiles prefer dense brushy or rocky areas, such as rosy boas (*Lichanura trivirgata*) and chuckwallas (*Sauromalus ater*), whereas others inhabit areas that are more open, such as sidewinders (*Crotalus cerastrus*) and desert iguanas *(Dipsosaurus dorsalis*).

The Decision Area's general lack of open water severely limits habitat for amphibians, which require wetland sites or ponds for at least part of their life cycle. These sites are generally limited to ephemeral rainwater collection areas such as impoundments, including the water retention dikes in the Vekol Valley; earthen livestock waters; and depressions in rocks. These areas support priority amphibian species such as the Sonoran green toad (*Bufo retiformis*), Great Plains narrow-mouthed toads (*Gastrophryne olivacea*), and Sonoran Desert toads (*Bufo alvarius*). Some portions of the Gila River are perennial and provide habitat for amphibians, including the non-native bullfrog.

Amphibian populations have seen dramatic declines worldwide. Disease, drought, environmental pollution, invasive species, and habitat loss appear to be the primary contributors to the decline of amphibians. Reptile populations are subject to habitat loss, direct mortality from vehicle traffic, drought, disease, and collection. Specific trend information for reptiles and amphibians is not available for the Planning Area. Protection of valley bottoms, vegetation structure, and rocky substrates could potentially maintain healthy reptile and amphibian populations.

Raptors

Golden Eagle. The plumage color of golden eagles ranges from black-brown to dark brown, with a striking golden-buff crown and nape. The upper wings also have an irregular lighter area. Immature birds resemble adults, but have a duller more mottled appearance, a white-banded tail, and a white patch at the carpal joint. Such colors gradually disappear until full adult plumage is reached in the fifth year.

In North America, golden eagle populations have declined over the past century; however, it is faring better than populations on a global scale. The main threat is habitat destruction, which by the late 19th century already had driven golden eagles from some regions they used to inhabit. In the 20th century, organochloride and heavy metal poisonings were also commonplace, but these have declined due to tighter regulations on pollution. Within the United States, the golden eagle is legally protected under the Bald and Golden Eagle Protection Act.

While golden eagles are uncommon throughout the Planning Area, they have been observed in many parts of the Decision Areas. There are no documented golden eagle nests in the Planning Area; however, systematic surveys for nesting golden eagles have not been conducted.

Other Raptors. Red-tailed hawks (*Buteo jamaicensis*), Harris' hawks (*Parabuteo unicinctus*), and American kestrels (*Falco sparvarius*) are some raptors that occur within the Planning Area. Many raptor species such as golden eagles and peregrine falcons (*Falco peregrinus*) use cliff faces and rocky ledges to roost or nest. Owl species documented include western screech owl (*Megascops kennicottii*), great-horned owl (*Bubo virgineanus*), elf owl (*Micrathene whitneyi*), barn owl (*Tyto alba*), and cactus ferruginous pygmy-owl.

Trend information for birds is difficult because of migration timing and patterns, climatological changes and events, and human-caused effects. Some of these changes may positively affect one species while negatively affecting another species. Specific trend information, by species, beginning in 1966 is available in the U.S. Geological Survey's (USGS's) North American Breeding Bird Survey at http://www.mbr-pwrc.usgs.gov/bbs/.

Game and Other Species of Interest

Small Game Species. In Arizona, small game species include but are not limited to small mammals, upland game birds, and migratory game birds. Common small-game species on public lands in the Planning Area include cottontail rabbits (Sylvilagus audubonii), Gambel's quail (Callipepla gambelii), mourning dove (Zenaida macroura), and white-winged dove (Z. asiatica). Populations of mourning doves in the Western Management Unit, which includes Arizona, have shown a downward trend since 1966, the year population-trend data collection began (Dolton and Rau 2006). Quail reproduction in Arizona depends on winter/spring precipitation to produce abundant forage and insects to sustain the coveys. The lack of precipitation during this critical time results in low reproduction and decreased population levels.

Furbearers and Predators. Furbearers in the Decision Area include but are not limited to raccoons (*Procyon lotor*), ringtail cats (*Bassariscus astutus*), and bobcats (*Lynx rufus*). Bobcats are also grouped with predators along with coyotes (*Canis latrans*), gray foxes (*Urocyon cinereoargenteus*), striped and spotted skunks (*Mephitis mephitis* and *Spilogale putorius*), and badgers (*Taxidea taxus*).

Big Game Animals. Big game animals found on public lands in the Planning Area include desert bighorn sheep *(Ovis canadensis mexicana*), javelina (*Pecari tajacu*), mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionous crooki*), and white-tailed deer (*O. virginianus couesi*). See Map 3-4: Sonoran Pronghorn Classification Areas for known mapped habitats.

Bighorn Sheep. Bighorn sheep typically are found in dry, inaccessible mountainous areas in foothills near rocky cliffs and seasonally available water sources. Bighorn sheep disperse between mountain ranges and most often are observed crossing during cooler weather (Monson and Sumner 1980). Wildlife movement corridors between mountain ranges are an important habitat and genetic diversity component for bighorn sheep and other wildlife in the Planning Area. The BLM participates with the AGFD and other agencies in the ongoing effort of identifying appropriate linkage corridors to allow the management of multiple resource uses and fragmented land parcels in such a way as to facilitate movements of wildlife and aid in maintaining genetic diversity

The BLM published an ecosystem-management strategy for desert bighorn sheep habitat on public lands (BLM 1995). Guidelines set forth in the Rangewide Plan (BLM 1988, 1995) include providing maximum habitat protection to lambing grounds, migration routes, mineral licks, and permanent water sources. The guidelines also propose fencing standards requiring

mitigation plans and surface use stipulations, supporting habitat enhancement projects, research, and outreach in bighorn sheep habitat.

Domestic livestock, particularly domestic sheep, can transmit certain diseases to bighorn sheep. The major disease posing a threat is Pasturella, which is a bacterium that occurs in nasal passages of both bighorn sheep and domestic sheep and goats. When Pasturella is introduced to big horn sheep, it can cause respiratory issues such as pneumonia, which can ultimately lead to mortality of individuals or entire herds.

Bureau of Land Management Instruction Memorandum (IM) No. 98-140, Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats, sets forth guidelines that pertain to the management of domestic sheep and goats in native sheep habitats. This document outlines mitigation, adaptive management, and best management practices for native wild sheep populations. Such guidelines include not allowing domestic sheep grazing within 9 miles of wild sheep habitats, which would reduce the potential for disease introduction from domestic sheep and goats into native sheep habitats and populations.

Migratory Birds

All migratory birds receive protection under the Migratory Bird Treaty Act, while Executive Order (EO) 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds, signed in January 2001) requires the BLM to evaluate the effects of Federal actions on migratory birds. In addition, IM 2008-050 (Migratory Bird Treaty Act: Interim Management Guidance) provides interim guidance to enhance coordination and communication toward meeting the BLM's responsibilities under the Migratory Bird Treaty Act and EO 13186. Such guidance establishes a consistent approach for addressing migratory bird populations and habitats when adopting, revising, or amending land use plans and when making project-level implementation decisions until a national Memorandum of Understanding (MOU) with the USFWS is established.

There are approximately 450 non-game bird species native to Arizona, with about 291 species documented as breeding in the State. Of the breeding species, 237 are neotropical migrants, or birds that breed in the United States or Canada and winter to the south, from Mexico to South America. While a migratory bird inventory has not been completed, 163 of Arizona's neotropical migrants are known to nest in the Planning Area regularly or irregularly (AGFD 2001a). Such species depend on quality habitats containing adequate substrate and cover for nesting purposes, as well as diverse vegetation to supply food for brood rearing. The Decision Areas contain breeding, nesting, brood rearing, and wintering areas, as well as migration routes that are important for migratory birds.

Bats

Bat species are considered sensitive species in Arizona and are best protected by conserving roosting sites and foraging areas. Although little information is available specifically for bats, a number of bat species occur on or near public lands in the Planning Area. Mines and natural caves, as well as crevices associated with cliffs, provide potential roosting habitat for bats. Bats may also roost on trees, beneath loose tree bark, under bridges, and in open buildings. The big brown bat (*Eptesicus fuscus*), cave myotis (*Myotis velifer*), occult little brown bat (*Myotis lucifugus occultus*), California leaf-nosed bat (*Macrotus californicus*), pallid bat (*Antrozous pallidus*), western pipistrelle (*Pipistrellus hesperus*), and fringed myotis (*Myotis thysanodes*) are most likely to inhabit public lands.

3.2.6.4. Non-native Invasive Animal Species

Invasive species occur throughout the Planning Area and generally can be defined as "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health" (BLM 1999). Invasive species, which have often been introduced accidentally or purposely into ecosystems by humans, can be detrimental to the environment by directly causing harm to native species through either predation or competition (Van Devender et al. 1997). This, in turn, can affect general ecosystem functions.

Invasive animals, both terrestrial and aquatic, include starlings (*Sturnus vulgaris*), Eurasian collared doves (*Streptopelia decaocto*), crayfish (*Procambarus clarkii*), bullfrogs (*Rana catesbeiana*), Rio Grande leopard frogs (*Rana berlandieri*), and Mediterranean geckos (*Hemidactylus turcicus*). Infestation by some of these species is so great that some native species are threatened with extirpation due to competition as well as habitat degradation and destruction.

3.2.7. SOIL RESOURCES

Soils are primarily the product of climate, parent material (i.e. underlying bedrock lithology or alluvium), and landscape. The Natural Resources Conservation Service (NRCS), formally known as the Soil Conservation Service (SCS), completed five soil surveys that, when combined, cover most of the Planning Area: Maricopa County, Central Part (SCS 1977); Eastern Maricopa and Northern Pinal Counties (SCS 1974); Pinal County, Western Part (SCS 1991); Gila River Indian Reservation (NRCS 1991); and Gila Bend-Ajo Area (NRCS 1997). (See Map 3-6: Soil Types.) A small part of the Planning Area, principally the Sand Tank Mountains in the Monument, falls outside these published reports.

Landforms in the Planning Area consist of broad, alluvial basin floors separated by basaltic or granitic mountains, hills, and rock outcrops, dissected by several major drainages and numerous ephemeral ones. In the western half, which includes most of the public land managed in the Lower Sonoran, the dominant basin soils are deep, usually calcareous, sandy loams (Gunsight, Denure, and Rillito soils). In the eastern and southeastern portions, including areas in the Santa Cruz Basin, Casa Grande and Mohall soils are more common. Casa Grande soils developed in sediments deposited along the axis of the Santa Cruz River, with Mohall soils forming on tributary alluvial fans (NRCS 1991; SCS 1991). Organic material and sodium contents are low in soils throughout the Planning Area.

Upland parts of the basins are carved by desert washes with soils that are coarse- to medium-textured and cobbly to gravelly on the surface. Glocker (SCS 1991) notes several fan surfaces preserved in the area, which have some of the oldest soils in the Planning Area. Soils located higher on broad alluvial fans often derive directly from upslope bedrock, and underlain by a caliche (hardened calcium carbonate) layer (i.e. Cipriano). Farther down on the alluvial fan, soils, such as Denure and Dateland, often occur with loamier texture in the upper horizons and less distinct carbonate layering.

Several large desert ephemeral (i.e. xeroriparian) washes divide the Planning Area. Deep, stratified sands, silts, and cobbles underlie the channels and floodplains with textures dependent on flow regimes. Some cobbly reaches along the Gila and Salt rivers are relics of the period before upstream dams diverted the rivers' perennial flows. More loamy soils exist on the higher floodplains. In the areas inundated by Painted Rock Dam, silt and clay layers of desiccation and salt accumulation are found, and, in some places, these layers are scoured by subsequent

flood events. Terrace soils that parallel the main channel of these rivers on one or both sides are coarse, gravelly, and stratified with low organic content (less than 1 percent), and recently active sediments overlaying older, valley alluvium or bedrock. Dunes are occasionally found where fine sand and consistent winds are common.

Current soil conditions are evaluated on grazing allotments, which make up a large percentage of the Decision Areas. Quantitative soil-resource data is available from the NRCS soil surveys. Some additional quantitative and qualitative data are collected for the Arizona Standards for Rangeland Health grazing-allotment evaluations. These data estimate the current condition and trends of soil resources based on periodic measurement of surface condition indicators. Five indicators for which some observations have been made include:

- **Total vegetative canopy cover**: These data are collected on line transects that are usually established as permanent monitoring sites, called key areas, in two or three key areas of each grazing allotment. The land health standard for cover has been set as the percent cover that is appropriate for each ecological site. Nearly all allotments are meeting land health standards showing that the percentage of canopy cover is sufficient to protect most of the soil surfaces in the Lower Sonoran and SDNM from accelerated erosion. This conclusion is supported by direct observation of existing erosion in the Decision Areas, which currently shows slight erosion in all but a few severely disturbed surfaces, such as roads, ROWs, and at livestock watering sites.

- **Bare ground**: Other cover data that is collected at key areas to factor into soil stability includes percentage of gravel and stone cover, litter presence, and cryptogams (biotic crusts), all of which help prevent soil erosion, and bare ground. Bare ground is an important measure of erosion potential. The proportion of bare ground on arid ecological sites is relatively high even on sites that are meeting standards. These sites may produce comparatively high runoff during precipitation, but rates of surface erosion are not abnormal or accelerated. As in the case of the cover indicator, most of the Decision Areas are meeting standards, which is consistent with observations that, except on or near roads and other major surface disturbances, little accelerated erosion is occurring in the Decision Areas.

- **Density of unsurfaced roads:** The average density of unsurfaced roads (i.e. roads without asphalt, gravel, or long-lasting palliative) is relatively low in both Decision Areas: below 1.2 miles of road per section throughout most of the Decision Areas. Road density is much greater within a few areas, such as Buckeye Hills and other northern areas of the Lower Sonoran and the area near the west end of the Anza Trail in the SDNM that have a density of 1.4 miles per section or higher.

- **Miles of roads or other disturbances that are on soils sensitive to wind or water erosion:** About 20 percent of the roads in the Decision Areas that are currently open are on soils that are classified by NRCS as sensitive to wind and water erosion. Some water erosion has already been observed on or near roads that have channeled runoff in the north portion of the Lower Sonoran and north of SR 238 in the SDNM. Eighty-eight miles of roads have been temporarily closed to motorized vehicle traffic due to the risk of wind and water erosion from roads with fine-textured surfaces that have been damaged by the disturbance of traffic.

- **Area of protective desert pavement or biological soil crusts that have been disturbed:** Desert pavement and biological soil crusts are located throughout both Decision Areas. They are very effective in preventing soil erosion, but are quite vulnerable if disturbed. Fine material that sifts below desert pavement is easily displaced by wind or water if the protective

layer on the surface is disturbed. Similar effects occur when biological soil crusts are disturbed. Due to the lack of data on the total area covered by desert pavement or biological soil crusts in the Decision Area, this indicator is qualitative in nature.

Desert pavement, found in parts of the Planning Area, is a dense surface layer of rounded stones, sometimes coated with desert varnish and underlain by a porous, skeletal layer of wind-transported silt or fine sand. The formation of desert pavement appears to be the result of surface heaving, which allows wind-deposited, fine-grained particles to sort downward and exposes the coarser layer (McFadden et al. 1998).

Biological soil crusts, also known as biotic crusts or cryptogamic soils, are found throughout the Planning Area and can be composed of cyanobacteria, green algae, lichen, mosses, microfungi, and other bacteria (Belnap et al. 2001). In the Sonoran Desert, these crusts most commonly include heterocystic cyanobacteria, gelatinous lichen, squamulose lichen, and short mosses and are most often present in areas with flat topography (unlike cooler, higher-elevation basin and range deserts). These soils represent a critical component of the arid West's ecology because they tend to fix nitrogen and contribute to the sparse nutrients available to desert plants.

Both biotic crusts and desert pavement provide protection against wind and surface-sheet erosion. Biological soil crusts appear to be indicators of rangeland health (Cameron 1960; Kade and Warren 2002) and may require considerable time to revegetate (Kade and Warren 2002). Little study or mapping of either desert pavement or biological soil crusts has occurred in the Sonoran Desert. Disturbed areas are most often found in close proximity to livestock waters, where the livestock generate heavily used trails, and in areas where intense cross-country off-highway vehicle (OHV) use creates new routes. Available trend data show generally static conditions for desert pavement and biological soil crusts.

Soil disturbance and compaction are present in long-term use areas, including livestock-congregation sites, roads, and parking areas. Larger areas of accelerated erosion and sedimentation are mainly in the Vekol Valley south of I-8. Historical uses, such as construction of water-spreading dikes in areas with higher erosion hazards, created these effects. While uses that could cause soil resource degradation have increased in the Planning Area over the last 20 years, protective and restoration practices have generally kept pace. On the other hand, ongoing drought and intensive dispersed uses, such as illegal off-road travel, continue to threaten soil resource conditions, as indicated by BLM grazing allotment records, NRCS ecological site guides, NRCS range health reference sheets, and NRCS soils surveys. If the current regional drought continues, impacts from recreation, livestock grazing, and other ground-disturbing uses could be compounded. Similarly, if urban demands for water increase on lands adjacent to the Decision Areas, soil loss could worsen.

Based on best-available data and analysis in the allotment evaluations, accelerated soil erosion occurs infrequently. Water-erosion hazard is highest on the coarse-textured, steeper soils found in the granitic soils in the western and southwestern portions of the Planning Area. Wind-erosion hazards are highest on the fine-textured, irrigated soils of the major drainages. Except for data collected on allotments, very little soil condition data is collected that could be used to indicate trends.

Table 3.2, "Lower Sonoran & SDNM Decision Area Soils (BLM Land)" (p. 282) identifies major soil associations and erosion potential, while Map 3-7: Soil & Erosion Potential shows areas of wind-erosion potential. These are typically areas of Mohall, Dateland, Denure, Indio, and Casa

Grande soils. Younger soils with silty surfaces and little cover, often occurring on drainage floodplains in the Planning Area, are the most susceptible to wind erosion.

Table 3.2. Lower Sonoran & SDNM Decision Area Soils (BLM Land)

Map Name	Texture	Slope %	Water Erosion Potential	Wind Erosion Potential	Elevation of Occurrence	Acres	% of Total
Scattered Parcels							
Hyder-Coolidge-Cipriano-Cherioni	basalt flow, colluvium, cobbly	1%-65%	moderate	slight	430-4,400	389,700	28%
Gunsight-Rillito-Denure-Chuckawalla	gravelly, sandy loam	1%-40%	moderate/high	slight	430-3,100	477,500	34%
Mohall-Denure-Coolidge	gravelly, sandy loam	0%-8%	moderate/high	high	350-2,400	228,500	16%
Rock outcrop-Quilotosa-Momoli	granitic colluvium, stony	3%-55%	severe	slight	800-2,800	216,600	15%
Rock outcrop-Quilotosa-Hyder-Gachado	extremely gravelly sand	5%-65%	severe	slight	1,150-3,100	38,500	3%
Denure-Dateland	loam	0%-8%	slight	moderate	1,140-2,000	34,000	2%
Why-Wellton-Gunsight-Growler-Denure	loam	0%-7%	very slight	moderate	550-800	9,900	1%
Spudrock-Rock outcrop-Cellar	no data	25%-60%	moderate/high	no data	3,300-5,200	3,700	<1%
Tremant-Pinamt-Ebon	gravelly loam	0%-12%	moderate/high	no data	1,400-2,600	2,600	<1%
Pinaleno - Eba	no data	5%-30%	moderate/high	no data	3,650-3,900	200	<1%

Soils in the SDNM have many soil series and associations in common with the Lower Sonoran. On the other hand, there is a significant difference between the geology of Oatman Mountains and Sentinel Plains in the Lower Sonoran and that of the Maricopa Mountains in the Monument. The dominant bedrock parent material in the Lower Sonoran is basaltic, while in the SDNM, granitic parent material predominates with gneiss (metamorphic rock) mixed in. The vegetation communities are similar desert shrub types, and the potential use and management is also similar, but granitic material is often more prone to water erosion. Rutting and roadway damage from vehicle use in the area between the North and South Maricopa Mountains is consistent with the more fragile soil types.

3.2.8. VEGETATION RESOURCES

The Planning Area lies within two different Major Land Resource Areas (MLRAs), as defined by the NRCS's soil surveys. They are the Sonoran Basin and Range and Arizona Mogollon Chaparral. An MLRA is a broad geographic area characterized by a particular pattern of soils, climate, water resources, vegetation, and land use. Each MLRA has subdivisions based on precipitation zones in which rangeland and forestland occur, and is further divided into ecological sites. The most common ecological sites within the Planning Area are identified in the plant community descriptions below.

Public lands support a variety of upland vegetation communities and a riparian plant community along the Gila River. These vegetative communities are determined in large part by site-specific topography, soil type, and climatic conditions. Vegetative community classifications follow the USGS's Gap Analysis Program (GAP) vegetation community map system.

3.2.8.1. Vegetation Communities

Eight vegetation communities are found on the Decision Areas. These are detailed in Table 3.3, "Vegetative Communities on Public Lands in the Planning Area" (p. 283)and illustrated on Map 3-8: Vegetative Communities. Although boundaries between vegetative communities are not precise, as several types or developmental stages may be found in any vegetative community, the grouping system can be used to describe vegetation over vast regions, such as the Planning Area.

Table 3.3. Vegetative Communities on Public Lands in the Planning Area

	Acres and Percent of Vegetative Community			
	Total on Public Lands		Applicable Decision Areas	
Vegetative Community	Acres	Percent	Lower Sonoran	SDNM
Creosote Bush-Bursage	777,300	54.87%	597,700	179,600
Palo Verde-Mixed Cacti	615,300	43.43%	312,000	303,300
Riparian (within Fred J. Weiler Green Belt)	447	0.03%	447	0
Apacherian-Chihuahuan Mesquite Upland Scrub	3,800	0.27%	3,400	400
Sonoran Mid-Elevation Desert Scrub (Woodlands)	3,800	0.27%	1,800	2,000
Mogollon Chaparral	1,500	0.11%	1,400	100
Desert Grassland	1,054	0.07%	0	1,054
Desert Washes (Xeroriparian), Linear Inclusion of Other Vegetation Communities	2,628 mile[s1]	N/A	1,658 miles[1]	970 miles[1]
Total public lands in Planning Area	1,416,600[2]	99.05%	930,200[2]	486,400[2]

[1]Data Source: USGS 1:100,000 scale topographic quadrangles. Desert washes are measured in miles, not acres, so are not included in area totals. Vegetation community mapping is currently not available at a high enough resolution to distinguish desert wash communities from dominant vegetation communities surrounding them.

[2]Totals do not add up because some plant communities are too small to be included in this list.

Creosote Bush-Bursage

The creosote bush-bursage is considered a subgroup of the Sonoran desert scrub vegetative community. It covers a greater percentage of Planning Area public lands than all other vegetative communities combined (55 percent). Occurring at elevations from 400 to 3,000 feet above sea level, it is the most arid of the vegetation communities, consisting primarily of creosote bush and white or triangle leaf bursage (Shreve 1951; Brown 1994). This vegetative community is most associated with the limy fan, limy upland deep, and sandy loam deep ecological sites in the 2-inch to 7-inch, 7-inch to 10-inch, and 10-inch to 13-inch precipitation zones.

Palo Verde-Mixed Cacti

The palo verde-mixed cacti vegetative community is another subgroup of the Sonoran desert scrub community and is the second most prevalent on public lands in the Planning Area, covering 44 percent. It is found at elevations from approximately 1,500 to 4,500 feet above sea level. Compared to the creosote bush-bursage community, this community is found in areas with different soil types, higher rainfall, and higher elevation gradients and contains a greater diversity of plant and wildlife species. Vegetation in the community consists of extensive stands

of saguaro cacti interspersed with cholla, barrel cacti, palo verde, brittlebush, creosote bush, ocotillo, mesquite, cat claw acacia, and ironwood (Shreve 1951; Brown 1994; Marshall 2000). This vegetative community is most commonly associated with the Limey upland, Granitic hills, Volcanic hills, and Basalt hills ecological sites in the 2-inch to 7-inch, 7-inch to 10-inch, and 10-inch to 13-inch precipitation zones.

Apacherian-Chihuahuan Upland Scrub

Vegetation for this shrubland community typically is dominated by mesquite species (Prosopis glandulosa or Prosopis velutina) and succulents. Other desert scrub/trees that may co-dominate or dominate includes acacia species (Acacia neovernicosa or Acacia constricta) or junipers (Juniperus monosperma or Juniperus coahuilensis). Perennial grass cover is typically low due to deep soils and unavailable moisture. Less than 0.3 percent of the Decision Areas consist of Mogollon chaparral, with the main concentrations occurring in the Globe-Miami area at elevations between 3,400 and 6,000 feet. The NRCS has not completed a soil survey and the associated Ecological Site Description for this community.

Mogollon Chaparral

The Mogollon Chaparral vegetative community is a warm, temperate scrubland containing woody species such as shrub live oak, mountain mahogany, desert ceanothus, and cliffrose. While such vegetation types are found mainly at elevations between 3,400 and 6,000 feet, they can also be found at higher elevations with drier and warmer slopes. Only 0.1 percent of the public lands in the Planning Area consist of Mogollon chaparral, with the main concentrations occurring in the Globe-Miami area. Periodic, naturally occurring, wildland fires are important in maintaining the plant community. Depending upon the fire's temperature, Mogollon Chaparral shrubs typically re-sprout from root crowns or germinate from long-lived seeds following fire. Woodland species now dominate the community, especially near urban areas, with a concomitant reduction in important understory species due to current and past fire suppression strategies. This vegetative community is most associated with the Granitic ecological site in the 12-inch to 16-inch precipitation zone.

Sonoran Mid-Elevation Desert Scrub (Woodlands)

The Sonoran Mid-Elevation Desert Scrub community is found mainly near mountain peaks surrounded by the palo verde-mixed cacti community. It covers approximately 3,800 acres of the Planning Area, receives higher precipitation, and has a higher diversity of native plants than that of the surrounding communities. The vegetation typically is composed of an open shrub layer of creosote bush, narrow leaf goldenbush (Ericameria linearifolia), or flattop buckwheat (Eriogonum fasciculatum) with taller shrubs, such as crucifixion thorn (Canotia holacantha) or jojoba (Simmondsia chinensis). The herbaceous layer generally is sparse. Relic communities of juniper, yucca, and elephant tree have also been observed in the Sonoran Mid-Elevation Desert Scrub community (BLM 1989; PBI 2003). Due to the more remote location of this vegetation type, it has generally escaped human-related impacts. This vegetative community is associated with the volcanic and basalt hills ecological sites in the 7-inch to 10-inch and 10-inch to 13-inch precipitation zones.

Riparian

The proportion of public land occupied by riparian vegetation is extremely small in relation with many of the other vegetation types (less than 0.03 percent), but this community's biological and ecological importance is greater than its limited geographic occurrence. The only riparian area in the Planning Area is associated with the Fred J. Weiler Green Belt along the Gila River, established as a resource conservation area in 1970. The Green Belt includes 45,978 acres of the Gila River channel and floodplain allocated for wildlife and migratory bird management. The BLM manages approximately 447 acres, or 1 percent of the Green Belt, with riparian vegetation. The remaining 99 percent of the Green Belt is in mixed ownership and under various withdrawals for use by other State and Federal agencies. The Gila River once was lined with native cottonwoods, willows, and mesquite bosques, but now contains only small pockets of native vegetation. The majority of it has been replaced with non-native salt cedar or tamarisk (Tamarix ramosissima and T. chinensis), a shift encouraged by changes in functionality and water flow from water impoundments, agriculture, and groundwater pumping. Such changes have resulted in an increased risk of unnatural, high-intensity wildland fires (BLM 2003). Areas appropriate for firebreaks in the Fred J. Weiler Green Belt have been identified to reduce wildfire severity, increase public safety, reduce tamarisk invasion, and restore vegetation to a more native composition.

Desert Washes (Xeroriparian)

The Desert Wash, or xeroriparian, vegetative community occurs as small inclusions in large areas of upland sites. They typically flow only briefly in direct response to significant precipitation events. The vegetation of desert washes is quite variable, ranging from sparse and patchy to moderately dense, and usually occurs along the banks but may occur within the channel. The woody layer typically is intermittent to open, and may be dominated by shrubs and small trees. Common species include mesquite, catclaw acacia, blue palo verde, and desert ironwood. While such plant species also are found in upland habitats, species growing in ephemeral washes commonly are larger and occur at higher densities than in adjacent uplands. This plant community is associated with the sandy wash ecological site in the 2-inch to 7-inch, 7-inch to 10-inch, and 10-inch to 13-inch precipitation zones.

Desert Grassland

The Desert grassland community is characterized as a warm, temperate grassland dominated by tobosa grass and ranging in elevation from 2,300 to 4,900 feet. Only 0.07 percent of public lands in the Planning Area consists of desert grassland. In fact, the only area supporting this community occurs in the southeast portion of the Monument, abutting the Tohono O'odham Indian Reservation. This plant community likely supported occasional wildfire historically, although it is quite arid in nature. It is associated with the Clayey Swale ecological site in the 7-inch to 10-inch precipitation zone.

3.2.8.2. Special Status Plant Species

There are six special status plant species within the Planning Area: one endangered, two candidate and four BLM sensitive. These species occur or potentially occur in the Decision Areas and are listed in Table 3.4, "Special Status Plant Species on Public Lands in the Planning Area" (p. 285).

Table 3.4. Special Status Plant Species on Public Lands in the Planning Area

Common Name	Scientific Name	Status
Arizona Hedgehog Cactus	*Echinocereus triglochidiatus var. arizonicus*	Federal Endangered
Acuña Cactus	*Echinomastus erectocentrus var. acunensis*	Federal Candidate

Common Name	Scientific Name	Status
Murphy Agave	*Agave mupheyi*	Federal Candidate
Kofa Mt. Barberry	*Berberis harrisoniana*	BLM Sensitive
Arizona Sonoran rosewood	*Vauquelinia californica spp. sonorensis*	BLM Sensitive
Tumamoc Globeberry	*Tumamoca macdougalii*	BLM Sensitive

Arizona Hedgehog Cactus. The Arizona hedgehog cactus is an endangered species and was listed in 1979 without critical habitat. It is a diploid, perfect-flowered cactus of southeastern Arizona, southwestern New Mexico, and northern Mexico. It can generally be distinguished from other similar subspecies by its thicker stems and spines. The cactus' flowers are brilliant red, are produced along the side of the stem, and appear in late April to mid-May. The species can be found on dacite or granite bedrock, open slopes, in narrow cracks between boulders, and in the understory of shrubs in the ecological zone between Madrean Evergreen Woodland and Interior Chaparral at elevation of 3,200-5,200 ft). The Arizona hedgehog cactus has been documented in Gila and Pinal counties in central Arizona, including locations in the Planning Area. Exact locations are not provided because illegal collecting threatens the species.

Acuña Cactus. The Acuña cactus (*Echinomastus erectocentrus var. acunensis*) is a candidate species for listing under the ESA. Seven populations are currently known, five in the U. S. and two in Sonora, Mexico. Four out of the five U.S. populations occur in four locations in the Planning Area: one location is on NPS lands in Organ Pipe Cactus National Monument (OPCNM); two locations are on public lands in Coffeepot ACEC (Lower Sonoran) and SDNM; and one location is on private land in Ajo. The cactus is restricted to well-drained knolls and gravel ridges between major washes in Sonoran desert scrub habitat at elevations ranging from 1,300 to 2,000 feet. The amount and quality of habitat for this species are currently not possible to assess due to limited information on its distribution. Recently monitored populations in OPCNM and SDNM range from 40 individuals (Arcadis, Geraghty & Miller and SWCA 1997) to more than 300 individuals (OPCNM 1998; BLM unpublished). Because this species grows in small, widely scattered populations and only a small part of its potential range has been surveyed, it is probable that additional populations have not been detected. The NPS and BLM populations of the Acuña cactus are located solely on Federal lands and are relatively secure; however, they are susceptible to drought conditions and poaching. Individual plants have been illegally removed from OPCNM population study plots (OPCNM 1998). The SDNM population is remote and relatively inaccessible; therefore, it is less at risk from poaching and currently appears relatively stable. The Coffeepot ACEC population is monitored annually and has experienced some decline due to drought conditions. The Ajo population, which is on private land, has been reduced due to impacts associated with mining.

Kofa Barberry. The Kofa barberry (*Berberis harrisoniana*), also known as Harrison's barberry, is a rounded, evergreen shrub that can grow to over 6-feet tall. Their range includes the Kofa Mountains in Yuma and La Paz counties, Sand Tank Mountains in Maricopa County, and north end of the Ajo Mountains in Pima County. The species has 1.6 to 3.5-inch long trifoliate leaves, with three leaflets that taper to a short, stout spine. The plant flowers mid-February to March and fruits in late March to April. The flowers are bright yellow and the fruits are blue-black berries. The Kofa barberry prefers bottoms of deep, shady, rocky canyons with soils derived from andesite or rhyolite, at 2,200 to 3,500 feet in elevation.

Arizona Sonoran Rosewood. The Arizona Sonoran rosewood (*Vauquelinia californica spp. sonorensis*) is a medium-sized tree with a dense, dark green canopy that typically grows up to 16 feet tall but can range from 10-16 feet tall as a large shrub or small tree. The plants' habitat is mainly in southwestern Arizona in the Ajo, Diablo, Mesquite, and Santa Rosa mountains of

Pima County, and Sand Tank Mountains of Maricopa County. The plant can be identified by its leathery leaves that are green on top and white-hairy on bottom. The leaves are approximately ¼ inch to nearly ½ inch wide and up to 4 inches long, with serrated margins and pronounced spines. Flowers are white, approximately ¼ inch to ½ inch wide, and clustered in flat-topped corymbs 2 to 3 inches broad.

Tumamoc Globeberry. Tumamoc Globeberry (*Tumamoca macdougalii*) is a perennial vine of the gourd family that produces fruit. In Arizona, the species' habitat exists from southern Pinal and Maricopa counties into Pima County, where it is widespread. It grows from a tuberous root and features a smooth, slender stem and grasping tendrils. The stems sprout annually and die back after fruiting. The roots typically are 2-6 inches long and united into a woody crown with a short stem. The plants' lacy leaves have three main lobes, each with narrow, linear secondary lobes ½ inch to 1.5 inches long. When the foliage is touched, it gives off a fetid smell. Globeberry flowers are pale yellow to greenish yellow and are united below their middle with male and female organs born in separate flowers. Male flowers outnumber female flowers, and male flowers form in racemes of two to six flowers. The perianth lobes narrow to 1⁄5 of an inch long. Female flowers have shorter lobes and are born singly in axils. Fruits are succulent and berry-like, resembling tiny, round watermelons that are pale green with darker stripes becoming yellow, then turning red when ripe. Seeds consist of two to several per fruit, and are ¼-inch long, quadrate, tubercular-rugose.

3.2.9. VISUAL RESOURCES

The BLM manages the scenic values of public lands through the Visual Resource Management (VRM) program. In a two-step visual resource inventory (VRI) process, objectives are established for four "classes" of visual quality. In the first step of the VRI process, the BLM inventories scenic resources through three indicators: scenic quality, viewer sensitivity, and distance zones.

Scenic quality, which considers the character and diversity of landform, vegetation, water, color, and man-made features, measures the inherent visual appeal of a landscape on a rating scale of "A" (highest appeal) to "C" (lowest appeal). Views with similar ratings are grouped to produce a map, or overlay, of scenic quality units over the Planning Area.

Viewer sensitivity is a measure of expected public concern for change to the scenic quality of each rating unit, and is determined on a scale of high, moderate, or low, based on such factors as user type, amount of use, public interest, adjacent land uses, and presence of special areas. In this step, the BLM considers public comments and other management concerns to adjust the boundaries of the VRM inventory classes or even to change the class.

Distance zones establish the relative visibility of landscapes from major travel routes or observation points, characterized as foreground-middleground, background, and seldom seen.

For the second step of the VRI process, the three indicator maps are overlaid across the Decision Areas, and areas of similar interaction between the three indicators are grouped into VRI Class I, II, III or IV. See Map 3-9: Visual Resource Inventory Classes for the VRI classes identified for the Decision Areas.

The VRI was conducted by Otak, Inc. from October to December 2009 to determine visual values within the Decision Areas at a specific point in time as outlined in BLM VRI Handbook, H-8410-1. Visual resource inventory classes provide the basis for considering visual values in

the RMP process. They do not establish management direction and are not used as a basis for evaluating surface-disturbing activities.

The extent of VRI classes in the Lower Sonoran and SDNM is shown in Table 3.5, " Extent of VRI Class Designations" (p. 288). Approximately 72 percent of the Lower Sonoran is inventoried as Class III or IV, which allow for moderate to major modifications to the visual landscape character. In contrast, approximately 65 percent of the SDNM is managed as Class I or II due to a higher percentage of designated wilderness. Presidential Proclamation 7397 that created the Monument does not specifically refer to scenic resources, but the visual quality of the Monument's landscapes inherently contributes to the natural and cultural resources for which the Monument was established. Wilderness areas and the Juan Batista de Anza NHT within the SDNM could be impacted through visual landscape changes.

Table 3.5. Extent of VRI Class Designations

VRI Class	Lower Sonoran		SDNM	
	Acres	% of Total	Acres	% of Total
I	91,800	9.9%	159,000	33%
II	166,800	17.9%	158,000	32%
III	290,900	31.3%	169,300	35%
IV	380,700	40.9%	100	0%
Total	930,200	100%	486,400	100%

Based on the VRI, the BLM assigned VRMclasses to the Decision Areas to define management objectives for each of the alternative identified in Chapter 2, *Alternatives* (p. 27). While the assignment of classes is ultimately based on management decisions made in the RMP, visual values must be considered throughout the planning process. All proposed actions resulting in surface disturbances must consider the impacts a project may have on visual resources. Management decisions in the RMP must reflect these important values, and may be the driving force for some decisions.

The objectives for VRM classes are:

- Class I: The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

- Class II: The objective is to retain the existing landscape character. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract, the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

- Class III: The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

- Class IV: The objective is to provide for management activities that require major modification of the existing landscape character. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer

attention; however, every attempt should be made to minimize the impact of these activities, through careful location, minimal disturbance, and repeating of the basic elements.

3.2.9.1. Visual and Scenic Resources

The scenic quality of the Lower Sonoran and SDNM consists of classic Sonoran Desert views, made up of jagged and isolated mountain ranges that are often thickly vegetated along the flanks with "forests" of columnar cactus and scrubby trees and jut dramatically from vast, flat valleys. Valley floors typically are vegetated with unbroken expanses of low growing, woody shrubs. Dominant colors range from dark browns and tans to gray, with textures ranging from coarse and broken in the mountain ranges to smooth on the valley floors. The colors and contrasts provided by permanent water usually are absent; however, ephemeral drainage washes across the valley floors produce intricate, dendritic lines of greener vegetation that relieve the unbroken expanses. Modifications to landscape views in the form of residential developments and infrastructure (i.e. highways, pipelines, and transmission lines) have greatly increased during the last 15 years.

Viewer sensitivity to visual changes in dominant landscapes increases with residential growth. Although numerous factors fuel residential growth, the rugged and open nature of the Sonoran Desert landscape plays, in part, a role in attracting increased numbers of residents. Through public meetings and comments during the planning process, the BLM has learned that the interested public places high concern and value on open space, natural landscapes, and mountain views.

Distance zones may also be affected by residential growth as new and expanded subdivisions provide viewing locations from which additional, landscape change may be noticeable to more residents. Distance zones may also be affected as new travel routes are constructed to accommodate increased population or as heavier traffic occurs on existing routes.

3.2.10. WATER RESOURCES

3.2.10.1. Groundwater

Most groundwater in the Planning Area lies in sand-and-gravel alluvium, filling the basins between rock outcrops and surrounding mountain ranges. The quantity of water stored in these basins varies widely because the numerous rock outcrops and shallow bedrock form barriers to groundwater flow. The alluvial stratigraphy, or layers, is similar in all of the larger basins. It is defined primarily by bedrock structure and associated variations in sedimentary-layer thicknesses that serve to isolate the groundwater and produce large variations in depths and availability. Three hydro-stratigraphic units are in the larger sub-basins: (1) an Upper Unit of coarse-grained basin fill; (2) a Middle Unit that contains finer-grained and evaporate (salt lake) units; and (3) a deep, conglomeratic Lower Unit.

Groundwater Quantity

The main subsurface sources of groundwater in the Planning Area are the Middle Unit and upper interval of the Lower Unit. Over the last 100 years, the Upper Unit has largely been dewatered through use as groundwater levels dropped below its lower boundary. Groundwater withdrawal is continuing throughout the Planning Area.

Deep groundwater monitoring in wells is done in terms of water levels, well yields, and water-quality concentrations. Current and past groundwater monitoring show that groundwater withdrawal for irrigation and potable water for urban development is continuing, as new subdivisions are developed in the Planning Area and near the Decision Areas. Most other uses are small. Increasing water demand for solar energy development in the Decision Areas is probable.

Arizona's 1980 Groundwater Management Act defined boundaries for the State's five Active Management Areas (AMAs) by identifying areas where groundwater pumping has significantly exceeded recharge. The law established guidelines for long-term management, designed to mitigate the effects of groundwater pumping in excess of recharge rates, including subsidence (collapse of a depleted aquifer resulting in sinking and fissuring of the ground at the surface) and other immediate impacts.

The Planning Area includes portions of twelve groundwater basins, including portions of special-management areas in the Harquahala Irrigation Non-Expansion Area (INA) and the Phoenix, Pinal, and Tucson AMAs (Map 3-10: Groundwater Basins). The rules for groundwater pumping in an AMA are stricter than in adjacent rural areas, and include sustainability targets for both water quantity and quality. The Arizona Department of Water Resources (ADWR) also places restrictions on increasing irrigated acreage in an INA. Available groundwater in the Phoenix AMA was quantified in the Third Management Plan (ADWR 1999a), which shows that the current rate of groundwater pumping will cause levels under the Planning Area to decline; however, the effects will vary in different locations. The Pinal AMA shows a similar trend, with most impacts caused by irrigation pumping.

The ADWR monitors groundwater depletion in the AMAs. The USGS and ADWR predict that ground subsidence, due to groundwater withdrawal, is likely to continue in the areas where it currently occurs, and in additional areas of significant groundwater depletion (Carpenter 1999). Although subsidence has occurred in many parts of the Planning Area, none has been detected in the Decision Areas.

Groundwater Quality

Most groundwater-quality issues in the Planning Area are caused by the infiltration of polluted agricultural irrigation water, particularly in the Gila and Salt River valleys. Groundwater quality in other parts of the Planning Area is not well documented. The Pinal Active Management Report (ADWR 1999b) reports little evidence of groundwater pollutants outside the Planning Area's urban and agricultural zones. No groundwater-quality trend has been addressed within the report.

The Phoenix AMA includes the northern third of the SDNM. Groundwater uses primarily are limited to livestock watering. Groundwater-quality monitoring wells were drilled in the SDNM about 30 years ago, but no recent data is available. Few, if any, new water developments other than wildlife waters are expected in the Monument.

3.2.10.2. Surface Water

Although perennial surface water is uncommon on public lands in south-central Arizona, ephemeral, intermittent, and effluent-dependant lotic (streams) and lentic (standing) water are both common and important. (See Table 3.6, "Monthly Mean Discharge (Flow) of Key Streams in Planning Area" (p. 291) for stream-flow data.) Desert washes are key resources in the Planning Area; however, most flow has been impounded for various purposes. Small water-control devices

including spreader dikes, berms, dirt tanks, and remnant impoundments from mining activities – are scattered across the Planning Area to capture rainfall and ephemeral flows in desert washes for use by livestock and wildlife. The Gila River is the primary watercourse and is ephemeral for its entire length in the Planning Area except for the discharge of treated effluent, which flows to about SR 85 most of the year. When there is precipitation and runoff, which mostly likely occurs in the summer (see Table 3.7, "Montly Temperature & Precipitation for Planning Area (Gila Bend Weather Station)" (p. 291) for climate data), flow occasionally continues into Painted Rock Reservoir.

Table 3.6. Monthly Mean Discharge (Flow) of Key Streams in Planning Area

Gage (USGS Reference Number)	January		April		July		October	
	Record high flow (year)	Mean flow	Record high flow (year)	Mean flow	Record high flow (year)	Mean flow	Record high flow (year)	Mean flow
Salt River at 51st Ave. (09512406)	5,484 ft^3/s (2005)	808 ft^3/s	4.92 ft^3/s (2007)	1.5 ft^3/s	7.46 ft^3/s (2006)	2.2 ft^3/s	9.15 ft^3/s (2005)	2.0 ft^3/s
Gila River near Maricopa (09479350)	0 ft^3/s	0 ft^3/s	0.3 ft^3/s (2005)	0.02 ft^3/s	8.1 ft^3/s (2006)	0.54 ft^3/s	8.4 ft^3/s (2006)	0.63 ft^3/s
Gila River at Estrella Parkway near Goodyear (09514100)	53,880 ft^3/s (1993)	3,480 ft^3/s	5,104 ft^3/s (1993)	388 ft^3/s	55.6 ft^3/s (1993)	3.9 ft^3/s	62 ft^3/s (1993)	11 ft^3/s
Hassayampa River near Arlington (09517000)	133 ft^3/s (2001)	79 ft^3/s	69 ft^3/s (2007)	47 ft^3/s	121 ft^3/s (1999)	46 ft^3/s	311.6 ft^3/s (2000)	77 ft^3/s
Centennial Wash at Southern Pacific RR Bridge near Gila Bend (09517490)	85 ft^3/s (1993)	4.0 ft^3/s	2.8 ft^3/s (1982)	0.17 ft^3/s	18 ft^3/s (1996)	2.9 ft^3/s	21.1 ft^3/s (2000)	0.94 ft^3/s
Below Painted Rock Reservoir (09519800)	6,348 ft^3/s (1993)	390 ft^3/s	16,160 ft^3/s (1993)	793 ft^3/s	3,286 ft^3/s (1980)	265 ft^3/s	3,996 ft^3/s (1980)	226 ft^3/s
Source: USGS 2010								

All water-quality issues discussed above for the Planning Area apply to the Lower Sonoran Decision Area. Nearly all water-quality issues relate to the Gila River. Portions of all 12 surface-water sub-basins occur in the Lower Sonoran Decision Area. About 40 percent of the LSFO's northwest portion, all public land in San Tan Mountain area and near Apache Junction, is included in the Phoenix AMA. As identified in Table 3.7, "Montly Temperature & Precipitation for Planning Area (Gila Bend Weather Station)" (p. 291), summer is the wettest season, followed by winter, while spring and fall are the driest. This is only partly reflected in monthly mean discharges of key streams in the Planning Area (see Table 3.6, "Monthly Mean Discharge (Flow) of Key Streams in Planning Area" (p. 291)) because other factors such as natural water regimes being restricted by impoundments and water being diverted for irrigation purposes greatly influences stream flows.

Table 3.7. Montly Temperature & Precipitation for Planning Area (Gila Bend Weather Station)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	An-nual
Average Max. Temperature (F)	69.0	73.6	79.8	88.0	96.7	106	108.9	107.2	103.1	92.1	78.5	69.2	89.3
Average Min. Temperature (F)	38.7	41.8	46.1	51.7	59.6	68.2	78.1	76.8	70.0	57.2	45.2	38.7	56.0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	An-nual
Average Total Precipitation (in.)	0.62	0.63	0.63	0.22	0.11	0.05	0.73	1.02	0.51	0.40	0.51	0.69	6.13
Source: Western Regional Climate Center, *http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?azgila*, accessed Sept. 26, 2010													

Surface Water Basins

The nation's watersheds are organized into a hierarchy of hydrologic units, each with a unique hydrologic unit code (HUC).Under the hydrologic watershed naming system, the entire Planning Area lies in the Lower Colorado Region. Within that region, most of the Planning Area is in either the Lower Gila or the Salt sub-region, identified by four-digit HUCs. Going down the hierarchy, the next subdivision is the basin, or six-digit HUCs. Sub-basins (eight-digit HUCs) are most commonly used to describe state-level drainage areas. Watersheds (ten-digit HUC) and sub-watersheds are commonly used in project-level planning but are too numerous to be individually described in this plan.

Table 3.8. Definition of Hydrologic Unit Codes in the Planning Area

Order	No. of Digits	Name	Unit Size
1	2	Region	Avg. 177,560 sq. miles
2	4	Subregion	Avg. 16,800 sq. miles
3	6	Basin	Avg. 10,596 sq. miles
4	8	Sub-basin	Avg. 703 sq. miles
5	10	Watershed	Range: 40,000-250,000 acres
6	12	Sub-watershed	Range: 10,000-40,000 acres
Based on Missouri Information Network (University of Missouri 2002)			

There are parts of 20 fourth-order hydrologic units or sub-basins (as defined in Table 3.8, "Definition of Hydrologic Unit Codes in the Planning Area" (p. 292)) in the Planning Area (Map 3-11: Surface Water Sub-Basins). The San Cristobal, San Simon (near Ajo), Lower Santa Cruz, Santa Rosa Wash, Roosevelt Lake, Lower Salt, Middle Gila, Lower Gila, Lower Gila-Painted Rock Reservoir (which includes the SDNM), Centennial Wash, and Tenmile Wash (Gila Bend Mountains area) comprise most of the Decision Areas. The Lower Verde, Sonoyta Valley, San Carlos, Colorado (Yuma-Mexico), and Brawley Wash sub-basins occupy only a small proportion of the Planning Area and are not discussed further.

Table 3.9. Surface Water Sub-basins in Planning Area

Name	Acres within Planning Area	% of Planning Area
Agua Fria Sub-basin	11,347	0.1%
Aguirre Valley Sub-basin	408,471	4.6%
Brawley Wash	36,626	0.4%
Centennial Wash	286,064	3.2%
Colorado (Yuma-Mexico)	43,105	0.5%
Hassayampa	24,470	0.3%
Lower Gila	294,981	3.3%
Lower Gila-Painted Rock Reservoir	1,291,772	14.6%
Lower Salt	505,992	5.7%
Lower Santa Cruz	559,450	6.3%
Lower Verde	111,892	1.3%
Middle Gila	1,058,211	11.9%
Roosevelt Lake	150,967	1.7%
San Carlos	26,362	0.3%

Name	Acres within Planning Area	% of Planning Area
San Cristobal Wash	893,832	10.1%
San Simon Wash	1,373,521	15.5%
Santa Rosa Wash	783,352	8.8%
Sonoyta Valley	267,466	3.0%
Tenmile Wash	741,013	8.4%
Tonto	88	<0.1%
Total	8,868,982	100%

San Cristobal and San Simon Sub-basins. The surface-water resources in these two sub-basins are not well documented. The San Cristobal Sub-basin, located south and west of Ajo, consists of ephemeral watercourses. The San Simon Wash Sub-basin contains over 1.4 million acres; however, only a small portion of the upper watershed in the sub-basin is within the Lower Sonoran.

Lower Santa Cruz Sub-basin. The Lower Santa Cruz Sub-basin is characterized by the lower Santa Cruz River, which is an ephemeral river. This river's single, topographically defined channel runs from the eastern boundary of the Planning Area to the confluence with the Gila River, albeit is often difficult to follow.

Roosevelt Lake Sub-basin. Only the southern tip of the Roosevelt Lake Sub-basin (sometimes referred to as the Upper Salt Sub-basin) is included in the Planning Area. It also includes the eastern-most portion of the Lower Sonoran, near the Globe-Miami communities. Drainages in this sub-basin flow to the Salt River and Roosevelt Lake, the latter being the largest of the Salt River Project (SRP) reservoirs on the river.

Lower Salt Sub-basin. The Lower Salt Sub-basin includes the Salt River from Roosevelt Dam to its confluence with the Gila River. The stream is highly urbanized within the Planning Area, and has a great deal of influence on downstream water resources, including critical parts of the Lower Sonoran. The Salt River originates in the White Mountains and drains 5,980 square miles. It is ephemeral as it passes through the Planning Area on the way to its confluence with the Gila River. A chain of dams operated by SRP control the flow of the Salt River and creates a number of reservoirs, including Roosevelt, Apache, Canyon, and Saguaro lakes. Downstream from the last reservoir is Granite Reef Diversion Dam, which is not used to store water but to divert the entire river's flow into SRP's irrigation-canal system.

Middle Gila Sub-basin. The Middle Gila Sub-basin comprises the main stem of the Gila River from the outfall of San Carlos Reservoir to its confluence with the Salt River. This is one of the most heavily impacted streams in the Planning Area in terms of water quantity; however, very little of the watershed lies within the Lower Sonoran boundaries. Because it is a large watershed draining most of southeastern Arizona, peak flows on the Gila River can be large relative to other Arizona rivers. Most of the Gila River between San Carlos Reservoir and Ashurst-Hayden Dam is dependent on irrigation releases from the reservoir.

Lower Gila/Painted Rock Sub-basin. The Lower Gila/Painted Rock Sub-basin contains a large portion of the Decision Areas, including the SDNM and several wilderness areas, and receives most of the flow from all the previously discussed drainages.

Lower Gila Sub-basin

The Lower Gila Sub-basin below Painted Rock Dam receives runoff from the extreme western part of the Planning Area, including the Sentinel Plain area.

Centennial Wash Sub-basin. Centennial Wash extends about 100 miles from the Gila River up to Wenden, Arizona, then runs east to about 10 miles west of Wickenburg, Arizona. Centennial Wash drains many parts of the Lower Sonoran, including Saddle Mountain and parts of Woolsey Peak and Signal Mountain wildernesses.

Tenmile Wash Sub-basin. Tenmile Wash is a long, ephemeral watercourse that drains a large amount of public land in the Lower Sonoran. It contains numerous water bodies protected for their riparian values. The wash goes through public lands a few miles east of Ajo, and includes most of the current flows emanating from the New Cornelia Mine and associated tailings pile located in the Ajo mining district. Any flows or contaminants from the mining district are transported to adjacent public lands. The wash also enters and bisects the BGR, and joins the lower Gila River near Dateland. There are no active USGS gauging stations in the Tenmile Wash Sub-basin.

Surface-Water Quality

The ADEQ assesses water quality in specific stream segments, or reaches, by determining if it is sufficient to carry out its designated uses. The assessment results are published every other year as part of the biennial State of Arizona 305(b) Report to Congress. The last report was issued in November 2008 (ADEQ 2008), although it did not include any new data since the 2006 report. A full report with new sampling data was planned for 2010 but was not published as of November 2010. The 305(b) report includes the 303(d) list, which lists all state stream segments with impaired water quality for their designated uses, and the pollutants causing the impairment . The Clean Water Act (as amended) requires that every stream placed on the 303(d) list must have a water-quality improvement plan prepared. A key element of these plans is the development of a total maximum daily load (TMDL), which is the concentration of a pollutant allowed for the stream to meet State water-quality standards. Each TMDL is specific to a given stream, its uses, and the pollutants that impair it.

In 1998, ADEQ classified all the sub-basins in Arizona as part of the Arizona State Unified Watershed Assessment (ADEQ 1998). All watersheds that included impaired streams, at that time, were designated Category 1 watersheds; however, this classification system currently receives little use. More common is the EPA classification system for impaired streams, which classifies streams in Categories 1-5. Category 1 refers to specific stream segments that have no impairment, while Category 5 refers to streams on the 303(d) List.

The three ADEQ water-quality basins that cover the Planning Area are the Santa Cruz/Rio Magdalena/ Rio Sonoyta, Middle Gila, and Colorado/Lower Gila. The Santa Cruz/Rio Magdalena/Rio Sonoyta water-quality basin includes all ephemeral washes draining the southeastern quadrant of the Planning Area. The most common water-quality pollutants identified for this basin by ADEQ include the following:

- Bacteria, chlorine, and cyanide from the Nogales International Wastewater Treatment Plant on the upper Santa Cruz River;
- Historical mining uses causing copper, zinc, and other metals to enter water bodies and washes;
- Mercury in fish at Arivaca and Peña Blanca Lakes;
- High turbidity in Nogales Wash.

There are ten impaired stream segments in the Santa Cruz/Rio Magdalena/Rio Sonoyta water-quality basin, but none in the Decision Areas. It is unlikely that any of the impaired segments could affect or be affected by any future BLM decisions.

The Middle Gila and Colorado/Lower Gila River water-quality basins have impairments that could influence BLM management actions. While the BLM manages more than a quarter of the land in the Middle Gila watershed, nearly all of which is in the Planning Area, the only public land stream reaches are along the Gila River between the Salt River and Painted Rock Reservoir. There are 11 water bodies (i.e. stream segments and lakes) in this water-quality basin on the 303(d) list, including those listed by EPA as not meeting standards for pesticides and with fish-consumption advisories.

The designated uses of the Gila River as it passes through the Gila River Indian Community are ephemeral aquatic and biota, partial immersion recreation, and fish consumption. Parts of the Salt River under Gila River Indian Community jurisdiction are designated for effluent-dependent, aquatic and wildlife, warm water fishery, and livestock watering. The Arizona reaches of the Gila River above the Gila River Indian Community are designated for aquatic and wildlife, ephemeral, partial body contact, and livestock watering, except for a short reach below the Florence Wastewater Treatment Plant that is effluent-dependent. From the Gila River Indian Community to Gillespie Dam, the designated uses are partial body contact, fish consumption, irrigation, and livestock watering. Below Gillespie Dam to Painted Rock Reservoir and on to the Planning Area's western boundary, the designated uses are aquatic and wildlife, full body contact, fish consumption, livestock watering and irrigation; however, there is a fish-consumption advisory for Dichlorodiphenyltrichloroethane (DDT) and other pesticides. All stream segments with fish-consumption advisories are on the 303(d) list. The ADEQ also assesses use attainability of the Grand Canal for agricultural livestock and livestock watering.

The USGS reports that past use of agricultural pesticides and herbicides in the west Salt River Valley is the origin of these compounds along the Gila River, from below the confluence with the Salt River to Painted Rock Reservoir (Cordy et al. 2000). Arizona Department of Environmental Quality studies have shown a sharp decrease in pesticides in fish over recent years (Marsh 2002). During 1999, collected fish tissue samples suggested much lower DDT levels than previous studies. Nevertheless, DDT levels were still high enough to trigger EPA advisories on fish consumption. Some samples contained high concentrations of toxaphene, an insecticide used heavily in agricultural treatments until banned in 1990.

The Gila River reach within the Planning Area, between Gillespie Dam and Centennial Wash, continue to exceed standards for boron and selenium, but the sources and trends of these impairments have not been determined. If the boron stream concentration remains at the current level (0. 370-2. 7 mg/l), there may be some effects on boron-sensitive riparian plants. The potential for this impact is unknown.

Gila River TMDL standards for boron and selenium will begin in 2012. The ADEQ recognizes the risks involved to the Yuma clapper rail and southwestern willow flycatcher resulting from exceeding water-quality standards for selenium, making it a high priority TMDL, although complicated by large numbers of potential sources of the pollutants and seasonal influences. Pesticides impair the entire length of the Gila River, from the Salt River to Painted Rock Reservoir. Pesticide TMDLs in all reaches should be completed in 2011.

Painted Rock Borrow Pit Lake exceeds State (EPA-approved) standards for dissolved oxygen and pesticides. The TMDL determination started in 2009, and is scheduled for completion in 2011.

Fecal coliform criteria changed in the last Arizona triennial review of water-quality standards: Painted Rock Reservoir may be removed from the 303(d) list after the 2012 triennial review.

In the Planning Area and above it on the Salt and Gila rivers, much of the surface water has been impounded behind dams for irrigation, industrial, municipal, and other uses. Dozens of stock ponds and other structures in the Decision Areas, such as water bars, spreader dikes, and impoundments designed to capture rainfall or ephemeral water flows in desert washes, may be contributing to a loss in flow by evaporation or infiltration; however, these are very small amounts compared to naturally occurring evaporation and infiltration.

3.2.10.3. Water Rights

The Planning Area is in the Gila River System and Source General Stream Adjudication (Gila Adjudication). Such judicial proceedings determine the nature, quantity, and priority (i.e. seniority) of water rights in Arizona. The majority of both Decision Areas lie in the Gila River Watershed, but small areas are also included in the Upper Salt River, Upper Gila River, and Upper Santa Cruz watersheds. Although the Gila Adjudication began in 1974, litigation is still unsettled in the San Pedro Basin. See Table 3.8, "Definition of Hydrologic Unit Codes in the Planning Area" (p. 292) for definitions of hydrologic unit codes in the Planning Area.

The BLM has filed claims in the Gila Adjudication for state appropriative water rights and well permits on numerous springs, small reservoirs, wildlife-water developments, and wells for stock watering, wildlife, or recreation purposes. The BLM has no in-stream flow water rights within the Decision Areas because there are no suitable perennial or intermittent streams on public lands.

The six wilderness areas in the Planning Area, designated by the 1990 Arizona Desert Wilderness Act, created an expressly stated, federally reserved water right for each wilderness area upon designation. The BLM has inventoried, quantified, and submitted notification of its Federal reserved rights to ADWR for Signal Mountain, Woolsey Peak, North Maricopa Mountains, South Maricopa Mountains, Table Top, and Sierra Estrella wildernesses. The sources claimed by notification to ADWR are for small amounts from springs, seeps, and potholes. No perennial or intermittent surface water exists in the wilderness areas, other than that which may flow for short distances from springs.

The Gila Stream Adjudication in Arizona is ongoing and will eventually address claims for water in the Planning Area. Current adjudication activity is limited to the San Pedro Basin, and the schedule for adjudicating water rights in the Middle and Lower Gila Basins is uncertain. The enabling Presidential Proclamation for SDNM explicitly states that the Monument has no water reservation, with exception of lands in North Maricopa, South Maricopa, and Table Top wildernesses. If water is needed for use outside of the wilderness areas in the SDNM, the BLM must secure water rights for those uses by appropriation from the State.

3.2.11. WILD HORSE & BURRO MANAGEMENT

The Painted Rock Herd Area (PRHA) is located approximately 85 miles southwest of the metro Phoenix area and about 11 miles west of Gila Bend, Arizona, and surrounds the Painted Rock Reservoir area. The Herd Area (HA) encompasses approximately 38,737 acres, of which 31,106 acres are BLM-managed public lands, 4,834 acres are private lands, and 2,796 acres are Arizona state lands. The HA includes portions of three allotments: Artex, Painted Rock, and Dendora Valley. All three allotments are classified as ephemeral. The HA has been home to wild burros

and a small band of horses over the years. Management of the herd area applies only to the Lower Sonoran Decision Area. No Herd Management Areas (HMAs) have been allocated within either Decision Area. The Painted Rock Herd Area is shown on Map 3-15.

The habitat of the Painted Rock Herd Area consists about 10,700 acres of river bottom between the Painted Rock Dam and Oatman Mountain. Approximately 28,000 acres of the Herd Area are upland volcanic flow in a region known as the Sentinel Plain. This area consists of broad lower Sonoran Desert plains cut by sandy washes and low mountain ranges. Vegetation consists of palo verde, cacti, creosote bush, and sage. The Gila River bisects the northern portion of the HA and is characterized by salt cedar, mesquite, cottonwood, and willows. Wildlife species that also inhabit the area include desert mule deer, javelina, dove, quail, water fowl, and a variety of small mammals, birds, amphibians, and reptiles.

The wild burros primarily live off water and forage found on private farmlands along the Gila River corridor to the west of the PRHA, and move in and out of the herd area in response to available farm feed. The horses follow the same general pattern of movement in the PRHA, but also make use of public lands to the north and west of the PRHA.

In 1971, Congress passed The Wild Free-Roaming Horses and Burros Act (WFRHBA, or "The Act"). The overall goal of the BLM's Wild Horse and Burro Program is to preserve the health of the land and water resources by managing wild horse and burro populations so as to restore and maintain a thriving natural ecological balance. Appropriate management levels (AML) for the herds, the habitat requirements of the animals, the relationships with other uses of the public and adjacent private lands, are analyzed to determine the health of both the animals and the rangeland resources (43 CFR 4710.3-1). Wild horses and burros are to be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat, while maintaining their free-roaming behavior (43 CFR 4700.0-6). However, wild horses and burros must be managed within the limits the animals' herd areas (43 CFR 4710.4).

In 1980, the population in the PRHA was estimated to be between 15 and 25 animals, but more animals may have been present, as the area's dense vegetation made it difficult to place high confidence on this estimate (BLM 1985). In 1993, a herd area inspection indicated the presence of 20 to 40 animals. In 1999, BLM removed 42 horses from the herd area and offered them for adoption due to concerns over potential overgrazing and impacts to privately owned farmlands. Another inspection later in 1999 found no animals. The BLM continues to receive occasional complaints regarding burros and horses grazing on the private farmlands within the herd area.

The WFRHBA defined wild horse and burro ranges as "the amount of land necessary to sustain an existing herd or herds of wild free-roaming horses and burros, which does not exceed their known territorial limits, and which is devoted principally but not necessarily exclusively to their welfare in keeping with the multiple-use management concept for the public lands." Established Herd Management Areas (HMAs) are designated lands that can provide adequate rangelands for the purpose of maintaining healthy herds of wild horses and/or burros, as well as wildlife and livestock. Elsewhere, wild horses and burros compete with livestock and wildlife for these resources.

For nearly four decades, the Painted Rock Herd Area has vacillated between trying to manage for a population of wild horses and burros as an HMA, and removing all burros and horses within the HA. The affected environment in which the animals reside is burdened with issues that negate the ability to manage the herd area for healthy, sustainable populations of wild horses

and/or wild burros. Details of these issues are provided in Appendix M, *Painted Rock Burro Herd Manageability Analysis* (p. 1257), but are summarized as follows:

1. Essential habitat components (forage, water, cover, and space) are not available for healthy herds of wild horses and/or burros. There is very limited forage and no year-round water source within the boundaries of the Painted Rock Herd Area.

2. Wild horse and burro movement in the area is restricted. Fences, roads, highways, and natural barriers isolate the Painted Rock HA from other (distant) herd areas, and restrict wild, free-roaming behavior of these animals. Immigration and emigration is very limited. In fact, resources are so scarce that a limited number of livestock are permitted in on the associated allotments *only* during years of above-average precipitation, pursuant to the Special Ephemeral Rule, and are otherwise prohibited in order to provide enough forage for wildlife.

3. This population of wild horses is unhealthy and unsustainable. The PRHA is isolated from other wild horse and burro herds, causing low genetic variability. Genetics testing of the Painted Rock horses in 2000 and 2010 indicated that genetic variation "is very low and well below the critical level, . . . likely due to a low population size over a few generations. . . . Inbreeding within the herd is likely and will probably continue and increase [which] could cause physical defects and low fertility (Cothran 2010)." Genetics were not conducted on wild burros, but it is also likely that genetic similarity exists in the burros in the area. Furthermore, it is unlikely that the addition of 2 or more outside mares or jennies, as suggested by the analysis (Cothran 2010), would enhance the blood lines enough to make these healthy, sustainable populations of wild horses or burros. Management of wild horse and burro herds under these conditions is inconsistent with the spirit of the WFRHBA and with 43 CFR 4700.0-6.

4. Wild horses and burros are to be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat (43 CFR 4700.0-6). A minimum population size of 50 effective breeding animals (i.e., a total population size of about 150-200 animals) is currently recommended to maintain an acceptable level of genetic diversity within reproducing wild horse and burro populations (Cothran, 2009). (Research has not yet established a recommended minimum breeding herd size for burros [BLM Handbook, H-4700-1, 2010]). Due to the scarcity of forage, water, cover, and space, a herd size of 150-200 animals (either wild horses or wild burros) is unsustainable in the Painted Rocks area.

5. In accordance with the Wild Horses and Burros Management Handbook (2010), "If wild horse herd size in small, isolated HMAs is so low that mitigation is not feasible, consideration should be given to managing the HMA for non-reproducing wild horses or to removing the area's designation as an HMA through land use planning." Because of the reasons stated above (lack of essential habitat components, movement outside the HA boundaries, and barriers limiting free-roaming behavior), managing the Painted Rock Herd Area as a HMA with non-reproducing wild horses is not feasible. Non-reproducing animals would face the same issues and have to resort to the same foraging habits (i.e., utilizing private agricultural fields and waters) as reproductive animals in order to survive.

3.2.12. WILDERNESS CHARACTERISTICS

Background

Inventories for wilderness characteristics were conducted by the BLM between 2003 and 2010. In addition, citizens' proposals were submitted to the BLM by the interested public (particularly the Arizona Wilderness Coalition [AWC] and the AGFD). As part of the land use planning process and in response to input received during scoping, the BLM assessed the Planning Area for wilderness characteristics.

Field Assessments

Assessment of lands with wilderness characteristics was developed from the following four sources:

1. A review of Wilderness Review, Arizona: Intensive Inventory of Public Lands Administered by BLM, Decision Report (BLM 1980) and Wilderness Review, Arizona: Initial Inventory of Public Lands Administered by BLM, Decision Report (BLM 1979). These documents are comprehensive evaluations of wilderness characteristics on public lands in Arizona that were conducted during 1978-1980, as directed by section 603 of the Federal Land Policy and Management Act (FLPMA).

2. Public input received during scoping that delineated tracts of public lands reported to possess wilderness characteristics.

3. Fieldwork conducted by the BLM in 2003 and 2005 to ascertain the continuing validity of the findings of the 1980 inventory and appraise input received from the public during scoping.

4. Citizen groups' wilderness characteristics proposals submitted between 2003 and 2005. The citizens' proposals were based upon their application of BLM's 1978 "Blue Book" wilderness inventory handbook process. The "Blue Book" process required route forms, road/way definitions, size requirements, definitions of "outstanding," and files, narratives and documentation for all areas proposed. Some submitted citizen proposals were highly detailed reports based on the "Blue Book" process. Other citizen proposals were maps of areas considered by citizen groups to possess wilderness characteristics.

Based on BLM's knowledge of the planning area and each inventory unit's current land uses and resource conditions, it may not necessarily be the case that all of the citizen's proposal in Alternative D contains wilderness characteristics as those characteristics are defined in the BLM Land Use Planning Handbook (H-1601–1) policy guidance. For example, off-highway vehicle use on some of these lands could affect wilderness characteristics.

The BLM field-checked public lands using 1978-1980 inventory records. Findings were documented by a variety of means: narratives, check lists, field map notations, photographs, and field inventory. All inventory findings were focused on naturalness and outstanding opportunities for solitude and primitive and unconfined recreation. All lands inventoried by the BLM or submitted as proposals by the public are considered in the range of action alternatives.

Findings

Wilderness characteristics are fully considered in the current draft of the LS-SDNM DRMP. In Alternative D, approximately 429,500 acres were considered, representing over 31 percent of the

lands in the combined Planning Area. Citizen information on wilderness characteristics utilized in Alternative D was provided by the Arizona Wilderness Coalition (AWC) in 2004. Additional areas inventoried by the BLM were added to form the largest acreage of lands managed to protect wilderness characteristics.

Alternatives C and E include only areas with wilderness characteristics fully inventoried by BLM. Alternative D includes all those lands considered in Alternative C, plus lands submitted as part of AWC's citizen's proposal, and some parts of former WSAs with wilderness characteristics. Table 3.10, "Units Under Consideration - Wilderness Characteristics" (p. 301) details the field inventory status of each unit under consideration and documents whether the consideration of the unit was initiated by BLM, by a citizen's proposal, or by both BLM and a citizen' proposal.

Comparison of the 1978-1980 wilderness characteristics review with fieldwork conducted in 2003-2005 identified five findings or trends. They are:

1. Overall, the Decision Areas maintained a high degree of naturalness. There were no large-scale or incompatible land uses with long-lasting or irreversible effects on naturalness occurring over the intervening period since 1980.

2. More acres of public lands in the Decision Areas exhibited potential wilderness characteristics in 2005 (compared to the original inventory in the 1980s), mainly due to either additional lands (acres) not considered in the 1980 wilderness review or changing land uses coupled with natural reclamation. Changing land uses often reflected less mineral exploration and assessment.

3. The 2003-2005 fieldwork indicated that three former wilderness study areas (WSAs) found to have wilderness characteristics in 1980 – but not included as part of the congressionally designated wilderness areas – continue to exhibit such character since their release from FLPMA Section 603 protection in the Arizona Desert Wilderness Act of 1990.WSAs released in their entirety in 1990 were Saddle Mountain, Face Mountain and the Butterfield Stage Memorial.

4. The 1978-1980 wilderness review did not include an evaluation of withdrawn lands administered by the U. S. Air Force and re-conveyed to BLM with the passage of the National Defense Authorization Act for Fiscal Year 2000. These lands primarily consisted of the Sand Tank Mountain area (formerly Area A) of the SDNM and Sentinel Plain area of the Lower Sonoran Field Office. Public lands next to the military lands, previously inventoried for wilderness characteristics in 1978 – 1980, were re-evaluated for wilderness characteristics in context with these contiguous re-conveyed lands. While much of the Sand Tank Mountains and adjoining areas were not inventoried in 1980, the area was found to have wilderness characteristics. These areas make up the majority of the 153,000 acres in the SDNM Monument assessed for wilderness characteristics.

5. Finally, the BLM's field assessments and BLM's comprehensive inventory of vehicle routes found a rise in motorized public visitation and the popularity of many areas for driving four-wheel drive and all-terrain vehicles (ATV). Many washes, and most upland routes, were being used for motorcycle and ATV travel – motorized uses not common in this area in 1980 as ATV use and technologies was were not yet developed or readily available to recreationists at that time. As such, the implementation of travel management may have considerable influence on lands managed to protect wilderness characteristics.

Table 3.10. Units Under Consideration - Wilderness Characteristics

LSFO Decision Area Unit Name	Acres	Miles: Vehicle Routes	Miles: Routes in Washes	% of Wash Routes	Status of BLM Inventories or Field Assessments	Origin of Inventory Unit
Lower Sonoran						
Total Acres Considered for Wilderness Characteristics	276,500					
Batamote Mountains East/West	45,725	52.3	3.4	7%	(1)	(3)
Black Mountain	10,154	19.9	0	0%	(1)	(4)
Cortez Peak	16,070	22.5	6.2	28%	(2)	(4)
Cuerda de Lena	10,961	25.3	5.2	21%	(2)	(4)
Face Mountain	30,905	46.2	27.1	59%	(1)	(4)
Gila Bend Mountains	25,314	33.4	11.1	33%	(2)	(4)
Oatman Mountain	13,434	10.5	4.7	45%	(2)	(4)
Palo Verde Hills	12,139	10.4	1.9	18.2%	(2)	(5)
Pozo Redondo	18,210	26.8	6.6	25%	(2)	(4)
Saddle Mountain	24,413	39.8	0.1	0.3%	(1 and 2)	(4)
Sauceda Mountains	10,367	4.0	0	0%	(1)	(3)
Sentinel Plain	25,282	6.9	0	0%	(2)	(5)
Why	4,162	12.1	0	0%	(2)	(4)
Yellow Medicine Butte	29,364	31.8	20.1	63%	(2)	(4)
SDNM						
Total Acres Considered for Wilderness Characteristics	153,000					
Blue Plateau – Sand Tank Wash	55,701	65.1	23.4	36%	(1)	(3)
Butterfield Stage Memorial	9,352	7.7	0.2	2.6%	(1)	(4)
Javelina Peak	51,970	48.9	9.5	19%	(1)	(3)
Margie's Peak	13,427	8.8	1.6	18%	(1)	(4)
South Maricopa Mountains Addition	9,520	2.9	0.1	3.4%	(1)	(5)
White Hills	13,030	5.0	4.7	94%	(1)	(5)

(1) Presence of wilderness characteristics confirmed by BLM. BLM conducted field inventory or assessment of unit. This inventory or assessment included BLM reviewing and field checking inventory reports/maps submitted by interested publics. BLM also examined the 1978 - 1980 BLM wilderness inventory findings (if applicable) for subject unit.

(2) Presence or absence of wilderness characteristics not yet determined. These units were submitted to BLM by interested publics. They submitted reports or maps for lands they considered to possess wilderness characteristics. BLM field checked some units, reviewed the submitted reports/maps, and also examined the 1978 - 1980 BLM wilderness inventory findings (if applicable) for subject unit.

(3) Both BLM and citizen's proposal initiated wilderness characteristics consideration of unit.

(4) Citizen's proposal initiated wilderness characteristics consideration of unit.

(5) BLM initiated wilderness characteristics consideration of unit.

* 5,500 acres of released Saddle Mountain WSA retains wilderness characteristics determined present in BLM wilderness inventories conducted between 1978 and 1981.

3.2.13. WILDLAND FIRE MANAGEMENT

3.2.13.1. Fire Ecology

In natural desert scrub communities, the distance between shrubs is too great for fire to spread, unless annual plant growth in the interplant spaces is sufficient to carry fire along between shrubs. As a result, such communities experience long fire-return intervals, with frequencies extending hundreds of years (McAuliffe 1995; Rogers and Steele 1981). Wildland fire is thus not a major natural process in the Sonoran Desert ecosystem and associated vegetation types are not dependent or adapted to fire (BLM 2002). Wildfires, whether of human or natural causes, are relatively rare and typically do not exceed one or two acres before burning out naturally. Above-average winter precipitation, such as the winter of 2005, can generate sufficiently dense grasses and other annual plants to carry wildfire over a more widespread area than normal. In years with typical precipitation levels, this effect most likely occurs in the upland and mountainous areas of the Decision Areas, where high annual plant densities and steep slopes may combine to create conditions to carry fire. The upslope effects of wind and convection are often factors in propagating fires in these circumstances.

Within Sonoran desert scrub habitats, the establishment and spread of non-native grass species such as red brome (*Bromus rubens*) has increased wildfire frequency. As mentioned above, interplant spaces within this community have historically had low fuel levels that would not carry fire. Because introduced, non-native annual grasses are prolific seed producers and grow rapidly, especially during wet years, they occupy interplant spaces and enable fire to carry throughout the non-fire adapted community. With an increased fire frequency, native grasses and shrubs cannot compete, resulting in a loss of native plant communities. In addition, fires burn hotter and farther, reducing the natural mosaic pattern typical of desert scrub communities (i.e. patchy distribution of plants and open space) (Esque et al. 2003). Since such fires have the potential to burn uncharacteristically in terms of intensity, severity, and extent and could have long-term, adverse impacts on ecosystem components and processes (e.g. biodiversity, soil productivity, and hydrologic processes), they are considered wildfires of special concern.

There is little evidence of extensive wildland fires in southwestern floodplain ecosystems prior to European settlement. Lightning- and human-induced fires now occur across a variety of low-elevation, riparian ecosystems where non-native plant species such as salt cedar (*Tamarix spp.*) has invaded (Busch 1995, cited in Ellis et al. 1998). Colonization and naturalization of non-native plant species affect native ecosystems by altering historical fire regimes. The deciduous nature of salt cedar, combined with periodic flooding suppression needed in river floodplain ecosystems to decrease forest-floor litter, has resulted in increased accumulation of fuels, rendering the riparian communities highly susceptibility to wildfires (Ohmart and Anderson 1982, cited in Ellis et al. 1998). In addition, these conditions put floodplain ecosystems at high risk of unnatural, high-intensity wildfire events (BLM 2003).

In some cases, wildland fire frequency in riparian ecosystems has increased, with fire return intervals being as short as five-to-fifteen years, which can create monotypic stands of salt cedar in the ecosystems. Salt cedar sprouts prolifically after a fire, but native riparian vegetation, including cottonwood, is not well adapted to severe fire (Ohmart and Anderson 1982; Busch 1995, cited in Ellis et al. 1998). The increasing frequency of wildfires in riparian ecosystems can further change the vegetation composition and structure, and may have detrimental effects on riparian-obligate species.

3.2.13.2. Fire and Fuels Management

All public lands within the Planning Area are assigned to one of the following categories for fire management (BLM 2003):

- Category 1: Wildland Fire Use (areas suitable for wildland fire use for resource-management benefit)
- Category 2: Non-Wildland Fire Use (areas not suitable for wildland fire use for resource-management benefit)

Within the Planning Area, there are limited lands in Category 1. Most lands are in Category 2 and consist of large areas dominated by desert scrub communities. Fire is not a part of the natural regime in these communities and is typically human-caused.

The goal of the Arizona BLM Wildland Urban Interface (WUI) Strategy is to implement an efficient and effective fuels reduction program. The WUI is defined as the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (NWCG 2008). One of the BLM's fire-management goals is to work collaboratively with communities at risk for wildfire property loss within the WUI to develop plans for risk reduction (BLM In Press). The desired resource condition is to maintain fuels at non-hazardous levels in WUI areas to provide for public and firefighter safety (BLM In Press). Fuels treatments within the Lower Sonoran, both WUI and non-WUI, focus on reducing the size and frequency of wildfires within the non-fire adapted, Sonoran Desert ecosystems, as well as the residual, native riparian plant communities, with WUI fuels treatments being the priority. These treatments are conducted utilizing fire, mechanical equipment, herbicide, and biological treatments (e.g. grazing). The desired resource condition is to maintain fuels at non-hazardous levels in WUI areas to provide for public and firefighter safety (BLM In Press).

Fire Management Units

Fire Management Units (FMUs) are specific land management areas defined by fire management objectives, management constraints, topographic features, access, values to protect, political boundaries, and fuel types. The Planning Area is subdivided into three fire management units (FMU): Phoenix District South (PHD) of I-10, Phoenix District Wilderness Areas, and the SDNM. Table 3.11, "Fire Management Units in Phoenix District that Overlap the Planning Area" (p. 303)1 provides descriptions of the FMUs geographical locations and areas.

Table 3.11. Fire Management Units in Phoenix District that Overlap the Planning Area

Fire Management Area	Location	Acres
PHD Desert South of I-10	The Lower Sonoran minus wildernesses areas.	845,454
Phoenix District Wilderness Areas	Signal Mountain, Woolsey Peak, North and South Maricopa Mountains, Sierra Estrella, and Table Top Wilderness Areas	249,450
SDNM.	The SDNM minus wilderness areas	408,646
Source: (BLM In press)		

Table 3.12, "Communities at Risk in the Planning Area by Fire Management Unit" (p. 304) shows the communities at risk within the Planning Area by FMU. The FMU with urbanized communities of concern is the Phoenix District (PHD) Desert South of I-10 FMU. The current description of

communities at risk could change as wildland fire risk assessments are accomplished through Maricopa, Pinal, and Gila County Community Wildfire Protection Plan (CWPP) efforts over the next few years.

Table 3.12. Communities at Risk in the Planning Area by Fire Management Unit

Fire Management Unit	Wildland Urban Interface/Communities at Risk
PHD Desert South of I-10 FMU	Pinal County: Maricopa, Stanfield, Casa Grande, Florence, Apache Junction, Queen Creek
PHD Desert South of I-10 FMU	Gila County: Globe
PHD Desert South of I-10 FMU	Maricopa County: Apache Junction, Avondale, Buckeye, Buckeye Valley, Gila Bend, Goodyear, Avondale,
Source: Maricopa County and Pinal County (CWPPs)	

3.2.13.3. Fire Regimes and Condition Classes

Fire regime refers to the nature of fires occurring over long periods of time and their immediate effects that generally characterize an ecosystem (Brown 2000b). Fire regimes can be defined through the attributes of frequency, seasonality, size/spatial extent, rotation (or fire cycle), predictability (or variation in fire frequency), and magnitude (both intensity and severity) (Agee 1993; Morgan et al. 2001). Fire regimes can be subdivided into components that vary in time, space, and magnitude. However, fire regime descriptions are often limited to frequency and severity. See Table 3.13, " Historical Fire Regimes Based on Fire Frequency and Severity" (p. 304) for a full description of fire regimes in the Planning Area.

Fire regimes vary considerably by both vegetation types and landscape characteristics. Table 3.13, " Historical Fire Regimes Based on Fire Frequency and Severity" (p. 304) displays the historical/natural fire regimes, based on fire frequency and severity, for the lands in the Planning Area. They are classified as Fire Regime III (fire frequency of 35 to over 100 years with mixed severity) and Fire Regime IV (fire frequency of 35 to over 100 years and high severity). These fire regime groups are generalized and address only the primary types of fire that occur in the Planning Area. (See Map 3-13: Fire Regime Groups.)

Table 3.13. Historical Fire Regimes Based on Fire Frequency and Severity

Fire Regime Group	Fire Frequency and Severity	Vegetative Communities	Acres of Vegetative Community		
			Planning Area	Lower Sonoran	SDNM
I	0-35 years; low (surface fire most common) severity	None in the Planning Area	0	0	0
II	0-35 years; high (stand replacement) severity	Desert Grassland and Apacherian-Chihuahuan Mesquite Upland	4,854	3,400	1,054
III	35-100+ years; mixed severity	None in the Planning Area	0	0	0
IV	35-100+ years; high (stand replacement) severity	Sonoran Mid-Elevation Desert Scrub and Mogollon Chaparral	5,300	3,200	2,100
V	> 200 years; high (stand replacement) severity	creosote bush-bursage, Palo Verde-Mixed Cacti, Sonoran-Mohave Mixed Salt Desert Scrub, and Riparian	1,401,400	918,500	482,900
Data Source: (Hann et al. 2004; National Interagency Fuels, Fire, and Vegetation Technology Transfer 2008)					

A vegetative community's current condition is a function of the degree of departure from historical fire regimes, resulting in alterations of key ecosystem components, such as species composition, structural stage, stand age, and canopy closure. This departure may have resulted from a number of factors, including fire exclusion or suppression, vegetation resources, grazing, introduction and establishment of exotic plant species, insects or disease (introduced or native), or other past management activities (Hann and Bunnell 2001).

To identify departures from historical conditions, the Planning Area lands are organized in condition classes (CCs) as indicators of fire-management needs (see Table 3.14, "Current Fire Regime Condition Classes by Vegetative Community" (p. 305)). CC1 describes lands that are within or near historical ranges, CC2 describes lands where fire regimes have changed moderately from historical ranges, and CC3 are fire regimes significantly altered from historical ranges. (See Map 3-14: Fire Regime Condition Class.)

Table 3.14. Current Fire Regime Condition Classes by Vegetative Community

Vegetative Community by Condition Class	Acres and percent of Vegetative Community			
	Planning Area		Decision Area	
	Acres	Percent	Lower Sonoran	SDNM
Creosote bush-bursage – CC1	738,952	52.16%	564,965	173,987
Creosote bush-bursage – CC2	27,940	1.9%	25,713	2,227
Creosote bush-bursage – CC3	4,132	0.29%	4,132	0
Palo Verde-Mixed Cacti – CC1	583,870	41.22%	295,080	288,790
Palo Verde-Mixed Cacti – CC2	31,162	2.20%	16,718	14,444
Palo Verde-Mixed Cacti – CC3	98	0.01%	98	0
Apacherian-Chihuahuan Mesquite Upland – CC1	1,759	0.12%	1,433	326
Apacherian-Chihuahuan Mesquite Upland – CC2	1,987	0.14%	1,963	24
Apacherian-Chihuahuan Mesquite Upland – CC3	0	0%	0	0
Sonoran Mid-Elevation Desert Scrub – CC1	2,470	0.17%	1,395	1,075
Sonoran Mid-Elevation Desert Scrub – CC2	456	0.03%	272	184
Sonoran Mid-Elevation Desert Scrub – CC3	119	0.01%	119	0
Sonoran-Mohave Mixed Salt Desert Scrub – CC1	4,791	0.34%	2,426	2,365
Sonoran-Mohave Mixed Salt Desert Scrub – CC2	296	0.02%	287	9
Sonoran-Mohave Mixed Salt Desert Scrub – CC3	0	0%	0	0
Mogollon Chaparral – CC1	557	0.04%	528	29
Mogollon Chaparral – CC2	891	0.06%	823	68
Mogollon Chaparral – CC3	62	0%	62	0
Desert Grassland –CC1	0	0%	0	0
Desert Grassland –CC2	1,054	0.07%	0	1,054
Desert Grassland –CC3	0	0%	0	0
Riparian – CC1	1,299	0.09%	779	520
Riparian – CC2	6,681	0.47%	6,457	224
Riparian – CC3	1,563	0.11%	1,563	0

Vegetative Community by Condition Class	Acres and percent of Vegetative Community			
	Planning Area		Decision Area	
	Acres	Percent	Lower Sonoran	SDNM
Total BLM Land in Planning Area[1]	1,410,139	99.54%	924,813	485,326

Data Sources (Hann et al. 2008; National Interagency Fuels, Fire, and Vegetation Technology Transfer 2008).
[1]Riparian vegetation class combines the following plant communities: invasive southwestern riparian woodland and shrubland, North American warm desert riparian mesquite bosque, and North American warm desert riparian woodland and shrubland. This total only includes the vegetated land classes in the Planning Area and does not include some minor vegetation communities that are too small to be included in this list.

Landscape-level fire and fuels management strategies, including wildland-fire suppression, vegetation and fuel treatments, and prescribed fires, are used in the Planning Area to reduce the fire hazard and risk in the wildland and WUI areas. In general, actions related to fire and fuels management should reduce the amount of lands characterized as Fire Regime CC 2 and 3. Fuel hazard reduction may include prescribed fire, mechanical, biological, and chemical treatments or a combination thereof. The fuel treatment strategies reduce both existing fuel levels and risks of large, damaging wildfires.

Landscape-level fire and fuels management strategies are designed to limit wildland fire extent, modify fire behavior, protect values at risk, and improve terrestrial ecosystem conditions. Fire management and fuel treatment strategies allow land/resource managers to control fires and set priorities that protect fire fighters, public life and property, and natural resources.

3.2.13.4. Fire History

Wildfire history is closely related to vegetation and climatic patterns in terrestrial ecosystems. Patterns of fire frequency, season, size, severity, and uniformity are functions of existing vegetation conditions, weather, elevation, physiographic features, ignition sources, and fire-suppression activities.

Between 1989 and 2009, approximately 70 percent of the total number fires in the Planning Area occurred in the PHD Desert South of I-10 FMU, and approximately 98 percent of all fires in the Planning Area were human-caused. Most of these fires typically occurred along main travel corridors and rivers. An increasing portion of the fires within the Planning Area is associated with UDAs or drug trafficking operations.

Fire numbers vary from year to year and generally occur between the months of March and September. The 20-year average is four fires a year that burn approximately 4,610 acres in total. Multiple fire days, consisting of two or more fires per day, have occurred two times in the past 20 years. There were no historically significant fires within the Planning Area until the 2005 fire season, which was the result of above average fall and winter rains that caused an abundance of annual grass that fueled over 20 fires totaling over 80,000 acres. The largest single fire that has occurred in the Decision Areas was the Tracks Fire, which burned in the Maricopa Mountains of the SDNM during summer 1994 and grew to over 5,000 acres.

3.3. RESOURCE USES

3.3.1. LANDS & REALTY

The lands and realty program for the Planning Area consists of three distinct parts: (1) land use authorizations, which includes ROWs for utility-scale renewable energy development, (2) land tenure (disposal and acquisitions of lands), and (3) withdrawals. The lands and realty program processes applications related to solar, wind, and biomass energy. Geothermal proposals are managed by the minerals program and are discussed in ???. The lands and realty program administers public lands within a framework of numerous laws and mandates, which are discussed in Appendix B, *Applicable Laws, Regulations, and Policies* (p. 1003) and Section 2.8.1, "Lands & Realty (LR)" (p. 118).

3.3.1.1. Land Use Authorizations

The LUA segment of the lands and realty program focuses on requests for ROWs, permits, leases, and easements. The objective of the Lower Sonoran Field Office (LSFO) is to strive to meet the public's needs on public lands, while also attempting to minimize impacts on resources and meeting multiple use objectives. One way the LSFO meets these objectives is by allocating major linear utility facilities within utility corridors.

Rights of Way

Rights-of-way grants are LUAs used for a specific piece of public land for a specific use, for a specific period. Currently, the vast majority of ROWs granted are authorized under Title V of FLPMA (43 U.S. Code [USC] 1761-1771) and the Mineral Leasing Act (Section 28 of the Mineral Leasing Act of 1920, as amended, 43 USC 185). It is the policy of the BLM to authorize ROW applications at the discretion of the authorized officer in a responsible, efficient, and economical manner. Rights-of-ways under FLPMA are authorized for electrical power generation, transmission and distribution systems, systems for the transmission and reception of electronic signals and other means of communications, highways, railroads, pipelines (other than oil and gas pipelines), and other facilities or systems that are in the public interest. Mineral Leasing Act ROWs are for oil and natural gas gatherings, distribution pipelines and related facilities (not authorized by appropriate leases), and oil and natural gas transmission pipeline and related facilities (BLM 2003e).

The LSFO has collaborated with several cooperating agencies in developing formal MOUs in an effort to meet the management objectives of the BLM, while also accommodating the needs of the cooperating partner. The BLM in Arizona, which includes LSFO, currently participates in an MOU with the Federal Highway Administration and Arizona Department of Transportation (ADOT), related to authorizing ROWs across Federal lands.

Since 1988, the number of ROWs issued in the Decision Areas has remained constant at about nine per year. In general, ROW applications are for access across public lands to private parcels, other transportation routes, utility distribution systems, communication facilities (e.g. cellular towers), telephone lines, water facilities, and pipelines. In 1988, the BLM granted (including amendments) a relatively high number of ROWs for roads, power facilities, and water facilities, mainly due to a backlog of applications that the BLM was able to address that year. Roads received nearly double

the amount of ROWs grants than any other category, with water facilities and power facilities following with about half as many ROWs each since 1988 (Information drawn from LR2000, Case Recordation Reports Lands Year End Report, 2010). The trend in population growth in close proximity to public lands suggests that the average number of ROWgrants issued across public lands will likely increase each year. Increased urbanization of public lands in the Planning Area suggests continued authorizations of two to three ROWs per year within the designated corridors.

Utility Corridors

Utility corridors have been allocated and maintained since their adoption in previous planning documents. Major utility systems such as transmission lines greater than 230kV, pipelines greater than 10 inches in diameter, and primary paved roads, as defined by the BLM's Planning and Conducting Route Inventories technical reference guide 9113-1 have been authorized within these corridors. There are currently ten 1-mile wide corridors that cross public lands in the Planning Area, which are listed in Table 3.15, "Utility Corridors within the Lower Sonoran" (p. 308). The corridors are centered at the centerline of the major utility system in which the corridors are named after, unless otherwise stated within the table.

Table 3.15. Utility Corridors within the Lower Sonoran

Size and Legal Area of Utility Corridor	Active LUA Holders within Utility Corridor
El Paso Natural Gas (EPNG) Utility Corridor	
Length: 50.6 miles **Width:** 1 mile (half mile north and south of the centerline for EPNG LUA for a natural gas pipeline (when the utility corridor runs adjacent to the Monument's northern boundary (beginning in section 28 of T. 2. S., R 3. W.), the southern border of the utility corridor repositions to the Monument's northern border and extends 1 mile wide north)). **Legal Area (T/R):** *Outside of the Ajo Block* T.1.N., R.9.W.; T.1.N., R.8.W.; T.1.S., R.8.W.; T.1.S., R.7.W., T.1.S., R.6.W.; T.2.S., R.6.W.; T.2.S., R.5.W.; T.2.S., R.4.W.; T.2.S., R.3.W.; T.2.S., R.2.W; T.3.S., R.2.W.; T.3.S., R.1.W.; T.4.S., R.1.W; T.4.S., R.1.E; and T.5.S., R.1.E. *In the Ajo Block* T.12.S., R.6.W.; T.12.S., R.5.W., T.12.S., R.4.W.; T.11.S., R.4.W.; and T.11.S., R.3.W. **Geographic Area Description:** *Outside of the Ajo Block* This portion of the EPNG Utility Corridor travels southeast from the northeast corner of the Planning Area, north of the Gila Bend Mountains, and along the northern edge of the SDNM until it intersects with the TEP Utility	*Outside of the Ajo Block* **EPNG:** holds several perpetual and non-perpetual LUAs for a 50' to 52.5' wide underground natural gas pipelines (approximately 30" in diameter) and operation and maintenance facilities, including cathodic protection stations, test wells, access roads, and storage facilities. **Southwest Gas Corporation** holds a 20' wide perpetual LUA for an underground natural gas pipeline and related facilities, which run south (perpendicular to the utility corridor) from the EPNG pipeline in section 1 and 12 of T.1.S., R.8.W. and four 40' wide LUAs for underground natural gas pipelines which intersect the utility corridor in section 28 of T.2.S., R.4.W., section 3, T.3.S, R.2.W., and section 20, T.3.S, R.1.W. **Private Property Owner** holds a 33' wide LUA for an existing road, which runs parallel to the Southwest Gas Corporation's LUA mentioned above (perpendicular to the utility corridor) (AZA-18271). *APS* holds six 40' wide LUAs for 12 kV and 69 kV transmission lines, which intersect the utility corridor in section 16 of T.1.S., R.7.W., section 27 of T. 2. S., R.6.W., section 28 of T.2.S., R.4.W., and section 27 of T.2.S., R.6.W., section 26 of T.2.S., R.4.W., and section 25 of T.2.S., R.4.W. APS also holds five LUAs for 15' to 20' wide 12 kV transmission lines, which run parallel to the utility corridor for less than half a mile in section 26 of T.2.S., R.4.W, section 36 of T.2.S., R.3.W., section 30 of T.2.W., R.2.W., section 30, T.3.S, R.2.W., section 11, T.3.S, R.2.W., and section 13, T.3.S, R.2.W. **Transwestern Pipeline Corporation** holds a 50' wide LUA for an underground natural gas pipeline and access

Size and Legal Area of Utility Corridor	Active LUA Holders within Utility Corridor
Corridor, just south of Mobile, AZ) (refer to Map 2-5a: Land Use Authorizations). *In the Ajo Block* This portion of the EPNG Utility Corridor travels east-northeast from Ajo, AZ towards the Batamote and Sauceda Mountains, until the utility corridor ends at the Tohono O'odham Nation in the east (refer to Map 2-5a: Land Use Authorizations).	road, entering the utility corridor in section 11 of T.2.S., R.6.W., then traveling southwest within the utility corridor. **APS, EPNG, Public Service Company of New Mexico, and SRP** jointly holds a 200' wide LUA for a 525 kV transmission line and access roads, entering the utility corridor in section 11 of T.2.S., R.6.W., then traveling southwest within the utility corridor. **Maricopa County Department of Transportation** holds a 130' LUA for Agua Caliente Road, which intersects the utility corridor in section 11 of T.2.S., R.6.W., a 65' LUAfor Riggs Road, which intersects the utility corridor at section 30, T.2.S, R.2.W., and another 65' wide LUA for a road which intersects the utility corridor at section 28, T.3.S, R.1.W. **Gila Bend Power Partners LLC** holds a 200' wide LUA for a 500 kV transmission line. Paloma Ranch Investments holds a several LUAs for a reservoir, canal, and Gillespie Dam, which encroaches into the utility corridor in section 28 of T.2.S., R.5.W. **Maricopa County Flood Control** holds a non-linear LUA (less than 1 acre) for flood control purposes in section 28 of T.2.S., R.5.W. **Enterprise Land and Water** holds a 100' perpetual LUA for a canal, which intersects the utility corridor in section 28 of T.2.S., R.5.W. **Deep Rainbow Valley Community and other private property residents** hold a LUA for a road, which intersects the utility corridor at section 30, T.2.S, R.2.W. **Lufthansa German Air** holds a 2-acre LUA for an instrument landing facility, which encroached into the utility corridor in section 27, T.3.S, R.1.W. **Salt River Project (SRP)** holds a 330' wide LUA for a transmission line that intersects the utility corridor in section 7, T.7.S, R.1.E. **Southern Pacific Railroad** holds a perpetual LUA for a rail line, which intersects the utility corridor at section 18, T.4.S, R.1.E. *Within the Ajo Block* **EPNG** holds a 50' wide perpetual LUA for a natural gas pipeline and related facilities. **Freeport—McMoran** holds a 50' LUA for a transmission line, which runs parallel to the utility corridor in section 19, T.12.S, R.5.W.

Size and Legal Area of Utility Corridor	Active LUA Holders within Utility Corridor
	APS holds a 15' wide LUA for a 12 kV transmission line, which runs parallel to the utility corridor and a 30' LUA for a 69 kV transmission line, which also runs parallel to the utility corridor. *Note: The San Diego Gas and Electric, Liberty -Gila Bend, Palo Verde-Kyrene, Santa Rosa-Gila Bend, and TEP Utility Corridors all intersect this utility corridor. The LUA that lie within these utility corridors are not described here.*
Palo Verde-Devers Utility Corridor	
Length: 8.8 miles **Width:** 1 mile (half mile north and south of the centerline for APS's LUA for a 500 kV transmission line). **Legal Area (T/R):** T.2.N., R.7.W., T.1.N., R.8.W.; T.1.N., R.7.W.; T.1.S., R.7.W.; T.1.S., R.6.W.; and T.1.S., R.5.W. **Geographic Area Description:** This utility corridor travels southeast through the Saddle Mountain area of BLM land towards Arlington, AZ to connect with the San Diego Gas and Electric Utility Corridor, which connects to the Palo Verde Nuclear Facility (refer to Map 2-5a: Land Use Authorizations).	**APS** holds a 200' wide, LUA for a 500 kV transmission line. **Southern California Edison** holds one 160' wide LUA for a transmission line. **Maricopa County Department of Transportation (MSDOT)** holds a 1,000' by 1,000' site LUA for a materials production facility and access road. *Note: The Interstate 10 and San Diego Gas and Electric Utility Corridors all intersect this utility corridor. The LUAs that lie within these utility corridors are not described here.*
San Diego Gas and Electric Utility Corridor	
Length: 21.8 miles **Width:** 1 mile (half mile north and south of the centerline for San Diego Gas and Electric Company/APS's LUA for a 500 kV transmission line). **Legal Area (T/R):** T.4.S., R.9.W.; T.4.S., R.8.W.; T.3.S., R.9.W.; T.3.S., R.8.W.; T.2.S., R.8.W.; T.2.S., R.7.W.; T.1.S., R.7.W.; and T.1.S., R.6.W. **Geographic Area Description:** This utility corridor travels east-northeast from the western border of the Planning Area northeast through the Gila BendMountain towards the Palo Verde Nuclear Station, just north of the Signal Mountains Wilderness (refer to Map 2-5a: Land Use Authorizations).	**San Diego Gas and Electric Company / APS** holds a 200' LUA for a 500 kV transmission line. **Santa Fe Pacific Pipeline Company** holds a 50' wide LUAs for a natural gas pipeline and other LUAs for related facilities, which run parallel or intersect the utility corridor. **Southern Pacific Railroad** holds a perpetual LUA for railroad and station grounds. **Arizona Eastern Railroad** holds a 200' LUA for a railroad line, which runs parallel to the utility corridor. **MCDOT** holds a 130' LUA for Agua Caliente Road, which intersects the utility corridor in section 11 of T.2.S., R.6.W. *Note: The EPNG, Palo Verde-Devers, Interstate 10, and Liberty-Gila Bend Utility Corridors intersect this utility corridor. The LUAs that lie within these utility corridors are not described here.*
Palo Verde-Kyrene Utility Corridor	

Size and Legal Area of Utility Corridor	Active LUA Holders within Utility Corridor
Length: 7.6 miles **Width:** 1 mile (half mile north and south of the centerline for APS's, EPNG, Public Service Company of New Mexico and SRP's LUA for a 525 kV transmission line). **Legal Area (T/R):** T.2.S., R.3.W.; T.2.S., R.2.W.; and T.1.S., R.3.W. **Geographic Area Description:** This utility corridor travels northeast from the northern border of the Monument from the EPNG Utility Corridor until it intersects with the TEP Utility Corridor near Liberty, AZ (refer to Map 2-5a: Land Use Authorizations).	**APS, EPNG, Public Service Company of New Mexico, and SRP** jointly holds a 200' wide LUA for a 525 kV transmission line and access roads. *Note: The EPNG and TEP Utility Corridors intersect this utility corridor. The LUAs that lie within these utility corridors are not described here.*
Liberty-Gila Bend Utility Corridor	
Length: 9.6 miles **Width:** 1 mile (1 mile west of the centerline of APS's LUA for a 20' wide transmission line). **Legal Area (T/R):** T.1.S., R.4.W.; T.1.S., R.3.W.; T.2.S., R.4.W.; T.2.S., R.3.W.; T.3.S., R.4.W.; and T.4.S., R.4.W. **Geographic Area Description:** This utility corridor travels directly south from the Interstate 10 Utility Corridor towards Gila Bend, AZ, on the east side of State Route 85 (refer to Map 2-5a: Land Use Authorizations).	**APS** holds two LUAs for a 230 kV (120' wide LUA) and 69 kV (20' LUA) transmission line which both run parallel to the utility corridor. **Gila Bend and Water Company** holds an LUA for a water irrigation canal, which intersects the utility corridor in section 19 of T.1.S., R.3.W. **AZ SHWY** (also referred to as the Arizona Department of Transportation (ADOT)) holds perpetual LUAs for State Route 85, along with several other LUAs for highway related facilities (such as dykes and pull-offs). **Bureau of Reclamation** holds a 100' LUA for an access road, which intersects the utility corridor at section 26, T.3.S., R.4.W. **BLM** holds three 100' LUAs for access roads, which intersect the utility corridor at section 2, 14, and 23 of T.4.S., R.4.W. **Qwest Corporation** holds an 8' wide LUA for an underground fiber optic line which runs parallel to the utility corridor. *Note: The Interstate 10, EPNG, Santa Rosa-Gila Bend, and Interstate 8 Utility Corridors intersect this utility corridor. The LUAs that lie within these utility corridors are not described here.*
Gila Bend-Ajo Utility Corridor	
Length: 0.9 miles **Width:** 1 mile (half mile east and west of the centerline of APS's LUA for a 20' wide transmission line). **Legal Area (T/R):** T.11.S., R.6.W. **Geographic Area Description:** The majority of this utility corridor lies within the Barry M. Goldwater Air Force Range. The utility corridor travels south from Gila	**APS** holds a 20' LUA for a 69 kV transmission line, which runs parallel to the utility corridor and a 15' LUA for a 21 kV transmission line which intersects the utility corridor at section 21 of T.11.S., R.6.W. **AZ SHWY** holds a 200' perpetual LUA for State Route 85, which runs parallel to the utility corridor. **Table Top Telephone Company** holds a 20' wide LUA for an above ground telephone line, which runs parallel to the utility corridor.

Size and Legal Area of Utility Corridor	Active LUA Holders within Utility Corridor
Bend, AZ until it arrives at Ajo, AZ (refer to Map 2-5a: Land Use Authorizations).	*Note: The Interstate 8 Utility Corridor intersects this utility corridor. The LUAs that lie within this utility corridor are not described here.*
Santa Rosa-Gila Bend Utility Corridor	
Length: 0.1 miles **Width:** 1 mile (half mile north and south of the centerline of Southern Pacific Railroad's LUA for a rail line). **Legal Area (T/R):** T.5.S., R.4.W. **Geographic Area Description:** This portion of the utility corridor travels northeast from Gila Bend, AZ until the utility corridor enters into the Monument (refer to Map 2-5a: Land Use Authorizations).	**MCDOT** holds one 110' wide LUA for operating and maintaining State Route 238. **Southern Pacific Railroad** holds a perpetual LUA for a 200' wide rail line and storage facilities, which run parallel to the utility corridor. **Qwest Corporation** holds one 20' wide LUA for an above ground telephone line and another 25' LUA for an underground fiber optic line, which both run parallel to the utility corridor. *Note: The Liberty-Gila Bend, EPNG, and TEP Corridors intersect this utility corridor. The LUAs that lie within these utility corridors are not described here.*
Interstate 8 Utility Corridor	
Length: 21.7 miles **Width:** 1 mile (half mile north and south of the Interstate 8 Highway LUA centerline). **Legal Area (T/R):** T.7.S., R.10.W.; T.6.S., R.10.W.; T.7.S., R.9.W.; T.6.S., R.9.W.; T.6.S., R.8.W.; T.6.S., R.7.W.; T.6.S.; R.6.W.; T.6.S., R.5.W.; T.5.S., R.5.W.; T.6.S., R.4.W.; T.7.S., R.1.E.; T.7.S., R.2.E.; T.7.S., R.3.E.; and T.7.S., R.4.E. **Geographic Area Description:** This utility corridor divides the Planning Area and runs from the Yuma County line in the west until it reaches Interstate 10 to the east (refer to Map 2-5a: Land Use Authorizations)	**AZ SHWY** holds several LUAs for operating and maintaining the major 300' wide LUA for the Interstate 8 Freeway. These additional LUAs include fencing, access roads, drainage sites, and sand and gravel production and storage facilities. **Qwest Coporation** holds one 20' wide LUA for an above ground telephone line and another 10' wide LUA for a buried telephone line, both LUAs run parallel to the utility corridor. **APS** holds a 6' wide LUA for a short 12 kV transmission line which lies within the utility corridor. **Southern Pacific Railroad** holds several perpetual LUAs for a 200' wide rail line and storage facilities, which run parallel to the utility corridor. **BLM** holds a perpetual LUA for an access road, which intersects the utility corridor at section 10, T.6.S., R.4.W. *Note: The Gila Bend-Ajo, Liberty-Gila Bend, and TEP Utility Corridors intersect this utility corridor. The LUAs that lie within these utility corridors are not described here.*
Tucson Electric Power (TEP) Utility Corridor	

Size and Legal Area of Utility Corridor	Active LUA Holders within Utility Corridor
Length: 30.6 miles **Width:** 1 mile (1 mile east of the centerline of TEP's LUA for a 500 kV transmission line). Within the Ajo Block, the utility corridor is 1 mile wide (half mile north and south of APS's LUA for a 69 kV transmission line, until the corridor reaches section 5 of T.12.S., R.5.W., where the utility corridor heads south and extends one mile wide, east from the LUA's centerline. **Legal Area (T/R):** Outside the Ajo Block T.2.S., R.1.W.; T.2.S., R.1.E.; T.3.S., R.1.E.; T.4.S., R.1.E.; T.4.S., R.2.E.; T.5.S., R.1.E.; T.5.S., R.2.E.; T.6.S., R.2.E.; T.7.S., R.2.E.; and T.7.S., R.3.E. In the Ajo Block T.11.S., R.6.W.; T.11.S., R.5.W.; T.12.S., R.6.W.; T.12.S., R.5.W.; and T.13.S., R.5.W. **Geographic Area Description:** *Outside the Ajo Block* This utility corridor travels southeast towards Tucson, AZ from Buckeye, AZ, just east of the Monument and exits the Planning Area when it enters the Tohono O'odham Nation (refer to Map 2-5a: Land Use Authorizations). *In the Ajo Block* This utility corridor begins where the Gila Bend-Ajo Utility Corridor ends, just north of Ajo, AZ. The utility corridor bypasses Ajo, AZ to the north and east and heads southeast towards Why, AZ, parallel to State Route 85 (refer to Map 2-5a: Land Use Authorizations).	*Outside the Ajo Block* **TEP** holds two major LUAs for a 500 kV and a 345 kV transmission line (220' and 210' wide respectively). **Pinal County Department of Transportation** holds one 50' LUA for Hidden Valley Road, which runs parallel to the utility corridor. *In the Ajo Block* **APS** holds a 30' wide LUA for a 69 kV transmission line, which runs parallel to the utility corridor. **AZ SHWY** holds a perpetual 200' wide LUA for State Route 85, which connects Ajo, AZ to Why, AZ and runs parallel to the utility corridor **Tucson Cornelia Railroad** holds a 200' wide LUA for a rail line, which intersects the corridor at section 35 of T.11.S., R.5.W. **Freeport-McMoran** holds a 50' wide LUA for one 44 kV transmission line and two water pipelines, which intersect the corridor at section 35 of T.11.S., R.5.W. *(ADEQ)* **Arizona Department of Environmental Quality (ADEQ)** holds a 35' by 35' LUA for a air monitoring station, which lies within the corridor in section 1 of T.12.S., R.5.W. **Table Top Telephone Company** holds a 20' wide LUA for an above ground telephone line and another 10' wide LUA for an underground fiber optic line, both of which runs parallel to the utility corridor. *Note: The Palo Verde-Kyrene, Santa Rosa-Gila Bend, EPNG, TEP, and Interstate 8 Utility Corridors intersect this utility corridor. The LUAs that lie within these utility corridors are not described here.*
Interstate 10 Utility Corridor	
Length: 1 mile **Width:** 1 mile (1 mile south of the Interstate 10 Highway LUA centerline). **Legal Area (T/R):** T.2.N., R.8.W. **Geographic Area Description:** This utility corridor runs directly south and parallel to Interstate 10, and is the northern boundary of the Planning Area until Interstate 10 reaches Phoenix, AZ.	**AZ SHWY** holds an LUA for operating and maintaining the 450' wide LUA for the Interstate 10 Freeway. **Sprint Communications** holds a 15' wide LUA for an underground fiber optic line, which runs parallel to the utility corridor. **APS** holds a 15' wide LUA for a 12 kV transmission line, which intersects the utility corridor at section 7 of T.2.N, R.8.W.
*All data was collected from BLM Master Title Plats (March 2011)	

Table 3.16. Existing Utility Corridors within the SDNM

Size and Area of Utility Corridor	Active LUA Holders within Utility Corridor
Interstate 8 Utility Corridor	
Length: 22.4 miles **Width:** 1 mile (half mile north and south of the Interstate 8 Highway LUA centerline). **Legal Area (T/R):** T.6.S., R.4.W.; T.6.S., R.3.W.; T.6.S., R.2.W.; T.6.S., R.1.W.; T.7.S., R.1.W.; T.7.S., R.1.E.; T.7.S., R.2.E.; and T.7.S., R.3.E. **Geographic Area Desciprtion:** The portion of the Interstate 8 utility corridor within the Monument travels eastward from Gila Bend, AZ through the Monument (south of the South Maricopa Mountains Wilderness), towards Casa Grande, AZ (refer to Map 2-5a: Land Use Authorizations). *Note: Portions of the north half of the utility corridor does encroach into the South Maricopa Mountain Wilderness, however, no LUAs have been authorized within that portion of the utility corridor and no new authorizations would be entertained.*	**AZ SHWY** holds several LUAs for operating and maintaining the major 300' wide LUA for the Interstate 8 Freeway. These additional LUAs include fencing, access roads, drainage sites, and sand and gravel production and storage facilities. **BLM** holds one 30' wide LUA for an access road (called Vekol Valley Road), which intersects the Interstate 8 Utility Corridor and travels south towards a private land in-holding within the Vekol Valley portion of the Monument. **Western Farm Credit** holds one LUA for a legal road access on Vekol Valley Road, in order to access a private land inholding in the Vekol Valley portion of Monument. *Note: The TEP Utility Corridor intersects this utility corridor at T.7.S, R.3.E. The LUAs that lie within the TEP Utility Corridor are not described here.*
Santa Rosa-Gila Bend Utility Corridor	
Length: 18 miles **Width:** 1 mile (beginning at the western edge of the Monument, the utility corridor is a half mile north and south of the centerline of Southern Pacific Railroad's LUA for a rail line, until APS's LUA for a transmission line begins at section 23, in which this LUA's centerline becomes the midpoint of the utility corridor. At section 5 of T.5.N, R.1.W, the utility corridor aligns with the centerline of ADOT's LUA for SR-238 until the route exits the eastern side of the Monument). **Legal Area (T/R):** T.5.S., R.4.W.; T.5.S., R.3.W.; T.5.S., R.2.W.; T.5.S., R.1.W.; and T.4.S., R.1.W. **Geographic Area Description:** This portion of the Santa Rosa to Gila Bend Utility Corridor within the Monument travels northeast from Gila Bend, AZ through the northern portion of the Monument (between the North and South Maricopa Mountains Wildernesses) along SR-238 towards Mobile, AZ (refer to Map 2-5a: Land Use Authorizations). *Note: Portion of the south half of the utility corridor does encroach into the South Maricopa Mountain Wilderness, however, no active LUAs are within that portion of the utility corridor and no new authorizations would be entertained for that segment of the utility corridor.*	**APS** holds one 30' wide LUA for a 69 kV transmission line that travels from Gila Bend, AZ to a hazardous waste facility near Mobile, AZ. **MCDOT** holds one 110' wide LUA for operating and maintaining State Route 238, which also includes portions of a fence and a bridge. The road travels from the western side of the Monument until it reaches section 5 of T.5.N., R.1.W. **AZ SHWY** holds one 100' wide LUA for operating and maintaining State Route 238, which begins at section 5 of T.5.N, R.1.W., until the road exits the eastern side of the Monument. **Southern Pacific Railroad** holds several perpetual LUAs for a 200' wide rail line and storage facilities. **ADEQ** holds one 50' to 100' wide LUA for an access road to a hazardous waste facility, just north of the utility corridor. **Arizona Department of Administration** holds one 50' wide LUA for an underground water pipeline to service a hazardous waste facility. **Qwest Corporation**holds one 20' wide LUA for an above ground telephone line and another 25' LUA for an underground fiber optic line, which both run parallel to the utility corridor.

Size and Area of Utility Corridor	Active LUA Holders within Utility Corridor
Tucson Electric Power (TEP) Utility Corridor	
Length: 7 miles **Width:** 1 mile (1 mile east of the centerline of TEP's LUA for a 500 kV transmission line). **Legal Area (T/R):** T.7.S., R.3.E. *Geographic Area Description:* **Geographic Area Description:** This portion of the TEP Utility Corridor clips the far east side of the Monument and travels southeast after intersecting with the Interstate 8 Utility Corridor and runs directly north along the Table Top Wilderness boundary (refer to Map 2-5a: Land Use Authorizations). *Note: Portions of the west half of the utility corridor do encroach into the Table Top Mountain Wilderness, however, no active LUAs are within that portion of the utility corridor and no new authorizations would be entertained for that segment of the utility corridor.*	**TEP** holds two major LUAs for a 500 kV and a 345 kV transmission line (220' and 210' wide respectively). **AZ SHWY** holds one LUA for an access road, drainage easements (at varying widths), and sand and gravel production site) which encroaches into the utility corridor. **APS** holds one 110' wide LUA for a 230 kV transmission line which intersects the utility corridor in section 25. *Note: The Interstate 8 Utility Corridor intersects this utility corridor at T.7.S, R.3.E. The LUAs that lie within the Interstate 8 Utility Corridor are not described here.*

Permits, Leases, and Easements

Applications for leases, permits, and easements are processed under the guidance of FLPMA and other applicable laws and regulations pursuant to 43 CFR 2900. Issuance of leases and permits (such as apiary permits and film permits) is a discretionary action. These authorizations may include but are not limited to airport leases, Recreation and Public Purposes Act (R & PP) leases, special-use permits and leases under 43 CFR 2920, permits, or easements (agricultural leases/permits, film permits, apiary permits, concession leases, etc.). Approximately two permits are authorized each year. Apiaries have been the most common permits issued in the Planning Area. No leases (excluding R & PP leases) or easements have been authorized within the Lower Sonoran since 1988. Approximately ten R & PP leases have been authorized since 1989. Approximately seven R & PP patents have been completed in the Planning Area since 1989.

Communication Sites

The Planning Area has one designated communication site that is managed through the Oatman Mountain Communication Site Plan. This site is located in the Gila Bend Mountains in Section 25 of T. 4 S. R. 9 W, Gila and Salt River Meridian. Since 1988, six facilities have been constructed within the site. Currently the site is near capacity because the unique topography of the area and limited developed space make it difficult to locate new facilities. However, co-location into existing facilities where leaseholders are willing remains a viable option.

Utility-scale Renewable Energy Development

While utility-scale renewable energy developments were not specifically addressed as a part of the lands and realty program in previous land-use plans, recent advancements in renewable energy technology and increased interest in this type of land use authorization have changed this. The BLM's general policy has been to facilitate environmentally responsible commercial development of solar energy projects on public lands and to use solar-energy systems on BLM

facilities where feasible. Responding to increased interest in solar-energy development, the BLM issued national guidance to facilitate the processing of ROW applications for solar-energy projects on public lands. All applications for renewable energy projects are processed as major, site-specific ROWs under FLPMA.

As of spring 2011, there were seven pending applications for utility-scale solar-energy developments in the Lower Sonoran. The BLM and the U.S. Department of Energy (DOE) have prepared a joint programmatic environmental impact statement (PEIS) to provide guidance in facilitating environmentally responsible utility-scale solar energy development by establishing policies and best management practices. The Draft PEIS was released to the public in December 2010. The focus is on BLM administered lands in Arizona, California, Colorado, Nevada, New Mexico, and Utah because those states have the highest potential for solar energy production. The preferred alternative within the PEIS analyzed 24 "solar energy zones" in those states, including three that are in Arizona. One study area is within the Planning area and is located north of the Gila Bend Mountains and directly south of the El Paso Natural Gas Utility Corridor. It is referenced as the Gillespie SEZ in the Solar Energy Development Draft PEIS. More information on the PEIS, including the draft and final documents, are available on the website http://solareis.anl.gov/documents/maps/studyareas/Solar_Study_Area_AZ_Ltt_6-09.pdf when they are available.

The BLM Arizona State Office is currently in the process of developing a Draft EIS (called the Restoration Design Energy Project – EIS), which aims to build off of the agency wide Programmatic EIS, by allocating additional areas and sites for renewable energy development within Arizona BLM administered lands (with an emphasis on allocating suitable areas on previously disturbed sites and areas with low resource conflicts). A draft of this EIS is projected to be released in the fall of 2011.

Market trends have been focused around the development of solar energy (having nine applications for solar) with the assumption that there is little potential for biomass or wind energy on public lands in the Planning Area. As a result, no applications for biomass or wind energy development have been submitted or authorized.

3.3.1.2. Withdrawals

Withdrawals are formal lands actions that set aside, withhold, or reserve Federal land by statute or administrative order for public purposes. A withdrawal creates a title encumbrance on the land. Withdrawals are established for a wide variety of purposes such as power site reserves, military reservations, administrative sites, recreation sites, national parks, reclamation projects, and wilderness areas. Withdrawals are most often used to preserve sensitive environmental values and major Federal investments in facilities or other improvements, to support national security, or to provide for public health and safety. Withdrawals can be designated by Congress through a public land order or statute, or processed by the BLM administratively through FLPMA and 43 CFR 2300.

Classification of lands is the process of determining whether the lands are more valuable or suitable for transfer or use under particular or various public land laws than for retention in Federal ownership for management purposes. The classification process is currently used for potential disposals under the R & PP Act. The segregation of lands is an action such as a withdrawal or allowed application (e.g. R & PP) that suspends the operation to entry under all or portions of the public land laws, which includes the mining and mineral leasing laws.

Existing withdrawals where the BLM does not retain any management authority are limited to the BGR for military purposes. The BLM retains specific management responsibilities, such as fire management or grazing, based on the specific legislation guiding withdrawals to other Federal agencies such as the Bureau of Reclamation and the Army Corps of Engineers for dams, reservoirs, and canals, or the USFWS for wildlife-management purposes.

Lands within congressionally designated wilderness areas also are withdrawn from all forms of appropriation under the mining laws and from disposition under mineral leasing laws. Prior existing claims or leases with valid existing rights may be developed, though mineral development within wilderness areas is rare. Within the Planning Area, 249,500 acres have been withdrawn under the Wilderness Act of 1964, as amended. Withdrawn lands (with surface estate not currently managed by the BLM) are displayed on land use authorization maps 2-5a to 2-5e.

3.3.1.3. Land Tenure

Land tenure refers to actions that result in the disposal of public lands or the acquisition of non-Federal land or interests.

The existing surface-management pattern within the Planning Area is shown on Map 1-1: Surface Management. The BLM administers approximately 1,416,600 acres of surface estate in the Decision Areas, which includes 486,400 acres in the SDNM and 930,200 acres in the Lower Sonoran. The current land-tenure pattern can be difficult to manage in areas where there are scattered and isolated parcels or where there is split estate (where the subsurface estate owner is not the surface owner). Larger blocks of land generally allow for management that is more efficient.

Land Disposals through FLPMA Exchanges and Competitive Sales

Bureau of Land Management adjustments to land tenure can occur under a variety of realty actions, exchanges, and sales. Public lands selected for disposal typically meet the following criteria:

- Isolated and fragmented from larger tracts of BLM-managed lands,
- Adjacent to urbanizing private and State lands subject to future development,
- Currently leased under the R & PP Act and eligible to be patented,
- Present an economic and management challenge to retain under public ownership,
- Not within designated wildlife corridors,
- Not occupied by species listed or proposed as threatened or endangered under the ESA,
- Not designated or proposed critical habitat for listed or proposed threatened or endangered species,
- Not supporting listed or proposed threatened or endangered species if such transfer would conflict with recovery of the listed or proposed species, and
- Not supporting Federal candidate species if such action would contribute to the need to list the species as threatened or endangered.

Under the authority of FLPMA, the BLM can sell public lands through competitive sales and exchange lands with other land management agencies and private landowners. Federal lands can only be sold at fair market value, that is, at a price comparable to private land sales.

There have been no land exchanges and only one competitive sale within the Planning Area since the Lower Gila South RMP Amendment was signed in 2005. The competitive sale was for a 160-acre parcel south of the City of Goodyear. Since September 2008, real estate values and sales have decreased significantly in the Planning Area; therefore, the LSFO is not anticipating growth in competitive land sale proposals in the foreseeable future.

Subsurface Estate Disposals

The BLM regulations establish procedures under section 209 of FLPMA for conveyance of mineral interests owned by the United States where the surface is or will be in non-Federal ownership. The objective is to allow consolidation of surface and subsurface or mineral ownership where there are no "known mineral values" or in those instances where the reservation interferes with or precludes appropriate non-mineral development and such development is a more beneficial use of the land than the mineral development.

Land Disposals through R & PP Act Patent

Land Disposals through the R & PP Act provides for the transfer, at a reduced cost, of public lands to a state, state agency, political subdivision of a state or a qualified non-profit organization for recreation such as a park, or a public purpose such as a fire station (BLM 1996a). R & PP actions have resulted in the transfer (i.e. patent or lease) of approximately 2,005 acres out of public surface estate in the Planning Area; however, 130 acres were returned to BLM management when the Arizona State Parks Department relinquished an R & PP patent at Painted Rocks State Park. Approximately 7,687 acres of public land eligible for patent or lease is pending application.

Most R & PP applications come from government agencies, especially the State of Arizona or local jurisdictions. A majority of the acreage transferred to date under the R & PP Act was by the State of Arizona (this does not include pending leases or patents). Cities are receiving nearly double the number of patents and leases compared to the State; however, the acreage transferred to cities is less. Of the issued and pending leases and patents, which make up the majority of the R & PP actions, approximately 90 percent of the acreage has been related to parks and recreational facilities, while fewer acres have been requested for other public purposes (e.g. municipal facilities) (BLM 2004b).

Since the adoption of the Phoenix RMP (BLM 1989), Lower Gila North Management Framework Plan (BLM 1983), and Lower Gila South RMP (BLM 1989), as amended, surface-estate changes within the Planning Area have been minimal, with only 9,952 acres disposed. As indicated by the acreages of land transferred, minimal changes in land status have occurred since previous plans were adopted. The two main factors that have caused a decrease in land status changes were a legal determination that the Arizona State Land Department did not have the authority to exchange lands under the Arizona Constitution and the Planning Area's location in a volatile market with land prices that were above the national average.

Land Acquisitions

Acquisitions can occur through purchases, exchanges, easements, and other land transfers. Acquired land is always designated for retention. Disposed land is no longer under BLM's surface management and no longer classified for retention or disposal. Purchases, easements, exchanges, and directed sales are completed based on appraised market value. Competitive sales are completed based on a minimum of appraised fair market value, but may exceed that value based on competitive bidding.

No land acquisitions have taken place within the Planning Area since the adoption of the Phoenix RMP (BLM 1989), Lower Gila North Management Framework Plan (BLM 1983), and Lower Gila South RMP (BLM 1989), as amended.

3.3.2. LIVESTOCK GRAZING

Livestock grazing in Arizona is managed under Title 43 of the CFR, section 4100, and is based on the Taylor Grazing Act (43 USC 315, 315a-315r), FLPMA (43 USC 1701 et seq.), the Public Rangeland Improvement Act (43 USC 1901 et seq.), and other executive and public land orders. Grazing leases and permits are issued according to CFR 4130.2(d) and generally last 10 years. The BLM can change allotment schedules, stocking rates, classes of livestock, or other grazing practices if a resource concern arises. When leases or permits are scheduled for renewal, the BLM evaluates resource conditions within the allotments consistent with the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (S & Gs). Approved in 1997, the S & Gs are now also referred to as Land Health Standards and Arizona Guidelines for Grazing Administration (See Appendix L, *Guidelines for Grazing Administration* (p. 1253), and Appendix W, *Land Health Standards* (p. 1339)). Grazing practices are managed to achieve resource and grazing objectives, as described in the terms and conditions of the grazing permit or lease.

3.3.2.1. Rangeland Health and Condition

The overall objective of the Planning Area's rangeland management program is to manage soil and vegetation communities to meet land health standards and multiple-use objectives. The purpose of the S at 43 CFR 4180 is to provide a measure (i.e. standard) to determine land health and methods (i.e. guidelines) to improve the health of public rangelands. The BLM's job is to maintain the health of the land or make appropriate changes on the ground where land health standards are not being met. The standards help the BLM, public land users, and others to focus on a common understanding of acceptable resource conditions. The standards communicate current and desired resource conditions among the various groups. Guidelines describe or communicate techniques for managing activities to achieve those desired conditions. Guidelines for grazing management emphasize multiple use by incorporating needs for wildlife habitat, soil, watershed, riparian areas, and recreation.

The specific program goals and objectives are accomplished through activity-level planning, with attention given to proper season of use; suitable grazing systems; plant and animal requirements; kind, class, and distribution of livestock; and placement of rangeland improvements. Together with livestock operators, other affected agencies, and interested publics, the BLM examines the indicators addressed by the standards, and assesses whether or not they are being achieved through the evaluation process. If resource monitoring shows standards are met or progress is being made towards meeting them, existing management can continue. Resource monitoring can include the collection of vegetation and soil attributes (i.e. cover, frequency, and species composition, etc.),

utilization levels of key forage plants, actual livestock use, and climate data from permanently established plots within allotments. If progress is not being made towards achieving standards and current livestock grazing is determined to be a significant causal factor, then appropriate actions including changes to permits, grazing systems and practices can be implemented in order to ensure progress towards achievement of standards. Appropriate actions can consist of:

- Actions taken pursuant to 43 CFR 4110, 4120, 4130, and 4160 that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with the guidelines (43 CFR 4180.2(c)).

- Implementing and issuing a final decision pursuant to 43 CFR 4110, 4120, 4130, and 4160 upon determining that existing grazing management needs to be modified to ensure that the Fundamentals of Rangeland Health exist (43 CFR 4180.1).

Historic Livestock Use

Livestock grazing in the Planning Area began in the late 1700s, based out of American Indian rancherias along the Gila River. At that time, livestock were confined to the flood plains of the Gila River, the only available and reliable water source to support livestock year-round. It is likely that the mountains and bajadas adjacent to the river would have received some livestock use, particularly during wetter periods when temporary waters were available in potholes, tinajas, or the few springs in the area.

Settlers began to move into the area along the Gila River in the 1860s and started farming operations. Livestock from these farms also were likely confined to the river floodplain and the adjacent bajadas. In addition, livestock brought in by miners and prospectors would have been scattered throughout the Planning Area.

More widespread livestock use of the drier valleys and mountains in the Gila Bend, Tonopah, and Ajo areas did not occur until the widespread use of dirt stock tanks began in the late 1800s, followed by well drilling in the early 1900s. In the Ajo area, the first dirt stock tanks were established in the 1890s. The first dirt stock tank close to the Monument was built around 1900 in the Little Rainbow Valley, just north of the present boundary. The first wells in the area were drilled in Rainbow Valley from 1910 to 1912. At that time, the only waters in the Vekol Valley area consisted of a couple of dirt pools that provided temporary water for cattle for the Tohono O'odham people. The Vekol Valley was not developed for additional livestock use until the 1920s and 1930s.

At the beginning of the 20th century, ranching in the Planning Area consisted of yearlong cow-calf operations, with herds limited only by climatic conditions, water, and available forage. Management limitations on livestock numbers did not occur until 1934 with the passage of the Taylor Grazing Act. During the following years, regulations were established pertaining to operators, allotments, kind and number of livestock, and season-of-use on public lands. Although such regulations were prescribed in 1934, it was not until after WWII that large numbers of steers were brought in to utilize the ephemeral forage from a wet winter and/or spring. Sheep grazing has occurred in the past, but was limited to occasional ephemeral authorizations on a few allotments.

Current Livestock Use

In Arizona, BLM grazing allotments are classified as perennial, ephemeral, or perennial-ephemeral. Perennial means the allotment consistently produces enough forage to support a livestock operation year-round and has an established forage limit, based on the quality and quantity of perennial plants for a defined period, stated in animal-unit months (AUMs). An AUM is a measure of forage that will support a cow and its calf for one month. The amount and length of grazing use, on ephemeral allotments and allotments with ephemeral forage, is based on vegetation production and determined prior to authorizing use. In addition, grazing allotments are assigned in three management categories (improve, maintain, or custodial) based on the present resource condition, management needs, ecological potential, conflicts with other resource values, and economic potential for improvement.

Livestock operations in the Planning Area on allotments not classified as ephemeral only are generally yearlong cow-calf operations and involve raising calves for market from a base cattle herd. These operations usually encompass a mixed ownership of private, Arizona State Trust, and public lands within allotment boundaries. Although the operations are yearlong, they may only use the Federal rangelands seasonally. Ephemeral, perennial, and perennial-ephemeral allotments that utilize ephemeral authorizations may turn out large numbers of steers to take advantage of annual grass and forb species that can produce significant forage amounts for several months during winter and spring. These livestock can have high weight gains, up to several hundred pounds, during particularly wet years before being shipped back to summer ranges in the northern U. S. or to feedlots. Currently, no sheep or goats are authorized on any allotments in either Decision Area.

Three allotment management categories define the management level needed to properly administer grazing lands in accordance with BLM Washington Office IM 2009-018. As allotments are evaluated, the categories, in consultation with affected operators, are reviewed and revised, where needed, to respond to changing resource conditions. All allotments are placed into these categories according to management needs, resource conflicts, potential for improvement, and BLM funding/staffing constraints. The allotment categories and management are defined as:

- Category I (Improve): Category I allotments are those where the current level of livestock grazing or use on public lands is or is expected to be a significant causal factor in the non-achievement of land health standards, or where a change in mandatory terms and conditions in the grazing authorization is or may be necessary. Identifying Category I allotments requires a review of critical habitat conditions and whether projects have been proposed specifically for implementing the Healthy Lands Initiative.

- Category M (Maintain): Category M allotments are those where land health standards are met, where livestock grazing on public land is not a significant causal factor for not meeting the standards, and where current livestock management is in conformance with guidelines developed by the state directors in consultation with Resource Advisory Councils. It also covers allotments where an evaluation of land-health standards has not been completed, but where existing monitoring data indicates that resource conditions are satisfactory.

- Category C (Custodial): Category C allotments are public lands that produce less than 10 percent of the forage in the allotment or are less than 10 percent of the land area. An allotment should generally not be designated Category C if the public lands in the allotment contain critical habitat for a threatened or endangered species or wetlands negatively affected by livestock grazing.

Livestock Permits

The Lower Sonoran Decision Area currently has 45 permitted grazing allotments, 21 of which are ephemeral only, with a perennial permitted capacity of 17,541 AUMs. Portions of six LS allotments, one of which is ephemeral only, are also located within the SDNM. These allotments have a perennial permitted capacity of 8,703 AUMs. Appendix P, *Grazing Allotment Information* (p. 1281) shows allotment names and numbers, permitted AUMs, and livestock numbers and types for both Decision Areas. Also see Map 3-15: Grazing Allotments.

The number of AUMs in the SDNM and Lower Sonoran for the 10-year period from 1998 to 2007 is shown in Table 3.17, "Animal Unit Months 1998–2007" (p. 322). This table is based on the permittees' billed amount for each year during the period. During several of the listed years, AUM amounts are substantially below permitted use levels, reflecting years when permittees elected non-use in anticipation of, or response to, drought conditions or times Animal Unit Months 1998 to 2007 when additional livestock were unavailable for restocking due to livestock markets. The ephemeral AUM column indicates years with exceptionally wet winters when ephemeral permits were issued, in addition to the perennial permits, to take advantage of additional available forage.

Table 3.17. Animal Unit Months 1998–2007

Year	Lower Sonoran Decision Area			SDNM Decision Area		
	Perennial AUMs	Ephemeral AUMs	Total AUMs	Perennial AUMs	Ephemeral AUMs	Total AUMs
1998	2,995	4,594	7,589	17,244	5,713	22,957
1999	6,168	0	6,168	10,887	0	10,887
2000	5,325	393	5,718	20,298	5,287	25,585
2001	7,556	1,054	8,610	14,550	24,920	39,470
2002	1,928	11	1,939	6,110	0	6,110
2003	5,049	162	5,211	15,192	6,334	21,526
2004	4,801	379	5,180	16,323	3,254	19,577
2005	5,929	4,861	10,790	16,309	21,870	38,179
2006	8,178	1,719	9,897	16,309	0	16,309
2007	6,747	1,781	8,528	13,900	1,488	15,388
Note: SDNM allotments include portions of the allotment outside SDNM boundaries						

Drought conditions in the mid 1990s and again in 2002 reduced perennial and ephemeral forage production. When this occurs, livestock use is reduced in Decision Area allotments, or temporarily reallocated, which allows allocation of the remaining available forage specifically for wildlife use. Overall, livestock use in the Planning Area has decreased over time, although the actual number varies yearly. Grazing and grazing management is dependent on precipitation and corresponding improvement in the abundance and vigor of forage, as well as non-forage species that support the general health and condition of soil and plant communities.

3.3.2.2. Grazing in the SDNM

The Monument Proclamation allowed Federal grazing on five allotments south of I 8 to continue until the existing permits expired. Four of these permits expired Feb. 28, 2008, and one expired Feb. 28, 2009, at which time livestock grazing in these areas ended. The public lands south of I-8 (155,900 acres), will remain unavailable for livestock use and the grazing preferences (7,884 AUMs) for permitted use on these allotments have been cancelled. These acres exclude the additional 78,000 acres south of I-8 located in the Sand Tank Mountains area, formerly withdrawn to BGR and known as Area A. These acres will remain unavailable to grazing as well resulting in a total of 233,900 acres being unavailable to grazing south of I-8. In addition, the proclamation stated, "grazing on Federal lands north of Interstate 8 shall be allowed to continue only to the

extent that the Bureau of Land Management determines that grazing is compatible with the paramount purpose of protecting the objects identified in this proclamation." A draft livestock grazing compatibility analysis (Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)) for the public lands currently available for livestock grazing within SDNM north of I-8 has been completed. The results of the analysis indicate that livestock grazing on 8,498 acres of the 252,500 acres of the public lands are not compatible with protection of the Monument objects and will be considered unavailable for livestock grazing in the range of alternatives.

3.3.2.3. Range Improvements

A number of range improvement projects were constructed for both the enhancement and protection of watershed and wildlife values and the management of domestic livestock grazing. These projects consist of water developments (windmills, pipelines, stock ponds) and fences. All projects were authorized under cooperative agreements or permits, depending on overall benefits, objectives, and private investment levels. Under most alternatives, the construction of range improvement projects would continue where the project benefits watershed, wildlife, and livestock grazing. The disposition of existing range improvements will depend upon the alternative selected (see Chapter 4, *Environmental Consequences* (p. 371) for details). Regulations pertaining to range improvements can be found at 43 CFR 4120.

3.3.3. MINERALS MANAGEMENT

The BLM mineral resources within the Planning Area include both federally owned mineral estate underlying BLM-managed surface lands, and those minerals under lands where the Federal Government has disposed of the surface rights but retained the minerals. The latter are called "split estate". There are also lands where BLM manages the surface but a different entity (e.g. the State of Arizona) owns the mineral estate. This also is referred to as split estate and presents other surface-management challenges because the mineral estate has primacy over the surface estate.

Although the Planning Area encompasses nearly 9 million surface and mineral estate acres, the BLM manages both the surface and mineral estate on only 15 percent (1,338,300 acres; see Table 3.18, "BLM Mineral Estate Acreage" (p. 323)). Approximately 713,300 acres of BLM-managed minerals under BLM-managed surface are currently open to mineral activities, along with 139,000 acres of BLM mineral estate under non-federal surface (Map 3-16: Mineral Estate).

Table 3.18. BLM Mineral Estate Acreage

Mineral Estate	Acres	Percent
Planning Area		
Total Acres (All Owners)	8,868,300	100%
BLM Mineral Estate BLM Surface	1,338,300	15%
BLM Mineral Estate – Non-Federal Surface	210,000	2%
All other owners, including other Federal (Park Service, Forest Service, Fish & Wildlife Service, Bureau of Reclamation, Department of Defense), tribal communities, State, counties, cities, and private	7,320,300	83%
Lower Sonoran & SDNM Decision Areas		
Total Acres	1,558,300	100%
BLM Mineral Estate BLM Surface	1,338,300	86%
BLM Mineral Estate – Non-Federal Surface	220,000	14%

Approximately 366,300 acres of Arizona State Trust lands are within the Planning Area, and are generally open to mineral exploitation, but subject to different requirements and restrictions than Federal lands. Private mineral estate is open to mineral development by the owner under regulations issued by various state and Federal agencies. Therefore, within the Planning Area, about 15 percent of the total mineral estate is available for exploration and development under Federal mining/mineral laws and regulations, and 2 percent under State of Arizona rules and regulations. (See Table 3.18, "BLM Mineral Estate Acreage" (p. 323) and Table 3.19, "Acreage Open to Minerals Activity" (p. 324).)

Table 3.19. Acreage Open to Minerals Activity

	Acres	Percent
BLM Surface with BLM-Managed Mineral Estate		
Total (BLM-managed mineral estate under BLM surface)	1,338,300	100%
Currently closed to minerals activity (includes SDNM, wilderness, and other mineral withdrawals)	625,000	47%
Currently open to minerals activity	713,300	53%
Non-Federal Surface with BLM-Managed Mineral Estate		
Total (BLM-managed mineral estate under non-Federal surface)	210,000	100%
Currently closed to minerals activity (primarily parks)	71,000	34%
Currently open to minerals activity	139,000	66%

By presidential proclamation, 461,000 acres of BLM mineral estate in the SDNM are closed to the location of new mining claims, mineral leasing, and mineral materials disposals. There are no existing locatable minerals rights as all previous mining claims have lapsed. Nor are there any existing mineral leases, mineral materials sales, or free use permits. For this reason, minerals will not be discussed further for the SDNM.

On public lands within the Lower Sonoran, there are approximately 210,000 acres of split-estate lands with BLM-owned mineral estate and non-Federal surface owners, including Arizona state lands, county and city parks, and private lands (see Map 3-13: Wildfire Regime Groups). Of those, approximately 71,000 acres (34 percent) are already withdrawn from mineral entry, with the remaining land open to mineral activities under the various mining and minerals laws.

3.3.3.1. Categories of Minerals on BLM Lands

By legal statute, three categories of mineral resources have been established on public lands: locatable, leasable, and salable. Federal laws, regulations, and legal decisions define these categories (BLM 1997).

Locatable Minerals

Locatable minerals include both metallic minerals such as gold, silver, and copper and nonmetallic minerals such as gemstones, silica, and perlite. Locatable minerals rights are established by staking a mining claim in accordance with Federal and State laws and regulations. Related mining operations are governed by Federal, State, and local environmental and safety laws and regulations, including BLM's regulations at 43 CFR 3802 (Exploration and Mining, Wilderness Review Program), 43 CFR 3809 (Surface Management), and 43 CFR 3715 (Use and Occupancy under the Mining Laws).

Surface-management regulations currently define three levels of mining operations: 1) casual use, 2) notice-level use, and 3) plan-level use. Casual use involves minor activity requiring only hand

tools, with no explosives or mechanized earth-moving equipment. No permit is required for these activities. Notice-level operations involve exploration activities using explosives or mechanized earth-moving equipment and a total annual unreclaimed surface disturbance of less than 5 acres. Plan-level use requires a plan of operations, along with a full environmental analysis. Bonding is required for both notice-level and plan-level operations. Both notice-level and plan-level mining require permits. Operators currently do not pay royalties on the production of locatable minerals.

Various mineral resources have been mined to different extents throughout the Planning Area for hundreds of years. Evidence suggests that Native Americans as well as early Spanish explorers prospected and mined within the region. With the entry of Europeans into the area, those activities increased tremendously. Virtually all of the mountains within the Planning Area exhibit evidence of some level of activity in search of minerals. Few of the mines ever had the quantity or quality of ore to sustain a viable operation for any period of time, but two areas containing large metal deposits, primarily copper, were discovered near Ajo and in the Globe-Miami area. These major districts began as large underground mines and eventually evolved into massive open-pit operations, along with their attendant milling and smelting facilities. Levels of activity at these sites have varied over the years, primarily as a reaction to fluctuations in the market price of metals. Most of the lands within these two areas are no longer in Federal ownership, having been patented through processes established through the 1872 Mining Law. Other patented individual claims and small groups also exist at scattered locations throughout the Planning Area.

There are 65 metallic mineral districts in five Arizona counties: 25 in Pima; 23 in Pinal; 11 in Maricopa; 5 in Gila; and 1 in Yuma. Many established mining districts within the Planning Area contain metallic or nonmetallic mineral resources or both. All of the districts historically have been explored and mined to varying extents; many still host active mining claims, but activity on the ground is infrequent.

In June 2009, the most notable active operations in the Planning Area were three copper mines in the Globe-Miami area of Gila County: BHP Billiton's Pinto Valley/Miami Mine, Quadra's Carlota Mine, and Freeport-McMoRan Copper & Gold's Miami Complex. These operations are located on a mix of private and Forest Service lands. In some places, they adjoin public lands, suggesting the possibility of additional mineral deposits on public lands. Other locatable minerals activities are comparatively small.

Some mineral districts historically were mined for nonmetallic minerals, including asbestos, barite, feldspar, mica, quartz, silica, and gypsum; gemstones such as amethyst and turquoise; and industrial-grade limestone and clay deposits. The most notable active nonmetallic mines are Tolleson Mine (clay, Clinton-Campbell Contracting Inc.); Superior Perlite Mine (perlite, Harborlite Corporation); Copper Hill Mine (silica, Kessen and Kessen); and Sleeping Beauty Mine (turquoise, Sleeping Beauty Turquoise) in Gila County.

Table 3.20, "Locatable Mineral Potential in Lower Sonoran & SDNM Decision Areas" (p. 326) describes mineral potential for locatable minerals in the Lower Sonoran on BLM mineral estate. Moderate- and high-potential areas are located primarily in the mountain ranges, with known mineral occurrences in the Ajo area, Gila Bend Mountains, and Buckeye Hills, and on public lands in northeast Pinal and Gila counties, primarily around Superior and Globe-Miami (BLM 2004). See Map 3-17: Locatable Minerals Potential.

Table 3.20. Locatable Mineral Potential in Lower Sonoran & SDNM Decision Areas

Potential	Total Acres	Percentage of Total BLM Land
Open to Minerals Activity		
Low	506,000	71%
Moderate	194,600	27%
High	12,200	2%
Closed to Minerals Activity		
Low	368,100	42%
Moderate	251,100	56%
High	5,800	2%
Acres and percentages are for the BLM mineral estate under BLM-managed surface estate within the Decision Areas, which excludes BLM-managed minerals under subsurface owned by other Federal agencies and non-Federal jurisdictions, such as State land, parks, county land, and private land.		

Over the past 25 years, the trend in locatable minerals has been toward a reduction of mining activity. Rising mining costs have led to a decrease in the number and size of mining operations, particularly for metallic minerals. However, increases in metal prices have resulted in increased interest in opening new or inactive copper mines near Superior, Globe-Miami, and Ajo.

Leasable Minerals

Leasable minerals include fluid minerals such as oil, gas, and CO_2; solid minerals such as coal and sodium; and geothermal resources. There has been no leasable-minerals development within the Planning Area during the last 20 years. (See Maps 3-18, 3-19, and 3-20.) Since 1913, 33 exploratory oil or gas wells have been drilled. Although some of these found indications of oil and gas, they were not present in economic quantities. No exploration or lease activity, planned lease sales, or drilling activity for fluid minerals such as oil, gas, CO_2, helium, or geothermal resources have taken place in or near the Planning Area in at least 20 years.

Leases for mineral development are allocated through competitive bid on lands open for leasing. If there is not competitive interest in a parcel, an interested party can get a noncompetitive lease. A successful lessee is required to pay rent on the leased parcel plus royalties on the sale of mineral resources produced from it.

Oil and Gas: Oil and gas are nonrenewable, fluid mineral resources typically discovered by drilling exploration wells into “targets” defined from prior geophysical and geological exploration. If exploitable resources are discovered, additional development wells are drilled for efficient production from the oil or gas field.

An economically exploitable resource is found in reservoir rock with adequate permeability and porosity, petroleum source rock such as organic-rich shales or coal in the vicinity, a stratigraphic or structural trap under which the oil or gas can accumulate, and a recent geologic environment to provide adequate geothermal heat flux to mobilize the liquid hydrocarbon fractions (but not so much that all of the volatiles are driven off and leave a tarry residue).

As discussed in the Energy and Mineral Resource Potential Report (URS 2004), there is moderate potential for oil and gas resources in approximately 40 percent of the Planning Area. Table 3.21, “ Leasable Mineral Potential Lower Sonoran & SDNM” (p. 327) describes the acres and percentages of various leasable mineral potentials for lands with BLM mineral estate within the Lower Sonoran (See Map 3-18: Oil & Gas Potential.) Moderate potential exists in two regional geologic structures: the Chihuahua Trough/Bisbee Basin in eastern Pima County, and the

Arizona-New Mexico Trough in northeastern Pinal and Gila counties. There also is moderate potential in the Tertiary alluvial basins between the mountain ranges (URS 2004).

Table 3.21. Leasable Mineral Potential Lower Sonoran & SDNM

Mineral Resource Potential	Oil and Gas		Geothermal		Sodium	
	Acres	Percent	Acres	Percent	Acres	Percent
Open to Minerals Activity						
Low	607,700	85%	157,000	22%	629,000	88%
Moderate	105,600	15%	517,000	72%	84,000	12%
High	0	0%	39,300	6%	300	<1%
Closed to Minerals Activity						
Low	573,500	92%	199,300	32%	577,000	92%
Moderate	51,500	8%	417,400	67%	47,200	8%
High	0	0%	8,300	1%	800	<1%

Acres listed are BLM mineral estate under BLM-managed surface within the Decision Areas. This excludes BLM-managed minerals under surface owned by other agencies and non-Federal jurisdictions such as State land, parks, county land, and private land. Percentages are the proportion of low, moderate, and high potential for each mineral.

CO_2 and Helium: Carbon dioxide and helium are nonrenewable, fluid mineral resources typically discovered during the drilling of exploratory oil and gas wells that encounter natural gas or nonflammable gas in sedimentary rocks. Three of the 33 exploratory wells drilled in the Planning Area reported the presence of gas, but there is no information on whether the gas was tested for CO_2 or helium. Consequently, there are no known occurrences and low potential for CO_2 and helium in the Planning Area.

Coal: Coal is a nonrenewable, solid mineral resource. It is typically exposed in outcrops of coal-bearing sedimentary rocks. No coal-bearing sedimentary formations or coalfields are known to exist in the Planning Area.

Sodium: Sodium is a nonrenewable, solid mineral resource that typically occurs as salt beds in deep-basin sediments. There is high potential for sodium in the Luke, Higley, Tonopah, and Picacho basins in the Planning Area; however, little of this potential exists on public lands (see Map 3-19: Sodium Potential). There is moderate potential for sodium in the remaining alluvial basins. The majority of these potential areas are within the Lower Sonoran (URS 2004). There is no leasing or development activity for this in the Planning Area; however, sodium is being extracted from the Luke Basin to the north.

Geothermal: Geothermal resources are nonrenewable, fluid mineral resources. Geothermal energy sources include artesian hot springs and wells that tap into groundwater or dry rock at elevated temperatures resulting from high heat-flow gradients in the earth's crust. They typically are discovered by drilling exploratory wells in areas of known or suspected high temperature gradients or by coincidence during water drilling.

There are 15 geothermal energy resource regions in the Planning Area ranging in temperature from 35 degrees to 120 degrees Celsius (95 degrees to 248 degrees Fahrenheit). These are considered low-temperature resources suitable only for residential or commercial space heating, greenhouse use, aquaculture, or heated swimming pools and spas. (See Map 3-20: Geothermal Resources Potential) Table 3.21, " Leasable Mineral Potential Lower Sonoran & SDNM" (p. 327) describes geothermal potential on the BLM mineral estate within the Lower Sonoran. High- and moderate-potential areas are located in deep alluvial basins, including the

Picacho, Maricopa-Stanfield, Rainbow, Luke, Harquahala, and western Higley basins (URS 2004). There is low potential for geothermal resources in the mountain ranges.

Salable Minerals (Mineral Materials Disposal)

Salable mineral resources (mineral materials disposals) have high potential throughout most of the Planning Area (URS 2003). (See Map 3-21: Mineral Materials Potential.) They include common varieties of sand, gravel, aggregate, clay, limestone, cinders, and decorative rock, as well as building or dimensional stone including granite, decomposed granite, basalt, and other volcanics. Large volumes of salable minerals are used in commercial, residential, and infrastructure construction within the Planning Area. Salable minerals within the Lower Sonoran are predominantly sand, gravel, and decorative (or crushed) rock.

Federal, State, and local environmental and safety laws and regulations govern mining-related operations, including the BLM's regulations at 43 CFR 3600 (Mineral Materials Disposal). The mineral materials disposal regulations require that commercial operators obtain a sale contract from the BLM prior to beginning operations. Sales are conducted through competitive bid or, when appropriate and when certain criteria are met, on a noncompetitive basis. Commercial operators pay the BLM a royalty based on the amount of materials taken from public lands. Government agencies and non-profit organizations can obtain mineral materials from public lands at no cost by obtaining a BLM free-use permit.

Within the Lower Sonoran, there are seven active commercial salable-mineral pits (crushed rock/decorative stone/aggregate): Arizona Pacific Materials, Bush Sand and Gravel, Chandler Rock, Kilauea Crushers (two locations), Red Mountain Mining, and Treasure Chest Granite Pit. Sand and gravel come from pits in Quaternary and Tertiary alluvial deposits in active or former stream channels, washes, floodplains, and alluvial fans. Decorative rock and building stone are mined or quarried from granitic, metamorphic, and volcanic rock outcrops. Mineral material pits and quarry locations are common throughout the Planning Area and usually are located close to cities and primary transportation arteries such as roads and railways.

The general trend for salable minerals during most of the past 25 years has been toward increasing development and production. On all public lands around metropolitan Phoenix, total salable-minerals production increased from 1.29 million short tons in fiscal year (FY) 2003 to 2.4 million tons in FY 2007 before falling to 2 million tons in FY 2008 during the recent economic downturn. Production for FY 2009 fell to about 1.3 million tons. (LR2000, BLM records)

Within the Lower Sonoran itself, salable-minerals production increased from 0.81 million tons in FY 2003 to 1.38 million tons in FY 2007 before falling to 1.01 million tons in FY 2008. (See Figure 3-1.) Production for FY 2009 fell to about 0.5 million tons (LR2000, BLM records).

There are many large, active sand and gravel pits in the Planning Area; however, sand and gravel production is not a significant activity within the Decision Area because most operations are on private or State lands. Consequently, the majority of the mineral materials production within the Decision Area is decorative rock.

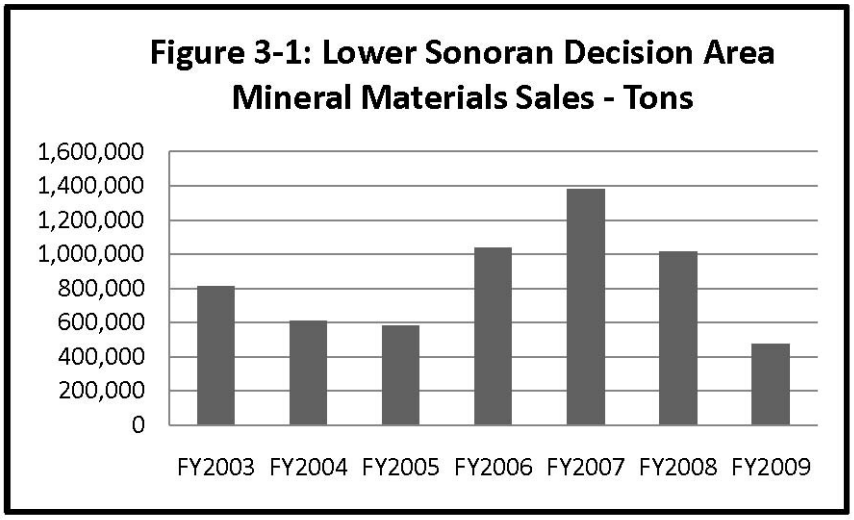


Table 3.22, "Mineral Materials (Salable) Potential Lower Sonoran & SDNM" (p. 329) below and Map 3-21: Mineral Materials Potential show the available mineral estate with potential for certain salable products. Areas for salable minerals are unranked and only designated as having potential based on being either bedrock or alluvial materials and sediments. In reality, almost any material can be mined and produced as salable minerals, though the quality and level of processing needed vary greatly. The primary factors determining which sites are of interest for salable minerals are market factors and transportation costs, with physical properties being dominant only for exceptional situations.

Table 3.22. Mineral Materials (Salable) Potential Lower Sonoran & SDNM

	Acres	Percent of Total[1]
BLM mineral estate with BLM surface currently open to minerals activity	713,300	100%
Areas with potential for crushed stone, decorative rock, boulders, aggregate, and related products	364,400	51%
Areas with potential for sand and gravel, aggregate, fill material, and related products	348,900	49%
Acres and percentages are for the BLM mineral estate under BLM-managed surface estate within the Decision Areas, which excludes BLM-managed minerals under subsurface owned by other Federal agencies and non-Federal jurisdictions, such as State land, parks, county land, and private land.		

3.3.3.2. Mineral Potential Maps

The various potential areas shown for locatable minerals (Map 3-17: Locatable Minerals Potential), oil and gas (Map 3-18: Oil & Gas Potential), sodium (Map 3-19: Sodium Potential), geothermal resources (Map 3-20: Geothermal Resources Potential), and mineral materials, i.e. salable minerals (Map 3-21: Mineral Materials Potential), are based on existing data (URS 2004). Boundaries between areas of different potential are considered general in nature, as the data is not sufficiently detailed to draw the divisions more precisely, the exception being small areas of high potential based on known commodity occurrences. Accordingly, acreage totals in the preceding tables are estimates rounded to the nearest 100 acres. Inaccuracies and inconsistencies in geographic information system (GIS) database layers contribute to variability in the numbers and can result in differences between equivalent acreages. These problems arise during data analysis and normally result in maximum errors of only a few percent.

3.3.4. RECREATION MANAGEMENT

The dramatic increase in population within and surrounding the Lower Sonoran and SDNM since the last planning effort was completed has brought increased demands for outdoor recreational opportunities. Much of this demand has fallen on public lands adjacent to new residential communities in Maricopa, Tonopah, and Gila Bend and the rapidly growing cities of Goodyear and Buckeye. There also is widespread, lower-density residential development on private land throughout the Decision Areas. Increased OHV sales and new technology have resulted in a rising demand for motorized trails and recreational areas. Community demand for parks, open spaces, and non-motorized trails, both on a local and regional basis, has increased in Maricopa and Pinal counties.

The process used to allocate public lands for the provision and management of recreation and visitor services has changed substantially during recent years. Integral to both prior and current recreation planning processes is the use of a tool called the recreation opportunity spectrum (ROS). This is a system used to inventory and classify public lands according to physical and social settings, which combine to offer specific types of recreational opportunities. As the name implies, such settings range across a spectrum of opportunities from primitive and primitive non-motorized, where motorized use does not occur and facilities are non-existent or minor in extent, to rural and urban, where opportunities are vehicle-dependent and facilities may be extensive.

In an approach known as benefits-based management, the BLM now integrates perceptions of visitor demand with ROS to produce market-based strategies that provide for recreational opportunities and visitor services. The result is that public lands are allocated to special recreation-management areas (SRMAs) in which structured recreation opportunities are offered or to extensive recreation management areas (ERMAs) in which management is of a custodial nature. The major way this approach differs from one using only ROS is that SRMAs now are targeted to demonstrated recreation-tourism markets (destinations); locales dependent on public lands for recreation (communities); or to dispersed, frontier-like opportunities dependent on the natural characteristics of the landscape (undeveloped).

3.3.4.1. Recreation Management in the Decision Areas

The Lower Sonoran and SDNM are used by visitors for a multitude of outdoor recreation activities, with the numbers of visitors to both areas increasing more than the increase in population experienced by adjacent communities. The principal activities of the two Decision Areas are OHV use, recreational target shooting, and non-motorized activities such as hiking and equestrian uses. Surveys of motorized and non-motorized trail users in Arizona, conducted by Arizona State Parks in 2003 and 2008, show that both types of trail use increased statewide as a percentage of the total population over the intervening period (see Table 3.23, “Types of Trail Users as a Percentage of Population, 2003-2008” (p. 331)). Additionally, the percentage of non-trail users among respondents declined, indicating that demand for motorized and non-motorized recreation opportunities has increased as a relative proportion of the population (Arizona State Parks 2009).

Table 3.23. Types of Trail Users as a Percentage of Population, 2003-2008

Locale	Primarily Motorized		Primarily Non-motorized		Non-User	
	2003	2008	2003	2008	2003	2008
Arizona	7.0%	10.7%	56.5%	57.9%	33.6%	31.4%
Maricopa County	5.6%	9.6%	55.1%	59.2%	36.2%	31.2%
Pima County	5.3%	7.9%	66.9%	63.5%	26.5%	28.7%
Pinal County	8.6%	13.8%	48.9%	48.3%	40.2%	37.9%
Source: (Arizona State Parks 2009)						

Route proliferation and off-road recreation areas were observed north of SR 238 in the SDNM, in Haley Hills, Rainbow Valley, Buckeye Hills, Saddle Mountain, parts of the Gila Bend Mountains, and in all areas near urban development in the Lower Sonoran.

The BLM does not have comparable data illustrating demand placed on the Decision Areas for recreational target shooting; however, this use has increased dramatically during the past five years. No improved or facilitated target shooting sites are managed by the BLM; most are informal gathering places adjacent to vehicle routes that commonly exhibit shooting damage to dominant vegetation, such as saguaro or trees, rock outcrops, and regulatory or informational signs. Large quantities of litter often are present, including spent shells and target debris, including broken bottles, cans, wooden pallets, appliances, computers, TVs, cardboard boxes, propane bottles, and abandoned vehicles.

Hiking and backpacking occurs throughout both Decision Areas, particularly in the mountain ranges. There are four designated, non-motorized trails within the Monument (Lava Flow, Table Top, Margie's Cove, and Brittlebush all within wilderness areas), and two within the Lower Sonoran (Quartz Peak in the Sierra Estrella Wilderness and Painted Rock Interpretive Trail). Designated non-motorized trails within the Monument and wilderness areas are minimally maintained, primitive, and in average condition.

Horseback riding is a relatively minor use within the Decision Areas but has been occurring for many years. Equestrian use occurs on most non-motorized trails except Quartz Peak Trail, which is inaccessible to horses. Most rides have taken place near Gap Well along the Butterfield Stage Route and from camp areas along Vekol Wash.

Generally, recreation settings are remote and access is by unmaintained, primitive roads that require high-clearance, often four-wheel-drive, vehicles. Facilities are small and primitive, recreation use is dispersed over the landscape, and BLM staff rarely makes contact with visitors. Area allocations managed for recreation uses are indicated in Table 3.24, "Recreation Land Use Allocations in the Decision Areas" (p. 331). Recreation facilities managed by the BLM are available only in the ERMA at Painted Rock Petroglyph Site and Campground and at Quartz Peak Trailhead in the Lower Sonoran. In the SDNM, small, primitive recreation facilities (trailheads) are available in the Gila Trail SRMA adjacent to the North Maricopa Mountains Wilderness, and in the ERMA adjacent to Table Top Wilderness. See Map 3-22: Special Recreation Management Areas & BLM Recreation Sites.

Table 3.24. Recreation Land Use Allocations in the Decision Areas

Allocation	Area (acres)	Area (% of Decision Area)	Goals
Lower Sonoran			
Ajo SRMA	175,200	19%	Provide facilities and maintenance; protect resource values; visitor safety

Allocation	Area (acres)	Area (% of Decision Area)	Goals
Saddle Mountain SRMA	46,300	5%	Emphasize interpretation of geologic, cultural, and wildlife resources; protect scenic landscapes and vistas; promote recreational opportunities
Sentinel Plain SRMA	20,800	2%	Provide facilities and maintenance; protect resource values; visitor safety
Gila Trail SRMA (part)	137,100	15%	Provide facilities and maintenance; protect resource values; visitor safety
ERMA	550,800	59%	Provide primitive facilities for resource protection, visitor safety, and /or improvement or increase of recreational opportunities
Total	930,200	100%	
SDNM			
Gila Trail SRMA (part)	143,900	30%	Provide facilities and maintenance; protect resource values; visitor safety
ERMA	342,500	70%	Provide primitive facilities for resource protection, visitor safety, and/or improvements or increase of recreational opportunities
Total	486,400	100%	

Table 3.25, "Recreation Opportunity Spectrum Classes of the Lower Sonoran Decision Area" (p. 332) shows ROS classes identified for the Decision Areas. Approximately 87 percent of the Lower Sonoran is allocated to ROS classes that accommodate or emphasize vehicle-dependent, recreational opportunities ranging from semi-primitive motorized to urban. Illustrative of the remote, unmaintained, and dispersed qualities in the Lower Sonoran, 69 percent of the area is allocated to a single ROS class: semi-primitive motorized. Only 9 percent is allocated to the non-motorized classes of primitive and semi-primitive non-motorized, which occur in wilderness. In comparison, approximately 32 percent of the SDNM is allocated to ROS classes that emphasize non-motorized, recreational opportunities. Although these areas exist principally in wilderness, substantial areas of semi-primitive, non-motorized settings are offered in the Sand Tank Mountains area. Nearly 54 percent of the SDNM is allocated to semi-primitive, motorized opportunities.

Table 3.25. Recreation Opportunity Spectrum Classes of the Lower Sonoran Decision Area

ROS Class	Lower Sonoran (acres)	SDNM (acres)
Primitive	10,154	14,951
Semi-primitive non-motorized	71,812	142,391
Semi-primitive motorized	639,117	262,041
Roaded natural	141,067	49,355
Rural	24,919	17,347
Urban	979	0
Public lands not allocated*	23,694	316
Total	930,200	486,400
*Private and State Trust Land in holdings		

With the exception of a specific prohibition against off-road travel by motor vehicles, Presidential Proclamation 7397 did not refer to the provision and management of recreation and visitor services on the Monument. Nevertheless, since an intrinsic result of such a designation is to encourage visitation, it is expected that curious visitors would be interested in seeing, learning about, and experiencing the natural objects for which the Monument was designated. Since designation, visitation has increased on the Monument, and lack of facilitated recreational opportunities resulted in degradation of certain portions. In June 2008, approximately 54,817 acres adjacent to the North Maricopa Mountains Wilderness were closed to motor vehicles

after off-road travel became rampant. Other areas of concentrated visitation include the three wilderness areas incorporated into the Monument, the Juan Bautista de Anza NHT, and areas used extensively for recreational target shooting adjacent to the Monument's northern boundary.

Portions of the Decision Area contiguous with the BGR, Sentinel Plain, and a part of the SDNM were re-conveyed to BLM by the National Defense Authorization Act for Fiscal Year 2000 from the Department of Defense. Due to unique safety concerns posed by previous military training exercises on these lands, entry is managed through a permitting process that requires visitors to view a brief safety video and sign a document acknowledging awareness of safety concerns. Combined, the U.S. Air Force, Marine Air Corps, USFWS, and BLM annually issue approximately 9,000 free-access permits to the BGR and adjacent areas, including Sentinel Plain. The BLM issues approximately 150 of these free-access permits annually. Commercial and competitive recreational use is limited, with BLM issuing approximately seven new special recreation permits annually.

SDNM Recreation Site Inventory

From 2003 to 2005, researchers under the direction of Dr. Pam Foti, a professor in Northern Arizona University's Geography, Planning, and Recreation Department, determined the extent of recreation impacts to the SDNM with a comprehensive inventory of all recreation sites visible from the vehicle-route network. At each of the 410 sites identified, impacts were assessed for a variety of impact variables and sites were categorized into five levels of relative impact based on the presence of these impacts. Approximate area size of each site was also noted with 276 sites (81 percent) having minimal area disturbance area (less than 1,000 sq. ft.) and 64 sites (19 percent) being larger than 1,000 sq. ft. in size. Map 3-23: SDNM Inventoried Recreation Impact Sites depicts all known recreation impact sites. Sites also were categorized as "non-shooting sites" or "shooting sites," based primarily on the presence of shooting-related litter such as spent ammunition casings and clay pigeons (Foti and Chambers, 2005). Approximately one-half of the total sites were identified for follow-up monitoring at three-year intervals to determine temporal changes in impacts, with the long-term objective to determine if impacts from recreation activities on SDNM resources were increasing, decreasing, or remaining relatively stable.

3.3.5. TRAVEL MANAGEMENT

3.3.5.1. Regional Travel Routes

Motorized vehicle travel is the dominant form of transportation throughout the Planning Area. The principal highways used to reach public lands in the Planning Area include I-8, I-10, SR 85, and State Route 86 (SR 86). (See Map 3-24: Travel Management.) Old U.S. Highway 80 (U.S. 80) is another key secondary highway accessing the Gila Bend Mountains area, and US 60 is the main highway for the BLM East Valley parcels. Maricopa Road/SR 238 is an important secondary highway frequently used to access the Monument.

The main transportation trend affecting the Planning Area is an expected continued increase in demand. Current RMPs governing travel in the SDNM and Lower Sonoran were written in the 1980s and 1990s. The Phoenix metropolitan area has experienced explosive growth since then, and seen considerable expansion of its freeway, arterial, and local street infrastructure. More importantly, from the perspective of public lands surface transportation, population growth has pushed road infrastructure into previously undeveloped areas near the Decision Areas. The

number of high-standard, regional roads has increased in recent years to accommodate community growth in Mobile, Vekol Valley, Rainbow Valley, Goodyear, Tonopah, Buckeye, Maricopa, and Gila Bend. Numerous existing roads have been widened and paved, and new roads built throughout the Planning Area. In addition, the Maricopa Association of Governments (MAG), Maricopa and Pinal counties transportation departments, and ADOT all are studying additional freeway, parkway, and arterial connectors throughout the Planning Area. Many of these would bisect public lands.

The introduction of ATVs and other vehicles with the capability to travel into more remote areas has led to increased use of public lands for recreational vehicle use. New routes and extension of existing ones have emerged in the Decision Areas as vehicles with more technical capability (such as rock crawlers) become common. These trends are likely to continue into the future.

Transportation network changes on and around public lands include upgrades to existing roads traversing the Planning Area; new ROWs for freeways, arterials, and streets; access elimination in some areas and expansion in others due to new roads; and increasing demand for motorized vehicle access to public lands as population grows. Changes to the Planning Area road system are detailed in the *MAG's Draft Regional Transportation Plan 2010 Update (MAG 2010)*.

The following is a description of planned highway and road projects expected to affect public lands:

Loop 202 (South Mountain Freeway): A new ROW that wraps around the southern and western edges of South Mountain Park will not only allow for easier access to the Lower Sonoran, it will increase demand for recreation and travel on public lands by encouraging residential and commercial development south and west of metro Phoenix's current boundaries.

Loop 303 (Estrella Freeway): A new ROW running west of the White Tank Mountains will connect U.S. 60 to the north with Goodyear to the south, encouraging further urban growth in these areas and speed access. Both of these developments are likely to drive up demand for recreational uses of public lands.

State Route 801 (I-Reliever): New ROW planned to run parallel to I-10 in southwestern part of metropolitan Phoenix could increase the amount of traffic passing near the Lower Sonoran.

CANAMEX Corridor: Segments of I-8 and SR 85 that pass through the SDNM and Lower Sonoran are planned to be part of the CANAMEX Corridor, an international highway designed to promote commerce throughout North America (MAG 2003). The minimum duty rating for the CANAMEX Corridor is a four-lane, divided highway.

Arterial roads: An expansion of the arterial and local street system is expected in the SR 85 corridor between Buckeye and Gila Bend over the next 20 years. Agua Caliente Road, northwest of Gila Bend, is experiencing increased use, and a connection with Harquahala Valley may be requested by Maricopa County in the future. MAG has outlined a plan to expand SR 238 to a four-lane, arterial connector linking the communities of Gila Bend, Mobile, and Maricopa. Similarly, the Gas Pipeline-Komatke Road, linking Mobile to SR 85 and U.S. 80, is planned to become four-lane, arterial connector, along with a one-mile square street grid to be developed in Rainbow Valley south of Buckeye and Goodyear. Although these road expansions would not be limited-access highways, they likely would affect existing, public motorized and non-motorized access to the Lower Sonoran and SDNM in Buckeye Hills East and Rainbow Valley

3.3.5.2. Motorized Vehicle Access to Public Lands

Motorized vehicle access to each of the major areas within the Planning Area is possible via routes that include primary and secondary highways, improved (though often unmaintained) roads from adjacent BLM and other Federal lands, and county or municipal roads and streets. The existing collection of access routes includes a limited number of legally established public ROWs and non-public routes. While some of these routes cross State trust or private lands where public vehicle travel is not authorized, access is not physically barred or denied by posted notice. This situation, however, can change at any time, cutting off critical access points for visitors and administrative personnel to reach the Monument.

Legal public access is minimal in several key geographical areas and continued access is dependent on other landowners or jurisdictional agencies. Obtaining legal public access is necessary to ensure future access to the areas. These areas are identified as:

Buckeye Hills West: Currently, the only legal vehicle access to Buckeye Hills West is available from SR 85 at Robbins Butte Wildlife Area, managed by the AGFD, and Buckeye Hills County Park, managed by Maricopa County. On the west side of the area near Gillespie Dam, physical access exists by using a canal road beginning two miles south of public lands, which then connects to the main access road on public lands.

Gila Bend Mountains: Legal access to the southeastern boundary of this area is limited. Citrus Valley Road, formerly a county- maintained road along its length on public lands, provides access except when interrupted by Gila River flows from Painted Rock Reservoir. Access to Citrus Valley Road north of the Gila River is possible from AGFD land accessed from Painted Rock Road and Sisson Road, but the road is in poor condition and crosses private land. The Enterprise Road borders the eastern boundary of the Gila Bend Mountains, but is posted for private use only. While another primitive road exists that would allow access to the area, it traverses the San Lucy Indian Reservation and is gated and locked.

Saddle Mountain: Legal access is available to the northern part of the area from Courthouse Road at several junctions. Access to the south part of the area is available from Dobbins Road and Elliot Road at several junctions as it crosses public lands.

Sentinel Plain: Legal vehicle access to the Sentinel Plain, south of the Union Pacific Railroad, is only available from I-8 at Exit 87, which provides an at-grade public railroad crossing. Exit 78 (I-8) at Spot Road, located about one mile west of the Planning Area boundary, is used to access the Sentinel Plain area from the west. This access route, however, requires the use of a private crossing over the Union Pacific tracks.

SDNM: Currently, most of the public lands within the Monument north of SR 238 are closed to motorized use due to ongoing restoration work. When the area is re-opened, it may be reached from several routes highways, roads, and primitive roads. The area south of SR 238 is accessed from I-8 with limited legal vehicle access provided into the area from the interstate. This area can also be physically accessed from SR 238 under the railroad track at one concrete box culvert and two trestles. The nearest legal crossing of the railroad is 83rd Ave in Mobile several miles away from the Monument, although it involves crossing private and state land.

3.3.5.3. Existing Travel Management Situation in the Decision Areas

There are currently 2,283 miles of motorized vehicle routes and 39 miles of non-motorized trails that cross public lands in the Planning Area. (See Map 3-23: SDNM Inventoried Recreation Impact Sites.) Existing RMP decisions have designated public lands in the Lower Sonoran and SDNM as either limited to existing or designated routes, or closed to vehicle use. There are no open areas for cross-country vehicle use within the decision areas. An inventory of existing routes was completed for this planning process (see Section 3.3.5.4, "Non-Motorized Travel" (p. 336)), which will be used to designate individual routes as open, limited, or closed to vehicle use during travel management planning. Routes within the SDNM will be formally designated in this RMP, and routes within the Lower Sonoran will be designated within 5 years of approval of the ROD.

In the Lower Sonoran, 1,670 miles of existing routes are currently open for vehicle use and 15 miles are closed. The areas designated as closed include the South and North Maricopa Mountains and Table Top Wildernesses (157,600 acres) and the Vekol Valley Grasslands ACEC (3,500 acres). In all other parts of the Monument, vehicles are limited to existing or designated routes. Scattered parcels east of Phoenix in the Florence, Miami, and Globe areas have not been inventoried for routes at this time. Inventory in these areas will take place as staff time and resources become available.

In the SDNM, 567.9 miles of existing routes currently are open for vehicle use and 6.6 miles are closed. Hiking and equestrian trails, totaling 37 miles are designated in the North Maricopa and Table Top mountains. The areas designated as closed include the South and North Maricopa Mountains and Table Top Wildernesses (157,600 acres) and the Vekol Valley Grasslands ACEC (3,500 acres). In all other parts of the Monument, vehicles are limited to existing or designated routes.

Interim Monument management requires that the inventoried route system in SDNM become the interim travel network. Currently, 63 miles of primitive roads were inventoried in sand washes. There are 971 miles of sand washes, of which only 63 were inventoried as being a primitive road. Of those 63 miles, 19 are currently closed due to their location inside the BGR Sand Tank Mountain area (formerly known as Area A), where driving in washes was prohibited by rules established by the military.

A temporary emergency closure to restore damaged lands is currently in place in the SDNM. The closure area is located north of SR 238 in the vicinity of the Anza NHT and extends north along the eastern edge of the North Maricopa Wilderness to the Gas Pipeline Road. No vehicle use is permitted on 54,817 acres, including 89 miles of existing primitive roads. This temporary closure began on June 13, 2008 and will remain in effect until the completion of this land use plan.

Visitors are required to obtain an annual safety briefing and access permit prior to entering the Sand Tank Mountain area (Area A). The ongoing access permit program informs visitors about both the military training activities at the BGR, and prohibitions on public travel from the Monument into restricted areas of the military range. Permit requirements include the use of licensed vehicles only within Area A.

3.3.5.4. Non-Motorized Travel

Non-motorized travel includes pedestrian, equestrian, and bicycling activities. Public access to the Decision Areas by pedestrian or equestrian travel, from external areas cross-country, is permissible

wherever public use of adjacent lands is legally authorized. A number of non-motorized trails are designated for hiking and equestrian use. Bicycle use is limited to existing or designated vehicle routes, so such use is limited. Pedestrian and equestrian activities are permitted within the wilderness areas in both Decision Areas, while all mechanized modes of travel, including bicycles, are prohibited. Non-motorized, wheeled carriers may be used for cross-country game retrieval anywhere in the Decision Areas, except in wilderness areas where they are prohibited. There has been an increase in demand for non-motorized travel in the Decision Areas as more people move into new developments nearby. Use of designated trails has grown along with increases in dispersed hiking, backpacking, and equestrian use. Little change in bicycle use has occurred.

In the Lower Sonoran, hiking is permitted in the Sierra Estrella Wilderness, although horse and pack-stock use is not recommended for the steep and narrow three-mile Quartz Peak Trail. A 0.2-mile designated, interpretive trail is available at the Painted Rocks Petroglyph Site. Development of private property and State trust land adjacent to or in the vicinities of the Decision Areas has reduced physical, and possibly legal, access for motorized and non-motorized use. Four existing designated trails are located in the Monument. Two trails, the nearly nine-mile Margie's Cove Trail and the six-mile Brittlebush Trail, are located in the North Maricopa Mountains Wilderness. The other two trails are within Table Top Wilderness. These trails include the 7.25-mile Lava Flow Trail and 3.5-mile Table Top Trail.

Five designated hiking trails were created in wilderness areas following wilderness designation in 1990. No other trails have been developed, although user-created trails have been identified in Saddle Mountain, and are likely to occur in other areas. In the Planning Area, Phase III of the Maricopa County Regional Trail System Plan (Maricopa County 2004) identifies a primary, county trail loop that incorporates Estrella Mountain and Buckeye Hills regional parks, and Phoenix's South Mountain Park. This trail traverses the East Buckeye Hills area. Options to link other parts of the Lower Sonoran or SDNM to the regional trail system have also been identified. Buckeye and Goodyear have identified potential trail corridors within the Decision Areas that could connect to neighborhoods in these cities.

3.3.5.5. Visitor Use & Travel Modes by Geographic Area

Area use by local and destination visitors is not equally distributed across public lands. Some areas are more popular for motorized or non-motorized travel modes. Table 3.26, "Primary Use and Current Settings for Existing Travel Routes" (p. 337) represents an overview of the geographic areas and a general classification of the primary travelers.

Table 3.26. Primary Use and Current Settings for Existing Travel Routes

Geographic Area	Primary Use and Origin of Visitor and Current Settings
Ajo Block	*Primary travelers:* Local visitors use four-wheel drive and ATVs to access all areas. Day use is popular for recreational pursuits. Access to adjacent jurisdictions, such as BGR Area B and Cabeza Prieta NWR, is popular seasonally. *Current Settings:* Local visitors use four-wheel drive and ATVs to access areas. Recreational day use is popular. Most users enjoy informational and route signs and maps. Access to adjacent jurisdictions, such as BGR Area B and Cabeza Prieta NWR, is popular seasonally.
Buckeye Hills and Rainbow Valley	*Primary Travelers:* In Buckeye Hills local and destination visitors use four-wheel drive, OHVs, horses, bicycles or hike in to access the area. Travelers use existing roads for camping, sightseeing, trail riding, and hunting. In Rainbow Valley, local and destination visitors use four wheel-drive vehicles, primarily to access designated wilderness areas for hunting and sightseeing.

Geographic Area	Primary Use and Origin of Visitor and Current Settings
	Current Settings: In Buckeye Hills, easily accessed areas and routes make day use of trails and areas popular by local visitors. Access points are limited and visitation is relatively low, yielding remote experiences near the city. A mix of motorized vehicle use and non-motorized use is common. In Rainbow Valley, areas near Phoenix and adjacent towns are easily accessed, where interaction with few people is desired. Vehicle access is necessary to reach popular hiking, sightseeing, and hunting destinations.
East Valley and Globe-Miami	*Primary Travelers:* Local and destination visitors drive passenger cars to access San Tan Regional Park and other easily accessible areas for trail-based, non-motorized travel. Visitors access scattered public lands using four-wheel drive vehicles for non-motorized activities. Local visitors drive four-wheel drive vehicles to access remote backcountry near Globe and Miami. Hunting and camping are primary uses of these areas. *Current Settings:* Structured, non-motorized travel with informational and trail signs and maps are emphasized at San Tan Regional Park. Other scattered public land parcels exhibit unstructured travel opportunities for non-motorized and motorized uses. In the Globe-Miami area, self-directed experiences are desired by locals, although some existing signing and maps are available. Four-wheel drive is usually required to access popular hunting, recreation, and other interesting sites.
Gila Bend Mountains and Sentinel Plain	*Primary travelers:* Destination visitors use four-wheel drive, ATV, and motorcycles to access the core area. Hiking and equestrian users visit designated wilderness areas and remote, unroaded areas. Local visitors, generally from Gila Bend, are day users accessing the area by four-wheel drive vehicles, ATVs, and motorcycles. In the northern portion of the Gila Bend Mountain area, including the Fourth of July Wash area, use is increasing by west valley visitors seeking day use and overnight OHV riding experiences. In Sentinel Plain, destination visitors predominately use four-wheel drive for sightseeing, stargazing, and overnight camping. *Current Settings:* Remote settings for traditional outdoor activities are enjoyed by many visitors. Vehicle access is required due to remoteness. Most visitors are self-directed and require little, if any, support. In the Sentinel Plain area, dark-sky areas are desired with easy access from a major highway or road.
Saddle Mountain	*Primary travelers:* Local visitors use four-wheel drive and ATVs to access the core area. Hikers primarily visit the area mountains for day use, but also for long-distance touring. Destination visitors drive two-wheel drive and four-wheel drive vehicles for camping, rock hounding, and sightseeing. *Current Settings:* Easy access for camping and passage through the area for sightseeing is available. Most users require informational and route signs and maps. Experiences are remote and self-directed, with only route signs and entry information kiosks.
Sonoran Desert National Monument	*Primary Travelers:* Destination visitors use four-wheel drive vehicles to visit the SDNM. Local visitors access it through Rainbow Valley and adjacent lands near Mobile, using four-wheel drive, ATVs, motorcycles, and horses for sightseeing and trail riding. *Current Settings:* A temporary closure is in effect, which causes some visitors to seek new areas for camping, exploring, and Monument tourism. Out of town and local visitors receive guidance through signs and maps to visit popular Monument locations, including historic places and scenic areas. Vehicle access is required, yet primary uses are designated wilderness hiking, exploring, hunting, and camping.

3.3.5.6. Data Collection and Analysis for Travel Planning

All routes in the Decision Areas were inventoried on-the-ground using global positioning system technology. Conditions were noted and basic information about each route was gathered, using a statewide standard data dictionary. Later, routes were reviewed by an interdisciplinary team, using a standardized methodology or “route evaluation process,” to systematically identify resource

concerns, values, and legal requirements associated with each route. This method allowed for the identification of both area-wide and site-specific issues. Each numbered route has a corresponding route report and database entry detailing the findings from the evaluation process (see the detailed, large-scale SDNM Route Designations map on the accompanying CD version of the RMP). This database was used to gather specific details for the impact analysis.

After the route evaluation process was completed in 2004, new guidance was issued directing field offices to designate roads and trails as specific types of travel-management assets. Asset types include road, primitive road, and trail and are established by the Roads and Trails Terminology Report issued with IM 2006-173. These definitions are contained in the glossary of terms. Roads under BLM management are maintained to specific standards, while primitive roads are not necessarily compliant with any engineering standards. The asset type primitive road fills the gap between roads and trails. The significance of the guidance for this plan revolves around the prohibition of off-road travel in the SDNM proclamation. The BLM interprets this to mean that travel off designated routes is cross-country travel, which is thus prohibited.

Additional guidance pertinent to the route designations was issued in 2009. Washington Office guidance, IM 2009-132. Characteristics will be identified in a transportation inventory as a "route". These routes will not be classified as a transportation asset and will not be entered into FAMS unless one of the following conditions are met:

a. Congress designates the area as Wilderness, or

b. RMP decision is made to not protect the area for wilderness characteristics, or

c. Congress releases the area from Wilderness consideration.

3.4. SPECIAL DESIGNATIONS

3.4.1. NATIONAL LANDSCAPE CONSERVATION SYSTEM

In June 2000, the BLM responded to growing concern about the loss of open space by creating the National Landscape Conservation System (NLCS). Congress codified the NLCS in 2009 through Public Law 111-11. The NLCS brings into a single system some of the BLM's premier designations. By putting these lands into an organized system, the BLM hopes to increase public awareness of these areas' scientific, cultural, educational, ecological, and other values. Inclusion in the NLCS does not create any new legal protections for these lands, but it does provide field offices with overall guidance and direction for management of the system. Components of the NLCS include public lands that have been specially designated by presidential or congressional action. These designations include national monuments, national conservation areas, wilderness areas, wilderness study areas, wild and scenic rivers, and national historic and scenic trails.

Each type of special designation (presidential and congressional) has been used to establish special management areas on public lands within the Planning Area (see Table 3.27, "Special Designations Within the Planning Area" (p. 340). Four special designations are located within the Lower Sonoran, including Sierra Estrella, Signal Mountain, and Woolsey Peak wildernesses and Juan Bautista de Anza NHT. Five special designations occur within the SDNM, including the Monument itself; the North Maricopa Mountains, South Maricopa Mountains, and Table Top wildernesses; and Juan Bautista de Anza NHT.

Table 3.27. Special Designations Within the Planning Area

Designation	Decision Area		Size (BLM Acres/Miles)	Designating Authority	Date Designated
	LS	SDNM			
Presidential Designations					
Sonoran Desert National Monument		SDNM	486,600 acres	Presidential Proclamation No. 7397 by President William J. Clinton	2001
Congressional Designations					
North Maricopa Mountains Wilderness		SDNM	64,228 acres	Arizona Desert Wilderness Act of 1990 (Public Law 101-628)	1990
Sierra Estrella Wilderness	LS		13,926 acres (excluding 640-acre State inholding)	Arizona Desert Wilderness Act of 1990 (Public Law 101-628)	1990
Signal Mountain Wilderness	LS		13,468 acres	Arizona Desert Wilderness Act of 1990 (Public Law 101-628)	1990
South Maricopa Mountains Wilderness		SDNM	60,424 acres	Arizona Desert Wilderness Act of 1990 (Public Law 101-628)	1990
Table Top Wilderness		SDNM	34,308 acres	Arizona Desert Wilderness Act of 1990 (Public Law 101-628)	1990
Woolsey Peak Wilderness	LS		64,456 acres	Arizona Desert Wilderness Act of 1990 (Public Law 101-628)	1990
Juan Bautista de Anza NHT	LS		10 miles	Juan Bautista de Anza NHT Act (Public Law 101-365)	1990
Juan Bautista de Anza NHT		SDNM	17 miles	Juan Bautista de Anza NHT Act (Public Law 101-365)	1990
Administrative Designations					
Coffee Pot Botanical ACEC	LS		8,900 acres	Record of Decision (ROD) for Lower Gila South RMP	1988
Vekol Valley Grasslands ACEC		SDNM	3,500 acres	ROD for Lower Gila South RMP	1988
Fred J. Weiler Green Belt Resource Conservation Area	LS		45,978 acres	Public Land Order 1015, Classification of Public Lands for Multiple Use Management, Designation of Fred J. Weiler "Green Belt" Resource Conservation Area	1954, 1967, 1970

3.4.2. CONGRESSIONAL DESIGNATIONS

3.4.2.1. Wilderness Areas

The Decision Areas include six wilderness areas designated by the Arizona Desert Wilderness Act of 1990. These areas total 249,450 acres: 91,750 acres are in the Lower Sonoran and 157,700 acres are in the SDNM.

Each wilderness area has its own management plan (BLM Manual 8560). Management guidance is provided under the Woolsey Peak Wilderness and Signal Mountain Wilderness Management Plan (BLM 2003) and the Maricopa Complex Wilderness Management Plan (BLM 1995) for the North Maricopa Mountains, Sierra Estrella, South Maricopa Mountains, and Table Top Wildernesses.

A five-year evaluation of the Maricopa Complex Wilderness Management Plan, completed in 2005, made the following observations:

> *Motorized use of the Maricopa Complex was authorized 91 times, principally for the inspection, maintenance, and redevelopment of rainwater catchments for wildlife, and such authorizations have decreased substantially as the catchments were upgraded. Monitoring for naturalness, solitude, and visitor encounter standards was attempted by several visitor-tracking methods; however, monitoring of standards for vegetation, trail width, and depth, frequency of manure on trails, grazing of vegetation, and plant density was not accomplished as planned. Of the 70 planned 'special project' wilderness management activities, 2 of 18 vehicle routes identified for active reclamation were completed; 23 of 26 planned vehicle barriers were completed; all 6 trail and trailhead development projects were completed; and 9 of 20 'other special projects' were completed, including 4 wildlife water catchment redevelopments. In total, 57 percent of planned 'special projects' were implemented, and largely represented high-priority vehicle and people management projects intended to ensure compliance with the Wilderness Act. ... Visitation data indicate that the visitor standards adopted by the Plan have adequately met public expectations. The Plan was amended twice to provide for the use of mechanized equipment for vehicle way rehabilitation and the capture and removal of desert bighorn sheep for release in other areas of the state. (BLM 2005)*

Although unauthorized activities that do not conform to wilderness values (e.g. unauthorized entry by motor vehicles) occur on an occasional basis, the above summary of the five-year plan evaluation indicates that the four wildernesses of the Maricopa Complex (North Maricopa Mountains, Sierra Estrella, South Maricopa Mountains, and Table Top wildernesses) have been successfully managed as envisioned by the Maricopa Complex Wilderness Management Plan (BLM 1995).

At the time that the Woolsey Peak Wilderness and Signal Mountain Wilderness Management Plan was written (BLM 2003), these two wilderness areas also were meeting all standards envisioned

by that plan. No significant threats to wilderness values have been detected by occasional staff field visits to these wilderness areas.

Recent regional trends in general population growth, public demand for outdoor recreation, emerging conflicts between types of outdoor recreation activities, and impacts resulting from illegal immigration pose the potential for substantial impacts to the wilderness values of the six wilderness areas in the Decision Areas. This is anticipated to be particularly true for impacts resulting from the unauthorized use of motor vehicles in wilderness areas associated with recreation activities and illegal immigration and smuggling.

Visitation data collected in the Maricopa Complex indicates yearly increases in trailhead visitation; however, visitation remains low in comparison to wilderness areas in closer proximity to urban areas.

3.4.2.2. Juan Bautista de Anza National Historic Trail

The Juan Bautista de Anza NHT is a 1,200-mile historic trail corridor commemorating the 1775–1776 land route that Spanish commander Juan Bautista de Anza took from Mexico through Arizona to California in an effort to establish a mission and presidio on San Francisco Bay. Although historians have researched the diaries and journals of the people that followed this trail in the 18th century, only a few segments can be tied to a specific topographic feature. Although this trail has no known surviving trail signature on the ground, several other historic trails lie within the NHT corridor that crosses through SDNM and in certain segments in the Lower Sonoran, which means portions are considered a multi-component historic trail with associated sites. These historic trails have a trail signature due to the use of wagons and stagecoaches of the mid-nineteenth century. Where this trail signature coincides with the NHT corridor results in a natural fit for identifying and interpreting all of these trails together. While the Anza NHT is a historic trail corridor, the later trails have artifacts, features, and associated historic sites that are more obvious, as well as contain more visible trail signature and corridor area to interpret and protect. Certain segments of the NHT that traverse the Planning Area are considered to be among the best-preserved corridor segments and most representative of the historic trail corridor conditions.

Since the NHT's designation in 1990, Anza friends groups, NPS, other agencies, and the BLM have worked collaboratively to develop and mark segments of the historic trail. The BLM marked a 12.5-mile segment of the trail through the Maricopa Mountains in SDNM during the late 1990s. The vision for the NHT is that the trail will gradually become a long-distance recreational trail that the public can access, and that some private developers will incorporate the trail and surrounding landscape into their development plans.

The prevailing conditions of the Juan Bautista de Anza NHT through the Lower Sonoran and SDNM have been generally maintained since the NHT's designation in 1990. Current management guidance for the entire length of the NHT is provided by the Comprehensive Management and Use Plan for the Juan Bautista de Anza NHT (NPS 1996). This plan was prepared by the NPS and cooperating agencies, which included the BLM. A Long Range Interpretive Plan for the Juan Bautista de Anza NHT also has been prepared by the NPS (NPS 2003). These plans are still in place and actively form the basis for collaborative implementation of trail segment identification, protection strategies, and interpretive projects.

Designation of the SDNM placed an additional layer of protection upon the NHT segment through the Monument. The NHT and other underlying historic trails (e.g. the Butterfield Overland Stage Route and the Mormon Battalion Trail) are all named Monument Objects and all follow the same corridor.

Threats to the NHT include increasing recreational use, particularly near urban areas, and removal of historic artifacts. These threats were realized in 2008 when the NHT and the access routes leading to it became unacceptably degraded by damage due to improper OHV use. A temporary closure in the fall of 2008 was followed by intensive restoration and repair work to address the excessive damage to the historic trails, vegetation, soils, and historic trail corridor setting.

Over the long-term, there will continue to be the challenge of protecting the trail from visitor over use and unauthorized visitor activities. The dramatic population growth projected for the Phoenix metropolitan area and the urban development expected in the vicinities of various NHT segments in the Planning Area indicates that this challenge will become increasingly complex. The population growth will lead to increased pressure to access the trail for recreational visitation. Moderate to high levels of use are expected over the life of the plan.

In the Planning Area, an additional threat is the loss of opportunity to protect the trail corridor as private and state trust lands are developed. Collaborative projects with Anza NHT friends groups and local communities will be the avenue through which additional pieces of the trail might be certified as official NHT segments. This might involve acquisition of easements and lands by local groups or Federal agencies.

3.4.3. ADMINISTRATIVE DESIGNATIONS

3.4.3.1. Fred J. Weiler Green Belt Resource Conservation Area

The Fred J. Weiler Green Belt along the Gila River was established as a resource conservation area in 1970 and allocated for management of wildlife, recreation, and cultural resources. The parts of the green belt that fall within the Planning Area include 45,978 acres of the Gila River channel and floodplain from Sierra Estrella Park on the east to the Planning Area boundary on the west. Approximately 20,000 additional acres fall within the BLM's Yuma Field Office for a total of approximately 63,000 acres in the green belt. Only the acres that fall within the Planning Area will be discussed further in this document. Following is a brief history of land use within this area.

Within the area now known as the green belt, Public Land Order 1015 withdrew 6,896 acres of land from the Department of the Interior (DOI) to the USFWS in 1954. At this time, the USFWS entered into a cooperative management agreement with the AGFD to manage these withdrawn lands for wildlife, notably waterfowl and migratory birds. These lands were segregated from all forms of appropriation under the public land laws, including the mining laws but not the mineral leasing laws. Grazing and existing withdrawals for power purposes were specifically exempted from the segregation.

In 1967, approximately 63,000 acres in the Gila River floodplain were studied, including the 1015 lands, and it was determined that they would be retained under the Classification for Multiple Use Act of 1964. A classification for multiple use was placed on the subject lands, segregating the 63,000 acres from appropriation under the public land and mining laws. Mineral leasing, however, was not excluded. The multiple-use classification was established to allow for the

management of nesting areas for white-winged dove, mourning dove, and songbirds; public recreation; historical significance; and flood and erosion control.

In 1970, the 63,000 acres were designated as the Fred J. Weiler Green Belt Resource Conservation Area. This designation was designed chiefly to draw public attention to the area and explicitly did not change existing land uses. The green belt qualified as a Class VI recreation area under the Bureau of Outdoor Recreation system of classification (the Bureau of Outdoor Recreation has since been incorporated into the National Park Service) due to its Native American habitation sites of "major historic or cultural significance" (43 CFR 2071.2 1971).

3.4.3.2. Areas of Critical Environmental Concern

Coffepot Botanical

The Coffeepot Botanical ACEC consists of approximately 9,600 acres located in the Ajo Block of the Lower Sonoran. It protects primarily botanical resources. The Sonoran Desert scrub community in this area is diverse and includes more than 285 plant species, many with limited distributions in the U.S. Among these is the Acuña cactus, a candidate for listing under the ESA.

Livestock grazing in the Coffee Pot ACEC is limited due to a lack of livestock watering facilities, and no mining activity has occurred in the ACEC.

In general, the Coffeepot Botanical ACEC is meeting the intent of the ACEC, although illegal drug and people smuggling do adversely affect the area. The ACEC is bisected by an improved road used for access to a gas pipeline, making closure impractical; however, the area is less impacted by illegal uses than other border areas and generally remains in good condition.

Vekol Valley Grassland

The Vekol Valley Grassland ACEC consists of approximately 3,500 acres located in the southeastern corner of the SDNM. It consists of mostly valley bottom with creosote bush, mesquite, and 300 acres of remnant tobosa grassland.

A spreader-dike system and watershed fence were built in the late 1940s to reduce soil erosion. Many of the spreader dikes are currently in disrepair, thus leading to localized erosion and reduction in hydrologic function. The dike system also provides valuable resting areas for migrating waterfowl and shorebirds. Mesquite thickets provide nesting and roosting habitat for non-game and small game birds (e.g. dove and quail) and escape cover for mule deer and javelina.

The deep clay/loam soil and grass cover provide a relatively mesic environment for Sonoran green toads (*Bufo retiformis*), green toads (*Bufo debilis*), and Great Plains narrow-mouthed toads (*Gastrophryne olivacea*) (Jones et. al. 1983). It is extremely rare to find these toad species occurring together, and it is the only known occurrence of the Sonoran green toads on public lands. Toad species with more widespread distribution, such as the Sonoran Desert toads (*Bufo alvarius*) and Couch's spadefoot toads (*Scaphiopus couchii*), are also present.

Authorized livestock grazing ceased in the Vekol Valley Grassland ACEC in 2008 after the grazing permits expired; however, boundary-fence cutting in the Vekol Valley related to illegal border activities has resulted in trespass-livestock use.

The Vekol Valley Grassland ACEC has been impacted by off-route motor vehicle use and heavy foot and bicycle traffic propagated principally by illegal drug and people smuggling. In general, it is heavily used by drug and people smugglers, which largely negates efforts to close the area to OHV or off-route use, which has remained stable or decreased over the years.

3.4.4. OTHER SPECIAL DESIGNATIONS

No national conservation areas, national recreation areas, cooperative management and protection areas, outstanding natural areas, forest reserves, wilderness study areas, wild and scenic rivers, byways, national recreation trails, watchable wildlife viewing sites, wild horse and burro ranges, or other special designations exist in the Decision Area.

The Gila River was evaluated for wild and scenic river eligibility and suitability. The portion of the river to the east of the Planning Area (commonly known as the Middle Gila) and other portions to the east were evaluated for suitability in the Final Arizona Statewide Wild and Scenic Rivers Environmental Impact Statement (EIS; 1997). The remaining lengths of the Gila River, approximately from Winkleman to the junction with the Colorado River, were not deemed eligible during the development of BLM resource management plans prepared before 1993 and were not evaluated as part of the EIS. The portion of the Gila River in the Lower Sonoran Planning Area, from the east boundary of the Planning Area to the west boundary of the Planning Area, was re-evaluated in 2005 (BLM, 2005) and determined not to meet the eligibility criteria outlined in Appendix D, *Wild and Scenic River Eligibility Assessment* (p. 1027), Wild & Scenic Rivers Eligibility Assessment.

3.5. TRIBAL INTERESTS, PUBLIC SAFETY & SOCIAL AND ECONOMIC CONDITIONS

3.5.1. TRIBAL INTERESTS

While tribal interests in the Decision Areas are as diverse and wide-ranging as those of non-Indians, tribes also have special concerns about cultural resources that are part of their tribal heritage.

The frequency of BLM cultural resources consultations with tribal groups has increased considerably over the last decade; however, no extensive inventories of traditional cultural resources have been completed. Assumptions have sometimes been made by Federal agencies that all tribal members know significant, traditional cultural information, but, unfortunately, this is not factual. Considerable effort is often required to obtain information about traditions that are fading with the passing of each generation. Collecting such data can be difficult as some traditional cultural information is so confidential that discussing it with non-tribal members is considered inappropriate, and some traditional knowledge is not even widely shared within tribes.

Virtually all tribes are concerned about preserving archaeological sites regarded ancestral and the disturbance of human remains associated with some of them. Some tribal groups continue to collect natural resources, such as plant materials traditionally used for food, medicine, ceremonies, or crafts and are concerned about public lands access to collect such items. The BLM has involved tribes by conducting formal consultations on certain projects and during RMP development efforts.

Several tribes have traditional cultural affiliations with the Planning Area. Formal consultation letters and follow-up telephone calls were used to contact the Ak-Chin Indian Community, Fort McDowell Yavapai Nation, Fort Sill Apache Tribe of Oklahoma, Gila River Indian Community, The Hopi Tribe, Pascua Yaqui Tribe, Salt River Pima-Maricopa Indian Community, San Carlos Apache Tribe, Tohono O'odham Nation, Tonto Apache, White Mountain Apache Tribe, Yavapai-Apache Nation, and Yavapai-Prescott Indian Tribe. More recently, three tribal communities (Fort Mohave Indian Tribe, Fort Yuma-Quechan Tribe, and Colorado River Indian Tribes) were identified for consultations, as well.

Four O'odham (Piman) groups, closely related linguistically and culturally, continue to reside on reservations in the Planning Area. These are the Ak Chin Indian Community, Gila River Indian Community, Salt River Pima-Maricopa Indian Community, and Tohono O'odham Nation. Spanish explorers encountered these peoples when they entered southern Arizona in the late seventeenth century. These indigenous groups consider themselves descendents of the prehistoric groups who occupied the region.

The Maricopa, an amalgam of groups that traditionally lived along the lower Gila and Colorado rivers, moved up the Gila River in the nineteenth century to live with the O'odham. Other groups living along the lower Colorado River (Cocopah, Quechan, and Mohave) occasionally traveled into the Planning Area.

Consultations with the Yavapai-Prescott Indian Tribe and the Yavapai-Apache Nation indicated that those groups have interests in the traditional territory of the Yavapai, which was primarily north of the Salt and Lower Gila rivers. The Fort McDowell Yavapai Nation's reservation is in the Planning Area's northeastern section. The Fort McDowell Yavapai Nation indicated that they have an interest in the management of public lands near their reservation and would like to acquire public lands available for disposal.

The territories of various Apache groups were primarily east of the Planning Area. The San Carlos Apache Tribe, White Mountain Apache Tribe, Tonto Apache Tribe, and Fort Sill Apache Tribe of Oklahoma were consulted. Proposed developments in areas traditional Apaches regard as sacred have been controversial (e.g. telescope construction on Mount Graham), but no such conflicts have been identified in the Decision Areas.

Traditional histories of some Hopi Tribe clans indicate they came from the south and have traditional cultural affiliations with the prehistoric occupants of southern Arizona. The Hopi have expressed interest in the cultural resources in the entire state of Arizona, including the Planning Area.

The Pascua Yaqui Tribe originated in northwestern Mexico and began to move into the United States about 125 years ago. Communities of Yaquis are found near Tucson where they have a small reservation, as well as a reservation in the Salt River Valley. Consultations with the Pascua Yaqui identified no special concerns.

The Mojave and Quechan peoples' traditional territories were centered primarily on the Colorado River. The Ft. Mojave Indian Tribe, Ft. Yuma-Quechan Tribe, and Colorado River Indian Tribe are currently located along the Colorado River and its confluence with the Gila River. Places important to these groups include areas along the Gila River, and may extend into the far western portion of the Planning Area.

3.5.2. HAZARDOUS MATERIALS & PUBLIC SAFETY

Government records document known and recognized sites of reported hazardous materials and wastes. These sites include facilities that handle hazardous materials and, in some cases, produce hazardous wastes. Most of the facilities in the Planning Area successfully manage the use of these products and wastes, but activities at some can contaminate soil, water, and air.

Although many facilities using hazardous materials, housing underground storage tanks, and producing hazardous wastes are located within the Planning Area, no contaminated sites on public lands within the Lower Sonoran or SDNM are privately owned. There is one State-owned site on State property adjacent to the SDNM where millions of discarded tires are stored. The State currently is attempting to remediate the site.

The BLM is assessing hazardous-waste contamination resulting from past mining activities within the Planning Area. As risks to human health and the environment are determined, the BLM will take appropriate action to remove the contamination and remediate, as appropriate and feasible.

In addition to hazardous materials and waste risks, other issues affecting public safety are natural and human-made hazards. These hazards include abandoned mines, motor vehicles operated on roads and primitive BLM roads, unsafe target shooting practices, and cross-border smuggling activities. In general, abandoned mine-related public safety trends are static. For other hazards, associated risks may increase over time because more people are visiting and using public lands.

3.5.2.1. Landfills and Wildcat Dumping

Seven active landfills are located within the Planning Area. They include the Butterfield Station Landfill in Mobile; the Southwest Regional Landfill, located east of SR 85 and north of the SDNM; the Salt River-Pima-Maricopa Indian Community Regional Landfill, located north of SR 87; the Allied Waste Landfill, located in Queen Creek; the Waste Management Seventh Avenue Landfill, located in south Phoenix; the Weinberger Landfill, located in south Phoenix; and a new facility, the SR 85 Landfill, located along the western side of the SDNM within Buckeye's municipal boundaries. There are no landfills located directly within the Decision Areas.

"Wildcat dumping" occurs frequently on public lands and is a significant hazardous and non-hazardous waste issue. This refers to trash left by individuals in areas other than regulated landfills and most commonly occurs near urban-interface areas. Occurrences range in severity and volume, and discarded items include, but are not limited to, construction debris, household trash, appliances, tires, oil and waste fluids, paper goods, and other unwanted items. It is likely that, as the population grows and urban encroachment increases, this trend also will increase.

Wildcat dumping occurs near the Lower Sonoran's urban-interface (e.g. Ajo, Saddle Mountain, southern Rainbow Valley, Haley, and Buckeye Hills). Wildcat dumping also occurs near the northern part of the Monument near established recreational-use sites, especially along roadways. Many of these sites also are associated with littering by people engaged in recreational activities (Foti and Patterson 2003). Undocumented immigrants and drug smugglers also produce copious amounts of trash concentrated along roads, in staging and pick up/drop off areas, and dispersed throughout the SDNM. Similar smuggling-related problems occur in the Ajo Block and Sentinel Plains.

Another form of waste involves litter from visitors recreating on public lands. Such litter can include target-shooting debris, trash, and human waste and is found in the highest concentrations at campsites, trailheads, and other high-use areas. Incidences of littering from recreational users have increased, with further increases likely.

3.5.2.2. Active and Abandoned Mines

Abandoned mines are found throughout the Lower Sonoran and SDNM. Data gathered by the Office of the Arizona State Mine Inspector in the early 1990s and the Bureau of Mines in 1995 show that more than 180 active and abandoned mines are located in the Decision Areas. Five abandoned mines have been found within the Ajo Block and at least eight in the Sand Tank Mountains (Arizona State Department of Mineral Resources 1979).

Mining activities may have historically included the use or presence of mercury, cyanide, arsenic, acids, and/or base metals as a component of the ore being mined. Another source of contamination sometimes occurs when hazardous materials are dumped into old mine shafts. In addition, mine tailings located at active and closed mine sites pose potential hazardous effects, including leaching of chemicals into the soil and/or groundwater and airborne hazardous wastes.

Visitors often find abandoned mines and prospects attractive to explore, but entering abandoned mining sites may expose them to hazards including open and unstable shafts, adits, drifts, pits, tailings piles, wells, or other excavations; dilapidated and unstable buildings or other structures; collapsed buildings or other structures; mining implements or construction debris; and the presence of hazardous or toxic materials. Injury can occur when entering or exploring features at abandoned mining sites. No specific data documents the extent to which this recreational activity is pursued within the Decision Areas.

While hazardous situations are corrected when found, there are numerous historical mines in the Decision Areas not thoroughly investigated or documented. The BLM is researching and ranking the human health and safety risks from known abandoned mine sites in order to develop long-term reclamation, remediation, and restoration projects.

The BLM has developed an inventory of high-risk, abandoned mine lands to prioritize funding requests for the restoration and reclamation of these sites. Over time, these actions are expected to decrease their numbers, thus decreasing both the hazardous waste and public safety risks.

3.5.2.3. Military Operations and Unexploded Ordnance

The Sand Tank Mountains and Sentinel Plain are adjacent to aviation weapon ranges in the BGR used to train military aircrews in the delivery of air-to-ground bombs, rockets, missiles, and gunnery. Unexploded ordnance refers to military munitions that have been prepared for action and remain unexploded by either malfunction, design, or any other cause. Entry into the range is prohibited because of ongoing military operations; however, signs and fences typically are inadequate or absent. Visitors to the Sand Tank Mountains area of the SDNM are required to obtain an annual BGR visitor permit, which includes an explanation of the risks of unexploded ordnance and guidance on avoiding them, as well as a warning not to enter the active training range.

Known and potential unexploded ordnance contamination exists in and around the Sand Tank Mountains (formerly known as Area A) and the Sentinel Plain due to the longtime inclusion of

these areas in the BGR. Unexploded ordnance also possesses a potential chemical hazard due to explosive, pyrotechnic, propellant, and incendiary components (U.S. Army Corps of Engineers 1995).

Most of the fired and detonated munitions are eliminated during clearances; however, some likely remain. Also undetermined is the extent to which chemical byproducts produced by the firing and/or detonation of munitions are present in the area. Studies suggest that, while possible, contamination from these byproducts is unlikely (U.S. Army Corps of Engineers 1995; U.S. Air Force 1996, 1997). Unexploded ordnance represents an immediate public safety hazard. Unspent munitions may be located on the ground's surface or buried beneath due to the momentum of impact. In addition, recent studies on the Sentinel Plain have identified large numbers of parachute flares, and such flares are continuing to drop into the area from military activities. The BLM and the Air Force also will continue to work together to identify other procedures, such as required visitor entry permits, to protect the public from such hazards.

The BGR has removed and cleaned up unexploded ordnance in the Sand Tank Mountains and is inventorying lands formerly part of the BGR in the Sentinel Plain area. When addressing unexploded ordnance elsewhere in the Decision Areas, the BLM works closely with the U.S. Army Corps of Engineers to monitor the remediation of unexploded ordnance sites. As a cooperating agency, the BLM participates in regular discussions with the Corps.

3.5.2.4. Recreational Target Shooting

Shooting activities including "target shooting," "shooting practice," "plinking," "sporting clays," "skeet," and "sighting-in" have been occurring in the Decisions Areas since firearms were introduced to the region. Target shooting commonly occurs on lands at the edge of private property, on the outskirts of communities, or in remote areas offering unstructured settings. Such settings are attractive because they accommodate a typically desired experience, and the participant is free to shoot whatever firearm is available in whatever manner desired, usually without fear of harming or interfering with the interests of other people.

With the population growth and subsequent urbanization of the American West in the 21st Century, the edges of property have become closer, the outskirts of communities more crowded, remote areas fewer, shooting closures more common, and "downrange" target sites both larger and more numerous. Target shooters are being pushed farther out from metropolitan areas seeking lands (private, State, and Federal) for target shooting. Urban growth and development have made it increasingly difficult for target shooters to find unstructured areas without affecting other users or natural resources. It is harder yet to find settings that can absorb continued deposition of destroyed and abandoned targets without becoming eyesores with an associated and perhaps an irretrievable loss of natural or heritage resources, Monument objects, and wildlife habitat.

Challenges for management of recreational shooting are clearly related to increased urbanization adjacent to public lands, the need for public safety, and the protection of Monument objects and natural resources. In and of itself, larger populations bring higher percentages of irresponsible people to these public landscapes. Commonly, other recreational visitors are displaced when target shooters occupy an area. Initially, this displacement is a result of the sights and sounds of shooting; later the lands are too littered and denuded to attract visitors seeking a non-shooting recreation experience.

Increasingly, Arizona's broad public demand for places to shoot is being shifted to public lands managed by the BLM. Continued demographic changes in Arizona are straining the limits of where and how recreational target shooting can be accommodated. For example, the Arizona State Lands Department has closed all their lands to all target shooting, the Tonto National Forest has closed 80,000 acres of USFS lands in the Phoenix proximity to shooting, and various Phoenix communities do not or no longer allow target shooting within incorporated limits.

Arizona's BLM recreation management staff was internally canvassed to identify issues arising from recreational shooting activities (BLM 2007). At that time, staff noted the following, which are in order of priority:

- A concern for the health and safety of visitors engaged in non-shooting activities and residents adjacent to public lands.
- Accumulation of abandoned household refuse used as targets, causing spending for regular cleanups in the Lower Sonoran and SDNM. Such cleanups drain fiscal, labor, and volunteer resources and supplant other program priorities.
- The gradual degradation or destruction of natural resources, such as intentional shooting of saguaro cactus, and Monument objects in protected landscapes, such as the SDNM.
- Vandalism to SDNM and Monument signage and structures, from the use of signage for targets and "drive-by" shotgunning to damage to remote infrastructure such as restroom doors and slump block walls being shot through.
- Damage to natural resources or Monument objects downrange of target sites, such as visible depletion of plant cover over time on slopes, delimbing of downrange trees, damage to trees or saguaros used to hang targets, and permanent pockmarking of rock outcrops due to gunfire.

The extent of recreation impacts to the SDNM were analyzed during a comprehensive inventory of all recreation sites visible from the vehicle route network (Foti and Chambers, 2005). Site impacts were assessed for a variety of impact variables and categorized as "non-shooting sites" or "shooting sites," based primarily on the presence of shooting-related litter such as spent ammunition casings and clay pigeons.

The inventory identified 243 recreation sites predominantly used for activities other than target shooting and 63 sites predominantly used for target shooting. Impacts at the two types of sites were analyzed to determine if significant differences existed between non-shooting and shooting sites with respect to management of Monument objects and natural resources. The major types of impacts relevant to this analysis were defined as follows: (1) damage to saguaro cactus, (2) damage to rock formations, (3) damage to trees, (4) damage to shrubs, (5) presence of litter, (6) presence of off-road vehicle impacts, and (7) number of 400 square foot barren cores. Every recreational target-shooting site had damage to one or more of these seven impact elements, while such impacts were significantly less prevalent at non-shooting sites.

Since designation of the SDNM in 2001, impacts from recreational target shooting have increasingly become a management concern. Such impacts commonly include damage to protected plants, particularly saguaro; areas denuded of vegetation, both at sites from which shooting occurs and at target areas; and accumulation of debris used as targets, such as discarded appliances, propane bottles, glassware, furniture, automobile tires, paint cans, computers, TV and video displays, plywood, sheet metal, insulation form cans, and numerous other types of trash.

Computer displays and electronics can be full of lead and other toxic materials. The safety of other visitors, particularly with regard to inadequate backstops, is a concern as well.

Recreational target shooting is dispersed throughout the SDNM; however, the activity is concentrated at locations adjacent to its northern boundary along the El Paso Natural Gas Company pipeline road and smaller sites adjacent to SR 238 and Vekol Valley Road. During October-November 2008, the BLM removed 12,000 pounds of debris from recreational target shooting sites adjacent to the northern boundary of the Monument.

Field observations by resource managers and law enforcement officers indicate target-shooting activities have become increasingly popular, especially near the growing fronts of the greater Phoenix metropolitan area (Hanson and Mahoney; 2010), even in summer. New and more powerful firearms used by target shooters may increase the public safety risk due to the distance that bullets can travel. In addition, more frequent and widely spread recreational use of automatic weapons has also been noted. Although there have been no reported incidents of specific harm to people, these activities remain largely unregulated and pose potential public safety risks.

Further discussion of target shooting on the SDNM can be found in Section 3.3.4, "Recreation Management" (p. 330) and in Appendix G, *Sonoran Desert National Monument Recreational Target Shooting Analysis* (p. 1183). From a hazardous materials standpoint, popular recreational-shooting sites may have minor potential for lead contamination in the soils derived from spent bullets. Recreational shooting tends to be less frequent and more widely dispersed than on an established shooting range where lead levels can exceed regulatory guidelines and cause potential impacts to humans and wildlife. In addition, based on the composition of the hard, rocky soil of the Sonoran Desert, it is unlikely that much of the lead has penetrated the surface (U.S. Air Force et al. 2003).

3.5.2.5. Motor-Vehicle Operations

Hazardous wastes associated with motor-vehicle operations are generally limited to vehicle abandonment and spills of oil and other fluids. While historically a small concern on public lands, rock-crawling activities dramatically increase the risks of oil/fluid spills, often in sensitive washes where waste movement via water flow is more likely. In addition, dumping and burning vehicles is a common occurrence on public lands, leaving various hazardous wastes.

Safety issues associated with the use of paved public highways, unpaved backcountry roads, and off-road areas may have implications for the management of or access to public lands. Available data indicate that the highest numbers of accidents on public highways and roads in the Decision Areas occur on I 8, SR 85, and SR 238/Maricopa Road. The lack of entrance or exit ramps or crossovers to support safe traffic interchanges on I-8 and SR 85 indicates that there is at least some elevated public safety risk associated with accessing public lands from these roads. Excessive speed is the most common contributor to accidents on major roadways traversing public lands.

Four-wheel drive, ATV, and dirt bike use is common in the Decision Areas, and BLM law-enforcement officers report that accidents among such users are a safety issue, although no data quantifying the extent of such accidents in the Decision Areas are available. While vehicles are required to stay on roads, illegal off-road travel does occur and increases user risk.

Regional population growth and increased awareness of public lands for recreational activities has and will continue to provide more opportunities for transportation-based recreation in the Decision Areas. As a result, dumping and burning of vehicles, abandonment associated with

illegal border activities, and use, particularly associated with rock crawling activities, increases the likelihood of small hazardous spills and wastes. Use of ATVs and other recreational vehicles has increased, proportionately, increasing the risk to public safety. This trend is expected to continue as population growth increases.

3.5.2.6. Other Permitted Uses

Utility maintenance, livestock grazing operations, and other permitted uses appear to present minimal risk to visitors on public lands, but potentially could influence public safety. Mishaps could result from collisions between livestock and vehicles, increased travel by large maintenance vehicles, or encounters with agitated livestock. Visitor mishaps could also occur at utility sites (e.g. communication or utility line towers) or range improvements (e.g. stock ponds, fences, or wells). No known hazardous conditions associated with other permitted uses within the Decision Areas have been identified.

3.5.2.7. Illegal Drug Production

Due to the remote nature of the Decision Areas, illegal drug production occurs across public lands. While occurrences of these activities are rare, it is a major problem when they are discovered. Byproducts from these illegal drug labs can include lye, acetone, red phosphorous, iodine crystals, ephedrine, and other chemicals. In addition, the perpetrators sometimes abandon or bury their supplies, including glassware and utensils. Materials left on site can present a public safety hazard to visitors and employees, as well as impact natural resources. When encountered, these areas typically are cleared by a BLM contractor hired for solid-waste cleanup (Kershaw 2003).

While the BLM does not have trend information regarding illegal drug production, the potential exists for illegal laboratories to be established on public lands, most often in washes and other low-lying areas and within abandoned mines. Specifically, production of illegal drugs has been noted in 2005 and 2006 in areas with abandoned mines. The vast expanse of remote desert lands with access through dry washes and off-road trails provides opportunities for such uses.

Within the SDNM, production of illegal drugs, including methamphetamine, has seen an increase near SR 238. Waste from the production of this drug especially presents health hazards through exposure and physical danger to visitors and BLM staff. There is a high risk of explosive combustion in methamphetamine labs when materials are exposed to normal atmospheric pressure. An increase in dumping of materials related to drug production was noted during late spring 2009 near SR 238 and Tijeras Road. Field observations suggest that it is now spreading to other BLM parcels within the vicinity of SR 238 and the Gas Pipeline road.

3.5.2.8. Drug Smuggling and Undocumented Immigrant Traffic

Illegal immigration and drug smuggling continue to be issues on public lands in the southwestern border of the United States with Mexico. Illegal activities affect public lands within 100 miles of the international boundary in the Lower Sonoran and SDNM.

The BLM collaborates with DOI agencies and state, tribal, and local governments to resolve issues caused by illegal borderland activities. Partnership efforts include:

- Coordinating with the Department of Homeland Security to provide needed support and coordination for deployment of border security infrastructure,

- Providing a leadership role in the mitigation of environmental impacts caused by illegal immigration and smuggling,
- Strengthening communication and intelligence sharing with other law enforcement agencies, particularly the U.S. Border Patrol, and
- Sharing funding with partner agencies, tribes, and organizations who manage lands within 100 miles of the U.S.-Mexico border.

Between FY 2003 and 2010, the BLM allocated $7 million toward these borderlands mitigation efforts, including the removal of trash, waste, and abandoned vehicles; road and trail restoration; and repair of damaged landscapes. Volunteer organizations participate in these critical efforts to remediate and restore public lands.

Border security for BLM employees and visitors continues to be a challenge. Escalation of drug-smuggling activities has created concerns for both the Lower Sonoran and SDNM. The BLM has posted travel caution signs, increased interactions with visitors, and is providing additional information at public access points and on websites.

Various areas of the Lower Sonoran and SDNM are used as travel routes by drug and UDA smugglers and independent parties of UDAs. Regular use by human and drug smuggling traffickers has become apparent over the last decade, with summertime lulls; however, over the past two years, traffic has been intense year-round with no respite during the heat of summer.

The most heavily traveled routes for smuggler and UDA traffic are in the SDNM south of I-8, where traffic is widespread and heavy. The Ajo Block and Sentinel Plain areas also have received smuggler and UDA traffic. Law-enforcement activity in the Decision Areas typically include the recovery of stolen vehicles abandoned by or confiscated from smugglers, recovery of weapons, drug interdictions involving the seizure of illegal drugs, and the apprehension of UDAs (Hanson 2010).

Law enforcement officers report that smugglers are often armed (Brasington 2010). Additionally, UDAs are themselves very much at risk from exhaustion and exposure to the elements as they attempt to walk considerable distances to reach pick-up points along I 8, SR 238, or other locations. The increased risk to the UDAs lives and health, from climatic exposure and other environmental hazards of the Decision Areas, has been clearly demonstrated by the number of people dying trying to cross the Sonoran Desert in recent years.

Smuggler and UDA traffic through the Decision Areas has increased within the last decade, while traffic in other regional areas has declined. This trend is due to the Decision Area's proximity to the United States/Mexico border (Brasington 2010), remote unpopulated terrain, and strong interdiction efforts elsewhere, such as in California, New Mexico, and other parts of Arizona. Increases in illegal and armed cross-border trafficking, coupled with increases in public visitation to these areas, intensifies related public safety concerns.

3.5.2.9. Wildfires and Fire Management

Wildfires endanger people and property. Normally, the vegetative cover in the Decision Areas is too sparse to carry wildland fires effectively or to generate fires with sufficient heat to be self-propagating. Over the past decade, however, a long drought coupled with a few exceptionally wet winters made atypical moderate to large wildland fires more common. There have been two

moderately sized fires in the SDNM since establishment in 2001, and one extremely large fire on the adjacent BGR. The potential for large fires may increase if fire adaptable invasive weeds make further intrusions into the two Decision Areas. Additionally, changes in the ecosystems, due to invasive species and long-term drought, may also increase the likelihood of fire, resulting in larger areas being burnt, and thus more risks to the public.

3.5.3. SOCIAL AND ECONOMIC CONDITIONS

This section provides information on the social and economic conditions of the Planning Area, particularly as it relates to resource issues addressed in the current planning effort. Management decisions, specifically those relating to energy and minerals, grazing, recreation, and lands and realty, have the potential to affect social and economic conditions of communities and individuals, negatively or positively.

This socioeconomic assessment considers the national, regional, and local levels identified below:

- United States: provides a baseline for comparison of national trends,
- State of Arizona: provides an indication of statewide trends,
- Tri-county region (Maricopa, Pima, and Pinal counties): provides an overview of the counties that encompass the majority of Planning Area. In addition, a small portion of the northeastern-most section of the Planning Area is located in Gila County.
- Local communities (Arlington, Buckeye, Gila Bend, Goodyear, Mobile, Palo Verde, Tolleson, Tonopah, Casa Grande, Florence, Maricopa, Stanfield, Ajo, Why, Globe, and Miami): provides specific information on communities located near the Decision Areas.

Indicators of the social and economic environment include population and demographic data represented by population size, density, and growth; income levels; employment rates; ROWs and other realty use of public lands; and attractiveness.

Four dominant social and economic trends in the socioeconomic study area include:

- Rapid population growth (though the rate of growth has slowed or even stopped since 2008);
- A decline in natural resource-based, extractive industries between the 1970s and 1980s and an increase in high-tech, knowledge-intensive services since the 1990s;
- Retirement as an increasingly important source of non-labor income in the local economy; and
- A higher intensity of changes in employment and income trends in small, rural communities compared to larger, urban areas.

3.5.3.1. Demographics

Population Growth

While the population of the United States has increased by 38 percent from 1970 to 2000, the population of Arizona increased by 190 percent (U.S. Census Bureau 2003d; Arizona Department

of Economic Security 2006). In this period, Maricopa County increased by 217 percent, Pinal County increased by 165 percent, and Pima County increased by 140 percent.

Based on the July 2008 American Community Survey, the population of the tri-county region was nearly 5.3 million, with nearly 4 million (75 percent) residing in Maricopa County, which represents nearly 60 percent of the total population of Arizona Between 2000 and 2009, the region's population grew by 1,290,172 people.

Local population estimates, available for incorporated cities and towns, indicate that the City of Maricopa had the fastest growth rate of any city or town in the State between 2000 and 2005, while Buckeye and Goodyear had growth rates ranked sixth and seventh, respectively. Some communities showed extremely slow population growth, such as the Gila County communities of Globe and Miami. Population estimates and trends for eight communities near public lands in the Planning Area are shown in Table 3.28, "Population Growth 2000 to 2008, Six Cities and Towns near the Decision Area" (p. 355).

Table 3.28. Population Growth 2000 to 2008, Six Cities and Towns near the Decision Area

Geographic Area	Population		Percent Increase, 2000-2008
	2000	2008 (estimate)	
Maricopa County			
Buckeye	8,497	47,261	623%
Gila Bend	1,980	1,831	-7.5%
Goodyear	18,911	59,508	214.7%
Tolleson	4,974	7,199	44.7%
Pinal County			
Maricopa City	1,482	45,571	4,281.8%
Casa Grande	25,224	41,152	63.1%
Gila County			
Globe	7,486	7,197	-3.9%
Miami	1,936	1,778	-8.2%
Source: American Community Survey 2009			

Population Density

The most densely populated portion of the Planning Area is its northern edge, from Phoenix west to Goodyear and from South Phoenix east nearly to the Maricopa County border. Portions of Phoenix and other cities are close to "build-out" and have urban densities of about 2,500 people per square mile. Nearby suburban areas are less densely populated (ranging down to about 1,000 people per square mile), with larger residential lot sizes and more pockets of vacant land.

Based on the 2009 American Community Survey, the population density in the three counties varies significantly, from 430 people per square mile in Maricopa County to 61 in Pinal County (see Table 3.29, "Selected 2008 Demographic Information" (p. 356)). Maricopa County's population density is more than seven times that of the State's, while Pima County's population is nearly twice as dense as the State's, while Pinal County's population is about the same as the State. These numbers are indicative of the focus of the three counties, with Maricopa County being strongly metropolitan and Pinal County being rural in many areas (American Community Survey 2009; Arizona Department of Commerce 2003b). Overall, each of the three counties has a much lower density than the urban centers due to large, undeveloped areas that are largely comprised of BLM-administered and other Federal lands as well as state trust lands within their borders.

Table 3.29. Selected 2008 Demographic Information

Demographic Category	Maricopa County		Pima County		Pinal County		Arizona	
Total Population	3,954,598		1,012,018		327,301		6,500,180	
Area (square miles)	9,203		9,186		5,370		113,635	
People per Square Mile	429.7		110.2		60.9		57.2	
	Number	%	Number	%	Number	%	Number	%
Sex								
Male	1,993,117	49.6	495,889	49.0	170,524	52.1	3,256,590	50.1
Female	1,961,481	49.6	516,129	51.0	156,777	47.9	3,243,590	49.9
Age								
Under 18 Years	1,083,560	27.4	240,860	23.8	84,444	25.8	1,083,560	26.3
18 to 64 Years	2,432,078	61.5	621,379	61.4	198,999	60.8	3,952,109	60.8
Age 65 and Older	438,960	11.1	149,779	14.8	43,858	13.4	838,523	12.9
Median Age	33.7	N/A	36. 7	N/A	34. 0	N/A	34.8	N/A
Race and Ethnicity								
White	3,251,355	82.2	895,636	88.5	284,097	86.8	5,655,157	87.0
Black or African American	170,460	4.3	36,433	3.6	12,765	3.9	260,007	4.0
American Indian/ Alaska Native	73,474	1.9	34,409	3.4	19,965	6.1	305,508	4.7
Asian	114,414	2.9	26,312	2.6	5,237	1.6	162,505	2.5
Native Hawaiian/ Other Pacific Islander	7,152	0.2	2,024	0.2	327	0.1	13,000	0.2
Hispanic or Latino (any Race)*	1,224,005	31.0	330. 930	32.7	96,881	29.6	1,924,053	29.6

SOURCE: American Community Survey 2009

NOTE: N/A = not applicable

*Hispanic or Latino heritage includes people of other races, so percentages will not tally to 100 percent.

The city of Maricopa in Pinal County and the Rainbow Valley area of Maricopa County border the Decision Areas. Both have privately owned land available for development. The collapse in the Arizona housing market and the nationwide recession have slowed growth in these areas since 2007, but development is expected to pick up again once the economic situation improves. Maricopa eventually plans to house 125,000 residents with a predominantly high-density development pattern (Maricopa 2006). Buckeye and Goodyear annexed the Rainbow Valley area, and similar growth rates and housing densities are expected there in the coming decades. Other areas, including Avondale, Buckeye, Goodyear, Casa Grande, and areas currently part of unincorporated Maricopa County, are also expected to experience significant growth over the next few decades (MAG 2003).

Population Composition

There are slight differences in racial distribution among the counties, primarily in the form of differences in the proportion of American Indians due to the locations of American Indian reservations. Further discussion of the Planning Area racial and ethnic profile is discussed in Section 3.5.3.4, “Environmental Justice” (p. 367).

Individuals who are foreign born represented 12.8 percent of the total population in Arizona in 2008, while 24 percent of the population in Phoenix was foreign-born (American Community Survey 2009). This ranked the city sixth in the nation among other large cities in terms of the percentage of foreign-born population.

3.5.3.2. Employment, Income, and Subsistence

The economy, in general, is shifting away from reliance on natural resources, as indicated in the decrease in the proportion of employment in the agriculture, forestry, fisheries, and mining industries. In the tri-county region, declines in the mining industry dominate this trend.

Employment

Over the past several decades, services, which include many of the knowledge-based professions, were the largest employment sector in the tri-county region. The service sector made up 53.9 percent of total employment in Maricopa, Pima, and Pinal counties in 2007, with a total of 1,604,453 jobs. Service jobs as a share of total jobs increased 32.3 percent from 2001 to 2007 for the tri-county region, especially in the areas of educational services (85.2 percent of total tri-county employment in 2007); real estate (79.8 percent); business management (36.7 percent); health care and social assistance (34.9 percent); and arts, entertainment, and recreation (28.7 percent). By comparison, farm employment in the tri-county region grew by 4.6 percent from 2001 to 2007 (employing 12,529 people in 2007), while forestry, fishing, and related sectors shrank by 19.9 percent from 2001 to 2007 (employing 4,243 people in 2007). Farm proprietor employment also shrank 4.7 percent from 2001 to 2007, further exemplifying the shift away from natural resource-related employment in the Planning Area. Key employment figures for each county in the tri-county region are presented in Table 3.30, " Key Employment Statistics: Changes from 2001 to 2007, Tri-County Region" (p. 357).

Table 3.30. Key Employment Statistics: Changes from 2001 to 2007, Tri-County Region

	TOTAL EMPLOYMENT			EMPLOYMENT BY INDUSTRY*			
	Wage and Salary Employment	Proprietors' Employment	Total	Forestry, fishing and related	Mining	Farming	**Services and Professional**
MARICOPA COUNTY							
2001	1,617,329	298,363	1,915,692	3,824	3,165	8,395	978,147
% of Total	84.4%	15.6%	100.0%	0.2%	0.2%	0.4%	51.1%
2007	1,924,699	452,812	2,377,511	3,160	4,360	8,671	1,293,557
% of Total	84.4%	15.6%	100.0%	0.1%	0.2%	0 4%	54.4%
PIMA COUNTY							
2001	362,427	82,041	444,468	499	2,505	1,173	218,400
% of Total	81. 5%	18. 5%	100.0%	0. 1%	0. 6%	0. 3%	49. 1%
2007	406,446	122,404	528,850	373	2,616	1,135	284,136
% of Total	76.9%	23.1%	100.0%	0.1%	0.5%	0.2%	53.7%
PINAL COUNTY							
2001	43,101	9,115	52,216	972	1,348	2,415	15,948
% of Total	82.5%	17.5%	100.0%	1.9%	2.6%	4.6%	30.5%
2007	56,411	14,252	70,663	710	1,342	2,723	26,760
% of Total	79.8%	20.2%	100.0%	1.0%	1.9%	3.9%	37.9%

SOURCE: Bureau of Economic Analysis 2010

*Employment by industry figures are by place of residence.

Between 1980 and 1990, employment in the agriculture, forestry, fisheries, and mining sector decreased by 14.2 percent in Pinal County, 14.1 percent in Ajo, 7.4 percent in Casa Grande, and 7.2 percent in Gila Bend. At the same time, the services sector share of local employment increased 32.2 percent in Sells, 17.6 percent in Ajo, and 6.8 percent in Buckeye. By comparison, the services sector share of local employment only increased by 4.9 percent in Maricopa County, 4.6 percent in Pima County, and 2.6 percent in Pinal County (Sonoran Institute 2003a).

Overall, key employment figures (see Table 3.30, " Key Employment Statistics: Changes from 2001 to 2007, Tri-County Region" (p. 357)) indicate large gains in employment in the tri-county region for the period between 1970 and 2000. Both wage and salary employment and the establishment of new businesses by proprietors have generally kept pace with the increases in population, land development, and housing. There have been shifts, however, in the dominant employment sectors. The services and professional sector has grown faster than other sectors. The regional trend matches the statewide trend whereby this sector provided approximately 75 percent of the new jobs in Arizona. In the tri-county region, and in each individual county and the state, unemployment increased each decennial period between 1970 and 1990 (Sonoran Institute 2003a). However, unemployment rates in Maricopa and Pima counties have generally been lower than the state national rates since 2000, while unemployment rates in Pinal County have remained consistently higher than that of the state and nation (see Table 3.31, "Unemployment Rates, Annual Averages 2000-2005" (p. 358)).

Table 3.31. Unemployment Rates, Annual Averages 2000-2005

Area	2000	2001	2002	2003	2004	2005
National	4.0	4.7	5.8	6.0	5.5	5.1
Arizona	4.0	4.7	6.0	5.7	4.9	4.6
Maricopa	3.3	4.2	5.6	5.2	4.4	4.1
Pima	3.7	4.3	5.6	5.3	4.6	4.6
Pinal	4.6	5.3	7.2	6.8	5.7	5.4
SOURCE: State of Arizona, Department of Economic Security 2006						

Typically, Pinal County has had the highest unemployment rates; however, over the last several years, its economy has become more robust and its unemployment rates are now more similar to those of the other two counties. There are rural areas far from employment centers in all three counties with chronically high unemployment rates.

Income

In 2008, Maricopa was the only county in the tri-county region with a median family income value ($66,752) higher than that of the state of Arizona ($60,426). The median family income was $57,972 for Pima County and $53,308 for Pinal County. The median family income, adjusted for inflation, has risen in each county in the tri-county region since 1970.

In 2006, non-labor income constituted 40 percent of total personal income in Pima County, 38 percent of personal income in Pinal County, and 28 percent of total personal income in Maricopa County Non-labor income includes transfer payments (primarily related to retirement) and dividends, interest, and rent (money earned from past investments) (see Table 3.32, "Key Income Statistics: Changes from 2001 to 2007, Tri-County Region" (p. 359)). The median value for non-labor income as a percentage of total personal income in all U. S. counties was 37.4 percent in 2006. High levels of non-labor income have important implications for the management of public lands because much of the income in this sector is brought in by individuals who are not tied to a specific job or industry and have flexibility in where they choose to live. Examples of

people contributing this type of income include retirees and second- and vacation-home owners. These groups tend to be attracted to areas with natural and scenic resources and the presence of public lands, which offer recreational opportunities and a desirable setting in which to live. As a percentage of new income from 1970 to 2006, non-labor income grew faster than labor income in all three counties that comprise the Planning Area. From 1970 to 2006, non-labor sources of income as a percentage of new income grew 5.5 percent a year in Maricopa County, 5.0 percent a year in Pima County, and 6.6 percent a year in Pinal County.

Table 3.32. Key Income Statistics: Changes from 2001 to 2007, Tri-County Region

INCOME	MARICOPA COUNTY			PIMA COUNTY			PINAL COUNTY		
	2001	2007	% Change	2001	2007	% Change	2001	2007	% Change
Per Capita Personal Income	$29,238	$36,135	23.6%	$24,706	$31,755	28.5%	$19,082	$22,975	20.4%
Per Capita Non-labor Proportion*	28%	30%	32.3%	39.8%	41.6%	34.2%	36.9%	37.9%	23.7%
SOURCE: Bureau of Economic Analysis 2010 *Non-labor Income Proportion of Per Capita Personal Income									

In 2001, 6,744 workers in the tri-county region were employed in the mining North American Industry Classification System sector (which includes mining, oil and gas extraction, and support activities for mining) and derived $355.3 million in personal income (U.S. Bureau of Economic Analysis 2004). See Table 3.33, "Employment and Income in the North American Industry Classification System" (p. 359) for employment and personal income numbers at the county and state level. While Gila County's active mines were in or near the Planning Area, data concerning the county's mines were undisclosed (U.S. Bureau of Economic Analysis 2004).

Table 3.33. Employment and Income in the North American Industry Classification System

Area	Total Mining Employment	Personal Income (in millions)
Maricopa County	2,984	$195.4
Pima County	2,426	$92.4
Pinal County	1,334	$67.5
Tri-County Region		$355.3
Arizona	12,573	
Source: U. S. Bureau of Economic Analysis 2004		

Mining Income

Mining yields secondary employment and income impacts on the economy. For example, it is estimated that the jobs of nearly 23,000 Arizona residents resulted indirectly from the copper industry's presence in Arizona in 2002. About 2,600 of those jobs were in state and local government, including public education. Another 8,300 were in trade and service businesses. In 2002, the personal income indirectly received by Arizona residents because of copper industry spending in the State amounted to more than $560 million (Arizona Mining Association 2002). Since 1910, Arizona has been the nation's top copper producer, producing more copper than all the other 49 states combined.

In the Planning Area, the Ajo and Globe/Miami areas have been most affected by the long-term trends in mining. The mining industry supported the development of Ajo, which arose from the Ajo Phelps Dodge copper mine and operated from the early 1930s until 1985. In 1980,

manufacturing of durable goods and agriculture, forestry, fisheries, and mining were the largest SIC employment sectors in Ajo, but decreased greatly over the next 20 years while the service sector increased greatly. By 2000, just 3.3 percent of employment in Ajo was in the agriculture, forestry, fisheries, and mining (Sonoran Institute 2003a). An increased focus on tourism and retirement industries in Ajo was, in part, responsible for the shifting of the workforce to the services sector. The Globe/Miami area has also realized reductions in mining employment, but community leaders are reviewing ways to enhance the tourism market and diversify their economy (Arizona Department of Commerce 2003a).

Locatable Minerals. Locatable minerals, particularly copper and silver, have historically been very important to both Arizona's and the Panning Area's economy (Niemuth 2006). Arizona's total mineral production from operating all 160 mines in the state valued at $2.8 billion in 2000 and $2.2 billion in 2001 (Arizona Department of Mines and Mineral Resources 2003). The value of non-fuel mineral production per capita in 2000 was estimated at $474 for Arizona, compared to the $139 national average, making Arizona sixth in the nation for mineral production per capita.

Active locatable mineral mines in Arizona employed 11,676 workers in Arizona in 2002 (Arizona State Mine Inspector 2002). Of these, approximately 1,100 workers (9.4 percent) were employed in or near the Decision Areas, mainly in Gila County, where 1,012 workers were employed by locatable mineral mines. Over two-thirds of those working in the Gila County mines were primarily employed within or near the Decision Areas. Sixty-three workers were employed at active mines within or near the decisions areas in Pinal County, which represented only 5.3 percent of all workers employed at active mines in Pinal County.

Salable Minerals. Salable mineral development is active in the Decision Areas, where the predominant mineral materials are decorative rock and building stone (e.g. granite, weathered granite, basalt and other volcanics, and cinders). In Arizona, approximately 10 million tons of decorative rock was produced in 2006, of which approximately 1 million tons, or 10 percent, were produced in the Lower Sonoran. Decorative rock is also an important commodity in Arizona, with production value increasing from approximately $48 million in 2000, with a high of $76 million in 2004. Non-industrial sand and gravel has become increasingly important in Arizona. Its production value has increased from approximately $300 million in 2000 to $560 million in 2006. In addition, from 1991 to 2001, the production value of non-industrial sand and gravel has quadrupled (Arizona Department of Mines and Mineral Resources 2002) and continued to increase yearly through 2004 (Niemuth 2003, 2005). See Table 3.34, "Comparison of National, State, and Decision Area Trend in Decorative Rock Values" (p. 360) for national and local comparisons in value. Sand and gravel operations in the Planning Area occur primarily on private, Native American, and Arizona State Land Department lands, with lands in the Decision Areas being only a minor component. Total mineral production value in the Lower Sonoran has increased in parallel with the regional trend, growing from approximately $6.9 million in 2003 to $7.6 million in 2006, ranging from 6 percent to 14 percent of the total decorative rock production value in the State.

Table 3.34. Comparison of National, State, and Decision Area Trend in Decorative Rock Values

Year	United States	Arizona	Lower Sonoran	% of AZ value produced in Lower Sonoran	Lower Sonoran Royalties Produced
2000	$8,290,000,000	$48,200,000	N/A	N/A	N/A
2001	$8,870,000,000	$49,600,000	N/A	N/A	N/A
2002	$8,650,000,000	$51,500,000	N/A	N/A	N/A
2003	$9,060,000,000	$49,100,000	$6,900,000	14. 1%	$689,061. 74

Year	United States	Arizona	Lower Sonoran	% of AZ value produced in Lower Sonoran	Lower Sonoran Royalties Produced
2004	$9,890,000,000	$75,900,000	$4,900,000	6. 5%	$490,192. 82
2005	$12,100,000,000	$69,300,000	$4,800,000	6. 9%	$479,710. 46
2006	$12,900,000,000	$60,000,000	$7,600,000	12. 7%	$760,506. 97
Sources: USGS Survey Minerals Yearbooks 2002-2005 for Crushed Rock and Sand and Gravel/Construction; USGS Mineral Industrial Survey 2007; LR2000, BLM records					

Livestock Grazing and Agriculture Income

Grazing permits issued by the BLM in the Planning Area constitute about one-third of the grazing permits issued in the tri-county region, including those issued by the Arizona State Land Department, USFS, American Indian communities, and others (U.S. Department of Agriculture [USDA] 1997).

The acreage of land in ranches and farms continues to decline in the tri-county region. Increasing population growth and urbanization have correlated with a decline in traditional, rural-oriented industries such as ranching and farming. This may be due largely to the consumption of land for urban development and an overall shift towards a service-oriented economy. In the tri-county region, income in the agricultural services, forestry, fishing, and other sector has remained relatively flat over the past 30 years, although there has been a slight increase since the late 1980s.

Between 1997 and 2002, there was an overall increase in the market value of agricultural products sold throughout Arizona. Data for the tri-county region show the greatest increase in Pima County (40 percent, to $68.9 million), and the least in Maricopa County (9.1 percent, to $740.2 million). The livestock market value increase was greatest in Pinal County (41.7 percent, to $247 million) and increases in both Maricopa and Pima counties were at rates greater than the statewide average (USDA 2004).

In 2000, farm and agricultural services accounted for 0.9 percent (16,184 jobs) of employment in the tri-county region: 6.3 percent (3,841 jobs) in Pinal County, 0.9 percent (3,192 jobs) in Pima County, and 0.6 percent (9,151 jobs) in Maricopa County. In 1999, earnings associated with the agricultural services, forestry, fishing, and other sector were $82.0 million or 0.9 percent of total earnings in Pima County, and 439.4 million or 0.8 percent of total earnings in Maricopa County. By comparison, total earnings in this sector in Arizona were $773.0 million or 1.09 percent of total earnings for the state (Sonoran Institute 2003a).

Recreation Income

Much of the recreational activity on public lands qualifies as tourism, which is one of Arizona's leading industries and is the dominant industry in most communities (U.S. Department of Commerce 2003a). In 2000, an estimated 29.5 million domestic and international overnight visitors to Arizona and 19.3 million day-trip visitors spent 15.8 billion in tourism dollars (Pollack 2002). The overall economic impact from these tourism dollars is estimated to be nearly $30 billion. In addition, the fiscal impact (revenues from local, county, and state government taxes) totaled $1.3 billion and supported more than 451,600 jobs in Arizona, including direct, indirect, and induced jobs created by the industry. These jobs equate to about 20 percent of total employment in the State. Based on averages of jobs per household and people per household, the tourism industry supported about 382,000 households, or an estimated population of 1 million.

Key reasons cited for tourism in Arizona are outdoor recreation opportunities and open space, which are prevalent assets in the Planning Area. The Planning Area extends over four of Arizona's seven tourism regions identified by the Arizona Office of Tourism: the Metro Phoenix Region, which includes the SDNM as well as Lower Sonoran lands surrounding the Monument; the West Coast Region, which includes the Gila Bend Mountains and Saddle Mountain area; the South Central/East Region, which includes the Ajo Block; and the East Central Region, which includes the Globe/Miami Area. Annual visitation in these four regions is 19.4 million, while annual visitation in Arizona is 25.1 million. A large portion of tourism in the rural communities originates from the greater Phoenix and greater Tucson areas (Arizona Department of Commerce 2003a).

While all forms of recreation affect the current economic climate of the Planning Area and Decision Areas, only a few have been closely examined for their economic influence. These include wildlife-related recreational activities (i.e. hunting, fishing, and wildlife viewing), OHV use, and visiting cultural and historic sites.

In 2001, there were 1.7 million Arizona residents and non-residents (16 years old and older) that fished, hunted, or viewed wildlife in Arizona and spent in excess of $1.6 billion in the State: $512 million on trip-related expenditures; $1.0 billion on equipment purchases; and $67 million on licenses, contributions, land ownership and leasing, and other items and services (USFWS and U. S. Department of Commerce; U.S. Census Bureau 2001a). According to BLM estimates, $203 million was spent on wildlife-related recreation on public lands in Arizona in 2002, with $41.7 million being spent by hunters, $16.2 million by anglers, and $145.1 million by wildlife viewers (BLM 2002c). See Table 3.35, "2001 Economic Impacts of Wildlife Viewing (in $ millions)" (p. 362) for a quantification of the economic impacts of wildlife viewing.

Table 3.35. 2001 Economic Impacts of Wildlife Viewing (in $ millions)

	Expenditures	Total Multiplier Effect	Full- and Part-Time Jobs	Salaries and Wages	State Tax Revenues
Maricopa County	$368.3	$690.4	6,603	$192.8	$25.8
Pima County	$173.5	$326.5	3,196	$90.7	$12.2
Pinal County	$50.9	$96.0	949	$26.6	$3.6
Total for Tri-county Region	$592.7	$1,112.9			$41.6
Total for Arizona	$820.7	$1,542.9	15,058	$429.4	$57.6
SOURCE: Southwick Associates 2003					

In comparison, consumptive wildlife-related recreation (i.e. hunting and fishing) created a total statewide impact of $1.34 billion, based on $958.5 in direct expenditures and an estimated 17,190 jobs in Arizona.

The tri-county region accounted for $642.9 million of the statewide impact and 6,865 jobs. Table 3.36, "2001 Economic Impacts of Hunting and Fishing (in $ millions)" (p. 362) shows the breakdown in economic impacts of hunting and fishing for each county in the tri-county region.

Table 3.36. 2001 Economic Impacts of Hunting and Fishing (in $ millions)

	Expenditures	Total Multiplier Effect	Full- and Part-Time Jobs	Salaries and Wages	State Tax Revenues
Maricopa County	$409.1	$515.0	5,382	$103.0	$21.1
Pima County	$84.5	$105.0	1,187	$18.3	$5.4
Pinal County	$20.0	$22.9	296	$3.8	$0.9
Total for Tri-county Region	$513.6	$642.9	6,865	$125.1	$27.4
Total for Arizona	$958.5	$1,340.0	17,190	$314.0	$58.2
SOURCE: AGFD Department 2003					

The AGFD and Arizona State Parks (2003) estimated that recreation activities involving OHV use in Arizona created a statewide impact of $4.25 billion, including secondary impacts (see Table 3.37, "2002 Economic Impacts of OHV Recreation Activity (in $ millions" (p. 363)) and supports an estimated 36,951 jobs. About 60 percent of the total economic benefit and slightly less than half of the jobs occurred in the tri-county region.

Table 3.37. 2002 Economic Impacts of OHV Recreation Activity (in $ millions

	Expenditures	Total Multiplier Effect	Full- and Part-Time Jobs	Salaries and Wages	State Tax Revenues
Maricopa County	$1,358.1	$1,787.1	13,113	$428.9	$3.3
Pima County	$323.6	$403.5	3,307	$84.3	$17.7
Pinal County	$135.3	$152.7	1,099	$24.2	$5.9
Total for Tri-county Region	$1,817.0	$2,343.3	17,519	$537.4	$26.9
Total for Arizona	$3,055.7	$4,252.0	36,951	$1,088.0	$187.0
SOURCE: AGFD Department and Arizona State Parks 2003					

One of the fastest growing segments of the tourism industry in Arizona is cultural heritage tourism. An estimated 59 percent of the visitors to Arizona tour historic sites, and 28 percent visit historical museums. A study by the National Trust for Historic Preservation found that nationally, heritage tourists stay on average a half-day longer and spend $62 a day more than typical tourists. In Arizona, cultural heritage tourists spent $1,534 during their stay (as compared to $389 for typical travelers) in 1997, and their propensity to shop was 20 percent greater (Arizona Humanities Council 2000). Cultural heritage tourism sites in the Decision Areas include the Juan Bautista de Anza/Butterfield Stage Trail, Painted Rocks petroglyph site, Sundad, historic mining sites, historic ranching sites, and various other cultural sites.

Economic Impact of Lands and Realty

Indicators of social and economic conditions as they relate to the BLM lands and realty program are drawn from land tenure adjustments and ROWs, permits, leases, and easements that have economic activity. The trend in land tenure adjustments, either acquisitions or disposals, has been a decrease in activity over the last 20 years. Only a few land tenure adjustments had occurred since the mid 1980s compared to years prior.

Rights of Way, Permits, Leases and Easements

The ROWs currently accommodated in the Planning Area support several large utility companies providing power, telephone, and natural gas service to the southwestern United States. These include El Paso Natural Gas, Southwest Gas, SRP, Arizona Public Service (APS), U. S. West Communication, Tucson Electric Power, as well as Arizona Water Conservation District, which is the State of Arizona's entity responsible for operating, maintaining, and repaying the Federal government for the Central Arizona Project). The ROWs for roads, railroads, and associated transportation facilities support the flow of commerce in southern Arizona and northwestern Mexico. These include I-8, I-10, SR 85, SR 238, and Southern Pacific Railroad. These links also connect people as they support multiple forms of communication and travel and support a wide range of commercial, industrial, and residential uses. Data are not readily available to quantify the economic value of these relative to the Decision Areas; however, the aggregate social and economic ties to these ROWs are recognized as significant.

Renewable Energy Resources

There is high potential for the development of solar energy throughout the Planning Area. Development of solar sites has accelerated considerably within Arizona between 2000 and 2006 (APS 2006; Tucson Electric Power 2006); however, no sites are present in the Decision Areas. Due to high energy demands that are on the increase and climatic conditions that are conducive to solar energy, the trend for solar energy development the Planning Area involves increases in employment and income generated from solar energy production. However, nine applications for renewable energy development sites in the Lower Sonoran Decision Area are pending. There is little or no potential for industrial development of wind energy or biomass in the Decision Areas, and there is no trend for their use.

Renewable energy facility development on public lands, including collection or processing, generation, and transmission requires an ROW grant. Currently there are no approved ROW grants for solar, wind, or biomass energy development within the Decision Areas. The Planning Area has potential for solar development due to contiguous large land masses, high solar radiation, and relatively flat ground (Map 3-16: Mineral Estate). There are several solar sites that may be in operation by 2014 in the Planning Area on private land, but none in the Decision Areas (Arizona Public Service [APS] 2006; Tucson Electric Power 2006). Historically, solar energy production has not been a large source of employment or income in Arizona, but with the recent interest in solar development, some manufacturing plants have located to the Phoenix area.

Economic Impact of Public Finance and Government Services

Payment-in-Lieu-of-Taxes (PILT) payments are Federal payments to local governments that help to offset losses in property taxes due to nontaxable Federal lands within county and municipal boundaries. These payments are used for services including education, water, and transportation and are based on a formula whose principal criterion is the number of Federal acres within the locality. The number of qualified acres is multiplied by a dollar amount per acre set by law. Payments are subject to certain population-size-based limits and annual congressional program funding limits. The entitlement acreages have varied slightly over recent years, but the relative share of agency PILT payments has remained constant. See Table 3.38, “2009 PILT Entitlement Acreage by Federal Agency ” (p. 364) for PILT payments in the tri-county region for 2009.

Table 3.38. 2009 PILT Entitlement Acreage by Federal Agency

Area	BLM	USFS	Bureau of Reclamation	NPS	Army Corps of Engi-neers	USFWS	Total	BLM as % of Total
Maricopa County	1,749,122	657,723	30,832	11	2,478	0	2,440,166	71.68 %
Pima County	377,496	389,871	5,933	410,821	0	416,210	1,600,331	23.59 %
Pinal County	382,231	222,889	19,095	358	0	0	624,688	61.19 %
Arizona	12,201,796	11,255,164	234,528	2,666,418	7,192	1,567,498	27,932,596	43.68 %
SOURCE: Department of the Interior 2010								

Overall, revenues and expenditures in the tri-county region have been increasing in proportion with population growth. PILT payments have been increasing steadily from 1999 to 2009. See Table 3.39, “ PILT Payment and Entitlement Acreage” (p. 365).

Table 3.39. PILT Payment and Entitlement Acreage

Year	Area	Payment	Total Acres	BLM Portion*
1999	Maricopa County	$969,069	2,309,656	$675,441
	Pima County	$998,178	1,527,086	$201,632
	Pinal County	$377,565	516,901	$199,732
	Arizona	$10,275,296	27,580,348	$4,469,754
2000	Maricopa County	$1,019,264	2,299,643	$713,485
	Pima County	$1,061,362	1,527,386	$214,395
	Pinal County	$396,290	516,581	$209,637
	Arizona	$11,005,635	27,562,016	$4,798,457
2001	Maricopa County	$1,465,414	2,299,602	$1,025,790
	Pima County	$1,529,516	1,527,956	$308,962
	Pinal County	$568,264	516,581	$300,612
	Arizona	$16,057,080	27,566,920	$7,000,887
2002	Maricopa County	$1,539,003	2,299,624	$1,077,302
	Pima County	$1,618,859	1,528,206	$327,010
	Pinal County	$599,120	516,581	$295,774
	Arizona	$16,928,055	27,582,635	$7,380,632
2003	Maricopa County	$1,725,495	2,307,190	$1,202,670
	Pima County	$1,841,427	1,530,972	$370,127
	Pinal County	$673,798	518,313	$355,092
	Arizona	$18,045,248	27,668,453	$7,831,638
2004	Maricopa County	$1,775,295	2,456,262	$1,272,531.46
	Pima County	$1,901,776	1,599,417	$448,628.96
	Pinal County	$842,978	626,905	$515,818.24
	Arizona	$18,698,143	27,890,328	$8,167,348.86
2005	Maricopa County	$1,813,162	2,458,021	$1,299,674.52
	Pima County	$1,930,009	1,599,452	$455,289.12
	Pinal County	$861,637	626,902	$527,235.68
	Arizona	$19,233,714	27,885,022	$8,401,286.28
2006	Maricopa County	$1,858,155	2,457,360	$1,331,925.50
	Pima County	$1,925,348	1,600,332	$454,189.59
	Pinal County	$868,239	627,294	$531,275.44
	Arizona	$19,023,415	27,869,615	$8,309,427.67
2007	Maricopa County	$1,844,364	2,457,368	$1,322,040.12
	Pima County	$1,902,625	1,600,331	$448,829.24
	Pinal County	$858,776	627,294	$525,485.03
	Arizona	$19,098,223	27,872,586	$8,342,103.81
2008	Maricopa County	$2,915,379	n/a	$2,089,743.67
	Pima County	$3,003,013	n/a	$708,410.77
	Pinal County	$1,374,260	n/a	$840,909.69
	Arizona	$30,674,473	n/a	$13,398,609.81
2009	Maricopa County	$2,997,005	2,440,166	$2,148,253.18
	Pima County	$3,073,106	1,600,331	$724,945.71
	Pinal County	$1,403,450	624,688	$858,771.06
	Arizona	$31,662,123	27,932,596	$13,830,015.33

SOURCE: Department of the Interior 2010

NOTE: *The BLM portion is based on entitlement acreage; refer to Table 3.21, " Leasable Mineral Potential Lower Sonoran & SDNM" (p. 327)

3.5.3.3. Attractiveness of the Decision Areas

Open Space

During this planning process, there were many public comments regarding the role of public lands for recreation and open space. The value of open space often is cited as a non-market value of public lands. A study conducted in 2000 reported the loss of open land, including agricultural and desert lands, in the metropolitan Phoenix portion of the study area. In the same study, the Sonoran Desert was identified as a major part of what makes metropolitan Phoenix unique and gives it a special character. Losing huge tracts of land threatens the region with the loss of its most famous lifestyle and environmental assets (Morrison Institute for Public Policy 2000).

There is a perception that the public lands will help insulate communities from growth and provide open space and related modest economic growth. There is also support for planning and policy decisions to control growth to be made in collaboration with the BLM and the broader context of neighboring communities and the county. Strong sentiment was expressed in the communities to maintain BLM ownership of the lands to limit growth and provide open space (Sonoran Institute 2003b)

Across the nation, parks and protected open space have been increasingly recognized as vital to the quality of life that fuels economic health. As the nation moves toward a mixed economy based on services, light industry, consumer goods, and new technologies, businesses and their employees are no longer tied to traditional industrial centers. Businesses looking to relocate or expand prefer communities with a high quality of life, which includes an abundance of open space and nearby recreation. The economic value of parks and green space has long been established and demonstrated by increased demand and pricing of park-side properties (Trust for Public Lands 1999).

The effect on property values of a location near open space has been the subject of several studies. Studies have attempted to isolate the effect of open space from other variables that can affect property values, such as age, square footage, and condition of homes. Isolating the effect of open space can be difficult and results have been varied. Nevertheless, many studies have revealed increases in property values in instances where the property is located near or adjacent to open spaces (NPS 1995). Relative property values were found to be higher near South Mountain Park, an area similar in character to much of the Decision Areas but located more closely to the Phoenix Metropolitan Area (Maricopa County 2002b).

While the trend in the Planning Area has been a loss of open space, the Decision Areas have been maintained as natural desert landscapes. To accommodate increased population growth, development in Arizona is occurring in the form of planned communities in former rural areas, creating needs for goods and services and placing demands on public services. These new communities are also replacing agricultural lands and open spaces. Between 1960 and 1990, Phoenix' urbanized area grew 199 percent while the population increased 263 percent. Calculations from aerial photographs show that between 1975 and 1995, some 40 percent of all agricultural land and 32 percent of all undeveloped desert land was lost to urbanization (Morrison Institute for Public Policy 2000).

Sense of Place

Galliano and Loeffler (1999) define sense of place as a "link between social experiences and geographic areas." Through association and interaction with geographic areas, whether physically, spiritually, or through various media, people form values that are attached to geographic places. Place attachment is customarily passed down through generations (Galliano and Loeffler 1999).

The assessment of place-based values helps to identify and understand the values that people attach to the lands and resources within the Decision Areas. Understanding issues regarding the sense of place assists land managers in understanding resource and land use conflicts and how to approach them most effectively. Things that contribute to sense of place may include personal memory, community history, physical landscape appearance, and emotional attachment (Galliano and Loeffler 1999). Sense of place is subjective, and individuals or groups of people may develop a sense of place based on perceptions about amenities (e.g. recreational opportunities), historic or symbolic activities and places, or landscape and scenic vistas.

The identification of sense of place issues associated with the study area is based on continuing public and agency comment. Five community socioeconomic workshops that occurred in November and December of 2003 were held in Ajo, Buckeye, Gila Bend, Mobile, and Tonopah to discuss values people associate with their community and how they, in partnership with the BLM, can protect these values based on current and predicted trends in population growth. The vision the communities described for themselves during the workshops was consistent: they all expressed the desire to maintain their current quality of life and general rural character while gaining additional amenities in their communities (e.g. better jobs, restaurants and movie theatres, and community services). They all included some values about the natural environment, their communities, and the role of public lands for recreation and open space. Some of the commonly expressed values among all the communities included wildlife, flora and fauna, rural character, solitude/peacefulness/quiet/ remoteness, "small town" character, and open space. Many expressed the values of accessing public lands for a wide range of uses (Sonoran Institute 2003b).

Protection of the ecological landscape (e.g. wildlife and habitat) was identified as a priority by many individuals throughout scoping. The potential for conflict with livestock grazing and recreational activities such as motorized vehicle use and recreational shooting, among other concerns, was raised when wildlife and habitat protection were perceived as a top priority for public lands. Some people also supported ranching activities in the area as a means to preserve open space and the area's Western heritage, and to promote stewardship.

Many of the sites visited by tourists also contribute to Planning Area residents' sense of place. Local residents also value many prehistoric and historic sites that are not formally designated. Some scoping participants characterized both ranching and mining as an important basis of the area's sense of place. The complex cultural issues that contribute to a sense of place include issues of site protection, issues of tribal and family history, in addition to issues involving public access and education.

3.5.3.4. Environmental Justice

Bureau of Land Management environmental justice policy calls for the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental

consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies.

Fair treatment also means that the BLM cannot cause a disproportionately high and adverse human health or environmental effect during implementation of its programs, policies, and activities on minority populations, low-income populations, and Native American tribes. The BLM performed the following analyses to identify populations to be considered for environmental justice issues. After identification of the populations eligible for consideration under environmental justice guidelines, the BLM then considered what effects, if any, agency actions might have on specific populations.

For purposes of this analysis, minorities and low-income populations are defined as:

- "Minorities" describes people of Hispanic or Latino origin of any race, Blacks, American Indian/Alaska Natives, and Asians or Pacific Islanders (without double-counting people of Hispanic/Latino origin who also are contained in the racial groups).
- "Low-income" describes people living below the poverty level. The U.S. Census Bureau uses a set of income thresholds that vary by family size and composition to determine who is below the poverty level. The most recent detailed income information is from Census 2000, in which questionnaires gathered information on respondents' incomes for 1999. The poverty level for a family of four having two children under the age of 18 was $16,895 (U.S. Census Bureau 2002a).

A community is considered to have a concentration of minority and/or low-income residents if the proportion of such people in the community exceeds their proportion in a larger geographic area of reference. Communities located near the Decision Areas and those most likely affected by management decisions made regarding these lands were analyzed to determine their minority and low-income status. Census data are tabulated for incorporated communities and Indian reservations. The informal boundaries of several unincorporated communities were approximated by one or more census tracts and block groups (subgroups within census tracts). Such unincorporated communities were Arlington, Tonopah, Mobile, Palo Verde, Sentinel, Why, Stanfield, the area east of SDNM, the Rainbow Valley area, and the area surrounding Florence. Table 3.40, "Minority and Low-Income Populations, 2003" (p. 368) summarizes the minority and low-income status of communities within the Planning Area.

Table 3.40. Minority and Low-Income Populations, 2003

Geographic Area	Total Minority[1]	Minority Population		Poverty Rate[2]	Low-Income Population Poverty Rate	
		>50 %	>36.2%		>50 %	>13.9%
Arizona (comparison population)	**Minority Population: 36.2%**			**Low-income Population: 13.9%**		
Maricopa County	33.8%	No	No	11.7%	No	No
Buckeye	42.7%	No	Yes	18.8%	No	Yes
Gila Bend	65.3%	Yes	Yes	24.8%	No	Yes
Goodyear	30.2%	No	No	6.1%	No	No
Tolleson	81.0%	Yes	Yes	13.7%	No	No
Ak Chin Village, Ak Chin Indian Reservation	98.1%	Yes	Yes	26.8%	No	Yes
Gila River Indian Community[3]	96.7%	Yes	Yes	52.1%	Yes	Yes
Census Block Group 0506021 (Arlington)	36.7%	No	Yes	12.3%	No	No

Geographic Area	Total Minority[1]	Minority Population		Poverty Rate[2]	Low-Income Population Poverty Rate	
		>50 %	>36.2%		>50 %	>13.9%
Arizona (comparison population)	**Minority Population: 36.2%**			**Low-income Population: 13.9%**		
Census Block Group 0506032 (Tonopah)	36.7%	No	Yes	25.9%	No	Yes
Census Block Group 7233022 (Mobile)	65.7%	Yes	Yes	19.4%	No	Yes
Census Block Group 0506011 (Palo Verde)	49.7%	No	Yes	12.5%	No	No
Census Block Group 7233023 (Sentinel)	86.5%	Yes	Yes	19.4%	No	Yes
Census Block Group 7233021 (Rainbow Valley Area)	32.8%	No	No	19.4%	No	Yes
Pima County	38.5%	No	Yes	14.7%	No	Yes
Ajo	45.6%	No	Yes	22.3%	No	Yes
Tohono O'odham Nation	95.6%	Yes	Yes	46.4%	No	Yes
Census Block Group 0049001 (includes Why)	35.6%	No	Yes	7.0%	No	No
Pinal County	41.2%	No	Yes	16.9%	No	Yes
Apache Junction	12.1%	No	No	11.6%	No	No
Casa Grande	49.6%	No	Yes	16.0%	No	Yes
Florence	50.3%	Yes	Yes	7.0%	No	No
Maricopa	79.1%	Yes	Yes	23.4%	No	Yes
Census Block Group 0002021 (Florence and surrounding area)	32.0%	No	No	12.2%	No	No
Census Block Group 0017002 (Stanfield)	69.4%	Yes	Yes	19.0%	No	Yes
Census Block Group 0017003 (eastern border of SDNM)	58.0%	Yes	Yes	19.0%	No	Yes
Gila County	31.1%	No	No	17.4%	No	Yes
Globe	38.5%	No	Yes	11.4%	No	No
Miami	57.6%	Yes	Yes	21.5%	No	Yes

SOURCES: U.S. Census Bureau 2003f, 2003g, 2003h

1 The total minority population includes individuals of Hispanic/Latino origin, but those that are also Black/African Americans, American Indian/Alaska Natives, Asians, and Native Hawaiian/Other Pacific Islanders are not included in the total in order to avoid double counting.

2 Poverty rate among individuals, based on poverty status in 1999.

3 The Gila River Indian Community includes lands in both Maricopa and Pinal counties but is listed only under Maricopa County in this table.

From 2006-2008, out of Arizona's average yearly population of 6,343,952, 32.3 percent were minorities. Pima and Pinal counties each have a proportion of minority population that exceeds that of the State, while Maricopa and Gila Counties have a smaller share of minority population than does the State. All of the American Indian reservations are considered minority communities. Most of the individual incorporated and unincorporated areas analyzed are minority communities as well. About half of the communities considered reported minority populations greater than 50 percent, with most being small communities or are Native American lands. All but one of the communities studied exceed the statewide average of minority residents (see Table 3.40, "Minority and Low-Income Populations, 2003" (p. 368)).

The low-income and minority communities in the Planning Area were, for the most part, historically agricultural or mining communities. The forces currently affecting these communities are not closely related to any BLM action and are instead more related to worldwide market

conditions and the urbanizing area around Phoenix. Fluctuating mineral prices worldwide is the primary reason for the downturn in the economy of mining communities. The conversion of agricultural lands to housing developments has been the primary reason for the loss of income in agricultural communities. Some of these communities, however, have been directly and indirectly affected by current BLM actions. For example, Ajo is currently aiming to convert its economy primarily from mining to retirement, recreation, and art. The Lower Sonoran, Organ Pipe Cactus National Monument, and Cabeza Prieta NWR are all important components of the quality of life and tourism economy Ajo is building. The community of Mobile has been affected by a disproportionate number of projects, including landfills, power lines, and pipelines through the community.

Historically, several of the high minority/low income communities have had relatively robust economies and diverse populations, particularly the mining communities during periods when the mines were open and producing; however, in recent decades, these communities have been identified as environmental justice communities. Over the last several years, many of these communities are experiencing rapid changes due to urbanization and an influx of large numbers of new residents. These trends may eventually change the demographics of these communities such that they no longer consist of primarily minority or low income populations. While this trend is largely unrelated to BLM actions, in some cases, past BLM actions have affected these communities. Ajo and Miami-Globe in particular have had economies driven by local mineral resources, resulting in several boom-bust cycles. These communities are currently attempting to diversify their economies; however, public lands in the vicinity hold the potential for future mineral discoveries that could cause mines to open, providing high paying jobs and drawing additional people to the Ajo and Miami-Globe areas.

The community of Mobile has also been historically affected by BLM-related management actions, particularly involving development of utility lines through the community. Three utility corridors that cross the Lower Sonoran and SDNM converge at Mobile and currently include one power line, with two more planned, and several gas pipelines, with one additional planned. In addition, this community has been affected by the location of several landfills on private lands and a railroad. The community was successful recently in stopping an oil refinery from being built in the area. In 2007, Mobile was annexed into the City of Goodyear and much of the private land in the community was purchased by a developer for a master-planned community, displacing many local residents.

Chapter 4. Environmental Consequences

4.1. INTRODUCTION

This chapter describes the environmental impacts that likely would result from implementing the No-Action Alternative (Alternative A) and the four Action Alternatives (Alternatives B, C, D, and E). Of these, the Bureau of Land Management (BLM) has chosen Alternative E as the agency Preferred Alternative. Throughout this chapter, the impacts have been separated between the Lower Sonoran and Sonoran Desert National Monument (SDNM) Decision Areas, unless the text specifies that the impact is the same for both.

Impact analyses and conclusions are based on interdisciplinary team (IDT) knowledge of the resources and the Planning Area; information provided by experts in the U.S. Department of the Interior, BLM, or other agencies; and information contained in pertinent, existing literature. The baseline used for the impact analysis is the current condition or situation, as described in Chapter 3, *Affected Environment* (p. 251). Analytical assumptions have also been developed to help guide the determination of effects (see Section 4.1.2, "Overall Assumptions" (p. 373)). Because the draft resource management plan (RMP) and environmental impact statement (EIS) provide a broad management framework, the analysis in this chapter represents a best estimate of impacts because exact locations of development or management often are unknown.

4.1.1. IMPACT ASSESSMENT METHODS

To perform the analysis, each program area (i.e. resource, resource use, special area designation, and social and economic condition) first developed a set of indicators to quantitatively measure the impacts on their specific program from other programs' actions proposed in Chapter 2, *Alternatives* (p. 27). If quantifying impacts was not possible, a list of qualitative terms was created for select program areas to describe the level of intensity an impact would have on that program. Third, a set of program-specific assumptions was developed to adequately analyze impacts and establish a consistent analysis. Finally, the program areas that would have measurable impacts on a specific program area were identified, as well as those that would not have impacts.

4.1.2. OVERALL ASSUMPTIONS

The following general assumptions and guidelines were used in the analysis of environmental consequences. Other assumptions specific to a particular program area, where applicable, are presented in that program area section.

- Funding and personnel would be sufficient to implement any of the alternatives described in Chapter 2, *Alternatives* (p. 27) of the Lower Sonoran and SDNM Draft RMP/EIS.
- All BLM management activities, which include all management decisions proposed by the alternatives in this Draft RMP/EIS, are consistent with applicable law. Some of the major laws, regulations, and policies that guide BLM management are listed in Appendix B, *Applicable Laws, Regulations, and Policies* (p. 1003).
- RMP decisions are landscape in scale. Before implementation actions are taken, additional site-specific planning and National Environmental Policy Act (NEPA) analysis would occur.
- All alternatives would support meeting land health standards (Standards).

- In the event paleontological, geologic, or cave resources are discovered on lands in the Decision Areas, management actions to protect these resources would be implemented.
- The cleanup of hazardous materials and wastes would be managed to minimize impacts to resources while protecting public health and safety.
- Short-term impacts are those that would last no more than 5 years after implementation of the action that triggers the impact. Long-term impacts are those that would persist longer than 5 years.
- Attempts to manage or regulate environmental conditions could be affected by activities on adjacent lands that are beyond the BLM's authority (i.e. fugitive dust generation on adjacent lands that affects air quality on public lands).
- Existing decisions from wilderness management plans will be carried forward in the proposed RMP for the administration and management of the six congressionally designated wilderness areas that are within the Lower Sonoran and SDNM Decision Area.

4.1.3. LEVELS OF ANALYSIS (PROGRAMMATIC & IMPLEMENTATION)

There are two separate levels of analysis presented in this chapter that are dictated by the type of decisions set forth in Chapter 2, *Alternatives* (p. 27).

Programmatic or RMP level analysis addresses impacts from RMP level decisions, which are decisions set forth to achieve the goals and objectives of a specific program area within the RMP. Analyses for these decisions are broad in scale and focus on the scope of the individual alternatives and environmental effects. Programmatic analysis is typically regional in scope and accounts for differing land use scenarios, with an emphasis on cumulative effects from multiple activities and future projects (of which the location and details are not yet known). Refer to sections 4.2 through 4.23 for RMP-level impact analysis.

Implementation or activity-specific analysis addresses impacts from a specific project or activity. Emphasis on this type of analysis is based on the project site, the site's immediate surroundings, and a well-defined proposal, which includes different ways to meet a common objective. Unlike programmatic or RMP level analysis, implementation level analysis focuses on direct and indirect effects from one defined activity, rather than a slew of multiple activities and future projects. Refer to Section 4.25, "Implementation Level Analysis" (p. 906) for implementation level impact analysis.

4.1.4. TYPES OF EFFECTS (DIRECT, INDIRECT, AND CUMULATIVE)

Direct, indirect, and cumulative impacts are considered in the effects analysis according to guidance provided in 40 Code of Federal Register (CFR) 1502.16.

Direct effects are caused by an action or the implementation of an alternative and occur at the same time and place.

Indirect effects result from implementing an action or alternative but usually occur later in time or are removed in distance. They are reasonably certain to occur.

Cumulative effects are the direct and indirect effects of a proposed action's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR Part 1508.7).

Effects are quantified where possible, primarily by using Geographic Information System (GIS) applications. In the absence of quantitative data, best professional judgment is used; impacts are sometimes described using ranges of potential impacts or in qualitative terms.

4.1.5. QUALITATIVE TERMS FOR THE INTENSITY OF IMPACTS

A range of qualitative terms have been used to gage the intensity of each impact from one program area on another. Only adverse impacts have been quantified. Positive impacts are discussed in detail within the text and at times have lessened the intensity of the adverse impacts. Some program areas have further defined these terms specific to their program with particular thresholds. These definitions and thresholds can be found in the beginning of each program area's impacts analysis. The qualitative terms used for describing the intensity of impacts are presented in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375).

Table 4.1. Qualitative Terms for the Intensity of Impacts

Negligible	Minor	Moderate	Major
Lower Sonoran			
No known impacts to resources or resource uses. Any change is undetectable and immeasurable.	Direct effects are apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects are undetectable.	Direct effects would be readily apparent and measurable over a larger area, but are still mainly within the footprint of the action. Indirect effects are apparent and measurable, but do not exceed much beyond the footprint of the action.	Direct effects would be highly noticeable and extend well beyond the footprint of the action. Indirect affects would be readily apparent and measurable well beyond the footprint of the action.
Sonoran Desert National Monument			
No known impacts to resources or resource uses. Any change is undetectable and immeasurable. Objects are preserved throughout the Monument.	Direct effects are apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects are undetectable. Objects are preserved throughout the Monument	Direct effects are readily apparent and measurable over a larger area, but are still mainly within the footprint of the action. Indirect effects are apparent and measurable, but do not exceed much beyond the footprint of the action. Objects may be affected on site and in the vicinity of the activity, but are maintained within the Monument	Direct effects would be highly noticeable and substantial. Indirect effects would be readily apparent and measurable well beyond the footprint of the action. Objects, or some elements of the objects, would be permanently altered on site, as well as affected over a larger portion of the Monument.

4.1.6. REASONABLY FORESEEABLE DEVELOPMENT SCENARIOS

Analytical assumptions may include any reasonably foreseeable development (RFD) scenarios for program areas. A RFD scenario is a baseline projection for activity for a defined area and period of time. Though commonly used in minerals development, these scenarios may be used for other program areas as well. These scenarios are derived from the existing conditions and projected trends expressed in Chapter 3, *Affected Environment* (p. 251) for each program area.

General Reasonably Foreseeable Development Scenarios for the Planning Area

Population growth in Arizona is anticipated to be about 20 percent per decade over the next three decades. Population projections for the tri-county area (Maricopa, Pinal, and Pima counties) indicate that growth will continue and that Arizona's population ranking among the fifty states is projected to move from 20th to 10th by 2030. The most dramatic growth would occur in Pinal County, where the population already has nearly doubled from 2000 and 2010. By 2030, Pinal County's population could reach approximately 852,000, Maricopa County's population could be 6,208,000, and Pima County's population could be 1,442,000. The tri-county growth over the three decades likely will be higher than in the State of Arizona as a whole so that by 2030, the area would have an 82.2 percent share of the State's residents. The area's share of the State's total population in 2000 was 80.3 percent, with approximately 8,503,000 residents in the tri-county area and 10,348,000 in Arizona as a whole.

In addition:

- The cities and communities of Maricopa, Goodyear, Buckeye, and Gila Bend will continue to expand their boundaries through annexation. Other communities may also incorporate. The majority of the Decision Areas will border on or be included in incorporated cities and towns, with little county-administered land. The SDNM could be entirely surrounded by land annexed into cities or towns within ten years.

- For the majority of Maricopa County, western Pinal County, and western Pima County, the Lower Sonoran and SDNM Decision Areas will continue to serve as undeveloped open space as the private and State lands are developed.

- Undeveloped land, or open space, will decrease as population increases. Historical trends indicate the urban edge will advance 0.5 miles per year until build-out is reached. An increasing percentage of State and private lands around the Planning Area will be developed and no longer available for "backyard" community recreation. Recreation uses displaced by development will shift to public lands. Public lands administered by the BLM will become the only remaining "open space" as private and State trust lands used for recreation disappear due to development.

- Tourism will continue to be a major industry in Arizona, especially for some rural areas. This will create a demand for tourism-related recreational opportunities and increase the need for management.

- In-migration from other U.S. states, mostly California, is expected to continue. New residents are not likely to be familiar with desert ecosystems. Place-based values and culture are less likely to be shared by the majority of residents in rapidly changing communities.

The following RFD scenarios are separated by program area and are list in alphabetical order:

Air Quality

Air-quality management and compliance issues will grow more challenging as the counties within the Planning Area attempt to meet Federal air quality standards for particulate matter smaller than 2.5 microns in diameter ($PM_{2.5}$), particulate matter smaller than 10 microns in diameter (PM_{10}), and fugitive dust. The regulation and limitation of public off-highway vehicle (OHV) travel on dirt roads and washes will be among measures applied to meet air quality and fugitive dust standards over the life of the plan. Restrictions will increase over the life of the plan. Such restrictions will include use limits and closures on use of dirt roads and changes in operating procedures for all surface disturbing activities in areas not meeting air quality standards. These areas are designated as nonattainment areas. Air quality regulation boundaries for $PM_{2.5}$ and PM_{10} will expand to encompass the majority of the Decision Area, in parallel with population growth.

Climate Change

Future increases in global temperature are projected to occur with increased atmospheric green house gas concentrations. The Intergovernmental Panel on Climate Change climate models predict that further June to August temperature increases of 3.6F to 9.0F are possible by 2040 to 2069 for western North America, while the most extreme warming scenario currently considered possible suggests that annual mean temperatures in the southwestern United States potentially could increase by up to 14F before the end of the century. Impacts could include less precipitation, higher temperatures, and overall less water for natural resources, including vegetation, agricultural production, industrial supply, and human populations. Drought could become more intense and long lasting, affecting natural resources and livestock production. Fire season could become longer with more frequent and intense fires. Air pollution problems could be worsened as increased temperatures and drought contribute to ozone (O3), $PM_{2.5}$, and PM_{10} production. Changing vegetation regimes also are likely to result in animal species migration or extinction, which affects recreation opportunities and BLM management.

Lands & Realty Management

Land Tenure. Land disposals via exchanges, sales, and recreation and public purposes (R & PP) patents may increase for parks and other recreational facilities as communities grow. The expected total would be one to two per year, approximately 100 acres/year.

Land Use Authorizations (Including Utility-Scale Renewable Energy Development). Population growth in both urban and rural areas will increase infrastructure demand for new highways, roads, power lines, and communication sites. Increased demand for infrastructure will result in an increase of approximately three to four major linear land use authorizations (LUAs), including ROWs for high voltage power lines, large pipelines, and solar power plants every year. Other minor linear and nonlinear LUA requests, such as for roads, or smaller voltage transmission lines, will increase to an additional seven to eight proposals per year.

In addition:

- According to the Solar Energy Development in Six Southwestern States Draft PEIS (December 2010), the estimated acres foreseen to be developed for solar energy facilities on BLM administered lands would be 21,816 acres within the State of Arizona. The Gillespie

Solar Energy Zone (the only SEZ proposed in the Planning Areas, totaling 2,618 acres) is projected to be fully developed, as presented in the DPEIS's preferred alternative by the end of the life of this Plan.

- Renewable energy, primarily solar energy, will continue to be of high interest in the Planning Area. For the past three years, the numbers of solar energy applications for ROWs submitted to the Lower Sonoran Field Office (LSFO) have plateaued. Two of the seven pending ROW applications for solar energy development sites (as of March 2011) have progressed through the site-specific environmental analysis. Reasonable assumptions can be made that two additional proposals could progress to the environmental studies every year, for the next 20 years. The utility-scale solar power plant proposals are generally 4,000 acres to produce 250 to 500 megawatts of electricity. After considering the number of prohibited, high and moderate-sensitivity conflict areas for utility-scale renewable energy developments (as defined in Appendix N, *Analysis for Renewable Energy Sensitivity* (p. 1263)), it is anticipated that the number of accepted applications for solar energy development on public lands will not increase from the current numbers and that most of the development would occur within the low known conflict sensitivity areas (ranging from a minimum of 5,100 acres in Alternative D to a maximum of 40,600 acres in Alternative B).

Livestock Grazing

Livestock numbers are expected to remain at or near current levels, which fluctuate based on local climatic conditions. In the areas around metro Phoenix, Tonopah, and Maricopa the expected increase in population will result in an increase in recreation on public lands. This potentially could cause increased conflicts with livestock operations. In addition, permittees' ability to manage allotments could be negatively affected due to increased damage to improvements (e.g. cut fences and damaged waters) and harassment of livestock. This trend is expected to be more pronounced in allotments with substantial private inholdings due to development of the private lands.

In the Ajo, Gila Bend, and Globe areas, the general population increase will have some of the same impacts as mention above but to a lesser degree, with the exception of borderland impacts. No other significant changes would be expected from current conditions.

Minerals Management

Leasable Minerals. Leasable minerals are expected to continue as a minor component of the mineral development in the Planning Area. It is expected that if any leasable minerals are developed, oil and gas would be the most likely. It is anticipated that up to 10 exploratory oil and gas wells could be drilled in the Lower Sonoran Decision Area. Each well site would average 10 acres, all of which would be reclaimed.

Locatable Minerals. Locatable minerals have high potential in some parts of the Lower Sonoran, particularly in the Ajo and Globe-Miami areas, and moderate potential in several other areas. There could be up to 10 exploration-level operations every year, three to five new small mines every 10 years, and one to two larger operations. Exploration would disturb an average of one to three acres, small mines would disturb 20-50 acres, and large mines would disturb 100-500 acres. Most mining activities would be surface mines. Most of the surface area of a producing mine would be reclaimed to the prevailing standard at the conclusion of operations.

Salable Minerals. Salable mineral development would be expected to continue expanding in response to population growth, urban development, and infrastructure needs. On average, one to two new pits would be opened, or existing pits would be expanded, every year to meet the need. Production at existing and new pits would average 100,000-1,000,000 tons per year. Pits would disturb anywhere from 20-500 acres per operation. Reclamation of disturbance to required levels would occur either at the completion of operations or as an integral, ongoing part during continuing operations.

Priority Wildlife Species & Habitat Management

Without management intervention, wildlife populations are expected to continue a downward trend over the next 25 years.

Wildlife Waters. Surface disturbance of approximately 1 acre for each catchment is expected. Approximately five buried catchments are expected to be constructed each year. Areas of disturbance will be reclaimed. In the Lower Sonoran, the total expected amount of disturbance is expected to be approximately 50 acres over the next 25 years.

Pronghorn Enclosures. Under all alternatives, up to three permanent holding pens of up to five acres each will be constructed for the housing and release of Sonoran pronghorn. Enclosures will be constructed to be predator resistant. Fencing will be buried to repel burrowing animals.

Burrowing Owl Enclosures. Up to five temporary 1-acre enclosures may be constructed to acclimate burrowing owls into suitable habitat. Enclosures will be constructed of PVC pipes and netting.

Sonoran Desert Tortoise Habitat. Potential artificial housing for displaced Sonoran desert tortoises will be constructed.

Public Safety & Hazardous Materials. Illegal immigration and smuggling will continue to impact public lands at current or increasing levels. Impacts may shift as illegal immigrants and smugglers adapt to new border enforcement techniques.

Damage to natural and recreation resources, and related public safety concerns, will increase as resource crime and vandalism incidents swell in the growing public land-urban interface. The cost to patrol, repair, restore, and monitor crime and vandalism will grow and require more agency resources over the life of the plan.

Rapid growth of metropolitan areas will increase illegal dumping in the boundary lands. Hazardous materials and spills may also increase in these areas.

All abandoned mines within the Planning Area will be identified and inventoried in an effort to proceed with permanent closures.

All hazardous waste sites (including Superfund sites) within the Planning Area will be identified and inventoried in an effort to proceed with permanent closures.

Recreation Management

In the Lower Sonoran

Ajo Special Recreation Management Area (SRMA): In the Ajo Desert Recreation Management Zone (RMZ), it is anticipated that minimal road maintenance and construction will occur. The route system would remain in maintenance intensity levels 1 to 3 (intensity levels are defined in IM 2006-173 Roads and Trails Terminology Report). Routes rated intensity level 1 would be managed as primitive roads and routes rated intensity level 3 as roads. The maintenance levels of major access "stub routes" and parking points, may also be upgraded to level 5 as demand warrants. At this time, there is no timeline envisioned for such construction and maintenance because camping and other outdoor recreation activities are expected to remain primitive and undeveloped. In the Gateway RMZ, the route system generally would be maintained for two-wheel-drive passenger car access to developed recreation and interpretive sites. Up to three parking/staging areas (up to ten acres total) providing access to the Ajo Desert RMZ may be constructed on previously disturbed areas. Additionally, a 40-acre OHV/all-terrain vehicle (ATV) recreation area for unrestricted motocross bike riding and other motorized recreation activities will be located and built in a previously disturbed area near Ajo. Facilities may include two visitor-contact and three access points, with the area of new disturbance anticipated to total up to 10 acres. In the Gunsight Wash RMZ, facilities are expected to remain primitive; however, if demand warrants, the camping area will be upgraded to include a gravel-surfaced route system maintained for two-wheel-drive passenger car access (up to 3 miles in extent), gravel-surfaced camping sites with picnic tables and steel fire rings (up to 60 sites at 0.15-acre each, or 6.5 acres), two gravel-surfaced group areas (up to 10 acres total), and three two-vault toilets.

Arlington Community SRMA: To provide motorized loop opportunities, up to 25 miles of new roads may be constructed and approximately 60 miles of existing roads would be upgraded to maintenance level 5 to provide two-wheel-drive access. The remainder of the road system (approximately 140 miles) would be maintained at levels 1 to 3 to provide primitive motorized experiences. Additionally, up to two parking/staging areas would be developed with standard amenity facilities such as gravel-surfaced parking, picnic tables, and fire rings totaling 20 acres of new disturbance.

Buckeye Hills SRMA: In the Buckeye Hills East RMZ, RFD scenario varies substantially by alternative. In Alternative B, development would be directed toward motorized recreation activities. Although maintenance of the travel system is anticipated to remain at levels 1 to 3, up to six staging/parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables, and fire rings (up to 30 acres total) and two large staging areas not to exceed 10 acres each. In Alternatives C and E, development would be directed toward a balance of motorized and nonmotorized recreation activities. The route system would be maintained at levels 1 to 3; up to six staging/parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables, and fire rings (up to 30 acres total) and one large staging area not to exceed 10 acres. In Alternative D, development would be directed toward nonmotorized recreation activities. The route system would be maintained at levels 1 to 3, and up to four parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables, and fire rings (up to 20 acres total). In the Buckeye Hills West RMZ, maintenance of the travel system is anticipated to remain at levels 1 to 3, and all visitor facilities would be placed on the Maricopa County Buckeye Recreation Area Regional Park.

Extensive Recreation Management Area (ERMA): No new road construction, maintenance upgrades, or new facilities will be constructed except in response to visitor health and safety or conflicts with other resource uses.

Gila Bend Mountains SRMA: Ninety percent of the existing road system (325-465 miles) would be maintained at level 1, and 10-15 miles may be upgraded and maintained at level 5 to provide short access routes for two-wheel-drive vehicles. A campground and interpretive site at Sundad may be constructed, consisting of up to 2 miles of improved roads maintained at level 3 to 5, 20 campsites (0.15-acre each, 3 acres), picnic tables, and fire rings. The campground would be constructed on previously disturbed areas and total about 80 acres. The intent is for the Gila Mountains to remain generally undeveloped. In Alternative D, no facilities would be constructed except to resolve conflicts with other resource uses.

Saddle Mountain SRMA: In Alternative B, development would be directed toward a balanced mix of motorized and nonmotorized recreation activities. Up to six trails for nonmotorized uses (up to 20 miles total), 10 miles of new road construction to create motorized loop routes, three parking/staging areas (30 acres total), and eight primitive camping and interpretive sites (120 acres total) are envisioned. In Alternatives C and E, development would be directed toward nonmotorized recreation activities. Up to six trails for nonmotorized uses (up to 30 miles total) would be constructed, minimal upgrades to existing roads would occur to provide access, and up to four interpretive sites (60 acres total) are envisioned. In Alternative D, no facilities would be constructed except to resolve conflicts with other resource uses.

Lower Gila Historic Trails SRMA: In the Gila River RMZ, road construction and maintenance would be minimal, with up to 16 miles upgraded to allow for two-wheel-drive passenger car access. This access is anticipated to provide for public visitation and interpretation at the Butterfield West Site, nearby petroglyph sites, Oatman Mountain, and other attractions. Facilities would be modest in scope and scale and would be constructed on previously disturbed areas to the extent possible. Types of facilities generally would include unpaved parking, short (less than two 2 miles) visitor trails, interpretive and regulatory signs, picnic tables, and vault toilets if demand warrants. The total extent of these developments is not anticipated to be more than 8 acres. In the Painted Rock RMZ, road construction and maintenance would focus on the existing campground road system, totaling approximately 3 miles of gravel roads for two-wheel-drive passenger car access. If demand warrants, these roads and parking areas may be improved, including paving. Other routes in the Painted Rock RMZ are anticipated to remain at maintenance level 1 to 3. Expansion of the Painted Rock Petroglyph Campground is not anticipated, although the two group areas may be surfaced with gravel.

Painted Rock Mountains SRMA: If implemented, an undeveloped and unfacilitated motorized recreation opportunity would be offered. The designated motor vehicle travel system would consist of primitive roads maintained at levels 1 to 3, although up to 10 miles of roads may be maintained at level 5 to provide two-wheel-drive access. One parking/staging area would be developed, not to exceed 5 acres. Under Alternative D, four parking areas, three access routes, and nine campsites would be constructed. The facilities, to the extent possible, would be located on 10 previously disturbed acres.

San Tan Mountains SRMA: In Alternative B, the BLM would maintain existing facilities. No new construction of roads and facilities is envisioned. Under Alternatives C, D, and E, the area would be disposed of as an R lease.

In the SDNM

Under Alternatives B, C and E, there would be one 24-site campground, up to three visitor contact sites of 0.25-acre each, three group campsites, one equestrian corral, one OHV/ATV parking area,

one day use and interpretive area, and one 6-mile nonmotorized trail through Butterfield Pass, all situated in the Juan Bautista de Anza National Historic Trail (NHT) management zone. To the extent possible, these facilities would be located in areas previously disturbed; thus, the area of new disturbance would total approximately 6 to 10 acres. Under Alternative B, C and E, up to 12 additional 0.25-acre visitor contact sites or other small pullouts would be provided in the Desert Frontier Management Zone on the SDNM. These facilities would be located in areas previously disturbed to the extent possible; thus, the area of new disturbance would total up to 3 acres.

In Alternative D, up to 15 0.25-acre visitor contact stations and minimal pullouts would be provided. These facilities, to the extent possible, would be located in areas previously disturbed and may total up to 4 acres of new disturbance.

Water Resources

Land Use Authorizations. Population growth likely will cause increased demand for LUAs for roads, power lines, highways, and other developments that would increase surface disturbance and runoff from public lands. Disturbance and storm runoff are likely to increase erosion and sedimentation. Additional public land sources of water quality degradation are likely to come from spills of hazardous materials. As population and land use increase, the probability of hazard material incidents increases.

Minerals. Mineral exploration and development is probable in the Ajo and Globe-Miami areas and in other parts of the Decision Area. New roads are usually sources of dust and sediment, and increase the risk of erosion.

Travel & Recreation. Total miles of new road and acres of new disturbance from recreation activity will vary depending on the alternative, but potential future recreation development will include 20-50 miles of new low maintenance roads and 300-400 acres of new recreation sites. These disturbances will increase the probability of erosion and the quantity of sediment reaching the Gila River. Impacts will vary depending on the location and timing of new developments, and the level of maintenance.

Wild Horse & Burro Management

Wild horse and burro numbers are expected to remain low in the Planning Area. The Painted Rocks Herd Area will need occasional removal of nuisance animals around private farmlands.

Soil Resources

In the areas around metro Phoenix, Tonopah, Maricopa, and Gila Bend, the expected increase in population will result in an increase in recreation on public lands. This potentially could cause increased impacts to soil resources. These impacts would occur on the existing roads and trails, which will have accelerated erosion with increased use, and in adjacent areas due to cross-country travel.

Land Use Authorizations. Population growth likely will cause increased demand for LUAs for roads, power lines, highways, and other developments that would increase surface disturbance and runoff from public lands. Disturbance and storm runoff are likely to increase erosion and sedimentation.

Minerals. Mineral exploration and development is probable in the Ajo and Globe-Miami areas and in other parts of the Decision Area. New roads are usually sources of dust and sediment and increase the risk of erosion.

Recreation. Total miles of new roads and acres of new disturbance for campgrounds and interpretative areas vary depending on the alternative, but potential future recreation development will include 20-50 miles of new low-maintenance roads and 300-400 acres of new recreation sites. These disturbances will increase the probability of wind and water erosion. Quantities of soil loss will vary depending on the location and timing of new developments and the level of maintenance.

Special Designations

Areas of Critical Environmental Concern (ACECs). No RFD scenarios have been identified for ACECs.

National Byways. No RFD scenarios have been identified for National Byways.

National Historic Trails. The vision for the Juan Bautista de Anza NHT is that it will become a long–distance historic trail corridor with a recreational track along it that provides public access in several locations. The Anza NHT historic route segments will be marked so the public would be able to identify the recreational trail tread. The Anza NHT will include sites for interpretation, kiosks, interpretive signs, trails, overlooks, improved roads, parking areas of up to 1 acre, vehicle barriers, picnic tables, garbage facilities, restrooms, and other facilities that may be installed in or near the area in order to enhance the visitor experience.

Wilderness Areas. No RFD scenarios have been identified for wilderness areas.

Travel Management

For the Lower Sonoran, an RFD scenario for potential route designations has been created for all alternatives to give a basis for assessing impacts. The scenarios' mileage numbers are based on interagency route evaluations that were completed for the Lower Sonoran. These route mileage predictions are not displayed on a map in this plan to avoid confusion with the route designation process that will officially designate individual routes after the completion of this RMP.

Route by route analysis was done using the process identified in the Route Evaluation Methodology (Appendix S, *Route Evaluation Methodology & Impact Analysis* (p. 1311)). The analysis conducted created a hypothetical route network based on what allocations for each alternative would likely guide the travel system, during actual route designation after completion of this RMP. The individual route reports from this analysis are available to the public upon request and are on file for public review at the Phoenix District Office.

Incomplete or Unavailable Information

As mandated by 43 CFR 1502.22, agencies evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS must identify incomplete or unavailable information if that information is essential to a reasoned choice among alternatives. This Draft RMP/EIS is based on the best available data for each impact topic; however, there are few detailed resource surveys and inventories for the Planning Area. For example, little of the Planning Area has been surveyed for cultural or paleontological resources. Additionally, water quality and visitor use

information is very limited. In absence of such data, the best professional judgment of BLM resource specialists at the LSFO was used in the impact analysis.

4.2. IMPACTS ON AIR QUALITY

A qualitative comparison approach was selected for the analysis of impacts to air quality based on an understanding of the current air quality conditions within the Planning Area. The Planning Area includes some land within the Phoenix metropolitan nonattainment area for PM_{10}, O_3, and nonattainment with a maintenance plan for carbon monoxide (CO). The Planning Area also includes Globe-Miami (currently categorized as a nonattainment area for PM_{10} and an attainment with a maintenance plan for sulfur dioxide [SO_2]), and Ajo (currently categorized as a nonattainment for PM_{10}, and an attainment with a maintenance plan for SO^2). Active management to achieve air quality standards is occurring in the Phoenix metropolitan nonattainment area, all of Maricopa County, and parts of Pinal County. Various activities common to all management alternatives have the potential to impact the air quality status of the neighboring nonattainment areas. A landscape-scale analysis has thus been used to describe the impacts of the alternatives.

The method used in this air quality analysis involved identifying the pollutants associated with a proposed planning element, describing the relative magnitude of emissions changes, and indicating the extent of potential impacts. The primary air quality measure affected by activities on public lands is particulate matter, PM^{10} and $PM_{2.5}$. While significant across the landscape, CO, nitrogen dioxide (NO_2), volatile organic compounds, SO_2, and O_3 are unlikely to be substantially changed by actions on public lands. Impacts to air quality are assessed for the different alternatives to ensure that the overall air quality goal of managing use in the Decision Areas to be consistent with air quality standards is attained. It is important to note that regardless of the alternative selected, the BLM must continue to comply with applicable State and Federal air quality control regulations, as well as the identified air quality administrative actions.

4.2.1. Methods of Analysis

4.2.1.1. Indicators

The magnitude and extent of air quality effects resulting from the actions proposed in the five alternatives are too complex to quantify in a comprehensive fashion due to the wide variability of potential activities and the time of occurrence. Indicators of change in concentration of criteria pollutants in a given area are very difficult to apply because they require instruments for monitoring that often are unavailable. Therefore, impacts will be analyzed using qualitative terms. Some measurements of indicators that could be correlated with changes in the qualitative terms when sufficient data becomes available are:

- Measured concentration of criteria pollutants (when available)
- Volume of traffic on unpaved roads in the analysis area
- Miles of road constructed in fine textured soils
- Proportion of areas with fine textured soils that lack surface cover (vegetation, desert pavement, or cryptogamic crusts)
- Changes in visibility

4.2.1.2. Assumptions

No assumptions were used to analyze impacts from program areas on air quality.

4.2.1.3. Reasonably Foreseeable Development Scenarios

No indicators other than the RFDs identified in 4.1.6 were used to analyze impacts from program areas on air quality.

4.2.1.4. Program Areas with no Impacts on Air Quality

No impacts to air resources management are anticipated for management actions relating to the following program areas:

- Air Quality
- Cave and Cave Resources Management
- Cultural and Heritage Resource Management
- Paleontological Resource Management
- Social and Economic Concerns
- Vegetation Resource Management
- Water Resource Management
- Wild Horse and Burro Management

4.2.1.5. Qualitative Intensity Scale

The intensities of impacts are described using the following definitions:

Negligible: Changes in the concentration of criteria pollutants, changes in the volume of traffic in the Decision Areas, or changes in other indicators would remain below the level of detection. Changes in concentration of criteria pollutants over a prescribed period would be below the level of detection.

Minor: Changes in concentrations of criteria pollutants, changes in the volume of traffic in the Decision Areas, or changes in other indicators would be small, as would the area affected. If mitigation is needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.

Moderate: Changes in the concentration of criteria pollutants, changes in the volume of traffic in the Decision Areas, or changes in other indicators would be readily apparent and would affect a relatively wide area. Mitigating measures probably would be necessary to offset adverse effects and would likely be successful.

Major: Changes in concentrations of criteria pollutants, changes in the volume of traffic in the Decision Areas, or changes in other indicators would be readily apparent and long-term and

would substantially change the indicators over a large area. Extensive mitigation measures to offset adverse effects would be needed, but their success could not be guaranteed.

4.2.2. COMMON TO ALL ALTERNATIVES

4.2.2.1. Both Decision Areas

From Wildland Fire Management on Air Quality

Impacts from fire and fuels management would not differ by alternative but may cause temporary declines in air quality from particulate emissions and smoke. Prescribed burn plans are reviewed by the BLM and the Arizona Department of Environmental Quality (ADEQ). On high-pollution days, the BLM would not conduct prescribed burns. Impacts would be minor.

4.2.2.2. Lower Sonoran

From Minerals Management on Air Quality

Mining and mineral extraction activities in the Lower Sonoran would impact air quality in the immediate vicinity of related surface disturbing activities. Such impacts include particulates generated from blasting, excavation, loading, and hauling activities. For mining operations other than casual/recreational mining, plans of operation must be submitted by the claimant and reviewed by the BLM. Integral to these plans are requirements that all applicable Federal, State, and local regulation for air pollution control are met, such as requirements for dust control. Impacts would be minor.

4.2.2.3. Sonoran Desert National Monument

From Minerals Management on Air Quality

The Monument proclamation prohibits mineral development within the Monument's boundaries. As a result, the potential air pollutant emissions (i.e. particulate matter created from surface disturbing activities) from mineral development activities in SDNM would be eliminated. Therefore, no impacts are anticipated.

4.2.3. ALTERNATIVE A (NO ACTION)

4.2.3.1. Both Decision Areas

No unique impacts are identified for both the Decision Areas under Alternative A.

4.2.3.2. Lower Sonoran

From Lands & Realty Management on Air Quality

Surface disturbance resulting from utility-scale renewable energy development and increased use of utility corridors and associated LUAs could result in short-term increases in particulate matter emissions, particularly during construction and maintenance activities. Alternative A proposes 10 designated utility corridors in the Lower Sonoran, most of which are 1-mile wide. Because best management practices (BMPs) and dust control during construction would be used to control these emissions, impacts from utility corridor use on nonattainment areas would be negligible in the short-term. However, long-term ground disturbance from subsurface pipelines may result in loss of vegetation, increased erosion, and subsequent increases in particulate emissions. Impacts would be minor.

From Livestock Grazing on Air Quality

Under the No Action Alternative, all public lands in the Lower Sonoran would be open for grazing with the exception of the Cameron Allotment. Livestock movement would have a negligible impact on air quality, as any dust emissions produced by these activities would result in localized, short-term impacts.

Surface disturbance from developing or maintaining livestock developments or other small-scale construction and ground disturbing activities such as rangeland developments would cause localized, short-term increases in particulate emissions and an associated short-term decline in air quality, but would be unlikely to cause regional air quality thresholds to be exceeded. Impacts would be minor.

From Priority Wildlife Species and Habitat Management on Air Quality

Surface disturbance from developing or maintaining wildlife waters would cause localized, short-term increases in particulate emissions and an associated short-term decline in air quality, but would be unlikely to cause regional air quality thresholds to be exceeded. Air quality would be expected to decline over the short term as a result of increased dust associated with the construction of wildlife water developments or trucks supplying water to the developments in the Decision Area. Impacts would be negligible.

From Recreation Management on Air Quality

Motorized recreation is expected to grow along with population growth, which would increase the likelihood that regional air quality thresholds would be exceeded. Areas in close proximity to the urban interface are most likely to be affected. Because Alternative A does not include decisions to address and manage this recreation use, namely allocating locations for intensive motorized recreation use or requiring specific mitigation for dust control, uncontrolled recreation under this alternative would result in increased dust emissions, potentially causing particulate matter thresholds to be exceeded. High speeds typical in OHV races would result in increased CO and particulate matter pollution; however, these events typically occur on weekends, when air pollution across the nonattainment areas is within regulatory limits (Maricopa Association of Governments [MAG] 2008). It is thus unlikely that OHV races would cause air quality thresholds to be exceeded. Impacts would range from minor to moderate.

From Special Designations Management on Air Quality

Alternative A would retain the 8,900-acre Coffeepot Botanical area of critical environmental concern (ACEC) designation in the Lower Sonoran, which has restrictions on air pollutant emissions, including avoiding surface-disturbing activities and restricting motor vehicle use. Air pollutant emissions in the ACEC would thus be reduced. Impacts would be negligible.

From Travel Management on Air Quality

Motorized travel on 1,670 miles of existing road designated open for travel on 819,500 acres would contribute to CO. Travel on unpaved routes would contribute to PM_{10} emissions in the form of fugitive dust. Under the No Action Alternative, 280 miles of routes that would be open for motorized use within PM_{10} nonattainment areas. (See Table 4.2, "Miles of Routes in PM_{10} Nonattainment Areas for the Lower Sonoran" (p. 389).)

Table 4.2. Miles of Routes in PM_{10} Nonattainment Areas for the Lower Sonoran

Route Type	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Open	280	200	170	120	165
Closed	0	0	60	110	50
Seasonally Limited	0	35	0	0	35
Administrative Use only	0	10	10	15	15
Single-Track	0	35	30	0	35
All-Terrain Vehicle (ATV)	0	0	10	0	0
Nonmotorized	0	0	0	35	15

Dust emissions produced by utilization of nonmotorized routes (e.g., hiking and equestrian activity) would result in localized, short-term negligible impacts. In the long term, as population growth leads to increased recreation, nonmotorized trail development, both planned and user-created, would contribute to the production of dust in localized areas. Impacts would range from minor to moderate.

From Visual Resource Management on Air Quality

Assuring projects, uses, and activities are compatible for management of visual resources under the No Action Alternative may require restoration of disturbed areas to protect visibility and scenic quality. This would decrease the likelihood of particulate emissions from erosion and dust, especially in visual resource management (VRM) Class I and Class II areas. Alternative A would allocate 91,800 acres in VRM Class I and 116,300 acres in Class II in the Lower Sonoran. In the long term, vegetation restoration projects and protection of scenic quality in these areas would decrease particulate matter emissions due to reduced surface disturbance and erosion of the soil. Overall impacts would be negligible.

4.2.3.3. Sonoran Desert National Monument

From Lands & Realty on Air Quality

Surface disturbance resulting from the development and increased use of utility corridors and associated LUAs could result in short-term increases in particulate matter emissions, particularly during construction and maintenance activities. Three 1-mile wide utility corridors traversing portions of the SDNM would be designated under the No Action Alternative. Surface disturbance

resulting from use of these corridors could result in increased particulate matter emissions. Because BMPs and dust control during construction would be used to control these emissions, impacts from utility corridor usage on nonattainment areas would be negligible in the short-term. On the other hand, long-term ground disturbance from subsurface pipelines may result in loss of vegetation, increased erosion, and subsequent particulate emissions. The vulnerability of soils to disruption would be assessed on a case-by-case basis for projects in the Sand Tanks Mountains area, which would help to keep future emissions below required thresholds. Impacts would be minor.

From Livestock Grazing on Air Quality

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except that they would be much less extensive in the Monument because it is largely closed to grazing, e.g., allotments south of I-8 and areas determined unavailable to grazing by the grazing compatibility analysis. (See Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039).) Impacts in areas where grazing would be allowed in the SDNM would be minor.

From Priority Wildlife Species and Habitat Management on Air Quality

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Recreation Management on Air Quality

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Special Designations Management on Air Quality

Alternative A would retain the 3,500-acre Vekol Valley ACEC in the SDNM, which include requirements that would reduce air pollutant emissions, including avoiding surface-disturbing activities and restricting motor vehicle use. Air pollutant emissions in these areas would thus be reduced compared to areas outside special designations. Impacts would be negligible.

From Travel Management on Air Quality

Under Alternative A in the SDNM, motorized travel on approximately 570 mile of existing road designated open for travel on 325,200 acres would contribute to CO. Travel on unpaved routes would also contribute to PM_{10} emissions in the form of fugitive dust. In addition, 280 miles of roads would be designated open for motorized use within PM_{10} nonattainment areas. (See Table 4.3, "Miles of Routes in PM_{10} Nonattainment Areas for the SDNM" (p. 390)) Impacts would be minor to moderate.

Table 4.3. Miles of Routes in PM_{10} Nonattainment Areas for the SDNM

Route Type	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Open	5	4.7	2.1	1.1	1.7
Closed	0	0.3	2.9	3.4	3.3
Seasonally Limited	0	0	0	0	0
Administrative Use only	0	0	0.6	0.6	0
Single-Track	0	0	0	0	0

Route Type	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
All-Terrain Vehicle (ATV)	0	0	0	0	0
Nonmotorized	0	0	0	0	0

From Visual Resources on Air Quality

Assuring projects, uses, and activities are compatible for management of visual resources may require restoration of disturbed areas to protect visibility and scenic quality. This would decrease the likelihood of particulate emissions from erosion and dust, especially in (VRM) Class I and II areas. Alternative A would allocate 158,700 acres in Class I and 91,600 acres in Class II in the SDNM. In the long term, vegetation restoration projects and the protection of scenic quality in these areas would decrease particulate matter emissions as a result of reduced surface disturbance and erosion of the soil. Impacts would be negligible.

4.2.4. ALTERNATIVE B

4.2.4.1. Both Decision Areas

No unique impacts are identified for both Decision Areas under Alternative B.

4.2.4.2. Lower Sonoran

From Lands & Realty on Air Quality

Impacts from lands and realty actions in the Lower Sonoran would be similar to Alternative A; however, overall impacts would be reduced under Alternative B because specific decisions would be in place to manage and control surface disturbing activities to lessen particulate matter release, particularly on roadways associated with such activities. Adverse impacts would be minor.

From Livestock Grazing on Air Quality

Impacts nonmotorized would be the same as described under Alternative A, but not as widespread.

From Priority Wildlife Species and Habitat Management on Air Quality

Impacts would be similar to those described under Alternative A; with the exception that local air quality would experience a short-term minor decline due to increased dust (particulate matter) associated with the construction of additional wildlife water developments. Overall impacts would remain negligible. From Recreation Management on Air Quality Compared to Alternative A, construction of more recreation facilities to manage recreational uses under Alternative B may result in more ground disturbance and a greater, though still small, chance to cause regional air quality thresholds to be exceeded. Impacts would range from minor to moderate.

From Special Designations on Air Quality

Impacts would be the same as those described under Alternative A for the SDNM.

From Travel Management on Air Quality

Under this alternative, recreation uses would be managed with an emphasis on motorized recreation, which would likely result in similar air pollutant emissions as described under Alternative A. On the other hand, because Alternative B requires management of motorized recreation, air quality would not deteriorate over the long term compared to Alternative A.

Motor vehicles would be required to stay on designated roads on 828,400 acres of land within the Lower Sonoran and 101,800 acres would be closed under Alternative B, with approximately 1,639 miles of routes available for vehicle travel (1,241 miles open, 180 miles limited seasonally, 35 miles limited to single track travel, 10 miles limited to ATVs, and 8 miles for administrative use only). Seventy miles of routes would be closed.

While motorized travel on routes available for such use would contribute to CO and travel on such routes that are unpaved routes would contribute to PM_{10} emissions in the form of fugitive dust, such impacts to air quality under Alternative B would be reduced compared to Alternative A due 55 miles of roads being closed in the Lower Sonoran. In addition, Alternative B would result in the reduction of 80 miles of routes open for public use within nonattainment areas, which would decrease emissions in the form of fugitive dust in such nonattainment areas compared to Alternative A (see Table 4.3, "Miles of Routes in PM_{10} Nonattainment Areas for the SDNM" (p. 390)). Dust mitigation measures such as establishing speed limits, adding dust reducing agents, seasonal closure, or year round closure could also be implemented to minimize PM_{10} emissions under Alternative B, further reducing the potential for adverse impacts.

Under Alternative B, a 40-acre site in the Ajo Block, which is on the northern edge of a PM_{10} nonattainment area in the Lower Sonoran, would be limited to ATV and motorcycle use. Such use in this area may cause regional air quality thresholds to be exceeded, particularly during high wind events. In order to ensure that the area maintains compliance with the air quality standards, dust mitigation measures, such as restrictions on use during dry and/or windy periods, and restrictions on allowable speeds and use of dust suppressants would be implemented in this area, thus reducing the intensity of adverse impacts. Impacts from high speeds described under Alternative A, such as during OHV races, would be eliminated as speed event permits would not be authorized under Alternative B. Overall, impacts would range from minor to moderate.

From Visual Resources on Air Quality

Impacts would be similar to those described under Alternative A, except beneficial impacts from VRM Class II areas would be more widespread in the Lower Sonoran due to an increase of VRM Class II acres by 51,400 under Alternative B. In addition, Alternative B would place an emphasis on active vegetation restoration projects with specific restoration goals, which would likely result in larger areas being rehabilitated more quickly, thus having a greater ability to decrease particulate emissions compared to Alternative A. Overall, impacts would remain negligible.

4.2.4.3. Sonoran Desert National Monument

From Lands & Realty on Air Quality

Impacts would be the same as those described under Alternative A for SDNM. From Livestock Grazing on Air Quality Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Livestock Grazing Management on Air Quality

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on Air Quality

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Recreation Management on Air Quality

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Special Designations on Air Quality

Impacts from removal of the special designation for the Vekol Valley ACEC in the SDNM would be negligible as the area would still be managed to meet the requirements of the Monument proclamation.

From Travel Management on Air Quality

Impacts would be similar to those described in Alternative A for the Lower Sonoran, except that and the extent of impacts would be reduced due to 45 more miles of roads being closed in the SDNM under Alternative B. Overall, impacts would remain in the minor to moderate range.

From Visual Resources on Air Quality

Impacts from assigning the SDNM to the various VRM classes would be similar to those described under Alternative A, although beneficial impacts would be more extensive under Alternative B due to an increase of VRM Class II areas by 127,400 acres, decreasing the likelihood of particulate emissions from erosion and dust in Class I areas. In addition, placing an emphasis on active vegetation restoration projects with specific restoration goals under Alternative B would result in larger areas being rehabilitated more quickly, leading to decreased particulate emissions compared to Alternative A. In addition, requiring restoration methods until the soil is stabilized, 60 percent of the expected vegetation on the site is present and established, and the area meets the requirements in the designated VRM class would further decrease the possibility of particulate emissions. There would be negligible to no adverse impacts under this alternative.

4.2.5. ALTERNATIVE C

4.2.5.1. Both Decision Areas

No unique impacts are identified for both Decision Areas under Alternative C.

4.2.5.2. Sonoran Desert National Monument

From Lands & Realty on Air Quality

While impacts from utility-scale renewable energy development, the use of utility corridors, and associated LUAs that could result in short-term increases in particulate matter emissions would be similar to Alternative B, overall intensity of adverse impacts would be reduced under Alternative C due to managing and controlling surface disturbing activities to lessen particulate matter release. In addition, the extent of impacts would be reduced under Alternative C due to identifying or allocating WHAs, SCRMAs, ACECs, and lands managed to protect wilderness characteristics as avoidance areas for utility-scale renewable energy development and other LUAs that are outside designated utility corridors. Overall, impacts would remain minor.

From Livestock Grazing on Air Quality

Impacts would be the same as described under Alternatives A, just less widespread, as there are more areas closed to grazing under this alternative.

From Priority Wildlife Species and Habitat Management on Air Quality

In the Lower Sonoran, allocating four WHAs totaling 425,900 acres and wildlife movement corridors, which include restrictions on surface disturbance activities or require additional mitigation for surface-disturbing activities, would reduce air pollutant emissions. As a result, adverse impacts to air quality would decrease in these areas compared to Alternatives A and B. Adverse impacts from developing or maintaining wildlife waters described under Alternative A would be reduced as no new wildlife waters would be developed under Alternative C. Impacts would be negligible.

From Recreation Management on Air Quality

Managing recreation uses under Alternative C with a balance between motorized and nonmotorized recreation, while minimizing impacts on sensitive natural and cultural resources, would potentially reduce motorized recreation opportunities in the Lower Sonoran. This, in turn, could result in less localized air quality impacts related to such use compared to alternatives A and B. Impacts from nonmotorized (hiking and equestrian) use would be similar to Alternatives A and B, albeit slightly reduced due to the use of designated access points that would reduce the proliferation of user-created trails that destabilize the soil and make it vulnerable to wind erosion. Overall, impacts from all forms of recreation use under Alternative C would range from minor to moderate.

From Special Designations on Air Quality

Impacts from ACEC allocation would be similar to those described under Alternative A, except that beneficial impacts would be more widespread due to over seven times more acres being within ACEC designation in the Lower Sonoran under Alternative C. While benefits would be more intense within the ACEC, overall beneficial impacts would remain negligible.

From Travel Management on Air Quality

While motorized travel on routes within the Lower Sonoran would contribute to CO and travel on unpaved routes would contribute to PM_{10} emissions in the form of fugitive dust, such impacts to air quality would be reduced under Alternative C compared with Alternative A and B because 123 and 80 more miles, respectively, would be closed to motorized use in the Lower Sonoran. In addition, compared to Alternatives A and B, 110 and 80 fewer miles of routes, respectively, would remain open for public use within the PM_{10} nonattainment areas under Alternative C (see Table 4.3, "Miles of Routes in PM_{10} Nonattainment Areas for the SDNM" (p. 390)). This would decrease emissions in the form of fugitive dust within nonattainment areas compared to Alternatives A and B. Impacts from active management practices that would be instituted in OHV recreation areas would be similar to those described under Alternative B, thus further reducing impacts to air quality. Impacts from a 40-acre ATV and motorcycle area and OHV vehicle races would also be similar to Alternative B, although fewer areas would be available for vehicle races under Alternative C, thus reducing the extent of impacts. In addition, Alternative C would close washes with suitable cactus ferruginous pygmy owl habitat to OHV use for 6 months of the year, which would reduce air pollutant emissions in this localized area during this time. Impacts would range from minor to moderate.

From Visual Resources on Air Quality

Compared to Alternatives A and B, Alternative C would increase VRM Class I and Class II acreage, which would require restoration of disturbed areas to protect visibility and scenic quality. This would decrease the likelihood of particulate emissions from erosion and dust on an additional 271,500 acres over Alternative A and 322,900 acres over Alternative B in the Lower Sonoran. Overall, impacts would remain negligible.

4.2.5.3. Sonoran Desert National Monument

From Lands & Realty on Air Quality

While impacts from utility-scale renewable energy development, the use of utility corridors, and associated LUAs that could result in short-term increases in particulate matter emissions would be similar to Alternative B, overall intensity of adverse impacts would be reduced under Alternative C due to managing and controlling surface disturbing activities to lessen particulate matter release. In addition, the extent of impacts would be reduced under Alternative C due to identifying or allocating WHAs, SCRMAs, ACECs, and lands managed to protect wilderness characteristics as avoidance areas for utility-scale renewable energy development and other LUAs that are outside designated utility corridors. Overall, impacts would remain minor.

From Livestock Grazing on Air Quality

Impacts would be the same as described under Alternatives A, just less widespread, as there are more areas closed to grazing under this alternative.

From Priority Wildlife Species and Habitat Management on Air Quality

In the Lower Sonoran, allocating four WHAs totaling 425,900 acres and wildlife movement corridors, which include restrictions on surface disturbance activities or require additional mitigation for surface-disturbing activities, would reduce air pollutant emissions. As a result,

adverse impacts to air quality would decrease in these areas compared to Alternatives A and B. Adverse impacts from developing or maintaining wildlife waters described under Alternative A would be reduced as no new wildlife waters would be developed under Alternative C. Impacts would be negligible.

From Recreation Management on Air Quality

Managing recreation uses under Alternative C with a balance between motorized and nonmotorized recreation, while minimizing impacts on sensitive natural and cultural resources, would potentially reduce motorized recreation opportunities in the Lower Sonoran. This, in turn, could result in less localized air quality impacts related to such use compared to alternatives A and B. Impacts from nonmotorized (hiking and equestrian) use would be similar to Alternatives A and B, albeit slightly reduced due to the use of designated access points that would reduce the proliferation of user-created trails that destabilize the soil and make it vulnerable to wind erosion. Overall, impacts from all forms of recreation use under Alternative C would range from minor to moderate.

From Special Designations on Air Quality

Impacts from ACEC allocation would be similar to those described under Alternative A, except that beneficial impacts would be more widespread due to over seven times more acres being within ACEC designation in the Lower Sonoran under Alternative C. While benefits would be more intense within the ACEC, overall beneficial impacts would remain negligible.

From Travel Management on Air Quality

While motorized travel on routes within the Lower Sonoran would contribute to CO and travel on unpaved routes would contribute to PM_{10} emissions in the form of fugitive dust, such impacts to air quality would be reduced under Alternative C compared with Alternative A and B because 123 and 80 more miles, respectively, would be closed to motorized use in the Lower Sonoran. In addition, compared to Alternatives A and B, 110 and 80 fewer miles of routes, respectively, would remain open for public use within the PM_{10} nonattainment areas under Alternative C (see Table 4.3, "Miles of Routes in PM_{10} Nonattainment Areas for the SDNM" (p. 390)). This would decrease emissions in the form of fugitive dust within nonattainment areas compared to Alternatives A and B. Impacts from active management practices that would be instituted in OHV recreation areas would be similar to those described under Alternative B, thus further reducing impacts to air quality. Impacts from a 40-acre ATV and motorcycle area and OHV vehicle races would also be similar to Alternative B, although fewer areas would be available for vehicle races under Alternative C, thus reducing the extent of impacts. In addition, Alternative C would close washes with suitable cactus ferruginous pygmy owl habitat to OHV use for 6 months of the year, which would reduce air pollutant emissions in this localized area during this time. Impacts would range from minor to moderate.

From Visual Resources on Air Quality

Compared to Alternatives A and B, Alternative C would increase VRM Class I and Class II acreage, which would require restoration of disturbed areas to protect visibility and scenic quality. This would decrease the likelihood of particulate emissions from erosion and dust on an

additional 271,500 acres over Alternative A and 322,900 acres over Alternative B in the Lower Sonoran. Overall, impacts would remain negligible.

4.2.6. ALTERNATIVE D

4.2.6.1. Both Decision Areas

No unique impacts are identified for both Decision Areas under Alternative D.

4.2.6.2. Lower Sonoran

From Lands & Realty on Air Quality

Impacts from utility-scale renewal energy developments and utility corridors would be similar to those described under Alternative C, although adverse impacts would not be as widespread due to more acres identified as exclusion and avoidance areas for utility-scale renewable energy development and LUAs outside of designated utility corridors. Consequently, adverse impacts associated with increased emissions from surface-disturbing activities such as construction and maintenance would be minimal compared to the other alternatives, therefore, impacts decrease to negligible to minor levels.

From Livestock Grazing on Air Quality

Under Alternative D, all allotments would be closed to grazing once current permits expire, existing wildlife waters would be removed. As a result, Alternative D would result in the least amount of impacts to air quality in the form of localized, short-term particulate emissions due to surface-disturbing activities compared to the other alternatives. Adverse impacts would be reduced to negligible.

From Priority Wildlife Species and Habitat Management on Air Quality

Impacts would be similar to those described under Alternative C, although benefits from WHAs would be slightly more extensive due to 17,700 more acres being assigned within the Gila Bend WHA under Alternative D in the Lower Sonoran. Impacts would be negligible.

From Recreation Management on Air Quality

Managing recreational uses under Alternative D for sustainable and compatible levels of motorized and nonmotorized activities, while enhancing nonmotorized recreation and emphasizing the conservation and preservation of natural and cultural resources, would result in the least motorized activity taking place in the Decision Area. This would reduce localized air quality impacts from motorized recreational use more than Alternatives A, B, and C. Adverse impacts from recreational activities would be reduced to minor.

From Special Designations on Air Quality

Impacts from ACEC allocation would be similar to those described under Alternative A, although the extent of impacts would be much greater as approximately 30 times more acres in the Lower Sonoran would be under ACEC designation. While impacts would be more extensive, overall impacts would remain negligible.

From Travel Management on Air Quality

Alternative D specifies the fewest miles of routes open and most miles of routes closed to motorized vehicle use among all the alternatives, which would decrease the likelihood of particulate emissions from vehicles use. In addition, compared to Alternatives C, 50 fewer miles would be designated as open within the nonattainment areas (see Table 4.2, "Miles of Routes in PM_{10} Nonattainment Areas for the Lower Sonoran" (p. 389)), which would further decrease emissions in the form of fugitive dust within nonattainment areas; more so than under any other alternative. Impacts from dust mitigation measures would be the same as described under Alternative B. Closing washes with suitable cactus ferruginous pygmy owl habitat would have impacts similar to those described under Alternative C, but the reduced emissions would be extended to nine months, and some washes would be closed entirely, which would increase the extent of beneficial impacts. Impacts from a 40-acre ATV and motorcycle use area in the Ajo Block area of the Lower Sonoran would be the same as under Alternative B. Localized, temporary impacts from OHV races would be reduced compared to Alternatives B and C because fewer areas would be available for this use. Overall adverse impacts from transportation under Alternative D would be reduced to minor.

From Visual Resources on Air Quality

Alternative D would allocate the most acreage to VRM Class I and II in the Lower Sonoran among all the alternatives. In the long term, protection of scenic quality in VRM Class I and II areas by reducing surface disturbance would decrease particulate matter emissions over a broader area under Alternative D than under any of the other alternatives. Although beneficial impacts would be more extensive, they would remain negligible.

4.2.6.3. Sonoran Desert National Monument

From Lands & Realty on Air Quality

Allocating the entire Monument as an LUA exclusion area with no multiuse utility corridors would minimize adverse impacts associated with increased emissions from surface-disturbing activities such as construction and maintenance. Overall, adverse impacts would be reduced to negligible.

From Livestock Grazing on Air Quality

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on Air Quality

Impacts related to wildlife water development would be the same as those described under Alternative C for the Lower Sonoran.

From Recreation Management on Air Quality

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

From Special Designations on Air Quality

Impacts would be the same as those described under Alternative C for the SDNM.

F*rom Travel Management on Air Quality*

Alternative D specifies the least miles of routes open and greatest miles of routes closed to motorized vehicle use, which would decrease the likelihood of particulate emissions from vehicles use. Speed events would be prohibited in the SDNM, eliminating such impacts to air quality in the Monument. Overall, adverse impacts would be reduced to minor. From Visual Resources on Air Quality Impacts would be similar to those described for Alternative D for the Lower Sonoran due to more lands in the Decision Area being assigned to VRM Class I and VRM Class II compared to the other alternatives. Although beneficial impacts would be more extensive, they would remain negligible.

From Visual Resources on Air Quality

Impacts would be similar to those described for Alternative D for the Lower Sonoran due to more lands in the Decision Area being assigned to VRM Class I and VRM Class II compared to the other alternatives. Although beneficial impacts would be more extensive, they would remain negligible.

4.2.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.2.7.1. Both Decision Areas

No unique impacts are identified for both Decision Areas under Alternative E.

4.2.7.2. Lower Sonoran

From Lands & Realty on Air Quality

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

From Livestock Grazing Management on Air Quality

Impacts from grazing in the Lower Sonoran would be similar to those described under Alternative A.

From Priority Wildlife Species and Habitat Management on Air Quality

Impacts from WHA designation in the Lower Sonoran would be the same as identified under Alternative D. Impacts to air quality would be less intense compared to Alternative B due to decreased dust associated with the construction of one wildlife water development per section

or trucks supplying water to the developments in the Decision Areas. Impacts to air quality would be more intense compared to Alternative C and D under Alternative E due to the possible development of additional wildlife waters, although increased dust associated with construction would be mitigated, temporary, and localized. Impacts would be negligible.

From Recreation Management on Air Quality

Impacts from recreation uses in the Lower Sonoran would be similar to those described under Alternative C.

From Special Designations on Air Quality

Beneficial impacts from ACEC designations in the Lower Sonoran would be similar to those described under Alternative D, except that they would be less widespread due to 155,100 fewer acres within an ACEC designation. Impacts would remain negligible.

From Travel Management on Air Quality

Air quality impacts associated with travel on roads would be similar to Alternative C Decision Area due to similar miles of routes open, limited, and closed. In addition, compared to Alternatives C, 50 fewer miles would be designated as open within the nonattainment areas nonattainment (see Table 4.2, "Miles of Routes in PM_{10} Nonattainment Areas for the Lower Sonoran" (p. 389)), which would slightly decrease emissions in the form of fugitive dust within nonattainment areas nonattainment. Impacts from dust mitigation measures and a 40-acre ATV and motorcycle use area in the Lower Sonoran would be the same as described under Alternative B. Impacts from closing washes and OHV races would be similar to those described under Alternative C. Overall, impacts would remain in the minor to moderate range.

From Visual Resources on Air Quality

Impacts from assuring projects, uses, and activities are compatible with management of visual resources would be similar to Alternative B, although beneficial impacts would be more widespread as Alternative E would allocate 172,300 more acres to VRM Class II. Overall impacts would remain negligible.

4.2.7.3. Sonoran Desert National Monument

From Lands & Realty on Air Quality

Impacts would be the same as those described under Alternative D for the SDNM.

From Livestock Grazing on Air Quality

Impacts would be the same as those described under Alternative E for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on Air Quality

Impacts would be the same as those described under Alternative E for the Lower Sonoran.

From Recreation Management on Air Quality

Impacts would be the same as those described under Alternative C for the SDNM.

From Special Designations on Air Quality

Impacts would be the same as those described under Alternative C for the SDNM.

From Travel Management on Air Quality

Air quality impacts associated with travel on roads would be similar to Alternative C in the SDNM due to similar miles of routes open, limited, and closed., with impacts remaining in the minor to moderate range.

From Visual Resources on Air Quality

In the SDNM, Alternative E would also allocate VRM classes similarly to Alternative B, with 157,500 acres in Class I and 328,900 acres in Class II, although no acreage would be allocated to VRM Class III. Alternative E would thus decrease the likelihood of particulate emissions from erosion and dust in SDNM compared to Alternative A because it would allocate 237,000 more acres to VRM Class II. However, even though Alternative E allocates more acreage to VRM Class II than the other alternatives, Alternative E would increase the likelihood of particulate emissions compared to Alternatives C and D because it would allocate 136,100 and 321,800 fewer acres, respectively, to VRM Class I. Impacts would be negligible.

4.3. IMPACTS ON CAVE RESOURCES

Although no caves or cave resources have been identified in the Decision Areas, Paleozoic limestone outcrops in the Sand Tank Mountains may potentially contain caves and cave resources. In addition, two lava tubes located in the Sentinel Plain area of the Lower Sonoran are considered cave resources in this section. In the event caves or cave resources are discovered within the Decision Areas, management actions to protect these resources and any associated water resources would be implemented.

Impacts to caves and cave resources may take various forms. The discovery of new caves may generate recreational opportunities for spelunking or for development as a tourist attraction. The discovery may also expose the habitat of threatened or endangered species (e.g. bats) to impacts by humans. Additionally, although less obvious to the casual observer, modification or damage to soils or watersheds may impact caves by introducing sediment or contaminated water to the cave.

Due to the fact that limited caves and cave resources have been identified in the Planning Area, the impacts on caves and cave resources are not discussed in detail. During implementation or project-specific planning, the BLM would evaluate proposed actions for site-specific effects on natural resources, including caves and cave resources, focusing on management actions that could disturb or damage soils, watersheds, outcrops or structure at or near cave openings.

4.4. IMPACTS ON CULTURAL & HERITAGE RESOURCES

The extent of impacts on cultural resources among the alternatives varies in regard to three primary factors: (1) the types and intensities of uses of public land, especially the extent of ground disturbing activities, (2) the extent of areas specially designated to protect cultural resources, and (3) location of uses. Some impacts on cultural resources result from ground disturbance such as cross-country OHV travel, wildfires, unauthorized collection, vandalism, trash accumulation, and trampling due to human or livestock activities. Other impacts, including permanent destruction of site features, result from recreational target shooting activities, especially those that are intensive, repetitive, and concentrated. Under all alternatives, cultural resources would continue to be affected by natural weathering and erosion processes.

Cultural resources are subject to an active discovery process, so additional cultural resources may be found on public lands, but quantity and quality cannot be properly evaluated until discovered. The impacts described below would occur only if cultural resources are present in the area affected by the impact.

The BLM reviews activities and other authorized uses of the public lands, including route designation, pursuant to Section 106 of the National Historic Preservation Act (NHPA).

Section 106 reviews assess impacts on cultural resources, which may include consultation with the State Historic Preservation Office (SHPO) and other interested agencies and parties. Proposed activities and uses are designed to avoid adverse effects on cultural resources eligible for the National Register of Historic Places (NRHP) and to implement measures to reduce or mitigate adverse effects that cannot be reasonably avoided.

Management decisions for resources found to impact cultural and heritage resources include priority wildlife species and habitat management, vegetation resources, cultural and heritage resources, watershed and soil resources, visual resources, livestock grazing, recreation, travel management, lands and realty, energy and minerals, and special designation areas. Actions intended to maintain vegetation, protect or stabilize soils, or stop erosion, also would generally protect cultural resources. Ground disturbing actions associated with these resources, including installation of fencing, facilities, erosion control devices or similar activities, or removal of invasive species could have localized impacts to cultural resources. Many uses, e.g. LUAs and livestock facilities, may have secondary effects because they create new vehicle access, which often leads to inadvertent damage from vehicle traffic and increases in the threat of vandalism of fragile cultural resources. By altering the local environment, these developments also can affect the integrity of nearby cultural resources if their settings are important aspects of their historical values. Activities that are not subject to the permitting process, such as dispersed recreation use, also have the potential to disturb or permanently damage cultural resources.

In addition, cultural resources may be affected by certain actions associated with wildland fire management, public safety, and hazardous materials management. These impacts would not vary substantially by alternative and are described in under the section common to all alternatives.

4.4.1. METHODS OF ANALYSIS

4.4.1.1. Indicators

The assessment of impacts to cultural and heritage resources is based on specific indicators that allow specialist to qualify them. Provenance or context is the element that gives the features and artifacts meaning and a place in history. A cultural site has full integrity when its elements or attributes remain in place as originally deposited. Cultural resources are evaluated for their integrity of location, design, setting, materials, workmanship, feeling, and association. The following list describes many of the types of impacts to cultural and heritage resources that diminish or destroy integrity:

- Impacts on site integrity — These impacts to surrounding conditions result from circumstances or events that affect the site's context:

1. Damage to the arrangement or structure of features,
2. Artifacts missing or rearranged,
3. Site elements rearranged,
4. Ground surface disturbed,
5. Subsurface cultural deposits disturbed.

- Impacts on site setting/visual integrity — These types of site damage affect relationships of artifacts or features within a site:

1. Damage to physical environment of site,
2. Damage to historic sense of a particular period of time or feeling of site's context.

4.4.1.2. Assumptions

This impact analysis focuses on the extent of changes in site integrity associated with the alternatives detailed in Chapter 2, *Alternatives* (p. 27) and their potential to modify the risk of impacts on cultural resources. The following assumptions regarding the resource base and cultural resources management practices were considered in the analysis:

Before the BLM authorizes any project with potential to affect cultural resources, law and regulation require that the agency identify whether sites are present, evaluate potentially impacted sites for NRHP eligibility, and stipulate measures to reduce effects. Impacts may be reduced by avoidance or mitigation measures, such as data collection or project redesign.

Ground- and surface-disturbing activities can vary in nature. Ground-disturbing activities from mechanical and vehicular sources are assumed to have the potential to impact cultural resources by damaging features, crushing or compacting subterranean features, rearranging features, pushing soils to remove or excavate the original surface, or disturbing the contextual arrangement of features and artifacts. Ground-disturbing activities from wildlife and livestock sources can occur when an animal burrows or wallows in soft soils and damages features. Other animal activities can disturb original subsurface cultural soil horizons, crush or compact surface artifacts,

and rearrange the context of artifacts and features. Human-caused ground disturbance can occur from fire contamination, trampling, digging, vandalism, and unauthorized collection.

Little of the Planning Area has been inventoried for cultural resources, and there is no predictive modeling or sensitivity mapping available to estimate or quantify resource density. There is potential for cultural resources on most of the Planning Area, but the presence and significance of resources and impacts cannot be quantified.

There is qualitative information that indicates where there is a higher probability that cultural resources would be present relative to the whole Planning Area. These include river corridors, spring locations, historic trails, and high quality arable land in proximity to rivers. Highly disturbed or recently developed areas would be less likely to include intact cultural resources.

Measures that withdraw land or restrict surface development to protect resources can provide direct and indirect protection of cultural resources from disturbance and from incompatible and unauthorized activities.

Natural processes, such as erosion or weathering, will degrade the integrity of many types of cultural resources over time. Human visitation, recreation, OHV use, livestock grazing, fire and non-fire vegetation treatments, and other activities can increase the rate of deterioration through natural processes. While the effect of a few incidents may be negligible, the effect of repeated actions or visits over time is likely to intensify impacts.

Vandalism or unauthorized collecting can destroy cultural resources in a single incident. Increased access to areas where cultural resources are present can raise the risk of vandalism or unauthorized collection of cultural resources.

Site monitoring, non-project-related inventories, interpretive development, site stabilization and other proactive management activities would continue and may have negligible to minor impacts on cultural resources.

4.4.1.3. Qualitative Intensity Scale

The qualitative terms for intensity of impacts are generally the same as that adopted (see Table 4.1, “Qualitative Terms for the Intensity of Impacts” (p. 375)) elsewhere in this chapter. In addition to the definitions/thresholds identified for the SDNM, impacts specific to cultural and heritage resources will be measured as follows:

Negligible: Impacts would be extremely short-lived, would not extend beyond the footprint of the action, and would not affect the character-defining features of any historic or cultural Monument object.

Minor: Impacts would not affect the character-defining features of any of the historic or cultural Monument objects.

Moderate: Impacts may result in alteration of a character-defining feature, but would not diminish the integrity of the cultural resource Monument object.

Major: Impacts would result in alteration of character-defining feature of the cultural resource Monument Object, diminishing or damaging its integrity.

4.4.1.4. Program Areas with No Impacts on Cultural Resources

No impacts to cultural and heritage resources are anticipated for management actions relating to:

- Air quality resources
- Cave resources
- Paleontological resources
- Water resources
- Wild horse and burro management

4.4.2. COMMON TO ALL ALTERNATIVES

4.4.2.1. Both Decision Areas

From Hazardous Materials & Public Safety on Cultural and Heritage Resources

Fencing and filling abandoned mine shafts and drift features has the potential to directly affect sites' integrity because many historic mines contain closely related features such as adits and associated above-ground processing areas. The setting of historic mining sites also may be affected when mining structures are sealed and remediated. Planning for these remediation projects will enable the development and implementation of mitigation actions where warranted. In some cases, these actions could result in moderate impacts to sites and Monument objects. These may be mitigated to minor impact through the development and implementation of treatment plans.

Emergency hazardous material clean-ups may directly affect cultural resources at a minor to major level due to ground-disturbing activities from the use of heavy equipment for the short term in localized areas. For instance, emergency HAZMAT clean-ups could destroy a site completely if all the soil had to be removed; however, because the effects would be short-term and site remediation ultimately would public safety, this would be an acceptable overall outcome – even within the SDNM.

Vehicle use, driving cross-country, grading and other activities of the Department of Homeland Security and other border-related law enforcement agencies, including pursuit of undocumented immigrants and illegal drug loads, may affect cultural resources at a minor to moderate level. Driving cross-country over sites may have direct moderate impact on site integrity. Law-enforcement agencies are seeking interdiction methods that would reduce the necessity of cross-country law enforcement travel. However, decisions regarding border law enforcement interdiction methods are beyond the scope of this document.

Areas such as SDNM Area A and Sentinel Plain, where access is restricted to entry by permit only, will have a protective effect on all forms of the cultural resources integrity and Monument objects within those areas. Impacts would be negligible over the long term.

From Soil Resources on Cultural and Heritage Resources

Where the BLM implements measures to improve soil stability and vegetation cover, cultural resource integrity and setting would be better protected from soil erosion. Site-specific structures would not be authorized unless the projects were in compliance with existing cultural resources laws and regulations and appropriate mitigation measures, if necessary, were in effect. Therefore, impacts on sites would be negligible.

From Visual Resources on Cultural and Heritage Resources

Decisions regarding management of visual resources may affect the integrity of settings of cultural resources and Monument objects for the long term. Under all alternatives, a mixture of management allocations is employed for different areas of the Planning Area. Site internal integrity would be protected via procedures, following law and regulation, protecting cultural resources from project impacts.

Impacts to cultural resources from implementing management actions in accordance with the VRM classes would be dependent on the presence of sites and the extent to which the surrounding landscape would be modified. VRM classes and actions could affect qualities that contribute to the eligibility of cultural resource sites for nomination to the National Register of Historic Places by affecting site setting/visual integrity. These qualities include integrity of setting and integrity of the feeling (or historic sense). Impacts on setting could limit potential public educational opportunities.

The allocation of VRM Class IV would allow visual intrusions and associated ground disturbing activities associated with a variety of uses to dominate the landscape at a level that could damage or destroy historic landscape integrity at a moderate or greater level of intensity in the long term. Except for Alternative A, VRM Class IV does not occur within the SDNM.

The allocation of VRM Class III would impact the integrity of cultural resources and historic landscape settings in more localized areas by allowing visual intrusions on the landscape and ground disturbing activities associated with a variety of land uses at a level that would not dominate the landscape. Nevertheless, at some locations, this could have moderate impact on sites for which setting is integral to their National Register eligibility.

The areas managed for VRM Class II would see more benefits to the essential characteristics and attributes of historic landscape integrity. Management of activities and developments would be more restrictive in terms of visual intrusions and ground disturbing activities on the historic landscape, leading to more protection of the cultural resources, at a minor to moderate level of intensity.

Cultural resources and Monument objects managed on lands for VRM Class I has the most restrictive criteria for project design and mitigation. Classification as VRM Class I excludes most forms of ground disturbing activities and developments.

From Wildland Fire Management on Cultural and Heritage Resources

Cultural resources would be affected by fires and fire suppression activities. Fires alter the settings of some kinds of cultural resources visually. Fires remove the vegetation which may allow soil erosion to damage or destroy the site components. Fire suppression activities may impact cultural resources, if present, if heavy earth-moving equipment and vehicles are used to cut fire lines.

Wildfires and fuels treatments can affect cultural resources through direct exposure to fire and disturbances from the methods used to suppress and manage fires and natural fuels. Fuels treatment projects in the Decision Areas will usually involve mechanical and, perhaps chemical, treatment and be preplanned. This will assure that our Section 106 obligations have been met and that projects have been designed to avoid sites prior to implementation. Impacts to site integrity and setting will, therefore, be negligible.

Flammable structures and features, such as wooden buildings and mining head frames, are particularly vulnerable to damage and destruction by wildfire. In addition, fire suppression methods may entail surface disturbances resulting from staging activities, vehicle tracks, and use of earth-moving equipment or mechanical treatments to manage vegetation. A policy of aggressive initial attack on desert fires will ensure that direct effects of fire, itself, to settings are kept to minor impact intensity. Within wilderness areas and along the NHT corridor, Minimum Impact Suppression Tactics, that limit use of heavy equipment, will assure that otherwise moderate impacts to site integrity from ground disturbance would be reduced to minor.

4.4.2.2. Lower Sonoran

From Lands & Realty on Cultural and Heritage Resources

Construction, operation and maintenance of roads, utilities, and other types of uses (excluding renewable energy power plants) may directly impact cultural resources and Monument objects through associated ground disturbance. In most cases these impacts will be negligible to moderate and short-term. These impacts may be mitigated to minor through the development and implementation of treatment plans if warranted.

Construction, installation, operation, and maintenance within major utilities corridors may impact cultural resources and Monument objects directly by affecting site integrity though ground disturbance and change in site settings. Project-specific mitigation measures would be developed and implemented so that impacts would be reduced from moderate to major or minor. If setting is integral to National Register of Historic Places eligibility of a site, then degradation of site setting may be expected at the moderate level. This expected moderate impact may be mitigated to minor through project design, placement, underground placement of utility lines, or design and color selection of towers.

Concentrated solar power plants requiring development level terrain that is free of vegetation will have major impacts to sites.

Land tenure adjustments, including disposal or acquisitions, may directly affect cultural resources either by removing sites from the protections of Federal ownership or by bringing them under the protections of Federal ownership. The level of intensity of this impact would range from minor to moderate. Mitigation measures would be applied to reduce or minimize the impacts if significant sites are present in lands leaving Federal ownership.

From Vegetation Resources on Cultural and Heritage Resources

Cultural resources located on the lands on which the Fred J. Weiler Green Belt had been designated enjoy additional protections due to the closure to mineral entry and other restrictions of this designation. Impacts to site integrity due to ground disturbance expected from vegetation treatments (such as mechanical removal of tamarisk) would be addressed through standard

procedures required by law and regulation for managing projects with potential to affect cultural resources. Impacts are expected to be minor and of short-term duration.

4.4.2.3. Sonoran Desert National Monument

From Lands & Realty on Cultural and Heritage Resources

Impacts would be the same as those described for All Alternatives for the Lower Sonoran, except, the exclusion of utility-scale renewable energy facilities on the SDNM would have a protective effect on the cultural resources and Monument objects over the long term. Protective effects would stem from restrictions on construction activities that would disturb, alter, or destroy the existing ground surface and the cultural resources that are present.

From Minerals Management on Cultural and Heritage Resources

The SDNM is withdrawn from new mineral entry under all alternatives. The withdrawal was established in the proclamation that established the Monument. This withdrawal will have a protective effect on cultural resources, as ground disturbance from exploration, prospecting, and other activities associated with mineral development would be generally prohibited.

In those few parcels (25,800 acres) within SDNM where the surface is owned by the United States and the subsurface is owned by a non-Federal entity, minerals development may still occur. Depending upon the extent and intensity of ground disturbance, there may be direct effects on cultural resource site integrity at a moderate level. However, the BLM, as the owner/manager of the surface, will work with operators to mitigate impacts to affected sites and Monument objects and reduce effects to minor. Methods to reach a minor impact outcome would likely include project redesign or the development and implementation of a treatment plan to reduce or mitigate effects in compliance with existing law and regulation. However, mineral regulations do not apply to these types of actions, as they would be managed by the lands and realty program.

4.4.3. ALTERNATIVE A (NO ACTION)

4.4.3.1. Both Decision Areas

From Cultural and Heritage Resources on Cultural and Heritage Resources

Management of cultural resources is usually a non-disturbing activity that involves inventory, site monitoring, and occasionally installation of site protection measures. Some cultural resource management activities that are ground disturbing (e.g., installation of protective fencing to exclude livestock or motorized vehicles and development of interpretive projects or facilities, such as signs, kiosks, and public events) could cause small scale disturbances of cultural resources but are, generally, developed as overall protective measures. Pre-project implementation mitigation measures would ensure that impacts would be negligible. Where protective design features may be added, the effects may be mitigated through sensitive design. The effects would usually be negligible to minor.

Excavation for purposes of data collection is a mitigation measure used when sites that may be impacted by projects cannot be protected by other means, such as project redesign or avoidance.

In this case excavation in a controlled scientific manner is deemed a method of preservation, albeit not *in situ*.

By BLM policy, cultural sites are allocated to specific uses. Allocation of sites to public use increases opportunities for interpretation and education, but may also increase the disturbance of these sites. Allocation to scientific use allows the site to be available for consideration of appropriate scientific studies. Study methods may result in physical alteration or destruction of site attributes in order to answer important questions posed in a research proposal. Allocation of sites to traditional use would promote the preservation of cultural traditions. Allocation for future use would protect and preserve significant sites by segregating them from all other land or resource uses that would threaten their present condition or setting. Sites allocated to the experimental use category would be used to increase knowledge about damage and extent of damage caused by specific elements on cultural resources. However, cultural sites would be more subject to damage through certain types of experimentation. Sites allocated as discharged no longer meet the criteria necessary for protection. Since they cease to be a management constraint, management can focus on priority sites.

From Priority Wildlife Species and Habitat Management on Cultural and Heritage Resources

Improvements to existing wildlife water developments may affect cultural resources and Monument objects directly at a minor to moderate level in localized areas in the short term, as old developments are remodeled. These impacts would have direct impact on site integrity due to use of heavy equipment and ground disturbing activities to excavate and replace old facilities and indirect due to changes in adjacent drainage patterns leading to erosion of cultural sites. These effects would be mitigated to minor or negligible by soil erosion and hydrology BMPs and standard procedures in compliance with cultural resources laws and regulations.

Seasonal wildlife closure areas will have a protective effect by prohibiting vehicle and public access into particular areas for the long term, which would reduce considerably the effect of direct vehicle damage and trampling on cultural sites' integrity.

From Wilderness Characteristics on Cultural and Heritage Resources

There are no existing management decisions for wilderness characteristics. Under this alternative, all areas not otherwise protected by special designations would be open to multiple uses and development. Effects of any proposals for use would be evaluated in compliance with Section 106 of the National Historic Preservation Act. One would expect that impacts would, at most, be moderate with the opportunity to reduce them to minor with mitigation measures (including avoidance, project redesign or data collection).

4.4.3.2. Lower Sonoran

From Livestock Grazing on Cultural and Heritage Resources

Livestock may tend to gather in certain areas where water, soft soil, or shade is available. Site integrity may be affected directly by intense trampling of the surface soils at a minor to moderate level of intensity in localized areas or indirectly by denuding the vegetation and allowing erosion to accelerate. Erosion may ultimately affect site integrity at a minor level outside the immediate

impact area. Livestock development may be redesigned or mitigation measures developed to reduce impacts to a negligible level.

Areas unavailable to grazing or left un-leased would have a protective effect upon the cultural resources over the long term, since livestock would be excluded from gathering and trampling activities on sites. Under Alternative A, this condition would remain unchanged and have negligible impact on site integrity.

From Minerals Management on Cultural and Heritage Resources

Currently, 713,300 acres of the Lower Sonoran are open mineral development, whether locatable, leasable or saleable. Depending upon the extent and intensity of ground disturbance and production in approved plans of operation for mineral exploration and development, there may be direct effects on cultural resource site integrity at a moderate level. However, mitigation of impacts to affected sites is expected to reduce the effects to minor. Methods to reach a minor impact outcome would likely include project redesign and/or the development and implementation of a treatment plan in compliance with existing law and regulation.

New vehicle routes associated with mineral development may have moderate indirect impacts on site integrity if project access also opens new areas to site visitation. These impacts may be reduced to minor through project design.

From Recreation Management on Cultural and Heritage Resources

Construction, operation, and maintenance of new recreational developments may have a direct effect on cultural resources and Monuments objects in a localized area, due the installation of parking areas, interpretive media, and other amenities using heavy equipment. However, prior to approval, the project must be in compliance with all applicable cultural resource laws and regulations. Impacts, if identified, will be mitigated to the negligible or minor level using standard cultural resources impact mitigation practices such as avoidance, project redesign, or the development and implementation of a treatment plan. Increased visitation, brought about by recreational developments with amenities, may affect cultural resources and Monument objects directly at a minor level in localized areas due to increased unauthorized collection and indirectly by increased erosion brought about by increased traffic.

Camping in a dispersed manner may have minor impact on the integrity of cultural resources and Monument objects due to vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts.

SRP vehicle events and large group events may impact cultural resources and Monument objects indirectly by creating new access route patterns, ruts and berms that lead to erosion, and attracting large numbers of vehicles and visitors which may lead to increased vandalism and unauthorized collection. All of the impacts from SRP's are minor in impact.

Increased vehicle-based recreation has lead to an increase of off-road vehicle use which may have a minor direct impact cultural resources and Monument objects, due to driving over site features and artifacts.

From Special Designations on Cultural and Heritage Resources

The existing Juan Bautista de Anza NHT designation with its Comprehensive Management Plan (NPS) in the implementation phase may affect directly the historic sites associated with it for the long term due to its status as a nationally important resource. As visitation increases, cultural resources integrity may be impacted directly and indirectly by disturbance due to vehicle use, trampling by visitors, and unauthorized collection of artifacts. As interpretive media is developed for the trail, visitation will increase which may impact the cultural resources directly by vehicle damage to site features and trampling. Development of the Anza Auto Route along major highways and paved local roadways will have no effect on the cultural resources.

The Coffeepot Botanical ACEC closure to OHV use will ensure negligible impacts to site integrity from off-road driving.

Wilderness designation ensures a major protective effect on cultural resources over the long term. Prohibitions on the use of motorized and mechanized vehicles and equipment eliminates threats to the physical integrity and settings of cultural resources.

From Travel Management on Cultural and Heritage Resources

The use, operation, and maintenance of existing routes may have direct minor impact on cultural resource and Monument Object integrity due to ground disturbing activities associated with the use and care of routes. The use, operation, and maintenance of existing routes may indirectly impact cultural resources and Monument objects by allowing access into sensitive site areas or altering drainage patterns leading to inundation or erosion. Non-managed transportation routes and the potential for route proliferation are of particular concern for the management and protection or cultural resources. Vehicles cutting across cultural sites have the potential to directly impact site integrity in localized areas. This impact could be moderate to major depending on soil type.

New route development would require analysis and evaluation under the laws and regulations governing cultural resource management on BLM-managed land. Mitigation measures, including route redesign and avoidance would ensure that impacts to site integrity would be negligible to minor. Indirect impacts from opening new areas with improved recreational access would include impacts to site integrity from those who might drive over sites or collect artifacts. It is anticipated that these impacts would be minor.

Designation of a few routes to a nonmotorized level of use may have a direct and indirect protective effect on cultural resources and Monument objects for the long term by prohibiting motor vehicle use, thereby slightly reducing the number of visitors in a localized area. Limitations placed on access to particular areas may have an indirect protective effect on the integrity of cultural resource sites at a minor to moderate level of intensity for the long term across the Decision area.

From Vegetation Resources on Cultural and Heritage Resources

Authorization of the removal of native plant material and associated ground disturbance may impact cultural resources by affecting the integrity of the setting at a minor level, in a localized area, for the short term. Removal of traditionally and culturally significant vegetation types may directly impact at a minor level the features and settings of traditional use and harvest areas in particular locales for the short term.

Woodcutting and associated ground disturbance caused by the use of large vehicles during vegetation removal may directly impact cultural resources at a minor level for the short term.

Active vegetation management strategies may directly and indirectly affect cultural resources at a minor level in localized areas for the short term due to the use of heavy equipment which disturbs or damages surface and subsurface features on sites.

From Visual Resources on Cultural and Heritage Resources

Alternative A includes an allocation for the most acreage of VRM Class IV. This would have moderate or greater impact on site setting by allowing visual intrusions and ground disturbing activities associated with a variety of uses to dominate the landscape.

4.4.3.3. Sonoran Desert National Monument

From Livestock Grazing on Cultural and Heritage Resources

Under this alternative, livestock grazing north of I-8 within the Monument would remain permitted. Livestock tend to gather in certain areas where water, soft soil, or shade is available. Site integrity may be affected directly by intense trampling of the surface soils in localized areas or indirectly by denuding the vegetation and allowing erosion to accelerate. Erosion may ultimately affect site integrity at a minor to moderate levels.

Within areas south of I-8, livestock grazing has been discontinued. This would continue to have a protective effect upon the cultural resources over the long term, since livestock would be excluded from gathering and trampling activities on sites. Under Alternative A, this condition would remain unchanged and have negligible impact on site integrity.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to AUM allocations in the SDNM.

From Recreation Management on Cultural and Heritage Resources

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to target shooting.

From Special Designations on Cultural and Heritage Resources

The National Trail designation has a major protective effect on cultural resources and Monument objects over the long term. This protective effect occurs because of a restriction of certain types of ground disturbing uses that would not be compatible with the values for which the NHT was designated. Further, the trail segment within the Monument is considered to be a high potential route segment for interpretation, which leads to further protection of associated cultural resources.

The Vekol Valley ACEC closure to OHV use has ensured negligible impacts to site integrity from off-road driving. However, the continued need for the Vekol Valley ACEC has been supplanted by designation of SDNM.

Wilderness designation ensures a major protective effect on cultural resources and Monument objects over the long term. Prohibitions on the use of motorized and mechanized vehicles and equipment eliminates threats to the physical integrity and settings of cultural resources and Monument objects.

From Travel Management on Cultural and Heritage Resources

Refer to Table 4.30, "Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects" (p. 907) for impacts related to route designations with the SDNM.

From Visual Resources on Cultural and Heritage Resources

In Alternative A, allocation of VRM Class IV could affect qualities that contribute to the eligibility of cultural resource sites for the National Register of Historic Places. These effects could be long-term and moderate or greater in intensity. It is unlikely that these effects could be mitigated to an acceptable minor level of impact for these Monument objects.

4.4.4. ALTERNATIVE B

4.4.4.1. Both Decision Areas

From Cultural and Heritage Resources on Cultural and Heritage Resources

Impacts would be the same as those described under Alternative A for both Decision Areas, except, Alternative B would include a greater number of sites (including Painted Rock, portions of historic trails in Lower Sonoran and SDNM Decision Areas, Sundad, Big Horn Station) developed to promote public use and heritage tourism than in Alternative A. This, in turn, could increase public visitation for the long term. Structures added to handle increased visitation demand may present moderate levels of impacts to site integrity and setting. These impacts, however, may be mitigated to minor with sensitively designed visitor amenities.

Management of cultural landscapes as a whole entity may have a protective effect on cultural resources and Monument objects for the long term, due to an increased attention and better understanding of the interrelationships of the sites to one another and the relationship of these sites and features to natural topographic features than in Alternative A. These protective measures would present minor levels of impacts.

Increased monitoring of sites over the level performed in Alternative A would also have a protective effect on cultural resources and Monument objects directly and indirectly at a minor to moderate level for the long term.

From Priority Wildlife Species and Habitat Management on Cultural and Heritage Resources

Improvements to existing wildlife water developments and the addition of more developments would have impacts similar to Alternative A.

Seasonal wildlife closures and the prohibition of vehicle use in certain areas may have an indirect protective effect on cultural resources and Monument objects within the closure areas because there would be fewer incidents of vehicle-based surface damage than under Alternative A. Prohibition of motorized competitive speed events in certain areas may have an indirect protective effect within the closure areas leading to less vehicle damage on sites. These restrictions and prohibition would protect site integrity as well as site settings.

From Wilderness Characteristics on Cultural and Heritage Resources

Impacts would be the same as Alternative A for both Decision Areas.

4.4.4.2. Lower Sonoran

From Livestock Grazing on Cultural and Heritage Resources

Impacts would be the same as Alternative A for the Lower Sonoran.

From Minerals Management on Cultural and Heritage Resources

In Alternative B, 9,400 acres would be closed to entry for development of locatable minerals (703,900 acres open); 7,000 would be closed to leasable minerals development (713,100 open); and 20,100 would be closed to minerals materials development (700,000 acres open). Several of the areas to be closed were selected based upon the sensitivity of the cultural and historic resources known to be present. This will provide a protective effect over that provided in Alternative A. Depending upon the extent and intensity of ground disturbance and production in approved plans of operation for mineral exploration and development, there may be direct effects on cultural resource site integrity at a moderate level. However, mitigation of impacts to affected sites is expected to reduce the effects to minor. Methods to reach a minor impact outcome would likely include project redesign or the development and implementation of a treatment plan in compliance with existing law and regulation.

New vehicle routes associated with mineral development may have moderate indirect impacts on site integrity if project access also opens new areas to site visitation. These impacts may be reduced to minor through project design.

From Recreation Management on Cultural and Heritage Resources

The Decision Area will be divided into two types of management areas: ERMAs and SRMAs. In Alternative B, the ERMA area will be managed as under Alternative A (both Decision Areas) and, in those areas, the effects would be similar. The eight SRMAs in Alternative B would be managed to promote a vehicle-based recreational experience.

In the Buckeye Hills Trails SRMA, a combination of front country experiences and community interface management has been proposed. In the west section of this unit, the vehicle-based, front country, two-track, and route exploration would impact cultural resources site integrity indirectly through erosion, on a negligible to minor level for a short duration, in localized areas.

Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at

a minor level of intensity for short durations, in localized areas. In the eastern section of this unit, the community interface level of management implies that areas where camping and day use areas are designated, impacts would be negligible on cultural resources.

In the Saddle Mountain SRMA, a combination of front country experiences, back country primitive experiences, and a community interface area is proposed. In the front country areas, vehicle-based exploration and camping would impact cultural resources directly through erosion, on a minor level for short duration in localized areas. Areas where camping in a dispersed manner is prescribed may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas. Community interface areas where camping and day use are designated and activity structured could have direct impacts to cultural resources from unauthorized collection, but this is expected to be negligible. In the back country, it is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a negligible to minor level of intensity for short durations, in localized areas.

In the Arlington SRMA, vehicle-based, front country, two-track, route exploration would impact cultural resources indirectly, through increased ground disturbance. Impacts are expected to be negligible to minor, for a short duration, in localized areas. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas.

In the Gila Bend Mountains SRMA, the area is largely proposed as back country with a few areas of front country along the main access routes. It is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas.

In the Lower Gila Historic Trails SRMA, vehicle-based, front country route exploration is anticipated to be complementary to the historic trail features that cross the unit. Under this alternative, more routes will be open to vehicle-based exploration, which may lead to increased off-road travel and ground disturbance. It is anticipated that this activity would impact cultural resources on a minor level for a short duration, in localized areas. Alternative B is expected to have a greater negative impact on cultural resources than Alternative A. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and indirectly by possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity over the long term, in localized areas.

In the Painted Rock Mountains SRMA, vehicle-based, front country route exploration experiences could lead to ground disturbance associated with route proliferation and vehicle incursions. This would impact cultural resources on a negligible to minor level for a short duration, in localized areas. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas.

In the Ajo SRMA, a combination of community interface management and back country management are anticipated. Community interface areas where camping and day use areas are designated and activity structured would have more structure, oversight and enforcement of travel. Because of this, it is expected that route proliferation and vehicle incursion would be

reduced. Therefore, impacts are expected to be negligible or none on cultural resources. In the back country, it is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a negligible to minor level of intensity for short durations, in localized areas. In the back country, it is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a negligible to minor level of intensity for short durations, in localized areas.

In the San Tan Mountains Regional Park SRMA, vehicle-based, front country route exploration experiences could lead to ground disturbance associated with route proliferation and vehicle incursions. This would impact cultural resources on a minor level in localized areas for a short duration. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas.

Overall, the effects of implementation of this Alternative on cultural resources in the SRMAs would be negligible to minor, compared to the management of these areas in Alternative A.

From Special Designations on Cultural and Heritage Resources

The existing Juan Bautista de Anza NHT designation with its Comprehensive Management Plan (NPS) in the implementation phase may affect directly, on a minor to moderate level, the historic sites associated with it for the long term due to its status as a nationally important resource. As visitation increases, cultural resources may be impacted directly and indirectly by disturbance due to vehicle use, trampling by visitors, and unauthorized collection of artifacts. As additional interpretive media is developed for the trail, increasing visitation may impact the cultural resources directly by vehicle damage to site features and trampling. As vehicle-based visitation is highly promoted under this alternative, effects to cultural resources are expected to be greater than that expected under Alternative A. The impact would be at the moderate level.

In Alternative B, ACEC allocation is similar to Alternative A. Impacts would be of the same intensity.

In Alternative B, Agua Caliente Road would be evaluated for allocation as a scenic byway. This could impact cultural resource sites indirectly by encouraging increased public use of the area. More people may venture off Agua Caliente road and visit sites not previously impacted by recreational visitation. Impact is expected to be minor for site integrity.

In wilderness, impacts would be the same as described under Alternative A.

From Travel Management on Cultural and Heritage Resources

In the Lower Sonoran, action alternatives B through E would be subject to route designation within 5 years of RMP completion. Until designation, travel would be limited to existing roads and trails. Existing routes in areas proposed as open or limited may be subject to some level of cultural inventory and identification to assess potential impacts to sites. Areas where a proposed designation will shift, concentrate, or expand motorized travel into areas where properties are likely to be affected, an inventory would be required prior to designation to stay in compliance

with Section 106 of the National Historic Preservation Act. These and known sensitive areas will be considered in determining which roads will be designated as routes.

Alternative B allows for a more extensive network of transportation routes, which could increase the potential for cultural resource damage. Direct impacts could include disturbance to surface features, soils and artifacts from vehicle traffic resulting in damage, breakage or displacement. A more extensive road network would facilitate public access to a greater number of archaeological sites, increasing their vulnerability to vandalism and artifact theft. Impacts to site integrity are anticipated to be minor. Conversely, greater access may allow for more opportunities for public interpretation, which could increase public understanding and stewardship of resources.

From Vegetation Resources on Cultural and Heritage Resources

Harvesting of certain vegetative materials and woodcutting is generally not allowed, but may be approved in specific cases. These cases and vegetation restoration treatments in the Fred J. Weiler Green Belt could directly affect the integrity of site settings, at a minor level, in a localized area, for the short term. However, these activities would not be approved without compliance with existing law and regulation governing cultural resource use and protection. Appropriate mitigation would ensure that impacts would be minor to negligible. Expected impacts would be similar to those under Alternative A.

From Visual Resources on Cultural and Heritage Resources

VRM Class IV is reduced to 221,600 acres in Alternative B from an allocation of 442,500 in A. Class III is increased in B to 551,900 acres from 279,600 in Alternative A. This is likely to result in less impact than in Alternative A for those sites for which setting is integral to their eligibility for the National Register of Historic Places.

4.4.4.3. Sonoran Desert National Monument

From Livestock Grazing on Cultural and Heritage Resources

Impacts would be similar to those described under Alternative A for the Monument, except fewer acres would be available for livestock grazing (243,749). According to the Grazing Compatibility Analysis (Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)), approximately 8,500 acres of Monument objects (mostly vegetation) was found to be incompatible with livestock grazing, and would be fenced off under Alternative B. This exclosure would help protect cultural resources. Additionally, approximately 10 acres around the North Tank on the Anza NHT would be fenced off to protect that area. The combination of closed areas and a reduction in AUMs would decrease impacts to minor intensities as more areas where cultural sites could be present would be closed.

Refer to Table 4.30, “Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects” (p. 907) within Section 4.25, “Implementation Level Analysis” (p. 906) for impacts related to AUM allocations in the SDNM.

From Recreation Management on Cultural and Heritage Resources

Under this alternative, all parts of the SDNM are allocated to one SRMA. It is anticipated that this strategy would offer the same level of protection to cultural resources as Alternative A (both Decision Areas) because the increased management would not be enough to counteract anticipated sharp increases in public visitation.

In the SDNM SRMA, the majority of the lands would be allocated to back country. In the back country, it is expected that camping in a dispersed manner and increased vehicular recreation may affect the integrity of cultural resources and Monument objects directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor to moderate level of intensity over the long term, in localized areas.

Under this alternative, more routes will be open to vehicle-based exploration. It is anticipated that this activity would impact cultural resources and Monument objects on a minor level over the long term, in localized areas due to vehicle incursions and associated ground disturbance. Camping in a dispersed manner and increasing vehicle-based recreation may have minor effect on the integrity of cultural resources and Monument objects directly due to vehicle incursions, trampling, and indirectly by possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity over the long term, in localized areas.

Refer to Table 4.30, “Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects” (p. 907) for impacts related to target shooting within the SDNM.

From Special Designations on Cultural and Heritage Resources

The development of the Anza National Historic Trail and the promotional emphasis on it as a heritage tourism destination would lead to increased visitation, vehicular traffic, and amenities such as interpretive developments. Increased visitation is likely to lead to increased unauthorized collection of artifacts and trampling on features and artifacts located immediately adjacent to the trail. These impacts are expected to be minor to moderate compared to Alternative A, directly and indirectly affecting the cultural resources and Monument objects along the trail for the long term.

From Travel Management on Cultural and Heritage Resources

Refer to Table 4.30, “Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects” (p. 907) within Section 4.25, “Implementation Level Analysis” (p. 906).

From Visual Resources on Cultural and Heritage Resources

VRM allocations under Alternative B are increased from Alternative A by 127,400 Class II acres and decreased by 119,700 Class IV acres. This would have considerably more protective effect on the settings of cultural resources, due to some additional restrictions on the level of development as guided by visual intrusion. Overall, because of these added protections, impacts are expected to be minor.

4.4.5. ALTERNATIVE C

4.4.5.1. Both Decision Areas

From Priority Wildlife Species and Habitat Management on Cultural and Heritage Resources

Proposed avoidance areas and restrictions on development and surface disturbance within the Gila Bend Mountains Wildlife Habitat Area, the Saddle Mountain Wildlife Habitat Area, the Cuerda de Lena Wildlife Habitat Area, and the Batamote Mountain Habitat Areas (a total of 425,900 acres) would have a more protective effect on the cultural resources than under Alternative A.

4.4.5.2. Lower Sonoran

From Cultural and Heritage Resources on Cultural and Heritage Resources

Development of sites allocated to public use (Painted Rock, portions of historic trails, and Sundad) would emphasize protection of site features under Alternative C. Impacts on site integrity would be minor.

There would be some ground disturbance due to installation of facilities to manage visitation and protect resources, such as designated parking areas, protective fencing, and/or interpretive media displays. Impact to site integrity would be negligible to minor compared to Alternative A as facilities necessary to visitor safety and site protection would be placed and installed to maximize protection of site integrity and setting. This alternative will include additional evaluation of the suitability of sites for public use. Evaluation of suitability is conducted to ensure that important characteristics and values of a site can be protected.

From Livestock Grazing on Cultural and Heritage Resources

Impacts would be the same as under Alternative A for the Lower Sonoran.

From Minerals Management on Cultural and Heritage Resources

In Alternative C, 2,350 acres would be closed to entry for development of locatable minerals (710,950 acres open); 250 would be closed to leasable minerals development (713,300 open); and 157,300 would be closed to minerals materials development (528,500 acres open). Several of the areas to be closed were selected based upon the sensitivity of the cultural and historic resources known to be present. This alternative will have much more protective effect than in Alternative A on sites that could be affected due to mineral materials (saleables) development.

Depending upon the extent and intensity of ground disturbance and production in approved plans of operation for mineral exploration and development, there may be direct effects on cultural resource site integrity at a moderate level. However, mitigation of impacts to affected sites is expected to reduce the effects to minor. Methods to reach a minor impact outcome would likely include project redesign or the development and implementation of a treatment plan in compliance with existing law and regulation.

New vehicle routes associated with mineral development may have moderate indirect impacts on site integrity if project access also opens new areas to site visitation. These impacts may be reduced to minor through project design.

From Recreation Management on Cultural and Heritage Resources

The Decision Area will be divided into an ERMA and six SRMAs. In the ERMA, impacts would be the same as in Alternative A. In Alternative C, there would be fewer SRMAs than in Alternative B and more emphasis on resource protection overall than in Alternative A.

In the Buckeye Hills Trails SRMA, a combination of front country experiences and back country primitive experiences are proposed. Vehicle-based, front country route exploration experiences would lead to impacts from ground disturbance associated with vehicle incursions and route proliferation onto sites. These impacts on cultural resources are expected to be negligible to minor for a short duration, in localized areas. Overnight camping would be prohibited in Alternative C, unless specifically authorized.

In the Saddle Mountain SRMA, a combination of front country experiences and limited upland areas for back country primitive experiences are proposed. In the front country areas, vehicle-based exploration and camping would lead to impacts from ground disturbance associated with vehicle incursions and route proliferation onto sites. Impacts are expected to occur at a minor level for short duration in localized areas. Areas where camping in a dispersed manner is prescribed may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas. In the back country, it is expected that camping in a dispersed manner may affect the integrity of cultural resources at a negligible to minor level of intensity for the short term.

In the Gila Bend Mountains SRMA, the area is largely proposed as back country, with a few areas of front country along the main access routes. It is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas.

In the Lower Gila Historic Trails SRMA, vehicle-based, front country route exploration is anticipated to be complementary to the historic trail features that cross the unit. It is anticipated that this activity would lead to impacts from ground disturbance associated with vehicle incursions and route proliferation onto sites. It is expected to impact cultural resources on a minor level for a short duration, in localized areas. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity over the long term, in localized areas.

In the Ajo SRMA, a combination of community interface management close to town, back country management, and front country management are anticipated. Community interface areas where camping and day use areas are designated and activity structured, there would be negligible or no impact on cultural resources. In back country and front country settings, it is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a negligible to minor level of intensity for short durations, in localized areas. In the

front country areas, vehicle-based exploration and camping would impact cultural resources on a minor level for short duration in localized areas.

From Special Designations on Cultural and Heritage Resources

The existing Juan Bautista de Anza NHT designation with its Comprehensive Management Plan (NPS) in the implementation phase may affect directly the historic sites associated with it for the long term due to its status as a nationally important resource. Management of the NHT and cultural resources would emphasize increased scientific research and would institute a focused approach on trail corridor protection. Both of these emphases would have a protective effect on both cultural resources associated with the trail and those that are not associated with it. Impacts are expected to occur over the long term, at a minor intensity. Overall, negative impacts to cultural resources are expected to be slightly less than those under Alternative A.

Allocation of the Coffeepot Botanical ACEC will have no impact on cultural resource integrity and setting. The prescriptions will limit disturbance and access. Development in the area would be limited.

The designation of Agua Caliente Road as a Back Country Byway would have the effect of increasing the public visitation levels since byways are advertised and promoted. This increase in visitation may indirectly effect cultural resources by increasing vehicle-based recreation in the area, leading to road proliferation which would increase the likelihood of surface disturbance on cultural sites. Some increased vandalism of sites (with minor effect on site integrity compared to Alternative A) is possible.

From Travel Management on Cultural and Heritage Resources

In the Lower Sonoran, all the action alternatives would be subject to route designation within 5 years of RMP completion. Until designation, travel would be limited to existing roads and trails. Existing routes designated as open or limited may be subject to some level of cultural inventory and identification to assess potential impacts to sites. Where a proposed designation will shift, concentrate, or expand motorized travel into areas where historic properties are likely to be affected, an inventory is required prior to designation to stay in compliance with Section 106. These and known sensitive areas will be considered in determining which roads will be designated as routes.

Impacts to cultural and heritage resources under Alternative C would be similar to those under Alternative B for the Lower Sonoran.

From Vegetation Resources on Cultural and Heritage Resources

Impacts would be the same as Alternative B for Lower Sonoran.

From Visual Resources on Cultural and Heritage Resources

In Alternative C, VRM Class IV (65,000 acres) would be allocated to small areas around communities and along LUAs, leading to fewer areas where higher amounts of development and the associated ground disturbing activities would be expected. Limiting these areas would assure that major modification of the landscape would be more limited than under Alternatives

A and B (442,500 and 221,600 acres, respectively). Major impacts to setting would be highly localized. VRM Class II management would be expanded (by about 271,500 acres as compared to Alternative A) broadly across the Lower Sonoran, which would have a protective effect on cultural resources settings and physical integrity due to the restrictions on visual intrusion and the associated ground disturbing activities and projects at a level of minor to moderate intensity.

From Wilderness Characteristics on Cultural and Heritage Resources

Approximately 128,100 acres would be allocated as lands managed to protect wilderness characteristics. Few development projects would be implemented. Impact on site integrity and setting would be negligible.

Areas would be designated and managed as limited OHV use areas. This would mean that motorized vehicles would be limited to designated routes established through subsequent travel management planning. Impact on site integrity and setting would be negligible. This would have a more protective effect compared to Alternative A.

4.4.5.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Cultural and Heritage Resources

The emphasis for the Sonoran Desert Historic Trails SCRMA would be on protection of Monument objects. This would have a protective effect on site integrity, compared to Alternative A.

Development of sites allocated to public use (such as Big Horn Station and portions of historic trails) would emphasis protection of site features under Alternative C. Impacts on site integrity would be minor, compared to Alternative A.

There would be some ground disturbance due to installation of facilities to manage visitation and protect resources, such as designated parking areas, protective fencing, and/or interpretive media displays. Impact to site integrity would be negligible to minor under Alternative C, as facilities necessary to ensure visitor safety and site protection would be placed and installed to maximize protection of site integrity and setting. This alternative will include additional evaluation of the suitability of sites for public use. Evaluation of suitability is conducted to ensure that important characteristics and values of a site can be protected. This would ensure a protective effect compared to Alternative A.

From Livestock Grazing on Cultural and Heritage Resources

Impacts would be similar to those described under Alternative A for the Monument, except, fewer acres would be available for livestock grazing (207,431). This is fewer acres open than in Alternative B. For those acres open to grazing, all allotments would be reclassified as perennial only. Allotments that are currently designated as perennial/ephemeral would be reclassified as perennial only, which would also help reduce impacts from livestock grazing to negligible to minor intensities. Additionally, 44,800 acres would become unavailable for livestock grazing in the Bighorn, Conley and Lower Vekol allotments. This closure would help protect known and potential cultural sites and resources. Appoximately 10 acres around the North Tank on the Anza NHT would also be fenced off to livestock.

Refer to Table 4.30, "Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects" (p. 907) within Section 4.25, "Implementation Level Analysis" (p. 906).

From Recreation Management on Cultural and Heritage Resources

In the SDNM SRMA, 429,000 acres of land allocated to back country ensure that anticipated impacts to cultural resources and Monument objects are the same as Alternative B. In the Lower Gila Historic Trails SRMA, the majority of this unit would be allocated to back country use. In the back country, it is expected that camping in a dispersed manner may affect the integrity of cultural resources and Monument objects directly by vehicle incursions and trampling. Sites would be affected indirectly by possible exposure to the threat of unauthorized collection of artifacts at a negligible to minor level of intensity for short durations in localized areas. This is similar to the effects detailed in Alternative A. Refer to Table 4.30, "Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects" (p. 907) within Section 4.25, "Implementation Level Analysis" (p. 906).

From Special Designations on Cultural and Heritage Resources

The development of high—potential Anza NHT segments and the limitations on some segments would minimize the direct and indirect effects to cultural resources and Monument objects at a minor level of intensity over the long term. Under Alternative C, NHT segments would be evaluated for suitability more critically than under Alternative A, as subjects of interpretive developments and public use sites. These trail segments would be included within a defined historic trail corridor where cultural sites may be located where they would directly benefit from avoidance and exclusions of certain activities, leading to a reduction or elimination of some ground disturbing actions.

From Travel Management on Cultural and Heritage Resources

Refer to Table 4.30, "Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects" (p. 907) for impacts related to route designations within the SDNM.

From Visual Resources on Cultural and Heritage Resources

Under this Alternative, almost the entire SDNM would be allocated to VRM Class I and II (a total of 426,000 acres). The increased area managed as VRM Class II (175,700 acres more than Alternative A) will ensure a more beneficial effect than that of Alternative A on the essential characteristics and attributes of historic landscapes and individual cultural resources. Management of activities and developments would be more restrictive in terms of visual intrusions and ground disturbing activities on the historic landscape, leading to a more protection of the cultural resource settings.

Class III (60,400 acres) would be allocated to areas considered passage zones and areas where some intrusion by ground disturbing activities may impact cultural resources due to the installation of amenities for visitors. The impact would be minor in localized areas and could be mitigated through selective placement and design. The overall effect of these features would be positive for site integrity compared to Alternative A, since they would be proposed and designed for improved site protection and public safety.

From Wilderness Characteristics on Cultural and Heritage Resources

Approximately 112,200 acres would be allocated as lands managed to protect wilderness characteristics. Few development projects would be implemented. Impact on site integrity and setting would be negligible. This would have a more protective effect compared to Alternative A.

Areas would be designated and managed as limited OHV use areas. This would mean that motorized and nonmotorized vehicles would be limited to designated routes. Impact on site integrity and setting would be negligible. This would have a more protective effect compared to Alternative A.

4.4.6. ALTERNATIVE D

4.4.6.1. Both Decision Areas

From Livestock Grazing on Cultural and Heritage Resources

Eliminating grazing would have the most protective effect on cultural resource integrity in both the Lower Sonoran and SDNM, than any other alternative, including Alternative A, by removing those areas of stock gathering and the potential for trampling and accelerated erosion due to loss of vegetation and topsoil. Some impacts may occur if equipment or vehicles are used to remove livestock management structures and facilities or to restore developed water sites. Overall impacts would be negligible.

From Priority Wildlife Species and Habitat Management on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative B for both Decision Areas.

4.4.6.2. Lower Sonoran

From Cultural and Heritage Resources on Cultural and Heritage Resources

In Alternative D, only Painted Rock and portions of historic trails would be designated for public use. There would be some ground disturbance due to installation of facilities to manage visitation and protect resources, such as designated parking areas, protective fencing, and/or interpretive media displays. Impact to site integrity would be negligible to minor under Alternative D as facilities necessary to visitor safety and site protection would be placed and installed to maximize protection of site integrity and setting. This alternative would have more protective effect than Alternative A.

More sites are allocated to the scientific use category, including Butterfield West and Sundad. Restrictions on surface-disturbing research on cultural resource sites may have a direct, more protective effect than Alternative A on the integrity of cultural resource sites. However, there may be classes of scientific information that may not be obtainable without excavation.

From Minerals Management on Cultural and Heritage Resources

In Alternative D, 373,800 acres more than Alternative A would be closed to entry for development of locatable minerals (339,500 acres open); 373,900 acres would be closed to leasable minerals development (339,400 open); and 569,900 acres would be closed to minerals materials development (143,400 acres open). Many areas to be closed were selected based upon the sensitivity of the cultural and historic resources known to be present. This alternative will have the most protective effect of any alternative, substantially more than in Alternative A, on sites that could be affected due to all forms of potential minerals development. Effects on site integrity would generally be minor to negligible. Site settings would see negligible impact.

From Recreation Management on Cultural and Heritage Resources

The Decision Area would be divided into ERMA and three SRMAs. For the ERMA, impacts would be the same as Alternative A. Three SRMA units are proposed in Alternative D with fewer areas promoted as vehicle-based recreational zones. This alternative may lead to fewer vehicle-based impacts on cultural resources than that proposed for Alternative A.

In the Buckeye Hills Trails SRMA, a combination of front country experiences and back country primitive experiences are proposed. Vehicle-based, front country route exploration experiences would impact cultural resources on a negligible to minor level for a short duration, in localized areas. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas.

In the Lower Gila Historic Trails SRMA, vehicle-based, front country route exploration is anticipated to be complementary to the historic trail features that cross the unit. It is anticipated that this activity would impact cultural resources on a minor level for a short duration, in localized areas due to vehicle incursions and route proliferation which leads to damaged site features. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity over the long term, in localized areas.

In the Ajo SRMA, community interface management is proposed for the area close to town. In the community interface areas where camping and day use areas are designated and activity structured, there would be no impact on cultural resources.

From Special Designations on Cultural and Heritage Resources

The existing Juan Bautista de Anza NHT designation with its Comprehensive Management Plan (NPS) in the implementation phase may affect directly the historic sites associated with it for the long term due to its status as a nationally important resource. Management of the NHT and cultural resources would have a farther reaching protective direct and indirect effect on cultural resources at a minor to major level of intensity over the long term throughout the area than under Alternative A. This is because all trail related interpretive facilities and amenities would be constructed outside of the historic trail corridor and away from cultural and heritage sites, eliminating the likelihood of damage occurring on sites.

Impacts from scenic byways would be the same as those described in Alternative C for the Lower Sonoran.

Coffeepot-Batamote, Saddle Mountain and Cuerda De Lena ACECs will have numerous restrictions on allowable activities. The result will be negligible or no impact on site integrity or setting. This would be more protective than Alternative A.

The Lower Gila Terraces and Historic Trails SCRMA is proposed to protect cultural resources in the area. The emphasis is on conservation with minimal interpretation and only non-ground disturbing scientific research. The designation should ameliorate threats to site integrity. Impact would be negligible. This would provide a more protection than Alternative A.

From Travel Management on Cultural and Heritage Resources

In the Lower Sonoran, all the action alternatives would be subject to route designation within 5 years of RMP completion. Until designation, travel would be limited to existing roads and trails. While existing routes will not generally be inventoried for cultural or historic resources, known sites have been identified during the road inventory. These and known sensitive areas will be considered in determining which roads will be designated as routes.

Alternative D would close the greatest number (777 versus 15 in Alternative A) of transportation routes. Restricted access would protect many sites from inadvertent incursions from vehicles and may reduce the impacts on site integrity of unauthorized artifact collection. Restricted access would also limit regular monitoring of archaeological sites in remote areas by staff and volunteers, thereby reducing the effectiveness of some site protection activities. This may make some sites more vulnerable to vandalism. Restrictions on access for permitted scientific studies would limit scientific use of sites and gathering information useful for research and resource management. Overall, however, this alternative would provide the greatest protective effect on cultural and heritage resources. Impacts on site integrity and setting would be negligible.

From Vegetation Resources on Cultural and Heritage Resources

Impacts would be the same as Alternative B for Lower Sonoran.

From Visual Resource on Cultural and Heritage Resources

In this alternative, VRM Class I and Class II allocations dominate the Lower Sonoran, which offer the most protective management strategy for cultural resources, far more protection than under Alternative A. This alternative should have a protective effect on the settings of cultural resources for the long term. Impacts allowed under this alternative would be negligible to minor in effect on site setting.

From Wilderness Characteristics on Cultural and Heritage Resources

Approximately 276,500 acres would be allocated as lands managed to protect wilderness characteristics. Impacts would be the same as those described in Alternative C for Lower Sonoran, except that a considerable increase in acreage (148,400 acres) managed under this allocation would benefit more sites. This would provide more protective effect than Alternative A.

4.4.6.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Cultural and Heritage Resources

Restrictions on surface-disturbing research on cultural resource sites (Monument objects) may have a direct, more protective (albeit negligible to minor) effect than Alternative A on the integrity of cultural resource sites. However, there may be classes of scientific information that may not be obtainable without excavation.

Since no new cultural sites (including Big Horn Station) would be developed as interpretive sites, no impacts due to an allocated public use would be anticipated.

From Recreation Management on Cultural and Heritage Resources

In the SDNM SRMA, the majority of this unit would be allocated to back country use. In the back country, it is expected that camping in a dispersed manner may affect the integrity of cultural resources and Monument objects directly by vehicle incursions, trampling, and indirectly by possible exposure to the threat of unauthorized collection of artifacts at a negligible to minor level of intensity for short durations, in localized areas. It is anticipated that the proposed restrictions in travel routes and visitation would have a more protective effect on the cultural resources and Monument objects than that proposed in Alternative A due to a reduced likelihood of vehicle incursions onto cultural sites and Monument objects.

Refer to Table 4.30, “Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects” (p. 907) within Section 4.25, “Implementation Level Analysis” (p. 906).

From Special Designations on Cultural and Heritage Resources

Under Alternative D, interpretive and visitor facilities would only be developed outside of the historic trail corridor, this would have the effect of addressing potential impacts to Monument objects by finding alternative locations for those uses. Impacts on the integrity of the resource and its setting would be negligible. This would be more protective than Alternative A.

Allocations of SR–238 (18 miles) and I -8 (30 miles) as Scenic Byways would have no effect on the cultural resources and Monument objects.

From Travel Management on Cultural and Heritage Resources

Refer to Table 4.30, “Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects” (p. 907) for impacts related to route designation in the SDNM .

From Vegetation Resources on Cultural and Heritage Resources

Passive vegetation restoration projects may have a direct or indirect protective effect on cultural resources and Monument objects for the long term by helping to arrest erosion processes that damage site features by stabilizing the soil. Impacts on site integrity and setting would be negligible. This Alternative would have a more protective effect than Alternative A.

From Visual Resources on Cultural and Heritage Resources

This alternative, under which Class I allocation extends over at least 95 percent of the SDNM, has far more restrictive decisions than Alternative A for visual resources management resources. This would have a more protective effect on the settings of cultural resources and Monument

objects for the long term than provided in Alternative A. Impacts to Monument objects will be negligible as the objective of this class is preservation of settings.

From Wilderness Characteristics on Cultural and Heritage Resources

Approximately 153,000 acres would be allocated as lands managed to protect wilderness characteristics. Impacts would be the same as those described in Alternative C for the Lower Sonoran except that an increase in acreage (40,800 acres) managed under this allocation would benefit more sites. Impacts to site integrity would be negligible and this would provide more protective effect than Alternative A.

4.4.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.4.7.1. Both Decision Areas

From Priority Wildlife Species and Habitat Management on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative B for both Decision Areas.

4.4.7.2. Lower Sonoran

From Cultural and Heritage Resources on Cultural and Heritage Resources

Painted Rock, portions of historic trails, and Sundad would be allocated for public use. Sundad would also be available for scientific research. Impacts would be the same as those discussed under Alternative C for the Lower Sonoran.

From Livestock Grazing on Cultural and Heritage Resources

Impacts would be the same as under Alternative A for the Lower Sonoran.

From Minerals Management on Cultural and Heritage Resources

In Alternative E, 2,350 acres would be closed to entry for development of locatable minerals (710,800 acres open); 53,700 acres would be closed to leasable minerals development (659,600 acres open); and 192,300 would be closed to minerals materials development (521,000 acres open). Several of the areas to be closed were selected based upon the sensitivity of the cultural and historic resources known to be present. This alternative will have much more protective effect than in Alternative A on sites that could be affected due to leasable and saleable (mineral materials) development. Depending upon the extent and intensity of ground disturbance and production in approved plans of operation for mineral exploration and development, there may be direct effects on cultural resource site integrity at a moderate level. However, mitigation of impacts to affected sites is expected to reduce the effects to minor. Methods to reach a minor impact outcome would likely include project redesign and/or data collection in compliance with existing law and regulation.

New vehicle routes associated with mineral development may have moderate indirect impacts on site integrity if project access also opens new areas to site visitation. These impacts may be reduced to minor through project design.

From Recreation Management on Cultural and Heritage Resources

The Decision Area will be divided into one ERMA and six SRMAs. Impacts from the ERMA would be same as in Alternative A. Impacts from the SRMAs are detailed below.

In the Buckeye Hills Trails SRMA, a combination of front country experiences and community interface level of management has been proposed. In the west section of this unit, the vehicle-based, front country, two-track route exploration would impact cultural resources on a negligible to minor level for a short duration, in localized areas due to vehicle incursions causing damage to sites. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas. In the eastern section of this unit, the community interface level of management implies that areas where camping and day use areas are designated, impacts would be negligible on cultural resources. More intensive management of this area would ensure that this alternative would have a more protective effect than Alternative A.

In the Saddle Mountain SRMA, a combination of front country experiences, back country primitive experiences, and a community interface area. In the front country areas, vehicle-based exploration and camping would impact cultural resources on a minor level for short duration in localized areas. Community interface areas where camping and day use areas are designated and activity structured, there would be negligible or no impact on cultural resources. In the front country or back country, it is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a negligible to minor level of intensity for short durations, in localized areas. More intensive management of this area would ensure that this alternative would have a more protective effect than Alternative A.

In the Arlington SRMA, vehicle—based, front country, two-track, route exploration would impact cultural resources on a negligible to minor level for a short duration, in localized areas due to route proliferation and vehicle incursions onto sites causing damage. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas. More intensive management of this area would ensure that this alternative would have a more protective effect than Alternative A.

In the Gila Bend Mountains SRMA, the area is largely proposed as back country with a few areas of front country along the main access routes. It is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity for short durations, in localized areas. Impacts are expected to be similar to Alternative A.

In the Sonoran Desert Historic Trails SRMA, vehicle-based, front country route exploration is anticipated to be complementary to the historic trail features that cross the unit, since this SRMA would base interpretive development partially on retracement of the historic routes. It is anticipated that this activity would impact cultural resources through route proliferation and

vehicle incursions on a minor level for a short duration, in localized areas. Camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity over the long term, in localized areas. More intensive management of this area would ensure that this alternative would have a more protective effect than Alternative A.

In the Ajo SRMA, a combination of community interface management close to town, back country management, and front country management are anticipated. Community interface areas where camping and day use areas are designated and activity structured, there would be negligible or no impact on cultural resources. In front country or back country, it is expected that camping in a dispersed manner may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a negligible to minor level of intensity for short durations, in localized areas. In the front country areas, vehicle-based exploration and camping would impact cultural resources on a minor level for short duration in localized areas. More intensive management of this area would ensure that this alternative would have a more protective effect than Alternative A.

From Special Designations on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative D for the Lower Sonoran.

From Travel Management on Cultural and Heritage Resources

In the Lower Sonoran all the action alternatives would be subject to route designation within 5 years of RMP completion. Until designation, travel would be limited to existing roads and trails. While existing routes will not generally be inventoried for cultural or historic resources, known sites have been identified during the road inventory. These and known sensitive areas will be considered in determining which roads will be designated as routes.

Impacts would be the same as Alternative B, except for some decrease in the length of the road network due to elimination of excess routes and routes that are in conflict with sensitive resources. This may have a long-term protective effect indirectly on the cultural resource sites integrity by limiting access into remote areas, and directly by removing vehicle routes from encroachment into site boundaries.

From Vegetation Resources on Cultural and Heritage Resources

Impacts would be the same as Alternative B for Lower Sonoran.

From Visual Resource on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative B for the Lower Sonoran.

From Wilderness Characteristics on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative C for the Lower Sonoran, except that the acreage allocated under this alternative reduced more than 50 percent (55,400 acres verses 128,100 in Alternative C). This would have the effect of reducing the number of sites that

would benefit from the protective measures offered by this allocation. It still, however, provides more protection than in Alternative A.

4.4.7.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Cultural and Heritage Resources

Alternative E would designate the Lower Gila Trails SCRMA. Impacts would be the same as in Alternative C for SDNM.

Big Horn Station would be allocated for public use. There would be some ground disturbance due to installation of facilities to manage visitation and protect resources, such as designated parking areas, protective fencing, and/or interpretive media displays. Road access will have to be designed and constructed to enable safe public access off of I-8. Impact to site integrity would be negligible to minor under Alternative E as facilities necessary to visitor safety and site protection would be placed and installed to maximize protection of site integrity and setting. Due to more intensive management, overall protection for Big Horn Station should be greater than in Alternative A.

Scientific and historical studies at selected cultural sites (Monument objects) allocated to scientific research may include excavation. Scientific excavation is an acceptable method of data retrieval and preservation and is, therefore, considered a negligible impact. Alternatives A and E would be similar in protective effect.

From Recreation Management on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative C for the SDNM.

Refer to Table 4.30, “Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects” (p. 907) for impacts related to target shooting.

From Livestock Grazing on Cultural and Heritage Resources

Alternative E reflects the allotment classifications and corresponding impacts as described in Alternative A. Outside of Alternative D, (which eliminates grazing from the Monument) Alternative E would be the most protective alternative for cultural and heritage resources, as only 156,919 acres would be available for grazing.

The closures of 44,800 acres and corresponding impacts would be similar to Alternative C. Additionally, the Conley Allotment within the SDNM would become unavailable to cattle in order to protect important Monument objects that have been found to be incompatible with livestock grazing. This closure would specifically enhance the protection of the Anza NHT. Combined actions in this alternative would significantly reduce impacts on cultural resources from livestock grazing to negligible, or minor at the most.

From Special Designations on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative D for the SDNM.

From Travel Management on Cultural and Heritage Resources

Refer to Table 4.30, “Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects” (p. 907) for impacts related to route designations in the SDNM.

From Visual Resource on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative C for the SDNM.

From Wilderness Characteristics on Cultural and Heritage Resources

Impacts would be the same as those described in Alternative C for the SDNM. Acreage that would be allocated as lands managed to protect wilderness characteristics is nearly the same in both Alternative E (110,900 acres) and C (112,200 acres).

4.5. IMPACTS ON PALEONTOLOGICAL RESOURCES

In the Lower Sonoran, the Sentinel Plain lava flow is considered geologically significant. No other geologically significant areas have been identified in the Decision Areas; however, locally significant areas may be present. These include geologic formations or outcrops having unique or unusual features of scenic value, may contain important geologic characteristics, or contain scientific or educational significance. In the event significant geologic or paleontological resources are discovered within the Decision Areas, management actions to protect these resources would be implemented.

Proposed management decisions that involve ground-disturbing actions can impact geologic or paleontological resources that have yet to be inventoried, such as in areas with unique or unusual features of scenic value or interest, scientific or educational significance, or contain fossil-bearing sedimentary rock formations.. The areal extent of ground-disturbing actions would vary under each alternative and depend on the acreage excluded from ground disturbance to protect or preserve other resources. Conversely, decisions that restrict or prohibit ground-disturbing activities would promote the preservation of unique geologic and paleontological resources.

The extent of impacts on paleontological resources varies due to the types and intensities of uses of public land, especially the extent of ground disturbing activities, as well as the location of uses. Since certain rock units or outcrops have recreational, scientific, or educational significance, or contain fossil-bearing rock formations, the areal extent of ground-disturbing actions would vary under each alternative. It is anticipated that impacts on paleontological resources would result from ground disturbance such as cross-country OHV travel, wildfires, unauthorized collection, vandalism, and trampling due to human or livestock activities. Other impacts, including permanent destruction of fossil locales, result from intensive, repetitive, and concentrated ground-disturbing activities. Under all alternatives, paleontological resources would continue to be affected by natural weathering and erosion processes.

Due to the fact that limited paleontological and geological resources have been identified in the Planning Area, the impacts on these resources are not discussed in detail. During implementation or project specific planning, the BLM would evaluate proposed actions for site-specific effects on natural resources, including paleontological and geological resources, focusing on management actions that could disturb or damage fossil-bearing formations or outcrops. In the event significant geologic or paleontological resources are discovered within the Decision Areas, management actions to protect these resources and any associated water resources would be implemented.

4.6. IMPACTS ON PRIORITY WILDLIFE SPECIES & HABITAT MANAGEMENT

This section analyzes the impacts of management actions on priority wildlife species and habitat. Each of the Action Alternatives provide for overall ecosystem health, diversity, maintenance/enhancement of native wildlife populations, and proper management of threatened and endangered species and their habitats. The priority wildlife resource objectives stress the importance of natural ecological processes and functions and focus on land uses and discretionary actions to support multiple uses that are consistent with sustaining these natural ecological processes and functions.

The primary impacts to priority wildlife resources stem from resource conflicts with other management programs within the Planning Area and include loss or alteration of native habitats, increased habitat fragmentation, changes in habitat and species composition, and loss of wildlife.

Impacts to wildlife and priority species resources in the Planning Area from other management programs could include but are not limited to the loss or alteration of native habitats, increased invasion of noxious weeds and other exotic weed species, decreased water availability, increased habitat fragmentation, changes in habitat and species composition, disruption of species behavior leading to reduced reproductive fitness or increased susceptibility to predation, and direct mortality. Surface disturbing activities that alter vegetation characteristics (e.g., the structure, composition, or production of the vegetative community) have the potential to affect habitat suitability for wildlife and priority species, particularly where the disturbance removes or reduces cover or food resources. Even minor changes to vegetation communities have the potential to affect resident wildlife and priority species populations if there is no suitable or available habitat in close proximity to areas that have been disturbed and are considered unsuitable.

Direct impacts to wildlife and priority species from management activities may result in mortality or displacement of individuals and alteration of immediate environments through the loss of, or changes to, key habitat components. Key habitat components include food availability, quantity and quality of habitat, cover from predators and extreme temperatures, nesting, roosting, denning, breeding and young rearing habitats, water availability and access, and movement corridors to promote genetic flow and diversity. Direct impacts may affect wildlife or priority species populations or habitats for the duration of the action, for a few days thereafter, for several growing seasons, or may continue indefinitely where the action results in permanent habitat loss.

Indirect impacts to wildlife and priority species resources from management activities could result from changes in composition, recovery, or rehabilitation of the habitat. These impacts may be long-term or short-term depending on the severity of the habitat alteration, may change species assemblages (i.e. the relative abundances or species composition of plant or animal communities), species behavior, or overall population trends, which would benefit some species while negatively affecting others. The direct and indirect impacts of management actions on wildlife and priority species resources may vary widely depending on a variety of factors such as the dynamics of the habitat (e.g., the community type, size, shape, complexity, stage, and condition of plant or animal communities); season, intensity, duration, frequency, and extent of the disturbance; rate and composition of vegetation recovery; change in vegetation structure; soil type, topography and microhabitat sites; animal species that are present; and the ability of species to adapt, immigrate to or emigrate from a site following a disturbance.

The following resources are expected to impact wildlife and priority species: lands and realty management, livestock grazing management, minerals management, priority wildlife species and habitat management, recreation management, special designations, travel management, visual resources management, wilderness characteristics, and wildland fire management.

Of the resource management elements to be addressed by the Lower Sonoran and SDNM RMP, public safety and hazardous materials have the potential to harm wildlife and priority species. Clean-up of such sites could cause short-term impacts through soil disturbance or vegetation removal, but in the long-term, these actions could improve the ecological conditions in the immediate areas of such actions. Grazing by burros in the Painted Rock Herd Area could impact ecological resources; however, burro numbers are expected to remain near zero in all alternatives. Livestock grazing, priority wildlife species and habitat, recreation, special designations, travel management, and lands managed to protect wilderness characteristics would impact priority wildlife species and habitat and are discussed below.

4.6.1. METHODS OF ANALYSIS

4.6.1.1. Indicators

Management actions described in the alternatives could result in impacts to the wildlife program. Indicators used to quantitatively assess management changes include the following:

- Degradation or improvement of wildlife habitat quality due to changes in vegetation abundance or quality,
- Changes in wildlife populations in general due to changes in population numbers,
- Shifts in wildlife use of habitat due to the availability of movement from one area to another.

4.6.1.2. Assumptions

The following assumptions regarding wildlife and priority wildlife or plant species are made:

- Wildlife habitat will be managed for wildlife and migratory birds with an emphasis on priority species;
- Priority species habitat will be managed for the benefit of those species as a priority over other resource allocations and uses;
- All surface-disturbing activities will include mitigation and adaptive management to reduce impacts to priority wildlife and priority species and their habitat;
- In general, vegetative communities are considered to be in good condition, but small localized impacted areas may be present;
- Although some areas are more suitable for different classes and species of wildlife, the impacts from different classes of wildlife will be similar and would not be discussed separately.

4.6.1.3. Program Areas with No Impacts on Priority Wildlife Species and Habitat Management

Management actions associated with the following program areas are expected to have no impact on priority wildlife species and habitat: air resources, caves and cave resources, cultural and heritage resources, paleontological resources, public safety, vegetation resources, visual resources, water resources, watershed and soils, and wild horses and burros. It is anticipated that these programs would have no impact, and they will not be analyzed further in this document with respect to priority wildlife species and habitat.

4.6.1.4. Qualitative Intensity Scale

The qualitative terms for intensity of impacts are generally the same as that adopted (see Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375)) elsewhere in this chapter. In addition to the definitions and thresholds identified for the SDNM, impacts specific to Priority Wildlife Species and Habitat management will be measured as follows:

Negligible: Impacts include but are not limited to: wildlife remaining in the area without having to relocate due to interactions or surface disturbance created by humans, livestock, or other wildlife. Wildlife expending little to no energy to avoid such interactions or surface disturbance. Wildlife not being beleaguered during normal everyday routines such as loafing, feeding, or shading. Populations are expected to remain at current levels or increase. Habitat connectivity is good and expected to remain that way, and movements, seasonal or otherwise, will not be effected, and approximately 80 to 100 percent of the habitat is unfragmented. Overall change to wildlife populations, habitat quality, or habitat connectivity will be undetectable.

Minor: Impacts could include but are not limited to: wildlife having to move small distances, but remaining in the same vicinity as before the interactions or surface disturbance created by humans, livestock or other wildlife; wildlife expending minor amounts of energy to avoid such interactions; and wildlife routines being beleaguered for a short term. Populations would be expected to remain at current levels or increase. Habitat connectivity would remain good, and movements, seasonal or otherwise, would be affected only for brief periods during such interactions. Approximately 60 to 80 percent of the habitat would be unfragmented. Overall change to wildlife populations, habitat quality, or habitat connectivity would be apparent and measurable but small and localized with in the footprint of the action.

Moderate: Impacts could include but are not limited to: wildlife vacating the area for a short time but returning shortly after actions are no longer considered a threat; wildlife expending moderate energy to avoid interactions or surface disturbance created by humans, livestock or other wildlife. Populations would be expected to remain at current levels or decrease slightly. Habitat connectivity could be reduced, and movement corridors, seasonal or otherwise, could be affected for longer periods of time. Approximately 40 to 60 percent of the habitat would be unfragmented. Overall change to wildlife populations, habitat quality, or habitat connectivity would be readily apparent and measurable over a larger area but are mainly within the footprint of the action.

Major: Impacts could include but are not limited to: wildlife moving great distances to avoid interactions or surface disturbance created by humans, livestock or other wildlife; vacating the area over the long term or abandoning it altogether; or expending moderate to great amounts of energy to avoid such interactions. Populations would be expected to decline locally. Habitat connectivity could be reduced or movement corridors fragmented. Wildlife movements, seasonal

or otherwise, could be affected for long periods of time, and corridors could be eliminated due to frequency of such uses or other factors associated with them but up to 40 percent of the habitat would be unfragmented. Overall change to wildlife populations, habitat quality, and habitat connectivity would be highly noticeable and extend well beyond the footprint of the action.

Short-term: Impacts would generally last less than a single year or growing season.

Long-term: . Impacts would result in a change in a resource or its condition would last longer than a single year or growing season.

4.6.2. COMMON TO ALL ALTERNATIVES

4.6.2.1. Common to Both Decision Areas

From Wildland Fire Management on Priority Habitat and Wildlife Management

Vegetation communities in both the Lower Sonoran and SDNM Decision Areas are predominantly Sonoran Desert types that are not adapted to fire. In these areas, both natural and human-caused fires would be suppressed. Various resource management objectives would result in modified fire-suppression activities to limit long-term effects as defined in the management actions below. A few areas may meet the criteria for utilizing prescribed fire to meet resource objectives. These objectives include:

- Improve vegetation, wildlife habitat, or watershed conditions;
- Maintain non-hazardous levels of fuels;
- Reduce the hazardous effects of unplanned wildland fires; and
- Meet other resource objectives.

Areas that could meet these criteria include stretches of the Gila River where tamarisk has suppressed native riparian vegetation and some parts of the Vekol Valley Grassland where fire may improve natural conditions of the grassland while protecting non-fire adapted vegetation communities in the vicinity.

When applying fuels-treatment methods, BLM policies, procedures, and plans are to be followed in all cases. The manual, chemical, biological, and fire-treatment methods that might be used are described in Section 4.8, “Impacts on Vegetation Resources” (p. 494). There are several treatment methods and SOPs that would be used in a vegetation-treatment program. BLM policies and guidance for public land treatments would be followed in implementing all treatment methods. Impacts of suppression activities would range from negligible to major, depending on the time of year and the duration and intensity of the fire. Impacts at this level would be an improvement compared to impacts in Alternative A.

4.6.2.2. Lower Sonoran

No unique impacts have been indentified for the Lower Sonoran Decision Area that is common to all alternatives.

4.6.2.3. Sonoran Desert National Monument

From Special Designations on Priority Habitat and Wildlife Management

All Action Alternatives would remove the Vekol Valley ACEC designation. The Vekol Valley ACEC currently is within the SDNM, and its protections of Monument objects supercede those of the ACEC and justify its removal. Negligible impacts would be expected from the ACEC withdrawal.

4.6.3. ALTERNATIVE A (NO ACTION)

Under this alternative, resources are managed to maintain the present levels of resource use and quality of public lands. The allocation of lands and resources remains essentially unchanged, reflecting only those changes identified in current LUP decisions. Some decisions in Alternative A would support maintaining or enhancing wildlife species and their habitats, but the overall impact of Alternative A on priority wildlife species and their habitat generally would lead in the opposite direction. With few specific decisions to manage public uses to protect wildlife and wildlife habitat, increased loss or alteration of native habitats, increased habitat fragmentation, changes in habitat and species composition, and loss of wildlife could occur under Alternative A.

4.6.3.1. Both Decision Areas

From Priority and Wildlife Habitat Management on Priority Habitat and Wildlife Management

No specific management objectives for priority species are specified in Alternative A; therefore, important habitat for priority plant and animal species would be protected on a case-by-case basis to maintain occupied and suitable habitats of such species. Species of concern include cactus ferruginous pygmy-owl, Sonoran desert tortoise, and bighorn sheep.

Constructing wildlife habitat improvement projects and wildlife water sources could cause short-term loss of vegetation for wildlife habitat; however, wildlife waters provide water availability for wildlife and support distribution of wildlife in the long term. Implementation of use restrictions and conservation measures for priority species could also reduce or eliminate disturbances that would otherwise have affected wildlife resources.

New wildlife water developments would continue to be evaluated and constructed on a case-by-case basis. Although many wildlife species use water developments, some species (e.g., desert bighorn, mule deer, and game birds) use water developments more than others, particularly during stressful periods such as lambing, fawning, and the summer months (Rosenstock et al. 2004). Impacts to wildlife from localized water developments could result in population expansion of some species in both numbers and distribution. The effect on wildlife populations is expected to be minor to moderate. Additional wildlife water sources could increase the ability for wildlife to transverse from one area to another, creating a minor to moderate improvement to habitat connectivity. Wildlife water sources also would improve the quality of habitats that currently are void of water sources, resulting in a minor to moderate impact to wildlife. New wildlife waters could have a negligible negative impact if they attract wildlife in numbers great enough to displace or damage animal and plant species that are already present in the area. Wildlife also may

become dependent on these water sources and could be affected if the water source is removed, not maintained or goes dry. The effect to wildlife could require that a species may have to vacate the area and find new water sources or a species could face mortality if unable to relocate.

Under Alternative A, the potential for disease introduction into native sheep habitats is reduced when using the guidelines set forth in IM No. 98-140, including a restriction on permitting domestic sheep grazing within 9 miles of wild sheep habitats, . The impact of this action would have a minor effect on the persistence of wild sheep populations. Not allowing domestic sheep grazing within 9 miles of wild sheep habitat provides a minor improvement of habitats for other grazing wildlife species, such as mule deer, antelope, and Sonoran desert tortoise. Removing domestic sheep grazing would reduce competition and improve forage availability.

Existing management actions for categorized Sonoran desert tortoise habitat would continue to ensure that adequate habitat is protected and available to support viable populations and habitat of Sonoran desert tortoise consistent with criteria contained in the Desert Tortoise Range Wide Plan and Arizona Implementation Strategy (BLM 1988, 1990), as amended. Following the Range Wide Plan, impacts to desert tortoises from other actions and uses would be reduced and could assist in maintaining or improving habitat and populations.

4.6.3.2. Lower Sonoran

From Lands & Realty on Priority Habitat and Wildlife Management

Land tenure adjustments could impact wildlife habitat management practices. The potential disposal of 18,900 acres under Alternative A could have impacts that range from negligible to major and vary by area if the disposed parcels contain important wildlife habitat areas or a reduction of habitat available for wildlife use. However, most of the parcels identified for disposal are small in nature, are surrounded by lands that are not managed by or are inaccessible to the BLM, and have abundant habitat available next to or in close proximity to the disposal areas. Therefore, negligible to minor impacts to wildlife are expected.

Development of energy projects, mainly solar, would have impacts on wildlife habitat management ranging from minor to major. Development of such projects would decrease the amount of available forage for wildlife species – as well as the destruction of dens, nests, or burrows and the mortality of species in the area because solar development practices include clearing vegetation and leveling the ground. For wildlife to not be affected, the proposal would have to be located in areas where habitat values are so poor or fragmented that wildlife cannot occupy it. Conflicts could be avoided by employing adaptive management and BMPs to allow multiple uses with minor impacts on wildlife.

Designating up to ten utility corridors through the Planning Area could lead to new access roads and associated increased vehicle traffic. Impacts would likely be negligible from conflicts between vehicles and wildlife where the corridors are limited to administrative access or current projects already exist. Overall impacts from Alternative A lands and realty management on wildlife are expected to range from negligible to major.

From Livestock Grazing on Priority Habitat and Wildlife Management

Impacts on wildlife or priority species from livestock grazing could include competition for space, forage, cover, and water resources throughout the Decision Areas. Localized changes in plant

community composition and wildlife/priority species populations could result. Impacts associated with grazing range from negligible to major.

Research indicates that there is a high probability disease is transmitted from domestic livestock to wildlife, particularly when there is direct contact between domestic sheep and bighorn sheep. The major disease that poses a threat to bighorn sheep is Pasturella. Pasturella is a bacterium occurs in nasal passages of both bighorn sheep and domestic sheep and goats. When Pasturella is introduced to bighorn sheep, it can cause respiratory issues such as pneumonia and can ultimately lead to mortality of individuals or entire herds.

Constructing rangeland development projects and new water sources would cause short-term losses of vegetation for wildlife habitat by removing or trampling vegetation but could improve water availability for wildlife and support distribution of wildlife in the long term. Moderate impacts typically occur within areas where livestock are concentrated, such as water sources, salting and supplement areas, or areas in which livestock are trailed or worked.

From Minerals Management on Priority Habitat and Wildlife Management

Mineral development could impact wildlife habitat management by disturbing surfaces and decreasing vegetation. Wildlife may vacate the area during active mineral operations, thus reducing occupancy by wildlife and reducing available space and habitat. However, small mining operations less than 5 acres in size would have minor impacts on wildlife. The size of an operation and the amount of human activity would dictate the level of impacts to wildlife species and could be moderate depending on the amount of habitat fragmentation and human activity. Some wildlife species could become accustomed to the activity over a relatively short period of time and negate the impact by habituation on their own concurrence. If so, impacts could be minor to some wildlife species. The level of impact on wildlife would vary by the size of the mineral development but generally would be minor in scale. Overall impacts to wildlife are expected to range from negligible to moderate under Alternative A.

From Recreation Management on Priority Habitat and Wildlife Management

In the Lower Sonoran, current levels of recreation management do not adequately address impacts to priority wildlife species and habitat. Informal, unauthorized recreational use areas are developed continually and cause habitat loss and disturbance. The existing management identified recreation opportunity spectrum for primitive, semi-primitive nonmotorized, semi-primitive motorized, roaded natural, rural, and urban. Primitive areas with low visitation, and intensively used areas with high visitation are intermingle and dispersed throughout the Planning Area. Overall impacts from recreation classifications on wildlife are expected to range from negligible to major depending on the intensity, duration, and concentration of recreational uses.

From Special Designations on Priority Habitat and Wildlife Management

Currently, the Coffeepot ACEC encompasses approximately 8,900 acres of public lands under Alternative A. This ACEC was designated for the protection of the endangered Acuna cactus. There are scattered populations of this cactus within the boundaries of the ACEC, and management is focused on this single species. The area does contain an active gas pipeline and numerous routes that could affect the existence of the species. The ACEC also is in close proximity to the town of Ajo, and recreation and mining uses do occur within the ACEC, which

could lead to further habitat fragmentation for the cactus. Impacts to the Acuna cactus are expected to range from negligible to moderate under current conditions of the ACEC.

From Travel Management on Priority Habitat and Wildlife Management

Travel on 819,500 acres of public lands in the Lower Sonoran would continue to be allocated as limited to existing routes. Travel on 110,700 acres would be closed, with approximately 91,750 acres designated as wilderness areas, and 8,900 acres allocated for the Coffeepot Botanical ACEC. Travel on 21,400 acres would be limited to designated routes. Impacts to wildlife resources are expected to be minor to moderate.

The designation of wilderness affords the highest level of protection for unfragmented habitat. Wilderness areas contain priority wildlife habitat for Sonoran desert tortoise, desert bighorn sheep, and potential foraging habitat for lesser long-nosed bats.

The number of open routes under Alternative A in the Lower Sonoran could cause impacts due to conflicts between wildlife and vehicles that could range from negligible to moderate. However, a well-designed route system could support wildlife management by facilitating access for wildlife movement and wildlife developments across the landscape. Closed or limited routes would generally be expected to reduce the level of conflict, and impacts from vehicles to wildlife habitat management impacts would be expected to range from negligible to minor.

Under Alternative A, few restrictions would be placed on motorized or nonmotorized users accessing the public lands in the Planning Area other than the prohibition of motorized cross country travel. Multiple access points could result in habitat fragmentation through the creation of multiple routes, increased soil erosion and compaction, and loss of vegetation as routes proliferate and the hydrologic flow is altered or diverted. Increases in surface disturbance may result in increases in noxious and invasive weeds from importation from vehicles, urban developments, roadways, livestock, equestrian users, and hikers, all of which could reduce native vegetation, alter vegetative composition, and reduce habitat suitability to some wildlife species. Some wildlife or priority species may be displaced or face mortality as a result of increased human interaction and habitat alteration. Impacts from interactions between humans and wildlife vary greatly, from negligible to major.

Typically, negligible and minor impacts to wildlife are expected where use is infrequent and human interactions are few. Interactions are fewer in areas where roads and trails are infrequently used, such as rough roads or wilderness trails. In Alternative A, there are approximately 34 miles of nonmotorized trails and approximately 582 miles of primitive roads where wildlife impacts are expected to be negligible to minor. Moderate to major impacts typically occur where use is more frequent and interactions between wildlife and humans are greater. These are typically routes and roads that are maintained for more frequent, higher speed travel. In Alternative A, there are approximately 16 miles of maintained roads where impacts are expected to be moderate. At this time it is expected that there would be no major impacts associated with travel for any of the alternatives.

Sonoran desert tortoise habitat would continue to be managed consistent with the objectives of the Desert Tortoise Rangewide Plan (BLM 1988) and Strategy for Tortoise Management on Public Lands in Arizona (BLM 1990. Identification and managing OHV use under limited would continue to be a challenge in controlling route proliferation and unauthorized uses. Habitat fragmentation and direct disturbance to wildlife resources would occur.

Overall impacts would be expected to range from negligible to moderate, depending on the location and duration of surface disturbing activities.

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Because no lands managed to protect wilderness characteristics would be allocated under Alternative A, no impacts would occur.

4.6.3.3. Sonoran Desert National Monument

From Lands & Realty on Priority Habitat and Wildlife Management

The designation of three utility corridors north of I-8 could lead to new access roads and associated increased vehicle traffic. The areas designated for transmission LUAs could increase perching opportunities for raptors, as well as increasing wire line strikes and electrocutions for some avian species. The corridors also could serve as areas where wildlife would travel from one area to another with the removal of vegetation. Removing vegetation in areas could assist wildlife in short term dispersal in a relatively secure manner; however, it also could increase predation on some species with the removal of cover for escape. Overall impacts from the utility corridors would be expected to range from negligible to minor.

From Livestock Grazing on Priority Habitat and Wildlife Management

Livestock grazing authorizations south of I-8 in the SDNM were terminated when existing grazing permits expired as directed by Presidential Proclamation 7397. Grazing in the SDNM north of I-8 would continue as perennial use, consistent with historical stocking rates and with ephemeral use authorized through ephemeral permits. Within these open areas, wildlife would compete for space, forage, cover, and water resources. Localized changes in plant community composition and wildlife or priority species populations would be maintained or decreased.

Constructing rangeland development projects and water sources would cause short-term losses of vegetation for wildlife habitat by removing or trampling vegetation but could improve water availability for wildlife and support distribution of wildlife in the long term. Moderate impacts typically occur within areas where livestock are concentrated such as water sources, salting and supplement areas, or areas in which livestock are trailed and or worked. Overall impacts would be minor to moderate.

Domestic sheep and goat grazing would continue within the Monument. Research indicates that there is a high probability that disease is transmitted from domestic livestock, particularly when there is direct contact between domestic sheep and bighorn sheep. The major disease that poses a threat to bighorn sheep is Pasturella. Pasturella is a bacterium occurs in nasal passages of both bighorn sheep and domestic sheep and goats. When Pasturella is introduced to bighorn sheep, it can cause respiratory issues such as pneumonia and can ultimately lead to mortality of individuals or entire herds. Mitigation measures would be required to decrease the impacts associated with sheep grazing to wildlife, therefore impacts would generally be negligible to minor.

Refer to Table 4.31, “Impacts from Implementation Level Decisions on Priority Species Monument Objects” (p. 920) for impacts related to AUM allocations in the SDNM.

From Minerals Management on Priority Habitat and Wildlife Management

Within the SDNM, mining would have negligible to minor impacts to wildlife habitat. The proclamation withdrew future and existing claims for mineral activities within its boundaries. Overall impacts are expected to range from negligible to minor to objects within the Monument. This would be common to all alternatives for the SDNM.

From Recreation Management on Priority Habitat and Wildlife Management

Recreation uses in the SDNM would be allowed to the extent it is consistent with protection of Monument objects. Overall impacts to wildlife are expected to be negligible to minor.

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to target shooting.

From Special Designations on Priority Habitat and Wildlife Management

Currently, there are 3,500-acres of public lands within the Vekol Valley Grasslands ACEC, which lies within the SDNM; however it was designated before the conception of the SDNM. A decision in a previous RMP closes the Vekol Valley Grassland ACEC to OHV use and remains in effect. In all other alternatives except Alternative A, the Vekol Valley ACEC designation would be removed as the SDNM proclamation contains prescriptions that protect the area with better conservation measures than the ACEC. Impacts of retaining the ACEC would range from negligible to minor based current restrictions within the ACEC.

From Travel Management on Priority Habitat and Wildlife Management

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to travel management.

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Because no lands managed to protect wilderness characteristics would be allocated under Alternative A, no impacts to wildlife would likely occur.

4.6.4. ALTERNATIVE B

4.6.4.1. Common to Both Decision Areas

From Priority and Wildlife Habitat Management on Priority Habitat and Wildlife Management

Alternative B would be similar to Alternative A except that the lesser long-nosed bat foraging habitat, populations, and connectivity would be protected under Alternative B. Protecting these habitats from fragmentation would ensure species foraging capabilities within both Decision Areas and would protect objects within the Monument, particularity saguaro cactus. Impacts to the lesser long-nosed bat would be negligible to minor from all alternatives.

Pronghorn habitat would be protected to achieve recovery goals as set forth in the Sonoran Pronghorn Recovery Plan. Sonoran pronghorn habitat would be open to all locatable and leasable minerals exploration and development, as well as mineral material disposals. Surface disturbance associated with locatable and leasable minerals exploration and development and mineral material disposals could reduce habitat availability, habitat connectivity, and localized populations of the Sonoran pronghorn. Allowing these surface disturbing activities within the pronghorn habitat could have major impacts to both the species and its habitat within the Lower Sonoran Decision Area.

Southwestern willow flycatcher, yellow-billed cuckoo, and Yuma clapper rail habitats in the Fred J. Weiler Green Belt and the Gila River bed would be maintained or improved. Under this alternative, attention would be focused on reducing the amount and number of non-native invasive species in the Green Belt riparian zone. Projects would be engineered to improve habitat quality, increase localized populations, and improve connectivity of riparian habitats. Habitat improvement projects could impact some species by removing the non-native invasive species and creating areas that are void of plant structure as natural communities of riparian vegetation reestablish themselves. Impacts to the two species would be expected to be minor to moderate from habitat improvement projects form all alternatives.

Bat species and habitat would be maintained or improved in coordination with the AGFD. Bat roosts associated with natural caves and abandoned mines would be gated to restrict access by humans but still allow bats the use of such features. Gating these features would provide bats areas of refuge from harassment by humans and could increase localized populations. Impacts to bats are expected to be negligible to minor for both Decision Areas for all alternatives.

Suitable or occupied habitat for the cactus ferruginous pygmy-owl would be maintained or improved by avoiding surface disturbing activities within 0.5 miles of occupied nest sites from February 1st through July 15th. Avoiding surface disturbing activities during this time would allow the pygmy-owl to breed, nest, and fledge young in relative seclusion. Impacts to the pygmy-owl are expected to be negligible to minor.

Sonoran desert tortoise habitat would be maintained or improved as outlined in the Desert Tortoise 1988 Range Wide Plan. Category I, II and III tortoise habitat would be open to all land uses and activities and would be managed through existing regulations. Mitigation and compensation may be required to achieve the no net loss criteria in the range wide plan. This alternative would allow surface disturbance at a small scale to accommodate land uses that could impact the tortoise. Impacts to desert tortoise are expected to be minor to moderate under this alternative.

Raptor habitat would be maintained or improved under all alternatives. By maintaining or improving habitat for raptors, it is expected that localized populations would remain stable or increase. All alternatives would avoid authorizing developments, uses, or activities within 300 meters (328 yards) of occupied raptor nests and may require developments to be relocated or seasonally limited to avoid disturbing raptors during the nesting season. Authorized developments, uses, and activities within 0.5 mile of communal raptor nesting areas would be avoided as to not disturb communal nesting areas. Impacts to raptors from these types of activities would be negligible to minor for all alternatives.

Wildlife movement corridors would be managed for habitat connectivity to improve habitat quality, increase local populations, and connect habitat areas for wildlife usage. Impacts to corridors would be mitigated to reduce effects of possible collisions with vehicles and human

interactions. Impacts to corridors are expected to me negligible to minor for wildlife species in both Decision Areas.

Existing wildlife waters would be maintained or redeveloped as necessary to provide year-round water sources for wildlife species. Additional wildlife waters could be developed, and existing wildlife waters would be removed and potentially relocated to higher priority areas if a water catchment is not needed or does not attract wildlife use. Such actions would be done in cooperation with AGFD to provide the density and distribution of wildlife waters needed to sustain and enhance native wildlife population numbers or distribution across their range. Impacts to wildlife from wildlife waters would be negligible to minor in both Decision Areas.

Non-native, invasive animal species would be prohibited unless peer-reviewed scientific literature states that the introduced species would have no detrimental effects to any native wildlife species within in the Planning Area. Typically non native species out-compete native species for resources; however if an introduced species does not cause competition for resources utilized for the continued existence of native species they could be introduced. Impacts to wildlife would negligible to minor in both Decision Areas.

4.6.4.2. Lower Sonoran

From Lands & Realty on Priority Habitat and Wildlife Management

In general, impacts from utility corridors, energy projects and LUAs on wildlife habitat management would be similar to Alternative A. However, development of new energy projects and allowing minor and non-linear LUAs to be located outside of designated corridors could affect wildlife habitat, leading to moderate impacts on wildlife due to the removal of acreage and habitat available for wildlife usage, the potential to fragment habitat and the likelihood of additional road development and access. Overall impacts from Alternative B would be expected to range from negligible to moderate.

Impacts from land tenure adjustment on wildlife habitat management in the Lower Sonoran would be similar to the scale of impact as described under Alternative A. However, more habitat could be impacted because approximately 36,300 acres that would be available for disposal under Alternative B. Overall impacts from land tenure is expected to range from negligible to moderate under Alternative B.

From Livestock Grazing on Priority Habitat and Wildlife Management

Managing perennial grazing allotments with a reduction in the authorized grazing preference will have a minor impact to wildlife habitat management. The reduction in livestock numbers would improve quality and quantity of habitat for most wildlife species. Requiring changes such as intensive management of livestock operations would generally improve wildlife habitat conditions. Land health standards and guides were established to maintain or improve habitat for wildlife and vegetative components utilized by both wildlife and livestock. Habitat improvement for some wildlife species (such bighorn sheep, desert tortoise and other grazers) would be moderate under this alternative but only minor to negligible for other species of wildlife that compete less with livestock. Allotments that are meeting or exceeding standards would be considered as providing habitat for healthy sustainable wildlife populations. Domestic sheep and goat grazing would be prohibited within nine miles of bighorn sheep habitat as in Alternative A.

Very few livestock grazing practices fragment wildlife habitats. The effect of changing grazing practices in Alternative B would have a negligible to minor impact to habitat connectivity, which would be an improvement as compared to Alternative A.

From Minerals Management on Priority Habitat and Wildlife Management

Impacts from Alternative B would less than Alternative A. Mineral development on wildlife habitat management would increase habitat availability by requiring plans of operations and minimizing the footprint of mining operations in areas of important wildlife habitat for all wildlife species, with an emphasis on priority wildlife habitats. Overall impacts to wildlife are expected to range from negligible to moderate under Alternative B.

From Recreation Management on Priority Habitat and Wildlife Management

Designation of SRMAs and RMZs are intended to direct and control the amount of recreation uses to reduce conflicts with other resources. Recreation use in the front country zone is expected to be higher and closer to the urban interface. Approximately 263,300 acres, or 34 percent of the Lower Sonoran, would be allocated in the Front County Zone. Increased uses in this area could result in impacts to wildlife resources that range from minor to major, depending on the species and habitat impacted. Development of recreation facilities would result in habitat loss and disturbance. All authorized action would be implemented with BMPs and SOPs to minimize impacts to wildlife resources.

Approximately 347,200 acres, or 45 percent of the Lower Sonoran, would be allocated in the Back County Zone. Impacts to wildlife resources area expected to be less in the back country zone. Emphasis in this zone would be natural primitive landscapes, resulting in limited access and less ground disturbance to vegetation and wildlife habitat. Impacts could be negligible to minor.

From Special Designations on Priority Habitat and Wildlife Management

Under Alternative B, impacts would be similar to Alternative A except that the Coffeepot Botanical ACEC would be closed to OHV use, reducing fragmentation and the possible crushing of individual plants. Mining activities would be required to be mitigated to not disturb individual plants and avoid known populations for the cactus reducing habitat fragmentation and allowing persistence of the species on a small scale. Livestock use would be managed to perpetuate botanical diversity and range developments would not be located in areas that would increase livestock use where local populations of the cacti could be found. Overall impacts would be expected to range from negligible to moderate. Alternatives C, D, and E do not address the Coffeepot Botanical ACEC.

From Travel Management on Priority Habitat and Wildlife Management

Under Alternative B, 101,800 acres would be closed to motor vehicle uses, and 91,750 acres would be closed with the designation of two wilderness areas. Impacts are expected to be similar to Alternative A. In Alternative B, routes would be open to designated roads within the Coffeepot Botanical ACEC. This could result in minor to moderate impacts to biological resources within the ACEC. The potential for route proliferation in the areas is limited somewhat by terrain; however, the potential for increased activity does exist. Habitat loss and fragmentation likely would continue to increase under Alternative B.

Approximately 825,400 acres would be limited to designated roads and trails. Impacts to wildlife could range from minor to moderate based on specific route designations and location and type of use in priority habitat areas. Requiring designated routes should reduce route proliferation and reduce the potential for habitat fragmentation.

Approximately 40 acres would be designated as open for recreational activities. The proposed open area is within the current range of the endangered Sonoran pronghorn. There are currently minor impacts associated to pronghorn habitat due to the location of Ajo.

Alternative B would limit travel to designated routes. Impacts associated with unmanaged travel detailed in Alternative A would be reduced. Under Alternative B, more restrictions would be placed on motorized and nonmotorized users accessing the public lands in the Planning Area. Limited access points would reduce habitat fragmentation through minimizing the creation of multiple routes, reducing soil erosion, compaction and loss of vegetation as routes are controlled, and hydrologic flow would not be altered or diverted. Decreases in surface disturbance may result in reduced incidences of noxious and invasive weed importation by vehicles, urban developments, roadways, livestock, equestrian users, and hikers. Some wildlife or priority species may be displaced or could face mortality as a result of human interaction and habitat alteration but less than in Alternative A. Impacts from interactions between humans and wildlife vary greatly from negligible to major.

Impacts to Alternative B would be similar to impacts in Alternative A except that Alternative B proposes approximately 38 miles of nonmotorized trails and approximately 495 miles of primitive roads where wildlife impacts are expected to be negligible to minor. Moderate to major impacts typically occur where use is more frequent and interactions between wildlife and humans are greater. These are typically routes and roads that are maintained for more frequent, higher speed travel. In Alternative B, there are approximately 29 miles of maintained roads proposed where impacts are expected to be moderate.

Overall impacts to wildlife under Alternative B would be less than Alternative A and are expected to range from negligible to moderate.

From Wilderness Characteristics Management on Priority Habitat and Wildlife Management

Impacts would be the same as Alternative A.

4.6.4.3. Sonoran Desert National Monument

From Lands & Realty on Priority Habitat and Wildlife Management

Impacts from multiuse utility corridors, energy projects, and LUAs on wildlife habitat management would be similar to Alternative A.

From Livestock Grazing on Priority Habitat and Wildlife Management

Impacts would be similar to those described under Alternative A for the Monument except that fewer acres would be available for livestock grazing (243,749 acres); therefore, impact intensities

would be decreased to minor impacts, as areas where wildlife and livestock would compete for space, forage, cover, and water resources would be decreased.

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to AUM allocations in the SDNM. From Minerals Management on Priority Habitat and Wildlife Management Impacts would be the same as those described under Alternative A for the SDNM.

From Minerals Management on Priority Habitat and Wildlife Management

Impacts would be the same as those described under Alternative A for the SDNM.

From Recreation Management on Priority Habitat and Wildlife Management

In the SDNM, impacts would be similar to the Lower Sonoran except that approximately 107,200 acres (22 percent of the Decision Area) would be allocated to front country, and approximately 377,600 acres (78 percent of the Decision Area) would be allocated as back country.

Under Alternative B, up to 12 additional 0.25-acre visitor contact sites or other small pullouts would be provided. These facilities would be located in areas previously disturbed to the extent possible; thus, the area of new disturbance would total approximately 3 acres. There would be one 24-site campground, up to three visitor-contact sites of 0.25-acre each, three group campsites, one equestrian corral, one OHV/ATV parking area, one day-use and interpretive area, and one 6-mile, nonmotorized trail through Butterfield Pass situated in the Anza NHT management zone. To the extent possible, these facilities would be located in areas previously disturbed; thus, the area of new disturbance would total approximately 6 to 10 acres. Localize disturbance would occur but would be negligible to minor which would be an improvement as compared to Alternative A.

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to target shooting.

From Special Designations on Priority Habitat and Wildlife Management

Under Alternative B, impacts would be similar to Alternative A except that the Coffeepot Botanical ACEC would be closed to OHV use, thereby reducing fragmentation and the possibility of crushing individual plants. Mining activities would be required to be mitigated so as to not disturb individual plants and to avoid known populations for the acuna cactus, reducing habitat fragmentation and allowing the persistence of the species on a small scale. Livestock use would be managed to perpetuate botanical diversity, and range developments would not be located in areas that would increase livestock use where local populations of the cacti could be found. Overall impacts would be negligible.

From Travel Management on Priority Habitat and Wildlife Management

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) within Section 4.25, "Implementation Level Analysis" (p. 906).

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Impacts would be the same as described for Alternative A.

4.6.5. ALTERNATIVE C

4.6.5.1. Common to Both Decision Areas

From Priority and Wildlife Habitat Management on Priority Habitat and Wildlife Management

Alternative C introduces Wildlife Habitat Areas (WHAs) in the Batamote Mountains, Cuerda de Lena, the Gila Bend Mountains, and Saddle Mountain.

Common to all Alternatives for WHAs would be the following:

Retaining public lands within the WHAs would improve habitat quality, maintain or increase local populations of wildlife and provide connectivity to habitats used by wildlife. Impacts to wildlife by retaining public lands in the WHAs would be negligible.

Maintenance of utility corridors, including vegetation clearing, would be restricted to the existing authorized LUA corridor only within the WHAs. This would reduce disturbance outside of utility corridors, leaving habitat available for wildlife. Some wildlife species use utility corridors as feeding, resting, or travel areas, as well as using vegetation surrounding the utility corridors for other day-to-day activities. By limiting vegetation clearing within the existing corridor, habitat fragmentation would be reduced to only the areas needed for the maintenance of utilities. Impacts to wildlife would be negligible to minor, an improvement over Alternative A.

Routes that conflict with resource protection and management could be closed, limited by seasonal restrictions, or mitigated to prevent habitat degradation and fragmentation. Using closures, seasonal restrictions, and mitigation to prevent habitat degradation and fragmentation would improve habitat quality, local populations, and the connectivity of habitats for wildlife species. Impacts to wildlife from resource protection from transportation routes would be negligible to minor, an improvement over Alternative A.

Through the route-designation process, route densities would be reduced and the designation of upland routes would be emphasized. Necessary use of access routes in washes would be allowed; however, these access routes may contain seasonal closures, an improvement over Alternative A.

All new roads or highways crossing public land would be designed to facilitate movement of wildlife and would be mitigated to minimize disturbance.

Priority habitat areas would be maintained during road improvements (e.g., altering, upgrading, paving, and widening), and improvements must meet Sonoran desert tortoise-protection standards. Mitigation may include at-grade wildlife crossings, wildlife under- or over passes, wildlife-appropriate fencing, speed limits, and other appropriate actions, an improvement over Alternative A.

Surface-disturbing activities affecting an area greater than 40 acres, including land use authorizations, utility-scale renewable-energy development, and recreation facilities, would be avoided. Overall impacts to wildlife under Alternatives C, D, and E are expected to range from negligible to minor.

Under Alternative C, surface-disturbing activities affecting an area greater than 40 acres, including land use authorizations, utility-scale renewable-energy development, would be avoided within WHAs. Uses would be concentrated in less sensitive resource areas or in already disturbed areas. If no other options exist, activities would be mitigated and managed to ensure consistency with management objectives, including an emphasis on maintaining wildlife habitat and movement connectivity. Impacts would be expected to range from negligible to moderate.

Surface-disturbing activities affecting an area smaller than 40 acres would be allowed if the use and disturbance is mitigated and managed to ensure consistency with management objectives and emphasizes maintaining wildlife habitat and movement connectivity. Uses would be concentrated in less sensitive resource areas or in areas already disturbed whenever feasible. Impacts would be expected to range from negligible to moderate.

WHAs would be open to extraction of leasable minerals, geothermal resources, and mineral material sales on a case-by-case basis. All surface-disturbing activities affecting an area greater than 40 acres must be mitigated and managed to ensure consistency with management objectives and emphasize maintenance wildlife habitat and movement connectivity. Impacts would be expected to range from negligible to moderate.

The construction of new routes would be allowed if they are consistent with natural resource objectives and do not conflict with wildlife management objectives. Closed roads could be converted for use as nonmotorized trails if they are consistent with natural resource objectives. Impacts would be expected to range from negligible to minor.

Under Alternative C, motorized vehicle use would be prohibited in washes the Batamote Mountains WHA that are found to contain occupied or suitable cactus ferruginous pygmy-owls habitat to protect pygmy-owls during the breeding, nesting, and dispersal season, from February 1 to September 15. All other areas would be limited to existing or designated routes. Impacts would be expected to range from negligible to minor.

Under Alternative C the Cuerda de Lena WHA would be closed to public use including all lands, discretionary minerals and recreation activities during pronghorn fawning, from March 15 to July 15, or as determined annually by the Sonoran pronghorn antelope recovery team. The area would remain open to locatable mineral entry but closed to leasable and salable minerals actions, including exploration and development. Federal, State and local government employees and permit holders operating within the scope of their authorizations would be exempt from the closure. Impacts would be expected to range from negligible to minor.

Motorized vehicle use would be prohibited in washes that are found to contain occupied or suitable cactus ferruginous pygmy-owls habitat during the breeding, nesting, and dispersal season, from February 1 to September 15. All other areas would be limited to existing or designated routes. Impacts would be expected to range from negligible to minor.

Mineral material disposals would be prohibited in washes that are found to contain occupied or suitable cactus ferruginous pygmy-owl habitat. Impacts would be expected to range from negligible to minor.

Overall impacts to wildlife are expected to range from negligible to moderate under Alternative C with in the WHAs, an improvement over Alternative A.

4.6.5.2. Lower Sonoran

From Lands & Realty on Priority Habitat and Wildlife Management

In the Lower Sonoran, impacts from utility corridors, energy projects, and LUAs on wildlife habitat management would be similar to Alternative B. Impacts from land tenure adjustment on wildlife habitat management would be greater than under Alternative A and similar to Alternative B because 36,300 acres would be available for disposal under Alternative C.

From Livestock Grazing on Priority Habitat and Wildlife Management

Managing all perennial/ephemeral grazing allotments as perennial only, with no additional ephemeral use, would result in a minor improvement of wildlife habitat by reducing the long-term competition between livestock and wildlife for important annual forage species. Requiring a seasonal adjustment in permitted use (approximately 65 percent during the winter-spring season [October 1 to April 30] and approximately 35 percent during summer season [May 1 to September 30]) would result in a minor improvement to wildlife habitats by increasing available habitat for wildlife during the winter, spring, and summer seasons. Habitat improvement for some wildlife species would be moderate under this alternative (including bighorn sheep, mule deer, Sonoran desert tortoise, and other grazers) but only minor to negligible to other species of wildlife that competes less with livestock. Domestic sheep and goat grazing would be prohibited within 9 miles of bighorn sheep habitat, and effects would be the same as Alternatives A and B.

Allotments that are meeting or exceeding standards would be considered to be providing habitat for healthy sustainable wildlife populations. Very few livestock grazing practices fragment wildlife habitats. The effect of changing grazing practices in Alternative C would have a negligible impact on habitat connectivity. Management prescriptions in Alternative C would result in a greater improvement to wildlife habitat than would occur in Alternative A, B, or E, but less than in Alternative D. Following BLM BMPs and SOPs would ensure that wildlife continue to thrive in any of the alternatives.

From Minerals Management on Priority Habitat and Wildlife Management

Impacts from mineral development on wildlife habitat management would be similar to Alternative B.

From Recreation Management on Priority Habitat and Wildlife Management

Impacts would be similar to Alternative B except that 186,300 acres (29 percent of the Decision Area) would be allocated to front country and 423,100 acres (66 percent of the Decision Area) as back country.

From Special Designations on Priority Habitat and Wildlife Management

Under Alternatives C, D, and E, the Coffeepot Botanical ACEC would be replaced by the Coffeepot-Batamote ACEC.

Under Alternative C, the proposed Coffeepot-Batamote ACEC would encompass 63,300 acres of public lands. This ACEC is being proposed to protect lesser long-nosed bat and

cactus ferruginous pygmy-owl habitats; the outstanding botanical diversity of the native plant communities; botanical resources unique to the area such as the Acuña cactus, desert bighorn sheep, and other diverse wildlife populations; and outstanding landscape and scenic features. The Coffeepot-Batamote ACEC also contains an endangered plant species: the Acuna cactus. The cactus ferruginous pygmy-owl has been petitioned as a candidate for the Endangered Species List, and habitat is available for it within the ACEC. The ACEC contains 100 percent public lands, and it is recommended to retain those lands within the ACEC as public ownership. Impacts from retaining the public lands within the ACEC would be negligible.

New routes in washes would be prohibited within the ACEC unless conflicts with wildlife are mitigated and minimization criteria are established during route designations. At the time of route designations, mitigation, adaptive management, and BMPs would be utilized to avoid harassment and long term displacement of wildlife. By utilizing these techniques, negligible to minor impacts to wildlife would be expected to occur.

Camping within the ACECwould be limited to dispersed and undeveloped sites. By limiting camping in this manner, minor impacts to wildlife are expected to occur. New utility, communication, transportation, and utility-scale renewable energy development would be avoided within the ACEC. If these actions are avoided within the ACEC, impacts to wildlife would be expected to be negligible to minor.

Motorized vehicle routes would be closed or limited with mitigation to avoid conflicts with wildlife habitat management, and new routes would be prohibited with the exception of routes needed for resource-management protection purposes. Mitigation, adaptive management, and BMPs would be utilized to avoid harassment and long term displacement of wildlife. By using these techniques, impacts to wildlife would be expected to be negligible to minor. Nonmotorized trails would be permitted within the ACEC as long as they are mitigated and adaptive management and BMPs are utilized to avoid harassment and long term displacement of wildlife. By using these techniques, impacts to wildlife would be expected to be negligible to minor.

Within the ACEC, new utilities would be required to be buried underground within existing LUAs to retain the unencumbered view shed. New LUAs would not be approved outside the existing LUA. Requiring the burial of LUAs and excluding all applications outside the existing LUAs within the ACEC would likely result in negligible to minor impacts to wildlife. Mitigation, adaptive management, and BMPs would be utilized to avoid harassment and long term displacement of wildlife.

Recreational development would be limited to the minimum requirements to protect resources and provide for public safety. By limiting recreational developments, impacts to wildlife would be expected to be negligible to minor.

Livestock grazing would be closed in the ACEC, and infrastructure associated with grazing would be removed. Once grazing is removed, impacts to wildlife would be expected to be negligible to minor; however, removing associated infrastructure could cause major impacts to wildlife, especially if water sources are removed. Water is a scarce resource in the Sonoran Desert, and removing any water source could be detrimental to wildlife species that have become accustomed to a particular water source. Local populations of wildlife in the area would have to relocate and possibly face mortality without water.

The ACEC would be closed to all forms of mineral entry, though existing valid rights would be recognized. Mitigation, adaptive management, and BMPs would be utilized to avoid harassment

and long term displacement of wildlife for existing rights. By using these techniques on existing valid rights and closing the ACEC to new and future form of mineral entry, impacts to wildlife would be expected to be negligible to minor.

Overall impacts on wildlife would be expected to range from negligible to minor, an improvement over Alternative A.

From Travel Management on Priority Habitat and Wildlife Management

Motorized use in Alternative C would be limited to designated routes, similar to Alternative B. Under this alternative, 101,800 acres would be closed to motor vehicle use, and 828,460 acres would be limited to designated routes. No open areas would be designated. Impacts under Alternative C would be similar to those described for Alternative B. In Alternative C, some routes (132 miles) would be closed seasonally to reduce conflicts in priority species habitats. These closures would reduce disturbance and human interactions during breeding, nesting, lambing, and fledging lifecycles. In Alternative C, there would be approximately12 miles of nonmotorized trails, and approximately 358 miles of primitive roads where wildlife impacts are expected to be negligible to minor. Moderate to major impacts typically occur where use is more frequent and interactions between wildlife and humans are greater. These typically are routes and roads that are maintained for more frequent, higher speed travel. In Alternative C, there would be approximately 25 miles of maintained roads where impacts are expected to be moderate.

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Approximately 128,100 acres would be allocated as lands managed to protect wilderness characteristics under this alternative. Proactive wildlife management would be limited; however, allowable uses prescribed to protect and enhance wilderness characteristics would mutually benefit wildlife resources. Impacts to wildlife resources are expected to negligible to minor.

4.6.5.3. Sonoran Desert National Monument

From Lands & Realty on Priority Habitat and Wildlife Management

Impacts from utility corridors would be similar to Alternative A, but reduced due to the elimination of the TEP multiuse utility corridor and the reduction in size of the remaining two corridors to a 0.5 mile wide limit. Overall impacts to wildlife would be expected to range from negligible to minor.

From Livestock Grazing on Priority Habitat and Wildlife Management

Impacts would be similar to those described under Alternative A for the Monument, except that far fewer acres would be available for livestock grazing (207,431), which totals fewer open acres than in Alternative B. In areas open to grazing, allotments would be reclassified as perennial only. Impacts would be negligible to minor, similar to those described in Alternative A. Within the SDNM, domestic sheep and goat grazing would be eliminated under Alternative C. Impacts to Monument objects from eliminating domestic sheep and goat grazing within the SDNM would be expected to be negligible. Overall impacts would be minor.

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to AUM allocations in the SDNM.

From Minerals Management on Priority Habitat and Wildlife Management

Impacts from mineral development on wildlife habitat management would be similar to Alternative A From Recreation Management on Priority Habitat and Wildlife Management In the SDNM, impacts would be similar to Alternative B except 55,500 acres, or 9 percent of the Decision Area would be allocated to front country and 383,500 acres, or 88 percent of the Decision Area, as back country.

From Recreation Management on Priority Habitat and Wildlife Management

In the SDNM, impacts would be similar to Alternative B except 55,500 acres, or 9 percent of the Decision Area would be allocated to Front Country and 383,500 acres, or 88 percent of the Decision Area, as Back Country.

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to target shooting.

From Special Designations on Priority Habitat and Wildlife Management

There are no special designations proposed for wildlife in the SDNM.

From Travel Management on Priority Habitat and Wildlife Management

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to travel management.

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Approximately 112,200 acres of the SDNM would be allocated as lands managed to protect wilderness characteristics under Alternative C. Impacts to wildlife would be expected to be negligible, within the level of protection prescribed in the proclamation.

4.6.6. ALTERNATIVE D

4.6.6.1. Common to Both Decision Areas

From Priority and Wildlife Habitat Management on Priority Habitat and Wildlife Management

Alternative D only addresses the proposal of the Gila Bend Mountains WHA. The other WHAs Coffeepot-Batamote, Cuerda de Lena, and Saddle Mountain are proposed as ACECs under the special designations heading under Alternatives D and E. Impacts to the Gila Bend WHA would be similar to Alternative C except that under Alternative D, the WHA would be an exclusion area for all surface disturbing activities, including land use authorizations such as seismic,

solar, wind, and other renewable energy development; testing and exploration; and recreation facilities. The WHA would be closed to all locatable and leasable minerals exploration and development (including geothermal and sodium) and mineral materials disposal. Public lands in the WHA would be recommended for withdrawal to all forms of mineral entry. Overall impacts to wildlife from Alternative D would be expected to range from negligible to minor, less than Alternatives C and A.

4.6.6.2. Lower Sonoran

From Lands & Realty on Priority Habitat and Wildlife Management

In the Lower Sonoran, impacts from utility corridors, energy projects, and LUAs on wildlife habitat management would be the least intrusive compared to any other alternative. Impacts from land tenure adjustment on wildlife habitat management would be greater under Alternative D than under Alternative A, but less than under Alternatives B or C, because approximately 26,200 acres would be available for disposal under Alternative D. Impacts would be negligible to minor.

From Livestock Grazing on Priority Habitat and Wildlife Management

Cessation of grazing throughout the Decision Areas would result in the greatest improvement to wildlife. Removing livestock would improve habitats for wildlife over the long term by reducing competition for resources. Habitats would be expected to improve and more closely resemble a natural state. However, the removal of livestock also would shift the burden of maintaining water facilities from livestock operators to State and Federal wildlife managers. This could result in declining water availability for wildlife. Overall, habitat quality would improve for some wildlife species), resulting in major impacts on bighorn sheep, mule deer, Sonoran desert tortoise, and other grazers, and negligible to minor impacts on other wildlife species that compete less with livestock. Species that depend on livestock or live synergistically with livestock (such as the brown-headed cowbird) may see a reduction in habitat quality, and populations of cattle-dependant species may decline locally. Such declines may in turn increase populations of species affected by nest parasitism, including the southwestern willow flycatcher.

Allotments that are meeting or exceeding standards are considered to be providing adequate habitat for healthy and sustainable wildlife populations. Very few livestock grazing practices fragment wildlife habitats, with the exception of some fencing practices. Fencing would be considered for removal in areas, and the burden of removal would fall on State and Federal wildlife managers. Removal of fences would improve movement of some wildlife species that have difficulty in negotiating passage ways at fences. The effect of changing grazing practices in Alternative D would have a minor impact to habitat connectivity. Cessation of grazing in Alternative D would have the greatest improvement to wildlife habitat in general than would occur in any other Alternative. Overall impacts to the cessation of livestock grazing in the Lower Sonoran would be expected to range from negligible to minor.

From Minerals Management on Priority Habitat and Wildlife Management

Impacts from mineral development on wildlife habitat management would be similar to Alternative B.

From Recreation Management on Priority Habitat and Wildlife Management

This Alternative allocates approximately 78,100 acres to front country and approximately 21,600 acres to back country. There would be less management direction in areas outside of the management zones. Fewer SRMAs and RMZs would be allocated under this alternative, and would have impacts similar to Alternative A.

From Special Designations on Priority Habitat and Wildlife Management

There are a total of four ACECs proposed under Alternative D and E. Under Alternative D and E the ACECs are addressed for wildlife and are as follows: Coffeepot-Batamote ACEC, Cuerda de Lena ACEC, Lower Gila Terraces and Historic Trails ACEC the Saddle Mountain ACEC. The intent of the proposed ACECs is to prevent irreparable damage to important historic, cultural, or scenic values; wildlife resources; other natural systems or processes; or to protect life and provide safety from natural hazards.

Coffeepot-Batamote ACEC. Under Alternative D, an area of approximately 77,600 acres of public lands would be designated as the Coffeepot-Batamote ACEC to protect habitat and populations of the endangered Acuna Cactus.

All public lands within the ACEC would be retained. New LUAs, including utility-scale renewable energy development, would be excluded from the ACECto reduce habitat fragmentation within the ACEC. Utility LUAs would be excluded from the remaining area to retain habitat connectivity and natural settings associated with the ACEC.

New routes would be prohibited within washes unless conflicts with wildlife and cultural resources are mitigated during route designation to minimize habitat fragmentation. Motorized vehicle use would be prohibited in washes that contain occupied or suitable cactus ferruginous pygmy-owls habitat to protect pygmy-owls during the breeding, nesting, and dispersal season. Prohibiting motorized vehicle use in areas that contain occupied or suitable cactus ferruginous pygmy-owls habitat stressors would be alleviated affording the owls the opportunity to complete life cycle requirements uninterrupted by human activities. The construction of nonmotorized trails would be permitted within the ACEC as long as mitigation occurs to protect T & E habitats.

Desert washes (xeroriparian) within the ACEC would be closed to all camping from February 1 to September 15 to protect pygmy-owls during the breeding, nesting, and dispersal season reducing human caused harassment during critical stages of the owl's life cycle.

The ACEC would be closed to livestock grazing to protect the outstanding botanical resources. Closing the ACEC to grazing would allow vegetation to reach desired plant communities and reduce competition between wildlife and cattle for food, water and space resources. Fencing and facilities (i.e. corrals, etc) related to the grazing operation would be removed. By removing these facilities wildlife could move unencumbered with the ACEC; however, if water sources are removed wildlife may vacate areas that have traditionally held water for livestock. This action could be detrimental to wildlife in the local area of water removals. The ACEC would be closed to all forms of mineral extraction; however, valid existing rights would be allowed to continue. Closing the ACEC to all forms of mineral extraction could retain habitat availability for wildlife.

Overall impacts to wildlife and threatened and endangered species are expected to range from negligible to minor which would be an improvement as compared to Alternative A.

Cuerda de Lena ACEC. The proposed Cuerda de Lena ACEC encompasses approximately 58,500 acres of public lands. This ACEC is proposed to protect habitat for the endangered

Sonoran pronghorn as well as protect habitat for other wildlife species, including the cactus ferruginous pygmy-owl. A vast majority of the ACECis public land with approximately 70 acres of private land and approximately 640 acres of state land. It is recommended that lands not in public ownership be acquired to further protect habitat for the Sonoran pronghorn as funding and opportunities arise.

Within the ACECsurface disturbing maintenance associated with LUAs within the ACEC would be limited to the authorized LUA grant. Mitigation, adaptive management and BMPs would be utilized to avoid harassment and long term displacement of wildlife. By using these techniques minor impacts to wildlife are expected to occur.

It is proposed that the ACEC be closed to public entry from March 15th through June 15th in accordance to the Sonoran pronghorn recovery team recommendations. This closure to entry to the public allows the pronghorn females to birth uninterrupted, allows new born antelope the opportunity to wean without distractions and allows male pronghorn the ability to seek females for procreation undisturbed. By closing the area to public entry during this timeframe, negligible impacts to the Sonoran pronghorn are expected. This closure would also assist the lesser long-nose bat in foraging without human disturbance from the general public and allow the cactus ferruginous pygmy-owl to breed, hunt and brood uninterrupted.

Camping within the ACECwould be limited to dispersed and undeveloped sites. By limiting camping in this manner negligible to minor impacts to wildlife are expected to occur. Overall impacts to wildlife and threatened and endangered species within the ACEC would be expected to range from negligible to minor which would be an improvement as compared to Alternative A.

r Gila Terraces and Historic Trails ACEC. Under Alternative D, the proposed ACEC would encompass approximately 79,100 acres of public lands. The intent of the ACEC would be to increase habitat availability by limiting surface disturbing activities within its boundaries. Route designation and the criteria used for minimization would decrease impacts to wildlife by allowing IDTs to evaluate and reduce the amount of roads, trails and routes that would be in conflict with wildlife management goals and objectives. Overall impacts to wildlife would be expected to be negligible to minor which would be an improvement as compared to Alternative A.

Saddle Mountain ACEC. Under Alternative D, the proposed ACEC would encompass approximately 48,500 acres. The intent of the ACEC would be to increase habitat availability by limiting surface disturbing activities within its boundaries with a focus on habitat conservation. Route designation and the criteria used for minimization would decrease impacts to wildlife by allowing IDTs to evaluate and reduce the amount of roads, trails and routes that would be in conflict with wildlife management goals and objectives. Overall impacts to wildlife would be expected to be negligible to minor which would be an improvement as compared to Alternative A.

From Travel Management on Priority Habitat and Wildlife Management

Motorized use in Alternative D would be limited to designated routes, the same as in Alternative B and C. No open areas would be designated. In this Alternative approximately 378,300 acres would be closed to motor vehicle use and approximately 551,900 acres would be limited to designated routes. The increase in closed areas would improve habitat connectivity and reduce impacts from human disturbance to wildlife resources which would be an improvement as compared to Alternative A.

In Alternative D there are approximately 49 miles of nonmotorized trails, and approximately 219 miles of primitive roads where wildlife impacts are expected to be negligible to minor. Moderate to major impacts typically occur where use is more frequent and interactions between wildlife and humans are greater. In Alternative D there are approximately 25 miles of maintained roads where impacts are expected to range from negligible to moderate. Overall impacts to wildlife from Alternative D would be less than Alternative A, B and C.

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Alternative D contains the largest number of wilderness characteristic acreage; at approximately 276,500 acres. Impacts are expected to be similar to Alternative C, except the intensity will increase slightly due to the larger area covered by the lands managed to protect wilderness characteristics allocation.

4.6.6.3. Sonoran Desert National Monument

From Lands and Realty Management on Priority Habitat and Wildlife Management

Impacts from utility corridors, LUAs, utility-scale renewable energy development, and land tenure would be negligible, as the entire SDNM would be a utility-scale renewable energy development and LUA exclusion area. No corridors would be allocated in the SDNM.

From Livestock Grazing Management on Priority Habitat and Wildlife Management

Under this alternative, the entire SDNM would be closed to livestock grazing. The impacts would be similar to those described in Alternative A for the portion of the Monument south of I8, and would be negligible to minor and similar to Alternative C as related to domestic sheep and goat grazing. Overall impacts to the cessation of livestock grazing in the SDNM would be expected to range from negligible to minor.

Refer to Table 4.31, “Impacts from Implementation Level Decisions on Priority Species Monument Objects” (p. 920) for impacts related to AUM allocations in the SDNM.

From Minerals Management on Priority Habitat and Wildlife Management

Impacts from mineral development on wildlife habitat management would be similar to Alternative A.

From Recreation Management on Priority Habitat and Wildlife Management

In Alternative D, up to 15 0.25-acre visitor-contact stations and minimal pullouts would be provided. These facilities, to the extent possible, would be located in areas previously disturbed and may total up to 4 acres of new disturbance. Impacts under Alternative D would be less than A, B, and C. Impacts to wildlife are expected to be negligible to minor.

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to target shooting.

From Special Designations on Priority Habitat and Wildlife Management

There are no special designations proposed for wildlife in the SDNM therefore no impact is expected.

From Transportation and Access Management on Priority Habitat and Wildlife Management

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to route designations within the SDNM.

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Approximately 153,000 acres would be allocated as lands managed to protect wilderness characteristics. This allocation is 37 percent more than Alternative C and more than any other Alternative. Impacts to wildlife are expected to be negligible due to the level of protection prescribed in the proclamation. Impact would be similar to Alternative C, except the intensity would be greater due to the larger amount of lands managed to protect wilderness characteristics.

4.6.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.6.7.1. Common to Both Decision Areas

From Priority and Wildlife Habitat Management on Priority Habitat and Wildlife Management

Alternative E only addresses the Gila Bend Mountains WHA. Impacts to the WHA would be similar to those in Alternative D except; under Alternative E emphasis is given to the conservation of habitat.

Surface-disturbing activities affecting an area greater than 40 acres, including land use authorizations, utility-scale renewable-energy development, would be avoided within suitable habitat. Uses would be concentrated in less sensitive resource areas or in areas already disturbed. If no other options exist, activities must be mitigated and managed to ensure consistency with wildlife management objectives, with an emphasis to maintain habitat and movement connectivity. The WHA would be open to leasable minerals and geothermal resources. However, the area would contain a No Surface Occupancy stipulation within suitable bighorn sheep habitat. The WHA would be open to mineral material sales on a case-by-case basis. Surface-disturbance greater than 40 acres, must be avoided within suitable bighorn sheep habitat. Uses would be concentrated in less sensitive resource areas or in areas already disturbed. If no other options exist within bighorn sheep habitat, activities must be mitigated and managed to ensure consistency with wildlife management objectives emphasizing habitat and movement connectivity. Overall impacts to wildlife from Alternative E would be less than Alternative C and D and would be expected to range from negligible to minor.

4.6.7.2. Lower Sonoran

From Lands & Realty on Priority Habitat and Wildlife Management

Impacts from utility corridors, energy projects and LUAs on wildlife operations in the Lower Sonoran would be similar to Alternative C due to similarities in the number, width, and location of utility corridors and reduced acreage.

Impacts from land tenure decisions on wildlife operations in the Lower Sonoran would be similar to Alternative C, due to similar numbers of acres that would be available for disposal. However through the identification process impacts to wildlife habitat are expected to range from negligible to minor under this alternative.

From Livestock Grazing on Priority Habitat and Wildlife Management

Alternative E represents a combination of Alternatives A and C. Impacts from grazing to wildlife would be very similar to those described in Alternative C because perennial AUMs are the same. Ephemeral use and associated impacts would be similar to Alternative A. Alternative E does include similar seasonal livestock restrictions to those in Alternative C. Impacts as described in Alternative C related to seasonal livestock restrictions would also be the same in Alternative E. Utilizing a full suite of allocations to perennial, perennial-ephemeral, and ephemeral would provide more flexibility to appropriately manage livestock and wildlife habitat as compared to Alternatives A, B and C. Changes in habitat conditions resulting from management prescriptions in Alternative E would be similar to C, and A wildlife habitat conditions would improve less than B with reduced perennial grazing and less than D with livestock cessation. Impacts would be expected to range from negligible to minor.

From Minerals Management on Priority Habitat and Wildlife Management

Impacts from mineral development on wildlife operations would be similar to Alternative A, except that Saddle Mountain would be closed to salable mineral disposal, thus decreasing potential conflicts with wildlife and wildlife operations. Overall impacts would be expected to range from negligible to minor.

From Recreation Management on Priority Habitat and Wildlife Management

Impact would be similar to Alternatives B and C except 244,000 acres would be allocated to front country and 345,100 acres as back country.

From Special Designations on Priority Habitat and Wildlife Management

Coffeepot-Batamote ACEC. Under Alternative E, impacts to wildlife and threatened and endangered species would be similar to Alternative D. However, the reduction in acres under Alternative E is based on elevation requirements and soil characteristics needed by the Acuna cactus. Under Alternative E an area of approximately 61,300 acres of public lands would be designated as the Coffeepot-Batamote ACEC.

All camping (vehicle-based and primitive) would be limited to designated sites within the ACEC from February 1 to September 15 to protect pygmy-owls during the breeding, nesting, and

dispersal season. Designating camping areas within the ACEC would allow the general public to utilize the ACECwhile providing protections to the owl during life cycle requirements.

Motorized vehicle use would be restricted in washes that contain occupied or suitable cactus ferruginous pygmy-owls habitat from February 1 to September 15 to protect pygmy-owls during the breeding, nesting, and dispersal season. All other areas would be limited to existing or designated routes. With restrictions in large washes and limiting motorized use to existing or designated routes that contain the owl or habitat characteristics for the owl, the public is still afforded recreational opportunities while protecting the owl and its life cycle requirements.

Livestock facilities could be developed to improve livestock distribution and natural resource conditions and when the facilities are not in conflict with wildlife or cultural resources. Allowing grazing within the ACEC could improve habitat characteristics for wildlife species within the ACEC. Livestock developments would be mitigated to allow passage, such as fences, and use, such as water sources, by wildlife.

Washes in the ACEC would be closed to disposal of mineral materials. Closing washes to the disposal of material minerals would retain wash characteristics for wildlife species in the ACEC and reduce the amount of fragmentation and retain natural settings within the xeroriparian systems. Management of mineral uses would be through plans of operation. Valid existing rights would be respected; however, potential surface disturbance would be minimized through plans of operations where appropriate. Impacts to wildlife are expected to be greater than D; however impacts would range from negligible to minor with proper management which would be an improvement as compared to Alternative A.

Cuerda de Lena ACEC. Alternative E is similar to Alternative D. However, under Alternative E, the ACEC would be closed to mineral material disposals. By closing the area to mineral material disposals habitat would remain connected and available for wildlife use. Valid existing rights will be respected; however surface disturbance would be minimized through plans of operation where appropriate. Using plans of operations on existing rights foot prints of operations could be decreased in the ACEC to allow for habitat availability for all wildlife species. Impacts from Alternative E would be greater than D; however, overall impacts would be expected to range from negligible to minor which would be an improvement as compared to Alternative A.

r Gila Terraces and Historic Trails ACEC. Under Alternative E, impacts would be similar to D. However, Alternative E mineral material disposals would not be allowed with in 5oo feet of cliff faces to protect raptor nesting areas. Impacts from Alternative E would be the same as Alternative D which would be an improvement as compared to Alternative A.

Saddle Mountain ACEC. Alternative E would be similar to Alternative D except: Livestock grazing would be managed to ensure the resource values of the ACEC are maintained and protected. Managing livestock grazing in this manner would allow the persistence of habitat for wildlife species within the ACECand reduce competition for resources needed by wildlife for life cycle requirements. Overall impacts from Alternative E would be expected to range from negligible to minor which would be an improvement as compared to Alternative A.

From Travel Management on Priority Habitat and Wildlife Management

As in all other action alternatives, motorized use in Alternative E would be limited to designated routes. 152,800 acres would be closed to motor vehicle use and 777,360 acres would be limited to designated routes. No open areas would be designated. The increase in areas closed would

improve habitat connectivity and reduce impacts from human disturbance to wildlife resources. Impacts in Alternative E would be similar to those described for Alternative C. In Alternative E some routes would be seasonally closed (141 miles) to reduce conflicts in priority species habitats. These closures would reduce disturbance and human interactions during breeding, nesting, lambing, and fledging lifecycles. In Alternative, E there are approximately 38 miles of nonmotorized trails, and approximately 330 miles of primitive roads in which wildlife impacts are expected to be negligible to minor. Moderate to major impacts typically occur where use is more frequent and interactions between wildlife and humans are greater. These are typically routes and roads that are maintained for more frequent higher speed travel. In Alternative E there are approximately 29 miles of maintained roads where impacts are expected to be moderate. Overall impacts to wildlife from Alternative E would be similar to C more than Alternative D, but less than B and A and would be expected to range from negligible to moderate.

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Impacts would be similar to Alternative C except 55,400 acres of would be allocated as lands managed to protect wilderness characteristics – 60 percent fewer than Alternative C. Overall impacts would be expected to range from negligible to minor.

4.6.7.3. Sonoran Desert National Monument

From Lands & Realty on Priority Habitat and Wildlife Management

Impacts from Lands & Realty would be the same as those described in Alternative D.

From Livestock Grazing on Priority Habitat and Wildlife Management

Outside of Alternative D (which eliminated grazing from the Monument), Alternative E would be the second most protective alternative for wildlife, as only 156,919 acres would be available for grazing. The entire Conley Allotment would be closed to grazing. Areas that would remain available to graze would have similar impacts to those described under Alternative A for the Monument. Domestic sheep and goat grazing would be similar to Alternative C. Overall impacts would be decreased to minor.

Refer to Table 4.31, “Impacts from Implementation Level Decisions on Priority Species Monument Objects” (p. 920) for impacts related to AUM allocations in the SDNM.

From Minerals Management on Priority Habitat and Wildlife Management

Impacts from mineral development on wildlife habitat management would be similar to Alternative A.

From Recreation Management on Priority Habitat and Wildlife Management

In the SDNM, impacts from recreation management would be similar to the Alternative B except 78,700 acres would be allocated to front country and 406,500 acres would be allocated as back country. Overall impacts would be expected to range from negligible to minor.

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to target shooting.

From Special Designations on Priority Habitat and Wildlife Management

There are no special designations proposed for wildlife in the SDNM therefore no impact is expected.

From Travel Management on Priority Habitat and Wildlife Management

Refer to Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920) for impacts related to route designations in the SDNM.

From Wilderness Characteristics on Priority Habitat and Wildlife Management

Impact would be similar to Alternative C, except 110,900 acres would be allocated as lands managed to protect wilderness characteristics under Alternative E.

4.7. IMPACTS ON SOIL RESOURCES

The analysis of how Alternatives A, B, C, D, and E would likely affect soil resources emphasizes management actions that could alter soil productivity and erosion rates and the actions' effects on sensitive soils.

4.7.1. METHODS OF ANALYSIS

General soil types, erosion potential, structure, and function were discussed and impacts were analyzed. The analysis was based on reference information, site investigations, lab analyses, soil mechanics and engineering criteria, anticipated effects of management actions by alternative, and professional interpretation and judgment. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate. When impacts are positive, it is so stated.

4.7.1.1. Indicators

Indicators used to assess impacts on soil resources in this analysis are sufficiently quantitative to compare the future impacts of this plan with the existing conditions of the Planning Area. They are:

- Bare ground (acres or proportion of a given area),
- Vegetative cover (acres or proportion of a given area),
- Unsurfaced road density (miles of road per section),
- Developments or other activities causing surface disturbance on soils with high wind or water erosion hazard (number of developments or other surface disturbances),
- Disturbances from management activities that damage the surface cover provided by desert pavement or cryptogamic biological crusts (acres),
- Soil aggregate stability (time required for a soil aggregate to dissolve in water).

4.7.1.2. Assumptions

The application of vegetation treatments and establishment of desired plant community implemented in a specific watershed, in combination with suitable tools and techniques, will improve infiltration and aeration, fertility, and microbial populations.

- Soil and vegetation resources will be managed to meet the Arizona Land Health Standards and Guidelines.
- Substantial surface disturbance to soil, including exposure of bare ground, loss of vegetative cover, or rutting on unsurfaced roads will increase water runoff and downstream sediment loads and lower soil productivity, thereby degrading water quality, altering channel structure, and affecting overall watershed health.
- The degree of impact attributed to any one disturbance or series of disturbances would be influenced by several factors, including the disturbance's location within the watershed, the

time and degree of disturbance, the existing vegetation, and levels of precipitation at the time of the disturbance.

- New access roads will be properly designed.
- When special management designations, such as ACECs or SRMAs, are proposed and management actions for resource protection are properly implemented, their impacts on soil resources will be positive. These positive impacts will exceed any negative impacts that could accrue from increased visitation caused by the designation itself.
- When a proposed management action includes a use restriction that requires monitoring and enforcement to be effective, such as routes designated as closed for travel management, resources will be available to assure that the necessary monitoring and enforcement occurs.

4.7.1.3. Program Areas with No Impacts on Soil Resources

There would be no impacts to soils from actions proposed under the following resource management programs:

- Air Resources
- Cave Resources
- Cultural and Heritage Resources
- Paleontological and Geological Resources
- Public Safety and Hazardous Materials
- Wild Horse and Burro Management
- Wilderness Characteristics
- Visual Resources

4.7.1.4. Qualitative Intensity Scale

The intensities of impacts are described, where possible, using the following terms:

Negligible: The amount of soil loss or erosion, or changes in soil characteristics, would be at or below the level of detection. Changes in the area of bare soil, to the desired plant community, or in extent of surface disturbance are below the level of detection.

Minor: The amount of soil loss or erosion and its indicators or the degree of changes in soil characteristics would be small, as would the area affected. If mitigation is needed to offset adverse effects, it would be relatively simple to implement and likely would be successful.

Moderate: The amount of soil loss or erosion and its indicators or the degree of changes in soil characteristics would be readily apparent and result in those changes over a relatively wide area. Mitigating measures probably would be necessary to offset adverse effects and likely would be successful.

Major: The amount of soil loss or erosion and its indicators or the degree of changes in soil characteristics would be readily apparent and long-term and would substantially change the indicators over a large area. Extensive mitigation measures to offset adverse effects would be needed, and their success could not be guaranteed.

4.7.2. COMMON TO ALL ALTERNATIVES

Natural disturbance from fluvial processes are essential to the long-term maintenance of desert washes and hydrology. Management actions that involve surface disturbing activities may impact soil and water resources by changing the rates of erosion or deposition, spatial patterns of erosion and deposition, and runoff conditions – potentially affecting air quality, water quality, and watershed health. Physical soil properties such as density, strength, infiltration and water-holding capacity, soil aggregate stability, and productivity may be affected from site-specific to landscape-sized scales.

Accelerated erosion, compaction, displacement, puddling, and rutting of soils can affect soil productivity. Erosion affects soil productivity by carrying away soil particles and nutrients normally held in the soil, such as phosphorous, magnesium and potassium. The ability of the soil to recover productivity is affected by loss or degradation of the upper layers or horizons. These horizons have the highest water holding and nutrient storage capacity. Given the low precipitation and limited vegetation levels in the Planning Area, soil productivity will be slow to recover once it has been reduced by erosion.

4.7.2.1. Both Decision Areas

From Hazardous Materials & Public Safety on Soil Resources

Soils affected by hazardous materials spills are usually removed. If an affected area is not remediated quickly, the area of soil loss could spread, raising the intensity of the impact from minor to moderate or major. Delays in cleanup could result in infiltration of hazardous materials into groundwater, possibly causing major impacts and requiring costly groundwater treatment. Impacts could range from negligible to major.

From Wildland Fire Management on Soil Resources

Suppression of wildfires in the Sonoran Desert ecosystem would reduce overall impacts to soil resources by retaining the vegetative communities and stabilizing the soil. This would maintain normal infiltration and sedimentation rates for soils. Wildfires that are not rapidly contained may destroy cryptogamic soil crusts and vegetation over broad areas, increasing erosion and sedimentation rates. Fires that burn with intense heat may create water-repellent layers in the soil below the surface that impede infiltration and plant growth and increase erosion. Impacts could range from negligible to major.

From Water Management on Soil Resources

Although many management activities have impacts on soil, few of the impacts are realized until the disturbed soil surface is exposed to water. Therefore, soil, which contributes to impacts on water quality, and water, which contributes to erosion impacts on soils, are discussed together

throughout this document. In this sense, the impact of water on soil is common to all alternatives and will not be discussed under each alternative. Additional discussion of impacts of water on soil will be included by alternative in Section 4.10, "Impacts on Water Resources" (p. 537).

4.7.3. ALTERNATIVE A (NO ACTION)

4.7.3.1. Lower Sonoran

From Lands & Realty on Soil Resources

Ten utility corridors for major linear LUAs would be designated under Alternative A through the Lower Sonoran. The designation of these corridors would lead to some localized impacts on soil resources where surface disturbing activities occur during construction or maintenance. Containing these uses in the corridors would limit their areal extent and represent a minor impact if corridors are revegetated to reduce bare soil, which in turn would reduce runoff and erosion. Depending on the soil type, impacts of the roads associated with the LUA could also be mitigated with surfacing.

LUAs for utility-scale renewable energy development also will have measurable, widespread affects on soil. Blading large acreages for solar energy facilities, estimated to cover more than 150,000 acres over the life of the plan, is likely disrupt drainage patterns and cause surface disturbance and soil compaction over a large enough area, resulting in a moderate impact. Large quantities of groundwater may also be needed for renewable energy production and may affect soil resources by causing subsidence in localized areas. This impact could be mitigated in future solar developments by use of dry cooling technology in the steam turbine systems or by using systems with entirely different means of generating electricity. Assuming that most solar energy developments built under this plan are solar energy concentration facilities, the overall impact of LUAs for this use would be moderate, although it would be major in the localized construction area.

Land disposal actions on up to 18,900 acres in the Lower Sonoran could potentially damage soil resources, particularly if the proposed future land use involved surface disturbance or removal of vegetation, such as for housing development or for a solar energy facility. An additional 8,000 acres would be available for exchange, which would only occur under Alternative A. Overall impacts on soils in the Decision Area would be minor due to the limited acreage of these lands. Local impacts on the disposed lands are difficult to quantify when the specific actions are unknown, but impacts in the moderate to major range are probable.

From Livestock Grazing on Soil Resources

Grazing would continue under the current management system, which would allow surface disturbing activities associated with livestock operations to continue and potentially increase erosion when sensitive surface cover provided by desert pavement and cryptobiotic crusts is disturbed. Exposure of fine material beneath the cover would make soils vulnerable to wind and water erosion. The limited area of these sensitive surfaces combined with stocking rates low enough to allow progress toward the desired plant community should keep disturbances small and site specific. The impact would, therefore, be classified as minor. No decisions related to

cryptobiotic soils and desert pavement has been made under Alternative A, which will decrease the likelihood that these areas would be monitored and managed.

In years when there is a substantial spring bloom and ephemeral grazing is permitted, the surface disturbance around grazing developments would increase as compared to years when only a small perennial herd is present. This disturbance area may be slow to recover. Increased livestock activity around new water developments would result in moderate localized impacts of soil compaction, surface disturbance, and damage to vegetation concentrated near the developments. Soils with a potential for wind erosion are identified in Table 4.4, "Acres of Soils with Potential for Wind Erosion by Grazing Type under Alternative A" (p. 469): Acres of Soils with Potential for Wind Erosion by Grazing Type under Alternative A. The total area of moderate to high potential for wind erosion is about 8 percent of Decision Areas, where ephemeral or perennial/ephemeral grazing occurs. Wind erosion following surface disturbance from grazing in the sensitive areas could be moderate, but the total area affected in the Decision Area is small and the overall impact is minor under current management practices. Loss of vegetative and cryptobiotic cover around water developments and some other range developments are likely to be readily apparent and measurable. However, these impacts and the erosion that could result occur in small areas and are rated as minor overall.

Table 4.4. Acres of Soils with Potential for Wind Erosion by Grazing Type under Alternative A

Grazing Management	Potential for Wind Erosion			
	High	Moderately High	Moderate	Slight
Lower Sonoran				
Ephemeral	38,900	2,000	8,600	273,800
Perennial	200	0	0	151,800
Perennial/Ephemeral	11,200	800	2,200	219,400
Closed	32,300	0	100	49,100
Total	82,600	2,800	10,900	694,100

From Minerals Management on Soil Resources

In the Lower Sonoran, mineral development would be allowed to continue on all lands not currently withdrawn in Alternative A. Impacts of mineral development on soil resources include potential disturbances including soil displacement and loss or burial of upper soil horizons. This would reduce water holding capacity (possibly permanently), loss of vegetation leading to increased erosion, and new roads. If a large mine with leach pads, open pits and tailings piles were developed, major impacts on soils would occur. Much of the mine footprint would experience a long-term loss of soil productivity.

From Priority Wildlife Species and Habitat Management on Soil Resources

Increased wildlife activity around existing wildlife water developments would result in a slight increase in soil compaction and surface disturbance. However, such impacts would be minor compared to the compaction and surface disturbance that occurs around livestock waters, which are minor themselves due to their limited spatial extent. The additional impact of wildlife sharing livestock water would be negligible.

Overall, the general objectives in Alternative A are to take actions, some specified and some not, to protect, maintain or improve habitat for Sonoran pronghorn, desert tortoise, bighorn sheep, ferruginous pygmy owl, and other priority and non-priority species. Since actions would reduce

the impacts of livestock management, and otherwise maintain more vegetative cover, the impacts on soils would be positive.

From Recreation Management on Soil Resources

Under Alternative A, recreation uses would continue to be distributed throughout the Decision Area, with only four SRMAs covering 379,400 acres in the Lower Sonoran, in which active management of recreation would occur. The remaining 893,300 acres would be allocated as an ERMA. Damage to soil resources is expected to increase as recreation use increases throughout the Decision Areas in both SRMAs and ERMAs However, the concentrated activity in the SRMAs increases the probability of impacts on soils such as erosion from increased storm water runoff, due to impervious or compacted surfaces of parking areas, structures and trails. These impacts will be limited in extent and minor. Mitigation and maintenance is planned for facilities and near historic sites. Impacts are likely to be offset by those planned management actions as well as the education about natural resource management provided by the SRMAs themselves. In the dispersed recreation occurring in the ERMAs, disturbed sites may be more numerous, but impacts to many of the individual disturbed sites will be minor. Dispersed recreation that occurs in the ERMAs and in undeveloped portions of the SRMAs, soil impacts are likely to increase as previously unaffected areas are used for camping, hiking, mountain biking, and equestrian activities. Most of the affected areas will be used for short periods, and will be relatively small. Campers are encouraged to use existing sites. The impacts are expected to be minor.

Only one established campground and two additional unimproved areas that are currently used for camping exist in the Decision Areas. Alternative A includes the possibility of establishing an LTVA. If any LTVAs are created in Ajo or elsewhere, they would be in existing short-term use campgrounds, which would limit the impact on soils to the approximate area of the campground. Compaction, rutting, a high proportion of bare ground and a high risk of erosion from storm water runoff exists in the designated camping areas. Increasing the stay limit to establish an LTVA could increase impacts if the area of the campground was also increased. Most impacts have already occurred, so designating an existing camping area as an LTVA would be a minor impact.

Parking and camping are permitted along existing roads for a distance of 100 feet from the road center line. This provision invites substantial expansion of the road surface impacts: increase in total area compacted, increase in area of bare surface, decrease in soil aggregate stability. These impacts increase probability of erosion on and near the road, which often leads to further expansion of the affected area as vehicle operators drive around damaged road surfaces. There is no data available on the current extent of this type of damage, or of the number of turnouts that have developed in the 100 foot zone on each side of the designated routes. The impacts are classified as minor, since they are individually small areas, and not numerous. However, there is a high probability that activity will occur, leading to an increased area of disturbance along the 1,688 miles of road in the Lower Sonoran.

From Special Designations on Soil Resources

The Coffeepot Botanical ACEC is the only ACECin Alternative A. An existing management decision closes the existing roads to all recreational use, which will greatly reduce the risk of unauthorized travel, widening of existing roads, and most other additional surface disturbance. On balance, this designation will have positive impacts.

From Travel Management on Soil Resources

Motor vehicle use is currently limited to existing or designated routes, with less than 3 percent of the Decision Area limited to designated routes, and most of the closed routes in the wilderness areas. Alternative A decisions on motorized vehicle use leaves the current OHV class designations and route system in place (see Map 2-15a). Limited to exisitng routes OHV area designations would have a low to moderate effect on soils by ineffectively managing an incremental expansion of the route system due to routes not being clearly marked and delineated for the public. This continued expansion would remove more vegetative cover thus destabilizing soils making them susceptible to erosion and lower productivity.

Under Alternative A, only 15 miles of routes out of 1,688 total miles would be closed in the Lower Sonoran. Increased road density increases the risk of rill and gully erosion as described below, increases bare soil reducing infiltration, and increases wind erosion. The average road density over the Lower Sonoran Decision Area is 1.15 miles per section, which is relatively low. However, the density varies in different parts of the Decision Area. If the very low density wilderness areas are not included in the calculation, the road density increases by almost 50 percent to 1.57 miles per section. The impact due to road density would still be moderate to low in the rest of the Decision Area.

Public travel in wash bottoms and dry streambeds that are part of the existing route system would continue, potentially impacting surface drainages, eroding banks, damaging xeroriparian vegetation, and leading to greater sedimentation during storm water runoff. Use of wash bottoms as existing, but undesignated travel routes is likely to increase use of new or unauthorized routes as vehicle operators exit or re-enter drainages. However, streambeds in the Decision Area are usually sand, and the affected areas are locally small, resulting in a minor impact overall. The intersections of roads and washes are numerous enough to cause moderate impacts locally where the intersections occur.

Routes on soils with a high or moderately high potential for wind erosion are vulnerable to greater soil loss and larger contributions to air quality degradation. Over a third of the miles of Limited to Existing Routes OHV areas are on soils with high wind erosion potential, creating a moderate impact on soils (Map 3-6).

Potential for water erosion is substantially greater on roads where storm water runoff is concentrated, and road drainage is not well developed. Alternative A would keep 99 percent of the total number of existing routes open, creating a moderate to high impact on soils in the areas of higher road density. Those areas include Buckeye Hills, the area north of the Signal Mountains, and in the areas north and southwest of Ajo. Gully erosion, soil loss, increased runoff and sedimentation in drainages may not be apparent everywhere, but the impacts will be widespread in the areas of relatively high density of open roads in Alternative A.. The impacts are also rated moderate to high because mitigation of impacts that have occurred would be impractical and the outcome would be in doubt, particularly since use of most of the roads would continue.

From Vegetation Resources on Soil Resources

Decisions intended to protect special status species, particularly those that avoid surface disturbance or maintain vegetative cover, would also protect soil and water resources. Continued wood harvesting in the Lower Sonoran would remove roots, limit the amount of debris, and reduce vegetation cover and increases bare ground. Reduced cover reduces infiltration, and

increases runoff, which could increase erosion. Such impacts, however, would mainly be limited to the Ajo Block, where the majority of wood harvesting has been occurring. Impacts would be minor, since they would be site specific in a limited area, and would not require mitigation, unless vehicle traffic created ruts or disturbances on sensitive soils.

4.7.3.2. Sonoran Desert National Monument

From Lands & Realty on Soil Resources

Three corridors major linear LUAs would be designated under Alternative A in the SDNM. The designation of these corridors would lead to some localized, moderate impacts to soil resources where surface disturbing activities occur during construction or maintenance. Containing these uses in the corridors would maintain a moderate level of surface damage. Other land uses authorized by LUAs, that cause surface disturbance, would have similar localized impacts on soil resources due to soil compaction, erosion, and sedimentation. Mitigation to re-vegetate, close and restore temporary roads and other construction disturbances, and keep stormwater runoff in natural drainages would reduce impacts over time.

Alternative A includes no solar energy development in the SDNM, However, some indirect effects to soil and water resources on the SDNM could occur in the southeast section of the SDNM (southern Vekol Valley) from developments that increased stormwater runoff and caused increased flow, erosion and sedimentation in drainages in the SDNM. These impacts would be minor and limited in extent.

From Livestock Grazing on Soil Resources

Under Alternative A, grazing will be discontinued south of I-8, since those permits have expired. No additional impacts on soils will occur in this area due to livestock grazing. The closures will end surface disturbance due to grazing with particular benefit to soils vulnerable to wind erosion in the Vekol Valley. The impact of the closure will be positive.

North of I-8, grazing would continue at current preference levels. The Land Health Evaluations for the SDNM allotments has shown negligible to minor impacts from grazing on soil resources. Therefore, grazing impacts are expected to be minor, and similar to those analyzed for the Lower Sonoran. Minor impacts are potentially due to the effects of grazing on the soils most sensitive to erosion.

F*rom Minerals Management on Soil Resources*

The SDNM would remain closed to all forms of mineral entry. Any potential impacts from mining or mineral claims would occur only on existing valid rights. Depending on what actions occur on existing valid claims impacts could range widely. A small claim for locatable minerals could disturb soils over a limited area and would have minor impacts. A larger claim by a mining company could disturb many acres, removing soils in some areas and burying soils in others time creating a major impact. Restoration requirements would potentially reduce these impacts over.

From Priority Wildlife Species and Habitat Management on Soil Resources

Impacts from wildlife species and habitat management would be very similar to those described in the Lower Sonoran discussion. The impacts from water developments would be negligible to minor, and probably even less than those in the Lower Sonoran. The actions planned in earlier LUPs to protect, maintain and improve priority and non-priority species habitat would reduce the impacts of livestock management, and otherwise maintain more vegetative cover, as in the Lower Sonoran Decision Area. The resulting impacts on soils would be positive.

From Recreation Management on Soil Resources

Alternative A has an SRMA that is intended to cover the portion of the Gila Trails SRMA that occurred within the SDMN. It has 143,900 acres which includes the Gila Trail, the Butterfield Stage Route, the Anza Trail and other historical points. Impacts to soil resources would increase as additional miles of hiking, biking and equestrian trails are constructed exposing disturbed soils to wind and stormwater erosion; and use of the area increases with increased visitation. However, management actions are planned that would protect resources values and limit OHV use to designated routes. The sum of these offsetting actions is likely to have a minor negative impact. The remaining 342,500 acres of the SDNM would experience minor impacts similar to those described above for the Lower Sonoran.

From Special Designations on Soil Resources

Retaining the Vekol Valley ACEC in the SDNM would decrease the likelihood of soil disturbances in these areas, because they would remain closed to vehicle use; thus decreasing ground disturbance. Impacts on soils from the designation are likely to be positive.

From Travel Management on Soil Resources

Decisions in this alternative to allocate OHV area designations as Open/Closed/Limited would have the effect of the highest levels of soil disturbance of any alternative. Continuing to allocate the Vekol Valley Grasslands ACECand Wilderness Areas as OHV Closed areas, 110,700 acres, would minimize the loss of soil through the prohibition of vehicles and bicycles which put high downward forces into soils. Continuation of OHV area allocation Limited to Existing Roads and trails on 798,100 acres would have the effect of maintaining high levels of soil disturbance throughout the SDNM. Disturbance would likely continue to increase as new routes come into use as a result of a steady net increase in the number of routes.

Under Alternative A, 65 miles out of 632 miles of routes would be closed in SDNM. Public travel in wash bottoms and dry streambeds that are part of the existing route system would continue, potentially damaging xeroriparian vegetation and destabilizing channel banks. This would lead to a moderate level of impact on soil resources, including an increase in sedimentation in drainages during periodic stormwater runoff events.

In addition:

- Restricting travel to existing routes will limit the impacts to some locally high, but generally moderate, levels over the Decision Area, assuming the restrictions are enforced.
- The soils along the De Anza-Butterfield trail corridor between the North and South Maricopa Mountain Wilderness Areas and east and west of Butterfield Pass are deep, loamy and often have calcareous layers. Typically they are not readily erodible, although some have a

moderately high wind erosion hazard. For example, the Why soil has a moderate-high wind erosion hazard ranking. Why soils make up about 15 percent of the Denure-Rillito-Why Complex, the most common soil grouping in the SDNM between the North and South Maricopa Mountain Wilderness Areas (at the third order soil mapping intensity commonly used for rangeland management). Despite the relatively low erosion rating for most SDNM soils west of the Vekol Valley, surface and vegetation disturbance or damage increases susceptibility to erosion on any soil. These disturbances have occurred due to OHV activity in this area. To reduce trail damage and control further erosion, the area has been temporarily closed to OHV traffic. If the temporary closure is lifted as planned in Alternative A, vegetation damage, surface disturbance, increase in total un-surfaced roaded area, and reduced soil aggregate stability are very likely to increase due to the lack of site hardening and natural barriers preventing cross-country travel and camp area expansion. These changes in the selected soil condition indicators will all contribute to moderate erosion at least and increased sedimentation in this area.

- The analysis of route designations that distinguished the open from the closed routes considered the soils associated with each route. The sensitivity of soils to impacts from motorized travel is part of the basis for the designation. Impacts will be greater on roads designated as open than on those designated as closed. Depending on a variety of factors impacts on soils from open roads will usually be moderate, based mostly upon the activities expected to occur in the Gap Well and North Tank areas. Soil characteristics, intensity of use, road grade, number of drainage crossings, the speed limit, and other factors will affect the level of impact in a specific section of road.

- Roads that are designated as open will have a tendency to widen as the 200 foot parking corridor is disturbed.

- Roads in use will have more impact on air quality by increasing the concentration of PM_{10} in the air.

- Roads in use will always have loose, fine particles on the road surface making them more susceptible to entrainment by wind and water.

- Surfaces of roads that are designated closed will slowly stabilize as vegetation recovers and no new disturbances occur.

- Roads that are closed can be rehabilitated and treated with water bars or other methods to improve drainage and reduce erosion.

From Vegetation Resources on Soil Resources

Decisions intended to protect special status species, particularly those that avoid surface disturbance or maintain vegetative cover, would also protect soil and water resources. Few specific management objectives for vegetation resources exist under Alternative A. Unauthorized removal of native plant materials is prohibited, which may provide a small measure of protection against soil disturbance. Generally vegetation management in the entire Planning Area is guided by Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (1997). Progress toward standards includes establishment of desired plant communities which increases protection for soil surfaces from wind and water erosion and has overall positive impacts.

4.7.4. ALTERNATIVE B

4.7.4.1. Lower Sonoran

Alternative B allows an increase in new facilitates and increased public access to the Decision Area, which would allow a greater number of surface-disturbing activities. As a result, Alternative B would generally increase the potential for soil erosion, sedimentation, and reduced soil stability as compared to Alternative A. Although mitigation will be planned when there is an acceptable probability of success, residual impacts, as measured by the six soil indicators, are likely to persist from grazing, recreation, travel, lands and realty, and mineral management.

From Lands & Realty on Soil Resources

In the Lower Sonoran under Alternative B, the multiuse corridors would be the same as those described in Alternative A. As in Alternative A, the impacts would be minor, assuming BMPs for mitigating corridor impacts are implemented. Other authorized land uses, including utility-scale renewable energy development, would have the same moderate impact to soil resources as described under Alternative A.

Approximately 39,700 acres are available for disposal under Alternative B. If disposal of all available land occurred, the impact could be twice the impact described under Alternative A, although the total impact would still be moderate.

From Livestock Grazing on Soil Resources

Under Alternative B, impacts from grazing would be less than Alternative A. Perennial and perennial-ephemeral allotments would receive a reduction in permitted AUMs to offset the effects of continued ephemeral grazing. Grazing would continue on the same number of acres as Alternative A, but permitted use would be approximately half the Alternative A perennial stocking rate. The reduced grazing would have a positive impact on soils of the Lower Sonoran grazing allotments, compared to the greater perennial use in Alternative A. Surface disturbance would be reduced, which would result in lower impact on sensitive surfaces such as cryptobiotic crusts and finer textured floodplain soils susceptible to wind erosion. Less utilization of perennial plants would occur, assuming that ephemeral herds were removed in a timely manner, which would provide a small increase in surface vegetative cover. Since livestock depend on browse more than perennial grasses in the Decision Area, positive impacts on grasses from reduced perennial grazing would be minor. Another positive effect of the reduced perennial grazing is to reduce the size of the herd that is on the allotments year-round. This would result on less pressure on plants during dry periods of the year when stress is greater. There are positive impacts from reduced perennial grazing, but the overall impacts are still minor, as in Alternative A.

From Minerals Management on Soil Resources

Impacts from mineral development would be the same as described under Alternative A, except in some RMZs (Painted Rock RMZ, Gunsight Wash Campground), which are proposed for mineral withdrawal.

From Priority Wildlife Species and Habitat Management on Soil Resources

Alternative B would increase the number of new wildlife waters by about 50 percent (approximately 32 additional water developments) more than Alternative A, and relocate or remove some existing waters in the Lower Sonoran to meet wildlife habitat and distribution objectives. These actions could cause a slight draw down of groundwater and impounding of storm water. These impacts would be negligible. Existing roads required to providing access to these waters would be used when possible. Any new roads required would be closed to public use and would have a negligible impact on soil resource indicators. Any increase in compaction or soil surface disturbance compared to Alternative A would be very slight or negligible.

From Recreation Management on Soil Resources

Recreation allocations in the Lower Sonoran would include 8 SRMAs. The effects of SRMAs on soil resources are dependent on the proposed recreation uses and are described in Alternative A. Impacts on soils from SRMAs in Alternative B are increased due to the additional management areas. All Lower Sonoran SRMAs in Alternative B allow motorized travel. Motorized travel within dry washes can destabilize banks, particularly where vehicles enter and exit the washes, and damage xeroriparian vegetation. Disturbing sensitive soils such as cryptogamic crusts may result in increased erosion due to exposure of bare soil. Management decisions intended to control motorized vehicle use, manage vehicle-based camping and recreational target shooting, and other intensive recreation uses, would help to mitigate impacts to soil resources. Three of the SRMAs, Buckeye Hills East Trails, Arlington Trails, and Ajo Trails, emphasize motorized recreation, where erosion from stromwater runoff concentrated on roads would be moderate. This impact is likely to occur in all SRMAs in Alternative B, which has open routes in all SRMAs and emphasizes motorized recreation.

Based on the provisions for visitor education and control, plans for mitigation in anticipated areas of more intense use, and the limited spatial extent of expected impacts, the overall impact of the additional SRMAs in Alternative B will be minor.

From Special Designations on Soil Resources

Under Alternative B, designation of the Coffeepot ACEC in the Lower Sonoran would be retained. Therefore, the impacts would be the same as those in Alternative A.

From Travel Management on Soil Resources

The miles of routes open to various categories of travel decline from Alternative A through D. Nearly all existing miles of roads are open in Alternative A (1,670 of the 1,688 miles in the Lower Sonoran). Efects of the making OHV Area designations of Limited to Designated Routes on 828,360 acres would have a minor effect on soils in the planning area. Allocating an Open OHV area of 40 acres would have a negligible effect regionally since the area is only 0.004 percent of the total area. Locally, the effects could be moderate if not well managed, since a sand wash passes through the middle of this area and bank instability could lead to sedimentation during rainfall. In Limited to Designated Routes, management, including the addition of earthen water control structures, would have a minor effect on soils whereby soil loss would be reduced or stopped and monitored periodically. Soil conditions in most areas would be expected to meet land health standards.

Only 1,241 miles are modeled as open in Alternative B. Alternative B has 198 more miles of closed routes and 180 more miles of seasonally closed roads than Alternative A. Many miles of those closures are to protect wildlife habitat management areas in the Gila Bend Mountains and in the Ajo area. These closures will reduce the impacts on soils, particularly on the sensitive areas of desert pavement and cryptobiotic crusts that are common in undisturbed areas of the Ajo Block. Important reductions in rutting, surface and vegetation disturbance and wind and water erosion will occur wherever routes are closed. In those specific areas where the road closures are concentrated, the impact on soil will decline from moderate to minor. However, even with the 25 percent reduction in road miles in Alternative B, the overall impact of travel on the indicators of soil condition in the Lower Sonoran will remain moderate. Alternative B includes plans for only 5 acres with new roads, which will be a negligible impact. Designation of routes in most areas should decrease OHV impacts over time by decreasing uncontrolled road proliferation, assuming resources are available for enforcement of designations.

From Vegetation Resources on Soil Resources

Alternative B would restore and reclaim disturbed areas and control invasive species. Treatment to eradicate invasive plant species may increase potential for erosion and increased turbidity in watercourses during storms in the short term but would effectively increase cover, reducing runoff and erosion, and stabilize soils in the long term. A vegetation resources management objective is to maintain and restore desired vegetative communities to protect soils from wind and water erosion. Achieving the desired future vegetation condition appropriate for the ecological site will also provide a proper proportion of bare ground and increase the probability that erosion will not be accelerated. Sufficient vegetative cover will increase infiltration of stormwater, reducing runoff and subsequent rill and channel erosion. Overall impacts of vegetation resources management in Alternative A and all action alternatives, including Alternative B, are positive. The specific objective in Alternative B and the other action alternatives to increase cover to protect soil from wind and water erosion, if achieved, will provide greater protection to soils than Alternative A. Alternative B plans to minimize surface disturbing activity in priority plant species habitat. Alternative B also addresses individual plant community composition objectives and plans to rehabilitate surface disturbances on sites most likely to be responsive. All of these objectives will increase cover and reduce surface disturbance that leads to erosion. Therefore, the positive impacts of Alternative B and the other action alternatives would be moderate in many areas and could be major in disturbed areas, compared to the minor to moderate positive impacts of Alternative A.

Wood harvesting would be prohibited under all action alternatives, including Alternative B, maintaining cover and avoiding soil compaction that vehicle use for wood hauling is likely to cause. This would be a positive impact, compared to the minor negative impacts from the limited level of woodcutting allowed in Alternative A.

4.7.4.2. Sonoran Desert National Monument

From Lands & Realty on Soil Resources

In the SDNM, the multiuse utility corridors would remain the same as Alternative A and the impacts would be the same.

From Livestock Grazing on Soil Resources

Reductions in perennial grazing would occur in the SDNM, although reductions would be somewhat smaller than in the Lower Sonoran. Positive impacts of the change would be similar, and the overall impact on soils would remain minor. Elimination of grazing south of I-8 would result in slow increase in surface cover, and a slow recovery of surface disturbance caused by livestock movements. Reductions in permitted AUMs in the portion of the Monument in which grazing would continue, would result in minor impacts on soils overall. Discontinued grazing on 8,500 acres of the monument would have positive impacts on soil resources within the SDNM.

From Minerals Management on Soil Resources

Impacts from mineral development would be the same as described under Alternative A.

From Priority Wildlife Species and Habitat Management on Soil Resources

Impacts on soils from wildlife management plans in Alternative B for the SDNM are similar to impacts described for the Lower Sonoran with similar positive impacts. Wildlife management in the SDNM will provide a slightly higher level of habitat protection, and therefore, soil protection, in tortoise habitat and pronghorn habitat. Some additional trails could be constructed or motorized routes could be constructed introducing minor impacts, but these would be off-set by route closures resulting in a net negligible impact.

From Recreation Management on Soil Resources

In the SDNM, the entire Monument would be established as an SRMA. Within the Decision Area, two RMZs would be established: The back country RMZ with 433,600 acres and the Anza Trail RMZ with 52,800 acres. An objective of the Monument is to keep recreation impacts on Monument objectives from exceeding 2001 levels. This will restrict new recreational facility development, so few impacts to soils from compaction or surface disturbance are likely to occur. Most roads will be primitive with low maintenance levels. This could result in erosion during stormwater runoff that could be compounded by delays in repair. Periodic inspection could mitigate this impact.

Increases in visitation, particularly on the historic trails, could result in increased impacts from vehicle traffic. Monitoring of impacts on historic sites is planned, so soil damage from rutting, or unauthorized expansion of the travel surface is expected to be promptly repaired. Impacts are expected to be minor.

From Special Designations on Soil Resources

Under Alternative B, the Vekol Valley Grassland ACECin the SDNM would not be designated and vehicle use would be allowed on routes in these areas, which would increase the potential for damage to soils as compared to Alternative A. The impact on soils in the area of the Vekol Valley Grassland ACEC would increase to moderate in Alternative B. Since Vekol Valley Grassland is the only special designations in the SDNM, the overall impact throughout the SDNM of its removal in Alternative B would be minor.

From Travel Management on Soil Resources

Decisions in Alternative B to allocate OHV area designations as Open/Closed/Limited would have the second highest levels of soils disturbance of any alternative as a result of designating the most open routes of any action alternative. Cross-country travel would not be permitted, so impacts would be limited to the linear routes and use areas adjacent to routes. OHV closed areas would total 3,600 acres less than Alternative A. Vekol Valley Grasslands ACEC would not be designated and this area would be designated as Limited to Designated Routes, allowing for limited vehicular and bicycle use on managed routes. Wilderness Areas would be included as OHV Closed areas (110,700 acres) and effects would be the same as Alternative A. Continuation of OHV area allocation Limited to Existing Roads and trails on 828,360 acres would have the effect of maintaining high levels of soil disturbance throughout the SDNM. Disturbance would liekly continue to increase as new routes come into use as a result of steady net increase in the number of routes.

All existing travel routes in the SDNM would be designated open, limited, or closed in Alternative B (and all other action alternatives). About 70 miles would be closed, which is comparable to the miles of closures in Alternative A (65 miles closed). The differences in impacts due to total route length and road density between the two alternatives would be negligible. The reduced impacts of motorized travel due to wilderness area restrictions would also be the same. The wilderness area size (157,700 acres) and management would be identical in Alternatives A and B.

In addition:

- Impacts of route designations are similar to Alternative A. Road density under Alternative B would average 1.03 miles per section across the SDNM, excluding the wilderness areas. That relatively low road density would represent a minor impact. However, in some areas other factors combine to increase the probability of wind and water erosion, such as:

1. Local areas of higher road density in Buckeye Hills, the land around Ajo, and the area north of Signal Mountain.
2. Where soils are identified as susceptible to wind erosion by NRCS in the Gila Bend-Ajo Soil Survey, floodplain soils of Vekol Wash, soils north and west of Mobile, and soils near the washes east and south of Ajo,
3. Where roads intersect washes and the amount of disturbed, fine-textured soil material is present.

From Vegetation Resources on Soil Resources

Impacts on soil would be the same as vegetation resources in the Lower Sonoran outside of the Monument, except that collection of vegetation and woodcutting would be more restricted in the Monument. This would have a minor positive impact on soils by protecting a small, additional amount of cover, including litter, and by reducing motorized vehicle activity by some small amount.

4.7.5. ALTERNATIVE C

4.7.5.1. Lower Sonoran

From Lands & Realty on Soil Resources

In the Lower Sonoran under Alternative C, multiuse utility corridors would be reduced to nine multiuse corridors. As in Alternative A, the impacts would be minor, assuming BMPs for mitigating corridor impacts are implemented. Other authorized land uses, including utility-scale renewable energy development, would have the same moderate impact to soil resources as described under Alternative A.

Approximately 39,700 acres are available for disposal under Alternative C. If disposal of all available land occurred, the impact could be similar to Alternative B and twice the impact described under Alternative A, although the total impact would still be moderate.

From Livestock Grazing on Soil Resources

Impacts on soils from Alternative C grazing proposals would be less than Alternative A, but greater than Alternative B. Perennial AUMs in Alternative A and C are the same, but supplemental ephemeral grazing allowed in Alternative A would not occur in C. The reduced perennial grazing in Alternative B would result in less impact compared to C, even in years when ephemeral grazing was allowed in B, due to the limited duration of ephemeral spring grazing. The additional impacts in Alternative C would be largely the result of the higher year-long stocking rate causing concentration of use near water and forage. The risk of surface disturbance and possibly compaction would be increased, although overall impacts would remain minor. Higher intensity of ephemeral grazing in Alternative B, and still higher intensity in Alternative A, when combined with a larger perennial herd, would reduce the positive impacts on soils of more organic matter and residual litter associated with the lower use of ephemeral forage in Alternative C.

Evaluating relinquished grazing permits for reallocation to other uses would provide the opportunity for impacted areas to increase surface cover, reduce bare ground, and reduce impacts on areas of sensitive cryptobiotic crusts and desert pavement. Impacts from programs for adaptive monitoring and management of grazing would be similar to Alternative B. These management actions could result in positive impacts on some allotments.

From Minerals Management on Soil Resources

Impacts from mineral development would be the same as described under Alternative A, except in some RMZs (Painted Rock RMZ, Gunsight Wash Campground) which are proposed for mineral withdrawal. Also, mineral materials disposals would be prohibited in areas that contain cactus ferruginous pygmy owl habitat, eliminating potential impacts in these areas. These differences would have a negligible effect on the overall major impact of mineral development on soils.

From Priority Wildlife Species and Habitat Management on Soil Resources

As under Alternatives A and B, decisions or actions intended to protect wildlife, particularly if they involve avoiding or remediating ground-disturbing activities, would also protect soils from erosion, sedimentation, and runoff. Differing from Alternatives A and B, Alternative C would allocate 425,900 acres of WHAs in the Lower Sonoran, which would help to reduce surface disturbances that can cause soil erosion or loss of biological soil crusts and desert pavement.

Positive impacts from many planned wildlife management actions are the same as those in Alternative B, including wildlife corridors, and protection of pygmy owl habitat. Restrictions on surface disturbing activities and goals to improve cover for habitat, will increase infiltration of storm water, reduce runoff, and, therefore, reduce water and wind erosion and maintain sensitive

surfaces with cryptobiotic crusts and desert pavement. Limits on some recreational activity in pronghorn habitat will contribute to similar positive impacts.

Four WHAs totaling 425,900 acres will provide positive impact in Alternative C by limiting surface disturbance in existing LUAs, areas greater than 40 acres, new route construction that did not support wildlife management objectives, leasable and mineral material sales, road density in WMCs, and travel in washes with pygmy owl habitat. All of these limitations would reduce erosion, and risks of damage to sensitive cryptobiotic crusts and desert pavement.

Improving distribution of wildlife by moving wildlife waters as needed, and limiting construction of new wildlife waters would have a minor positive impact on soil compaction, vegetation consumption and exposure of bare soil. Limiting these soil impacts will improve infiltration of storm water, reduce runoff and erosion.

From Recreation Management on Soil Resources

Five SRMAs would be allocated in the Lower Sonoran under Alternative C with total acreage of only about 139,500 less than Alternative B. Managing recreation use areas for a more even balance between motorized and nonmotorized uses would decrease the likelihood of impacts to soils by trampling, rutting, and erosion. Alternative C, would have SRMAs with a larger proportion of acres in the back country RMZ (423,100acres) compared to community interface (19,900 acres) and front country (186,300 acres). Compared to Alternative B, this is an increase of 72,500 acres in back country, which focus on providing for nonmotorized, dispersed activities. Reduced motorized travel within dry washes and on sensitive soils would decrease the likelihood of altering surface flow, exacerbating bank erosion, and damaging xeroriparian vegetation compared to Alternatives A and B. Proposed management actions in the Gila Bend Mountains RMZ to restore natural conditions of disturbed areas greater than 2 acres will reduce the impacts on soils in that areas by increasing cover and reducing the risk of accelerated erosion from roads and campgrounds. Overall impact of Alternative C recreation management in the Lower Sonoran Decision Area will be minor, assuming planned road and campground maintenance actions are effectively implemented.

From Special Designations on Soil Resources

Under Alternative C, designation of the Coffeepot ACEC in the Lower Sonoran would be expanded to the Coffeepot-Batamote ACEC covering 63,300 acres. This action would increase the positive impact of the ACEC. Impacts would be negligible.

From Travel Management on Soil Resources

A decision to allocate OHV area designations the same acreage as Alternative B would have similar effects except that increasing the mileage of closed roads, thus allowing vegetative cover to return and stabilize soils and would have minor effect on soils. There would be no Open area near Ajo in this alternative, thus the impacts to soils would be greatly reduced due to having designated routes instead of allowing cross-country travel.

As under all action alternatives, Alternative C would include a framework for vehicle and travel management that should over time decrease the affects of vehicle use on soil resources compared to Alternative A. Road density in areas of the Lower Sonoran in areas where, as modeled, 1,141 miles of roads could remain open (wilderness areas and allocated areas managed to protect

Wildernes Characteristics are excluded) would be 1.28 miles of open road per section, one of the higher densities among the alternatives, but still a relatively low value.

Alternative C has 319 more miles of closed routes and 154 more miles of seasonally closed roads and roads closed to public use than Alternative A. Many miles of those closures are to enhance lands managed to protect wilderness characteristics, protect wildlife habitat management areas in the Gila Bend Mountains and in the Ajo area. Other closures are in designated wilderness areas and in the area around the Painted Rocks Campground. These closures will reduce the impacts on soils, particularly on the sensitive areas of desert pavement and cryptobiotic crusts that are common in undisturbed areas of the Ajo Block. Less rill and gully erosion, surface and vegetation disturbance and wind and water erosion will occur wherever routes are closed. Ruts do not deepen. Detours to avoid obstacles, and use of the 100 foot parking area on each side of the road do not occur. However, the probability of storm water flow being concentrated on unsurfaced roads and resulting in erosion on and off the road will persist, even on closed roads. Despite the 32 percent reduction in road miles in Alternative C compared to Alternative A, the overall impact of travel on the indicators of soil condition in the Lower Sonoran will remain moderate.

Alternative C includes plans for only 25 miles with new roads, which will be a negligible impact on soil indicators.

About 25 percent of the open roads designated in Alternative C are on soils with moderately high or high vulnerability to wind erosion. Impacts on soils include loss or displacement of fine material from the road prism, an increased risk of rill and gully erosion during storm water runoff, and increases in PM_{10} air pollution.

From Vegetation Resources on Soil Resources

Objectives, management actions, and impact under Alternative C would be the same as Alternative B.

4.7.5.2. Sonoran Desert National Monument

From Lands & Realty on Soil Resources

In the SDNM, two underground utility corridors would be designated under Alternative C, increasing the potential for soil disturbance and associated erosion compared to Alternative B. In addition, communication sites would be prohibited within SDNM, eliminating surface disturbing activities associated with construction of such sites that can cause impacts to water resources and soils.

From Livestock Grazing on Soil Resources

Impacts of Alternative C on soils in the SDNM is very similar to impacts of Alternative C described above for the Lower Sonoran. The larger perennial herd in Alternative C would create a greater impact on soils than the smaller perennial herd with the periodic ephemeral grazing in Alternative B. Alternative A has the greatest impact with both a larger perennial herd and ephemeral grazing. The additional impacts from the higher use in Alternative C would be minor.

From Minerals Management on Soil Resources

In SDNM, impacts from mining would be the same as for Alternative A.

From Priority Wildlife Species and Habitat Management on Soil Resources

Impacts from wildlife management are positive on soils. The positive effects of wildlife corridors from reduced road speed limits, limits on disturbance near washes, and limits on road density are the same as Alternative B, but provide even more protection due to the corridor that connects the Sierra Estrella Mountains to the South Maricopa and Sand Tank Mountains in the Monument.

None of the WHAs are located in the Monument, but that is off-set by the protective presence of the three wilderness areas which limit motorized disturbance of nearly all resource values within their borders, including the soil surfaces and the vegetation which is key to maintaining soil health. Protective measures for Pygmy Owls and desert tortoises also protect soil surfaces through seasonal closures for the owl and the no net loss provision for the tortoise. These positive impacts apply to all the action alternatives.

Many of these provision could have been implemented under Alternative A, but were not specifically required as they are in Alternative C and in some of the other action alternatives. Also, Alternative C is the only alternative to provide the protection of the 117,300 acre Sierra Estrella-South Maricopa-Sand Tank corridor.

From Recreation Management on Soil Resources

The entire SDNM would be a SRMA, consisting of the desert back country RMZ and the Anza and Lower Gila Historic Trails RMZ. Although the Anza Trail is likely to attract increased visitation, 2/3 of that RMZ and nearly 90 percent of the Desert back country RMZ will be managed for undeveloped recreation activity. The undeveloped recreation includes 4-wheel drive touring, which would have characteristic impacts on soils. But overall impacts of Monument recreation are expected to be minor. Compared to Alternative A, which only has 143,900 acres in an SRMA and no distinction among categories of use, management of SDNM recreation under Alternative C would be more active. Under C recreation would probably increase, but most of the Monument would be managed for undeveloped, back country recreation. Therefore, the impacts on soils would be similar to Alternative A and minor.

Groups will be limited in size, competitive motor sports will not be allowed, and more than a third of the miles of road in the Monument would not allow year-long, motorized, public use. These management actions will reduce damage to the unsurfaced road prism, reduce risk of further impact from storm water on the road, and reduce the impact on soil erosion near the road. All of these positive impacts will offset the minor impacts that could be caused by increased recreational activity.

From Special Designations on Soil Resources

No special designations are planned for the SDNM under Alternative C. The impact of the removal of Vekol Valley Grassland ACEC designation would be the same as the impact of the same action in Alternative B.

From Travel Management on Soil Resources

Effects of acres allocated as Closed OHV Areas this Alternative would be the same as Alternative B since they are the same size. There would be no Open area near Ajo in this alternative, thus the impacts to soils would be greatly reduced due to having designated routes instead allowing of cross-country travel. Areas Limited to Designated Routes would have the same effects as Alternative B by limiting cross country travel and confining soil impacts to linear routes. Overall, effects to soils would be slightly less than in Alternative A, but would still remain at a moderate level.

Compared to other Alternatives, route closures will be approximately 80 more miles in the SDNM than in Alternative A; approximately 80 more miles in the SDNM than in Alternative B. Such route designations should decrease OHV impacts by decreasing illegal off-road use through the provision of a good map and marked routes. The potential for on- and off-road erosion and sedimentation usually associated with use of closed roads and closed areas would also decline As under Alternative B, Alternative C would include a framework for vehicle and travel management that should over time decrease the affects of vehicle use on soil resources compared to Alternative A.

Compared to Alternative A, fewer miles of routes in soils with a high potential for erosion would be left open. Compared to Alternative B, in both Decision Areas there would be fewer miles of routes open in soils with a high potential for erosion. This would decrease the potential for soil erosion, particularly wind erosion of fine-textured soils disturbed and displaced by increasing volume of motorized vehicle traffic. Density of open roads in the Monument would be 1.24 miles per section. This is a relatively low density, but among the higher densities in the Planning Area due to the large areas allocated as lands managed to protect wilderness characteristics. The roadless areas and areas of closed roads are not included in the density calculations.

Management actions are included in all alternatives that will have the effect of mitigating the impacts on soils from travel, assuming they are implemented. However, numerous illegal roads have been used by motorized vehicles under current management since the SDNM was established. Substantial disturbance of soils and vegetation has occurred near the Anza Trail corridor increasing the risk of erosion, adding to the concentration of dust in the air and sediment in nearby and downstream channels. Monitoring of impacts and enforcement of laws and closures is a key to controlling impacts and success of the plan. Due to the risk of continuing damage to soil, air and water resources, the overall impacts on soils of travel on is expected to be moderate.

From Vegetation Resources on Soil Resources

Impacts of vegetation resources on soils in the SDNM under Alternative C are the same as impacts under Alternative B.

4.7.6. ALTERNATIVE D

4.7.6.1. Lower Sonoran

From Lands & Realty on Soil Resources

Land available for disposal in Alternative D is about 26,200 acres, which is less than the other action alternatives, and only about 3 percent of the Decision Area. The impact on soils due to

disposal is likely to be minor, depending on how the land was eventually used. Land available for disposal is less in Alternative A (18,900 acres), but the impact will still be minor.

LUA exclusion and avoidance areas include most of the Decision Area under Alternative D. The worst case LUA impacts on soils are likely to be minor. For utility-scale renewable energy development, Alternative D would exclude or classify as sensitive 85 percent of the Decision Area. If utility-scale renewable energy development occurred in the Decision Area, the soil impacts would be major in the area where development occurred, but moderate on the overall Decision Area. Specific impacts would be similar to Alternative A and the action alternatives.

From Livestock Grazing on Soil Resources

Under Alternative D, all public lands in the Planning Area would eventually be closed to grazing once all active grazing permits expire (see Map 2-8d). The elimination of all livestock grazing is in contrast with Alternatives A, B, and C, which would continue livestock grazing at least in all currently open allotments. Eliminating grazing would reduce impacts to soil resources by decreasing ground disturbance and allowing additional vegetation cover to develop over time. These would be positive impacts for soils. During years of increased winter rainfall the fuel load created from the growth of annual species would not be subject to reduction from livestock grazing, which could result in increased frequency and/or intensity of fire in these non-fire adapted ecosystems resulting in the potential increase in soil erosion. Potential effects to soils could vary from minor to major in intensity, based on the size of the burn area.

From Minerals Management on Soil Resources

Compared to Alternatives A through C, where no new areas in the Lower Sonoran would be closed to new mineral development, Alternative D would close substantial areas to new mineral development. The closures would be a positive impact on soils, decreasing the potential for erosion, soil compaction, and displacement associated with mineral development activities.

From Priority Wildlife Species and Habitat Management on Soil Resources

Surface disturbing activities would be excluded from the Gila Bend Mountains Wildlife Habitat Area, Pronghorn Antelope habitat, Category I, II, and III desert tortoise habitat, and wildlife movement corridors. Mineral development would also be excluded from these areas. These exclusions and their reduced surface disturbance would be a positive impact to water and hydrologic conditions in the watersheds of the Lower Sonoran.

Motorized travel within pygmy owl habitat would be prohibited from February thru July. This would reduce the impact on most routes, especially in washes where channel banks and xeroriparian vegetation are susceptible to damage that causes sedimentation in downstream drainages.

New wildlife waters would be installed only in higher elevations under Alternative D. In Alternative A additional waters for livestock and wildlife would be developed as needed, but are not mentioned as a specific action since the 1983 land use plan. Water development in Alternative D would be much more limited reducing overall impacts with less ground disturbance associated with construction of these developments. Alternative D would represent a positive impact.

From Recreation Management on Soil Resources

The overall difference between Alternative D and other alternatives is the reduced number SRMAs in Alternative D. In SRMAs, management actions that are in conflict with recreation are generally resolved in favor of recreation management. Recreation allocations in Alternative D would establish two SRMAs; the Buckeye Hills and Lower Gila Historic Trails SRMAs. The effects of SRMAs on soils are dependent on the proposed recreation uses and are described in Alternative A. Extent of the impacts from SRMAs in Alternative D are reduced from those in Alternative A due to fewer acres of SRMAs and a different recreational opportunity emphasis. Recreational use in the Buckeye Hills SRMA would emphasize nonmotorized recreation opportunities in the Buckeye Hills East RMZ and dispersed recreational opportunities in the Buckeye Hills West RMZ. Lesser emphasis on facility development and motorized recreation would result in reduced surface disturbance, which is generally correlated with reduced soil impacts.

Recreational use of the Lower Gila Historic Trails SRMA would emphasize a greater level of development and more extensive motorized travel than the Buckeye Hills SRMA. Increased development of facilities in this area would result in negligible increases in runoff, erosion and sedimentation. Management of other recreational activities in the Lower Sonoran would be similar to other alternatives. Management decisions intended to control motorized vehicle use, manage vehicle-based camping and recreational target shooting, and other intensive recreation uses, would help to mitigate impacts to water resources. Fewer SRMAs and less motorized recreation in Buckeye Hills would result in the lowest soil impact under Alternative D compared with the other alternatives. The overall impact on soils from Alternative D would be minor.

From Special Designations on Soil Resources

Ground-disturbing activities would be restricted or excluded in ACECsunder Alternative D, including utility-scale renewable energy exploration and development. Also, ACECs would be closed to all locatable and leasable minerals exploration and development (including geothermal and sodium), and mineral material disposals. Although utilities would be placed underground, causing surface disturbance and increasing probability of wind and water erosion, similar disturbances would accrue from above ground utility transmission line construction. Overall, impacts from special designations under Alternative A, particularly ACECs, on soils would be positive by limiting soil disturbing activities, which would reduce erosion, compaction and damage to sensitive surfaces.

From Travel Management on Soil Resources

A decision to increase OHV area designations of Closed to 378,300 acres would have a moderate effect on soils. Allocating the balance of acres 551,900 acres, to Limited to Designated Routes would have the same effects as Alternatives B and C. As in Alternative C, there would be a 40 acre Open area near Ajo. Thus, effects to soils would be greatly reduced through the management of designated routes.

Alternative D would have the fewest number of miles open routes among the alternatives. Alternative D would keep only 47 percent (about 800 miles) of the total number of existing routes (1687 miles) open, compared to 99 percent of the roads open in Alternative A, 74 percent of the routes open in Alternative B, and 68 percent open in Alternative C, Road density in Alternative D is 0.75 miles of open road per section, a relatively low value. Potential for water erosion is substantially greater on roads where storm water runoff is concentrated, and road drainage is not well developed.. Depending on the effectiveness of restoration plans for roaded areas, a road is

likely to remain a water erosion hazard long after it is closed. Therefore, the risk of erosion on the travel system in the Lower Sonoran is lower in Alternative D than A and the action alternatives, but it is expected to remain moderate.

From Vegetation Resources on Soil Resources

The positive impacts from planned vegetation management actions would be similar to the impacts of Alternative C. However, the 263,700 acres of ACECs would allow an increase in vegetative cover over time under Alternative D. Increased cover would increase storm water infiltration, and reduce runoff and erosion (both wind and water). Also, surface disturbance would be reduced further reducing the risk of erosion. Overall positive impacts on soil would be greatest in Alternative D.

4.7.6.2. Sonoran Desert National Monument

From Lands & Realty on Soil Resources

In the SDNM, Alternative D would not designate any utility corridors and communication sites would be prohibited in the Monument. As an LUA exclusion area in Alternative D, new impacts on soils would be negligible. Additional limitations for desert tortoise habitat would be implemented specifically to reduce surface disturbance, which would be a positive impact under Alternative D. Continued use of existing multiuse corridors could experience surface disturbance and associated erosion risks. Those would be moderate, but limited in aerial extent.

From Livestock Grazing on Soil Resources

Under Alternative D all public lands in the SDNM would eventually be closed to grazing once all active grazing permits expire (see Map 2-8d). The elimination of all livestock grazing is in contrast with Alternatives A, B, and C, which would continue livestock grazing at least in all currently open allotments. Eliminating grazing would reduce impacts to soil resources by decreasing ground disturbance and allowing additional vegetation cover to develop over time. These would be positive impacts for soils.

From Minerals Management on Soil Resources

Impacts from mining in the SDNM would be the same as under Alternative A, except in areas withdrawn from mineral development and disposal due to wildlife considerations. Impacts in those areas would be negligible.

From Priority Wildlife Species and Habitat Management on Soil Resources

The impacts on soils from wildlife habitat management are positive under all action alternatives compared to Alternative A. Of all the alternatives, D is the most restrictive on management activities that disturb soil surfaces and reduce vegetative cover. Impacts under D are similar to Alternative C, but are more positive. Restrictions and exclusions for pronghorn, pygmy owl, and desert tortoise are all broader under Alternative D. Area in wildlife corridors is greatest in Alternative D, which will result in the least surface disturbance and the best maintenance of vegetative cover, protecting soil surface, increasing infiltration and reducing runoff and erosion.

From Recreation Management on Soil Resources

Under Alternative D, the entire SDNM would be managed as a single SRMA of 486,400 acres with a market strategy to present the Monument as primarily suited for "undeveloped" recreation. Ninety percent of the Monument would be managed as back country. The resulting impact on soils is likely to be a lower level of disturbance throughout the Decision Area, but a wider area of disturbance. All routes will be primitive, and designated from among existing roads. The impacts characteristic of roads include channeling of storm water on erodible surfaces leading to rills, gullies and sedimentation in natural drainages. The impacts will be locally moderate, if designations are followed, but will be minor overall throughout the SDNM compared to Alternative A. The lower level of impacts will result from the large proportion of the Monument that will be closed to motorized use in wilderness areas and areas allocated as lands managed to protect wilderness characteristics.

Restrictions on length of camping stays, target shooting, group size, management infrastructure, and competitive activities would all contribute to reduced surface disturbance compared to Alternative A, although many of those restrictions also apply to the other action alternatives. The restrictions would contribute to the overall minor level of impact on soils. Disturbance of vegetative cover is one of the major sources of surface disturbance and erosion. This impact would be most limited under Alternative D.

From Special Designations on Soil Resources

Impacts from special designations and the removal of the Vekol Valley Grassland ACEC in the SDNM would be the same as all the action alternatives. The ACEC would not be designated because the Monument status provides adequate protection against invasive weed species and impacts of OHV use. The impact on soils would be negligible, since the vegetation cover would be retained. With sufficient vegetation cover, soil surface protection would be good, bare ground would be consistent with ecological site, and runoff and subsequent erosion would not be accelerated. Under these conditions, soil impacts would be negligible.

From Travel Management on Soil Resources

Effects of acres allocated as Closed OHV Areas this Alternative would be the least of all alternatives since 41% of the area would be closed to public vehicle use and the building of any public use roads. Areas Limited to Designated Routes would have the same effects as Alternative B by limiting cross country travel and confining soil impacts to linear routes. Overall, effects to soils would be slightly less than in Alternative A, but would still remain at a moderate level.

Only 200 miles of routes would remain open under Alternative D. In calculating the road density, however, more acres are excluded for wilderness and areas with wilderness characteristics than any other Monument alternative. The road density for the Alternative D is 2.08 miles per section, highest in the Planning Area but somewhat anomalous. Compared to Alternative A, fewer miles of routes would be open in soils with a high potential for wind erosion and more miles of routes would be closed in these areas. Impacts on soils from route designations in the Monument are similar to impacts in the Lower Sonoran under Alternative D. Although more roads have been closed this alternative, moderate impacts will sill occur due to continuing, although declining, erosion after closure. All other action alternatives have more miles of primitive routes open than Alternative D. Since there is a strong correlation between miles of road in use and wind

erosion from road surfaces and from storm water runoff from roads, Alternative D would have the lowest level of impacts on soils. The impact would be minor throughout the SDNM, except for local eroded road segments that would be moderate. Additional assessments of road impacts are discussed in the recreation section for Alternative D above.

From Vegetation Resources on Soil Resources

The positive impacts from planned vegetation management actions would be similar to the impacts of on soils in the SDNM are the same as impacts under Alternative B.

4.7.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.7.7.1. Lower Sonoran

From Lands & Realty on Soil Resources

Impacts on soils from land tenure changes would be similar to Alternative A and minor, except on the specific disposed lands. About twice as many acres would be available for disposal, but those 36,800 acres are less than 4 percent of the Decision Area. Also, land available for exchange in Alternative A is not available in Alternative E. The impact on soils in the Decision Area is minor, and essentially the same as the impacts described in Alternative B.

Impacts due to land use authorizations are essentially the same as Alternative C. LUA exclusion areas are nearly the same in total acreage. Compared to Alternative A, the impacts are positive, since soil surface and vegetation disturbance and exposure of bare soil associated with LUAs, would occur on about 344,400 fewer acres. The use of existing utility corridors would remain essentially the same, resulting in similar impacts.

Impacts on surface acres from solar energy development is similar to those described in Alternative C. Impacts are positive compared to Alternative A, since Alternative E would have an additional 196,400 acres in areas of high sensitivity, reducing the probable future soil surface disturbance under Alternative E.

From Livestock Grazing on Soil Resources

Impacts from grazing on soils within the Lower Sonoran would be essentially the same as Alternative A.

From Minerals Management on Soil Resources

Impacts from mineral development would be the same as described under Alternative A, except in:

- Some RMZs (Painted Rock RMZ, Gunsight Wash Campground), which are proposed for mineral withdrawal; and
- The Cuerda de Lena pronghorn recovery area, which would be closed to some mineral exploration and development.

In these areas, risks of impacts from surface disturbance would be slightly reduced but would be the same as Alternative A if mineral development did occur.

From Priority Wildlife Species and Habitat Management on Soil Resources

Impacts on soils from protecting wildlife habitat through retention and acquisition of public land, limitations on LUAs, and travel restrictions are similar to Alternatives C and D. The impacts are positive, because they tend to minimize soil disturbance, retain vegetative cover, and assure consistent, long-term protective management of important habitat.

Acreage in the Gila Bend Mountain WHA proposed for Alternative E is the same as Alternative D. However, Alternative E provides less protection against surface disturbance in WHAs than Alternative D. Nevertheless, in making the WHA an avoidance area for surface disturbance and providing a high level of mitigation for mineral leasing activities, the soil impacts from WHA implementation and management under Alternative E will still be positive or negligible.

Wildlife corridors include 195,900 acres in Alternative E that extend across both Lower Sonoran and SDNM. Additional protective measures will be taken in the corridors that will also provide some additional protection to soils. These measures include mitigation of disturbances within 100 meters of large washes, limits on road densities to 3 miles per section (which may occur in some areas of the Decision Areas), and mitigation for other surface disturbing activities greater than 40 acres. The positive impacts of WHAs and wildlife corridors would not occur in Alternative A, which has no habitat areas or corridors proposed.

Impacts from habitat management in Alternative E for specific species would be the same as Alternative C for all species except the desert tortoise. Surface disturbing activities, and, therefore, disturbance of sensitive cryptobiotic and desert pavement soil surfaces would be avoided under Alternative E in Category I habitat, but allowed in Categories II and III. Such uses would have impacts similar to Alternative C, but a small additional measure of protection would be provided by the case-by-case review of mineral lease applications in Alternative E.

From Recreation Management on Soil Resources

The impact on soils of recreation management under Alternative E would be similar to the impacts analyzed under Alternative B, particularly in the distribution of area in SRMAs. Two SRMAs under Alternative B would not be designated in Alternative E. This could provide a minor positive impact under E, since less recreational activity would probably occur in the 48,100 acres in those two SRMAs. One of those two SRMAs, the San Tan Mountains SRMA, is relatively close to an urban area and would be likely to attract more use under Alternative B than E. The result for Alternative E would be reduced surface disturbance and less damage to vegetation. This would limit the increase in bare soil and water and wind erosion. However, even as an ERMA, some use would occur, so the differences in impacts would be minor. Limiting the San Tan Mountains SRMA to nonmotorized use would also minimize the differences between Alternatives B and E.

Some additional differences in management between Alternatives B and E also are proposed. Alternative E camping stay lengths and infrastructure would be more limited, possibly resulting in less soil compaction, vegetation and soil surface damage, and damage to banks and xeroriparian vegetation in adjacent Gunsight Wash, less runoff, erosion and sedimention into the wash. This would be a minor positive impact of Alternative E.

Differences in impacts from management under Alternatives B and E in the Buckeye Hills SRMA would be negligible.

From Special Designations on Soil Resources

Alternative E proposes 247,400 acres for ACEC designation. This is essentially the same acreage and designations as Alternative D, although Coffeepot-Batamote and Cuerda de Lena ACECs would be larger in Alternative E. Alternative E would create major positive impacts on soils with increased motorized travel and resource use and development restrictions.

From Travel Management on Soil Resources

A decision to allocate Closed OHV area designations as 152,800 acres and 777,360 acres as Limited to Designated Routes would have similar effect as Alternative C. Open OHV area effects for 40 acres on soils would be the same as Alternative B.

Travel management areas identified for future travel management planning are the same size in Alternative E as in all action alternatives. Acreage of areas with roads classified as closed versus limited to designated use is similar to Alternative B, so the impacts on soils are also similar. In the Lower Sonoran, Alternative E proposes approximately 55,400 more acres of closed roads than in Alternative B. This would reduce the impact of roads in Alternative E as the additional closed roads begin to recover, re-establish vegetation, and erosion caused by storm water runoff declines. Compacted road prisms may also recover some of their original soil structure, but that would be a very long process. Use of the 100 foot parking area on each side of roads in the Decision Area would not occur, further limiting disturbance of the soil surface and vegetation. Despite the reduced impacts under Alternative E, the overall impacts would remain moderate in the decision, though local impacts where roads are closed would slowly decline to a minor level.

Impacts to soil resources in both Decision Areas from open and closed routes in the areas with a high potential for wind erosion would be similar to Alternative B. Overall impacts on soils from travel on over 1100 miles of mostly unsurfaced roads, a density of over 4 miles per section, would be moderate with some areas of sensitive soils or higher road densities having major impacts. However, road density in Alternative B is only about 2/3 that of Alternative A. As road density increases, soil surface and vegetation disturbance, including disturbance to the 100 foot parking area on each side of the road prism, and total compacted surface area exposed to erosion during storm water runoff all increase. Impact on soils from wind erosion would be moderate due to the limited roaded area on sensitive soils (about 25 percent of the Decision Area), although mitigation would be impractical.

From Vegetation Resources on Soil Resources

Alternative E includes the same proposed management actions for controlling invasive weeds, meeting desired future vegetation community conditions, management of plant material collection, rehabilitating disturbed areas and plant communities, and managing the Fred J. Weiler Green Belt as in all the action alternatives. Therefore, the impacts of vegetation resources management under Alternative E would be comparable to Alternatives B, C, and D.

4.7.7.2. Sonoran Desert National Monument

From Lands & Realty on Soil Resources

Impacts on soils from use authorizations under Alternative E would be positive since the SDNM would be a LUA exclusion area except in established corridors. Otherwise, the impacts would be essentially the same as those described in Alternative C.

From Livestock Grazing on Soil Resources

Grazing impacts on soils will be the same as Alternative A for south of I-8, since those grazing permits have been cancelled. Grazing impacts on soil resources north of I-8 will be the same as Alternative B, with the addition of the impacts identified from the seasonal adjustment in livestock numbers from Alternative C. Additionally, the Conley allotment would become unavailable to livestock, which would have positive impact on the soils in that allotment.

From Minerals Management on Soil Resources

Impacts from mining in the SDNM would be the same as under Alternative A, except in areas withdrawn from mineral development and disposal due to wildlife considerations. Impacts in those areas would be negligible.

From Priority Wildlife Species and Habitat Management on Soil Resources

Positive impacts on soils from wildlife management would be similar to Alternative D and to Alternative E for the Lower Sonoran except the positive impacts of avoiding and mitigating surface and vegetation disturbance would be reduced in Alternative E. Total acreage of WHAs and WMCs in Alternative E would be only about one third the area designated in Alternative D. Alternative A still provides positive impacts for soils, but to a lesser extent without WHA's and corridors.

From Recreation Management on Soil Resources

The entire SDMN will be managed as an SRMA under all action alternatives. Under Alternative A only about ¼ of the Monument would be an SRMA. Under Alternative E, most of the Decision Area would be managed as back country, which means undeveloped recreational activity. Management plans will include limits on restoration of areas damaged by recreation, group sizes, special actions to control invasive weeds, and restrictions on target shooting. These actions will result in lower impacts on soils than are likely to occur in SRMAs in the Lower Sonoran. Impacts on soils will be minor, and similar to the other action alternatives. Impacts are positive compared to Alternative A.

From Special Designations on Soil Resources

Impacts from special designations and the removal of the Vekol Valley Grassland ACEC in the SDNM would be the same as the other action alternatives.

From Travel Management on Soil Resources

Impacts on soils from travel within the SDNM are essentially the same as impacts from Alternative B. Acres of OHV allocation areas are the same as Alternative B, therefore effects would be expected to be the same as B. About 130 more miles of 632 total would be closed to motorized use under Alternative E. The result would be fewer impacts on soils from reduced use of unsurfaced, primitive, unmaintained roads, impacts that have been described for Alternative A, Alternative B and other action alternatives. These impacts generally will be moderate in the SDMN under Alternative E.

From Vegetation Resources on Soil Resources

The impacts on soil of management actions in the SDNM are the same in all the action alternatives. New surface disturbance would be restored and stabilized by available rehabilitation practices. Control measures for invasive species would be implemented. Impacts on soil would be positive for all alternatives. Positive impacts are similar though greater than Alternative A, which has the objective to achieve desired plant communities throughout both Decision Areas, but lacks reference to specific ecological sites, and the objects of the Monument. The action alternative, including Alternative E, also establishes specific goals for restoration for disturbed sites, which is also a positive impact for soils.

4.8. IMPACTS ON VEGETATION RESOURCES

The goals established for the proposed Lower Sonoran and SDNM RMP provides that the overall ecosystem health, diversity, and distribution of native vegetation communities be maintained or enhanced and that species and their habitats be appropriately managed and conserved. The vegetative management objectives stress the importance of natural ecological processes and functions and focus on land uses and discretionary actions to support multiple uses that are consistent with sustaining these natural ecological processes and functions. The goals and objectives were identified for the major vegetation communities that occur within the Planning Area.

4.8.1. METHODS OF ANALYSIS

4.8.1.1. Indicators

Indicators of the primary impacts to vegetative resources as they relate to resource conflicts with other management programs within the Lower Sonoran and SDNM Planning Area include:

- Surface disturbance within a vegetation community
- Direct loss of vegetation
- Changes in ecological conditions necessary to support functioning and healthy vegetation communities (i.e. impacts to soils or water supply and/or quality).

4.8.1.2. Assumptions

- All surface-disturbing activities would include mitigation and adaptive management to reduce impacts to priority wildlife species and their habitat.
- In general, vegetative communities are considered to be in good condition but small localized impacted areas may be present.

4.8.1.3. Program Areas with No Impacts on Vegetation Resources

No impacts to vegetation resources are anticipated for management actions relating to:

- Air Quality
- Cave Resources
- Paleontological Resources
- Public Safety and Hazardous Materials
- Water Resources
- Wild Horse & Burro Management

4.8.1.4. Qualitative Intensity Scale

The intensities of impacts are described using the following definitions:

Negligible: The impact would not be detectable or measurable. There would be no appreciable change to vegetative resources.

Minor: The impact would be detectable and measurable. There would be a small, but slightly noticeable change to a plant community and some individual plant loss. The use of standard operating procedures to offset adverse impacts, including special measures, would be effective.

Moderate: The impact would be very apparent and measureable. There would be a significant change to a plant community over a large area and substantial individual plant loss. Mitigation would likely be needed in order to achieve vegetation community DFC's. The use of standard operating procedures to offset adverse impacts, including special measures to avoid affecting special status plants, animals, and important cultural resources, could be extensive, but should be successful.

Major: The impact would be severe. There would be a substantial change across a large area within a plant community and DFC's could not be achieved without substantial input. The extensive use of standard operating procedures to offset the adverse effects would be necessary, and their success would not be guaranteed.

4.8.2. COMMON TO ALL ALTERNATIVES

4.8.2.1. Both Decision Areas

From Cultural and Heritage Resources on Vegetation Resources

Protection of cultural resources would tend to protect vegetation resources. Activities associated with management of cultural resources would affect relatively small, localized areas and would not likely have measurable impacts on the overall communities. Even under the most intense management (i.e. site excavation), the amount of acreage disturbed would likely be very small. Fencing cultural sites would result in protection of the vegetation from other impacts. Increased heritage tourism and/or use of vegetation for traditional Native American purposes could result in some disturbance to vegetation, but only in localized areas. Impacts would be negligible to minor.

From Special Designations on Vegetation Resources

Managing the Juan Bautista de Anza NHT consistent with NPS standards to protect the historic landscape and visual values could minimize minor impacts to vegetative resources, due to loss of vegetation from ground disturbance, by increased restrictions on projects such as livestock or recreation developments.

Managing 249,500 acres as wilderness areas in both Planning Area to maintain naturalness would limit activities and reduce surface disturbance and therefore limit minor impacts to vegetation from direct loss of vegetation or soil erosion.

From Soil Resources on Vegetation Resources

Restricting developments and ground disturbing activities away from areas of significant desert pavement, cryptogamic crust, and soils that are vulnerable to disruption or have high wind or water erosion potential could reduce impacts to vegetation by limiting projects. The intensity of the impact limited is based on the level of surface disturbance from a project. Most projects, with the exception of large energy projects, are expected to have a negligible to moderate impact on vegetation since most projects are likely to occur in the vegetation communities with the most acreage in the Planning Area.

In addition:

- Restricting facilities not related to water management outside riparian areas and the 100-year floodplain of washes or water ways and in a manner that avoids changing natural water flow or watershed dynamics could restrict the impact to vegetation communities either directly from limiting the loss of vegetation and/or from reducing the impact to the watershed or floodplain function. The intensity of the impact would generally be minor, but could vary based on the scale of the project.
- Limiting proposed new water developments to only those that do not adversely affect springs, streams, tinajas, seeps or decrease water availability at existing wells will limit water loss required for the vegetation in those areas. Impacts would be minor.
- New erosion control projects could result in negligible or minor impacts to some localized areas of vegetation, varying by which vegetation community impacted; however, the projects could result in improved watershed conditions leading to improved conditions for vegetation, thereby mitigating the impacts.
- Implementing BMPs for activities that have been specifically established to protect streams from non-point source pollution will reduce the impact, to negligible or minor, from pollution on downstream vegetation.
- Existing water control structures that are resulting in moderate impacts due to excessive erosion and vegetation loss could be removed. This could reduce the impacts to minor or negligible.

From Wildland Fire Management on Vegetation Resources

The Lower Sonoran is largely comprised of non-fire adapted vegetation. The level of impact would vary depending upon the size of the area burned. Fire in Sonoran Desert plant communities that are not fire adapted could have moderate to major impacts to those communities in the long term by removal of vegetation over large areas. Suppression of wildfires in the Sonoran Desert Ecological Zone would emphasize MIST tactics. These tactics would primarily result in localized short-term impacts. Suppression actions could also have long term-impacts to native plant communities and increase soil disturbance, but would reduce the overall number of acres burned within the Planning Area.

A few areas may meet the criteria for utilizing prescribed fire, mechanical, chemical, and biological fuels treatments to meet resource objectives. These objectives include:

- Improving vegetation, wildlife habitat, or watershed conditions,
- Maintaining non-hazardous levels of fuels,

- Reducing the hazardous effects of unplanned wildland fires, and
- Meeting other resource objectives.

Areas that might meet these criteria could include stretches of the Gila River where tamarisk has suppressed native riparian vegetation, as well as portions of the Vekol Valley Grassland where fire may improve natural conditions of the grassland while protecting non-fire adapted vegetation communities in the vicinity. When applying fuels-treatment methods, BLM policies, procedures, and plans are to be followed in all cases.

4.8.2.2. Lower Sonoran

From Vegetation Resources on Vegetation Resources

Requiring surface disturbing activities to minimize, mitigate, or avoid impacts to achieve land health standards, achieve vegetation community DFC's and protect Endangered, Threatened, or Special Status Plants would reduce the intensity of impacts associated with activities or require projects to relocate. The intensity of the impact limited would vary by the size of the project.

Vegetation treatments, including but not limited to thinning, burning, seeding, transplanting, watering, closures and use restrictions could impact vegetation and disturb soils in the short term but would have long term objectives to achieve land-health standards thus mitigating the impacts. The intensity of the impact would vary by the size of the project.

Using rehabilitation practices, including prioritizing native vegetation, to stabilize and rehabilitate sites impacted from surface disturbing activities could limit long term impacts, ranging from minor to moderate based on size, to the vegetation on those sites. Allowing the use of mechanical, chemical, and biological treatment methods to remove invasive plants, such as tamarisk, in the Fred J. Weiler Green Belt for the purpose of restoring ecological conditions and function and reducing fuel hazards could have moderate impacts to riparian vegetation from surface disturbance and removal of vegetation; however, the control of invasive species would limit the long term impacts by eliminating tamarisk and allowing native species to return.

Limiting the collection of vegetation products, both living and dead, to personal uses and in small amounts could limit the impact on vegetation communities to negligible levels.

4.8.2.3. Sonoran Desert National Monument

From Minerals Management on Vegetation Resources

Impacts from Minerals Management would be negligible, as the SDNM is protected by the Monument Proclamation from disturbances related to mining activities.

From Vegetation Resources on Vegetation Resources

Within the SDNM emphasis is placed on protection of the vegetative communities and the vegetative objects of the Monument. Requiring surface disturbing activities to minimize, mitigate, or avoid moderate impacts to achieve land health standards, achieve vegetation community DFC's and ensure protection of the vegetative objects of the Monument would limit the intensity of the

impact to negligible or minor from the activity or eliminate the project. Limiting the collection of living vegetation products to authorized uses only could limit the impact on vegetation communities to negligible levels.

4.8.3. ALTERNATIVE A (NO ACTION)

4.8.3.1. Both Decision Areas

From Priority Wildlife Species and Habitat Management on Vegetation Resources

Wildlife management actions that serve to support wildlife populations by closing or restricting areas to activities, such as recreation use, mining or livestock grazing, would generally limit impacts to minor levels to vegetation by limiting direct loss of vegetation and impacts to soils. The intensity of the impact would vary by the area restricted by the action.

From Wilderness Characteristics on Vegetation Resources

No lands managed to protect wilderness characteristics would be allocated under Alternative A for both Decision Areas.

4.8.3.2. Lower Sonoran

From Lands & Realty on Vegetation Resources

Currently, the existing management does not have any guiding management actions related to renewable energy development, therefore, they would be approved on a case-by-case basis. Development of renewable energy projects, mainly solar, would have impacts ranging from minor to major on vegetation communities by direct removal of vegetation and soil disturbance on a large scale. Current solar technology requires the land to be at less than a 3 percent grade, which would have an impact primarily on the creosote bush-bursage and desert wash communities.

Under existing management, most LUAs are approved on a case-by-case basis. Development of future utility LUA's leading to an increase of transmission lines, pipelines, associated ancillary facilities and roadways within the Decision Area would result in the direct removal of vegetation and surface disturbance leading to the increased risk for the introduction or spread of invasive weed species during construction of these facilities. The impacts could range from negligible or minor for small projects to moderate for large LUA's (such as utility-scale renewable energy developments).

The designation of ten 1–mile wide utility corridor could result in minor impacts to vegetative resources from new access roads and associated increased vehicle traffic due to direct loss of vegetation and soil compaction and erosion. Impacts are expected to range from minor to moderate. Up to 29,600 acres of public land in the Lower Sonoran are identified for disposal. This could impact vegetation within and bordering the small, isolated parcels although it is not likely that the impacts would be more than minor to the vegetation communities in general.

From Livestock Grazing on Vegetation Resources

Potential impacts identified from heavy livestock grazing on vegetation are: reduced plant vigor, alteration of vegetation community composition or structure or reduction in plant cover, reduction of individual plants including desirable forage species, increased soil instability leading to erosion and soil compaction.

Through the land health evaluation process, any impacts that are identified from livestock grazing on vegetation and soils that result in the non-achievement of land health standards would require mitigation. Mitigation to offset these impacts could include livestock management changes such as adjustments in grazing timing, season, duration and/or adjustments to livestock numbers and implementation of grazing management systems (rest rotation, deferred, deferred rotation, seasonal and short duration). Construction of new rangeland development projects and water sources could result in minor impacts by the direct loss of vegetation and soil disturbance in the area immediately surrounding the project leading to reduced biological productivity. The size of the impact area around livestock water developments is estimated at approximately 6 acres on average. Larger water developments may have minor impacts at up to ¼ of a mile from the project or approximately 125 acres. Construction of these projects should result in improved distribution and management of livestock resulting in reduced impacts to vegetative resources on a larger scale (allotment wide).

The potential introduction or spread of invasive weed species through livestock grazing activities could result in changes in vegetation communities and/or increase the incidence of wildland fire in non-fire adapted communities. The impact would vary in intensity based on the type of invasive species and how the vegetation community is altered.

Under Alternative A for the Lower Sonoran, 23 of the 40 allotments would continue to be managed as ephemeral-only allotments. High density stocking rates during ephemeral years of high annual production could result in increased impacts around concentrated livestock areas through disturbance to soils and vegetation. These impacts would generally be minor in nature over the foreseeable future as years without ephemeral use would allow for rest and recovery of any impacts in these areas.

The remaining 18 allotments would continue to be managed as perennial or perennial/ephemeral grazing allotments, resulting in more continuous year round impacts to vegetation that vary from negligible to minor. Moderate impacts could occur during drier periods if livestock operators do not make appropriate management changes and the drought policy is not implemented. In general, livestock operators in the Planning Area adjust livestock numbers based on climatic conditions, allowing for rest and recovery periods to vegetation, which would reduce the intensity of impact to minor. Additional similar impacts could occur in these allotments associated with the impacts described above for ephemeral authorizations.

From Minerals Management on Vegetation Resources

Mineral development within the 614,900 acres currently open to development could impact vegetation by disturbing surfaces and direct loss of vegetation. Creation and expansion of material pits, roads, and ancillary facilities would result in the impacts. Mining operations would be expected to disturb an average of between 40-200 acres each. The intensity of the impact would vary depending on the size of the disturbance and the vegetation community impacted. Development within the creosote bush-bursage and palo verde-mixed cacti communities would likely have negligible to moderate impacts. Development within communities with smaller acreage could have negligible to major impacts.

Noxious invasive weeds could establish in some disturbed areas, potentially impacting surrounding vegetation by modifying the communities and increasing risk of wildfire.

The impacts from mineral exploration or development activities, resulting from direct loss of vegetation, is most likely to occur in the Ajo block and the Globe-Miami area where there is more potential for development.

From Recreation Management on Vegetation Resources

The allocation of four SRMAs could provide protection for localized areas of vegetation by limiting disturbance and loss of vegetation through the concentration of recreation activities. Within the SRMAs and in roaded natural areas under the Recreation Opportunity Spectrum (ROS), the increase of recreational activities, such as OHV travel and vehicle camping, could result in minor impacts due to the loss of vegetation and impacts to soils. The areas outside SRMAs would be allocated as ERMAs (550,800 acres), which are managed to custodial standards and do not generally provide structured recreation. ERMAs and semi primitive motorized ROS areas would not typically include the proactive development of facilities or specific management actions that could increase recreational activities, such as OHV use, resulting in minor impacts due to the loss of vegetation and impacts to soils. Semi-Primitive Nonmotorized and primitive ROS areas emphasis nonmotorized uses and would have negligible impacts on vegetation communities.

Requiring SRPs and establishing camping facilities could control the areas where surface disturbance from recreation occurs, limiting impacts by limiting the loss of vegetation.

The possibility of introduction, establishment and spread of noxious invasive plants could be increased due to the lack of existing LUP-level decisions regarding required use of weed-free feed for equestrian recreation. The spread of noxious/invasive plants can have impacts on vegetation communities that range from negligible to moderate in intensity based on the type of invasive species and how severely the vegetation community is altered. The potential increase risk of wildfire from some species could lead to major impacts in the vegetation communities. Soil compaction through recreational activities, such as OHV use and camping, could modify hydrologic flow and water infiltration rates and impact vegetation by altering the conditions necessary to support functioning and healthy vegetation communities. This would generally result in minor impacts, but could vary depending on the size of the disturbed area. Wood harvesting activities of up to one cord per individual annually could result in minor to moderate impacts from vegetation removal, particularly within the Cuerda de Lena area of the Ajo Block, where the majority of wood harvesting activities occur.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under the Common to All Alternatives for both Decision Areas for the designation of the Juan Bautista de Anza NHT and for wilderness.

Management prescriptions in the 8,900-acre Coffeepot Botanical ACEC include the mitigation of mining practices and a restriction on grazing developments that would reduce potential minor impacts on vegetation resources by reducing surface disturbance and the loss of vegetation.

From Travel Management on Vegetation Resources

In general impacts associated with travel management on vegetation are: direct loss of individual plants, increased soil instability, erosion and soil compaction leading to conditions that do not support functioning and healthy vegetation communities and increased potential for the spread of noxious/invasive weeds from vehicle traffic.

Under Alternative A, decisions on motorized-vehicle use would leave the current OHV class designations and route system in place and route designations would be deferred to a later implementation-planning and decision-making process. Within the Lower Sonoran, 1871 miles of routes would remain open (183 within desert washes) and 16 miles (1 within desert washes) would remain closed. Motorized vehicles would be limited to existing or designated routes in the Decision Area. In general, the closure of routes (currently 15 miles) to motorized use could minimize the level of impact to vegetation communities by preventing direct loss of vegetation and preventing further soil compaction and erosion, thus improving the conditions for the site to reclaim and revegetate. Heavier use trails within the desert washes can have minor impacts by bank and channel alteration of soils and direct loss of vegetation. Current guidance generally lacks specific prescriptions for managing motorized and nonmotorized uses. The lack of such prescriptions and the large number of routes open for public use under Alternative A may result in continued impacts, as described above, to vegetative resources.

Although motor vehicle use is currently limited to existing or designated routes, few routes have been designated as open, limited, or closed to use. Such designations provide a clearly delineated travel network, reduce route proliferation, and could minimize or prevent impacts to vegetation.

Restricting vehicle use to designated roads in the Painted Rock Mountains, restricting entry to Sentinel Plains and closing the Sonoran pronghorn management area from March 15 to July 15 would minimize impacts, to minor, on soils and vegetation resources in these areas. Prohibiting off-road and cross-country travel in the Sentinel Plain and Ajo Airport parcels and prohibiting new route proliferation could limit impacts on these parcels to minor intensity by reducing surface disturbance and vegetation loss.

From Visual Resources on Vegetation Resources

Under Alternative A, managing 116,300 acres of the Decision Area under VRM Class II standards would place some restriction on developments to comply with the visual protection requirements of the class. This could potentially limit the impacts, to negligible, on vegetation by reducing the disturbed area of projects. The intensity of the impact limited would vary depending on the size of the surface disturbance from the project. Managing 722,100 acres of the Lower Sonoran to meet VRM Class III or IV objectives would place fewer restrictions on developments and potentially increase the size of disturbance of projects and the vegetation effected. The expectation is that these restrictions would generally lead to only minor changes to projects and have a minor impact on vegetation resources. Only wilderness areas would be managed as VRM Class I under all alternatives. Restrictions on developments would occur mostly from the wilderness designation and reduce impacts to negligible.

4.8.3.3. Sonoran Desert National Monument

From Lands & Realty on Vegetation Resources

The designation of three 1–mile wide utility corridors north of I-8 could result in minor impacts to vegetative resources from new access roads and associated increased vehicle traffic due to direct loss of vegetation, increased risk of invasive plant or noxious weed establishment and soil compaction and erosion. There are no lands available for disposal within the Monument; therefore, impacts would be negligible.

In accordance with the Monument Proclamation, utility-scale renewable energy developments would not be allowed within the Monument. This would eliminate any minor to major impacts associated with these energy projects.

From Livestock Grazing on Vegetation Resources

Livestock grazing authorizations in the SDNM, south of I-8, were terminated when existing grazing permits expired, as directed by Presidential Proclamation 7397. Grazing in the SDNM north of I-8 would continue as perennial use, consistent with historical stocking rates and with ephemeral use authorized through ephemeral permits. Within these open areas, potential impacts identified from livestock grazing on vegetation are: reduced plant vigor, alteration of vegetation community composition or structure or reduction in plant cover, reduction of individual plants including desirable forage species, increased soil instability leading to erosion and soil compaction.

Construction of new rangeland development projects and water sources could result in minor impacts by the direct loss of vegetation and soil disturbance in the area immediately surrounding the project leading to reduced biological productivity. The size of the impact area around livestock water developments is estimated at approximately 6 acres on average. Larger water developments may have minor impacts at up to ¼ of a mile from the project or approximately 125 acres. Construction of these projects should result in improved distribution and management of livestock resulting in reduced impacts to vegetative resources on a larger scale (allotment wide).

The potential introduction or spread of invasive weed species through livestock grazing activities could result in changes in vegetation communities and/or increase the incidence of wildland fire in non-fire adapted communities. The impact would vary in intensity based on the type of invasive species and how the vegetation community is altered. Overall impacts would be negligible to moderate.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to AUM allocations in the SDNM.

From Recreation Management on Vegetation Resources

The allocation of the Gila Trails SRMA could provide long-term protection for localized areas of vegetation by limiting disturbance through the concentration of recreation activities. However, within the SRMA, the increase of recreational activities, such as OHV travel and camping, could result in minor impacts by altering the conditions necessary to support functioning and healthy vegetation communities. This would be the result of soil disturbance leading to erosion, modification of the hydrologic flow in the area and the direct loss of vegetation. The majority of the impacts associated with these uses occur within the creosote bush – bursage community with some additional use in the palo verde –mixed cacti and desert wash communities. The areas outside SRMAs would be allocated as ERMAs (342,500 acres), which are managed to custodial standards, and do not provide structured recreation or development of facilities. ERMAs would

not typically include the proactive or specific management actions that could lead to increased recreational activities, such as OHV use, generally resulting in less concentrated use and therefore negligible impacts due to the direct loss of vegetation and impacts to soils.

Requiring SRPs and establishing camping facilities could control the areas where surface disturbance from recreation occurs, limiting potential minor impacts by limiting the loss of vegetation.

The possibility of introduction, establishment and spread of noxious invasive plants could be increased due to the lack of existing LUP-level decisions regarding required use of weed-free feed for equestrian recreation. The spread of noxious/invasive plants can have impacts on vegetation communities that range from negligible to moderate based on the type of invasive species and how severely the vegetation community is altered and the increased potential for wildfire which could lead to moderate impacts to vegetation.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to target shooting.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under the Common to All Alternatives for both Decision Areas for the designation of the Juan Bautista de Anza NHT and for wilderness.

Continued designation of the 3,500 acre Vekol Valley Grassland ACEC in the SDNM would provide intensive management and protection of the plant community. Erosion control measures within the ACECcould result in minor or even moderate but short term impacts from erosion control projects by direct removal of vegetation, however in the long term the impacts would be mitigated by improving ecological conditions within the native grassland community and stabilize soils.

From Travel Management on Vegetation Resources

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to travel management.

From Visual Resources on Vegetation Resources

Managing 91,600 acres of the SDNM to meet VRM Class II objectives would place some restriction on developments to comply with the visual protection requirements of the class. This could potentially limit the impacts to the vegetation, negligible to minor, by reducing the disturbed area of a project. Managing 236,100 acres of the SDNM to meet VRM Class III or IV objectives would place fewer restrictions on developments and potentially increase the size of disturbance of a project potentially leading to minor impacts on vegetation. Only wilderness areas would be managed as VRM Class I under Alternative A and would restrict developments resulting in no impacts to vegetation.

4.8.4. ALTERNATIVE B

4.8.4.1. Both Decision Areas

From Priority Wildlife Species and Habitat Management on Vegetation Resources

Wildlife management actions that close or restrict areas to surface disturbing activities, such as limiting new surface disturbance within 300 feet of the edge of washes located in the desert washes vegetative community and restricting the maintenance of utility corridors to the existing authorized LUA corridor only, would generally limit impacts to negligible or minor levels to vegetation by limiting direct loss of vegetation and impacts to soils. This includes actions for wildlife movement corridors and T & E species management.

Developing additional wildlife waters and/or relocating existing wildlife waters would have a negligible impact on vegetation due to surface disturbance and direct loss of vegetation.

From Wilderness Characteristics on Vegetation Resources

No lands managed to protect wilderness characteristics would be allocated under Alternative A for both Decision Areas.

4.8.4.2. Lower Sonoran

From Lands & Realty on Vegetation Resources

Development of new energy projects and the likelihood of additional road development and access could lead to moderate to major impacts on 478,200 acres, primarily within the creosote bush-bursage and desert wash communities, due to the direct removal of vegetation and surface disturbing activities.

Impacts from Land Use Authorizations, would be somewhat reduced from Alternative A within the Decision Area with 329,300 acres as avoidance areas and 118,400 acres as exclusion areas.

The impacts from surface disturbing projects could range from negligible for small projects to moderate for large LUA's (such as utility-scale renewable energy development), depending on which vegetation community the project is located in. Impacts related to the designation of 10 multiuse utility corridors would be the same as those described under Alternative A for the Lower Sonoran. Impacts would remain at minor.

From Livestock Grazing on Vegetation Resources

Impacts would be the same as those described under Alternative A for the Lower Sonoran, although impacts will not be as widespread or in some cases as intense in the 18 allotments currently managed as perennial or perennial/ephemeral due to the reduction in the authorized grazing preference (livestock numbers). Allotments currently classified as ephemeral only would remain the same and have the same impacts as Alternative A.

From Minerals Management on Vegetation Resources

Impacts would be the same, and have the same general intensity, as those described under Alternative A, except, slightly more widespread, as 38,300 more acres would be open to mineral entry.

*From Recreation Management on Vegetation Resource*s

The overall focus of Alternative B is on identifying the greatest extent of public land area suitable for the widest potential array of appropriate uses, and on providing opportunities for those uses, including an emphasis on motorized recreation opportunities.

The impacts to vegetation and the ecological conditions necessary to support vegetation communities would be associated with development of intensive motorized trails, staging areas, facilities, developed campgrounds and new road development in certain RMZs within portions of the Ajo (two RMZs), Buckeye Hills Trails (one RMZ and one SMA), Lower Gila Historic Trails and the Arlington Trails SRMAs. The increased motorized activity and new facilities in the 192,300 acres of these RMZs could result in minor or moderate impacts from direct loss of vegetation, soil disturbance and/or the potential introduction and establishment of noxious and invasive weeds from trails and camping areas and during construction activities. Providing a mix of motorized and nonmotorized recreation opportunities on 73,300 acres in certain RMZs within portions of the Saddle Mountain and Buckeye Hills Trails (one RMZ) SRMAs could have impacts to vegetation similar to but at a lesser extent, potentially minor impacts, than those described under the SRMAs above with intensive use areas. These SRMAs are situated closer to metropolitan areas so they are expected to receive increased visitation from adjacent communities, potentially offsetting some of the reduced impacts to the vegetative communities. The Sentinel Plain SRMA would be managed as an ERMA under this alternative and would have similar impacts as above. The remaining 381,000 acres in RMZs within the Ajo, Gila Bend Mountains, Lower Gila Historic Trails SRMAs and the San Tan Mountains SRMA and the San Tan Mountains SMA would all emphasize non- motorized and primitive recreation activities and less intensive development. This would likely result in negligible to minor impacts mostly resulting from soil disturbance and the potential introduction and establishment of noxious and invasive weeds from trails and vehicles. Impacts from ERMAs would be similar to Alternative A, but with only 283,600 acres allocated.

Recreational shooting would have a negligible impact on vegetation communities with the designation of previously disturbed sites, such as abandoned gravel pits, as target shooting areas.

Front country and community interface RMZ allocations would be similar in effect to the roaded natural settings under Alternative A. These areas could have minor impacts due to the continuation of soil disturbance, vegetation loss and increased potential for noxious invasive plant species introduction in and around recreational use areas and access roads. Recreation management of the remaining areas as back country and passage RMZs would provide vehicle access with an emphasis on nonmotorized dispersed use and long distance touring, limiting impacts on vegetation to mostly negligible. Development of additional motorized routes and nonmotorized trails in front country RMZ could increase localized vegetation and soil disturbance. Establishment of additional extended-stay and large-group camping areas could cause minor impacts from additional vegetation loss and soil disturbance within and adjacent to these areas. Vegetation impacts to adjacent areas could be reduced if users are restricted to established camping areas. The decision to encourage equestrian and pack stock users operating under a special recreation use permit to provide their animals with weed-free feed would discourage the establishment or

spread of invasive species. Livestock and other pack users could continue to be a source of invasive species as in Alternative A. Impacts from authorizing individuals to remove one cord of wood annually would be the same as in Alternative A.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under the Common to All Alternatives for both Decision Areas for the designation of the Juan Bautista de Anza NHT and for wilderness.

Management of the 8,900 acre Coffeepot Botanical ACECwould the same as Alternative A.

Managing the Agua Caliente road as a Back Country Byway could increase traffic in the area resulting in minor impacts to vegetation from increase localized vegetation and soil disturbance.

From Transportation and Public Access Management on Vegetation Resources

The proposed route network under Alternative B could impact vegetation similar to that described under Alternative A on open routes, but slightly less widespread because approximately 429 fewer miles of routes would be open to the public, minimizing impacts, under Alternative B. In addition, impacts to vegetation could potentially be reduced on 180 miles of routes with seasonal closures and 8 miles open to administrative use only.

Alternative B would designate 40 acres in the Ajo area as open use. Within this area, vehicles would not be restricted to designated routes. This would result in a minor impact to the vegetation in the area from direct loss of plants and significant soil disturbance. Impacts could be minimized by soil stabilization. Some of these impacts could be mitigated at a larger vegetation community scale by providing a recreation area and potentially drawing these users off of the surrounding areas.

From Visual Resources on Vegetation Resources

Impacts from VRM Class I would be the same as Alternative A for the Lower Sonoran. A decrease in Class II acreage could lead to an increase in surface disturbing activities and increased impacts to vegetative communities. The expectation is that these restrictions would generally lead to only minor changes to projects and have a negligible or minor impact on vegetation resources.

4.8.4.3. Sonoran Desert National Monument

From Lands & Realty on Vegetation Resources

Impacts would be the same as those described under Alternative A for the Monument, except, management towards surface disturbing activities is slightly more restrictive. The entire Monument would be designated as a LUA Avoidance area and the I-8 multiuse corridor would narrow to ½ mile wide as it passes south of the South Maricopa Mountains Wilderness generally limiting the impact to negligible or minor.

From Livestock Grazing on Vegetation Resources

Impacts would be similar to those described under Alternative A for the Monument, except, fewer acres would be available for livestock grazing (243,749). Therefore, impact intensities would be decreased to minor impacts. Vegetation communities within the 8,500 exclosure would be protected from livestock grazing.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to AUM allocations and fencing in the SDNM.

From Recreation Management on Vegetation Resources

The overall focus of Alternative B is on identifying an increase of public land area suitable for the widest potential array of appropriate uses, and on providing opportunities for those recreation opportunities. The overall impacts on vegetation communities would be slightly less than Alternative A. Under Alternative B, impacts from the front country allocation and from the Lower Historic Trails RMZ would likely be similar to those from the roaded natural ROS settings under Alternative A. Impacts from back country and passage zones and the back country RMZ would be most similar to semi-primitive motorized and semi-primitive nonmotorized ROS settings under Alternative A. Managing the entire SDNM as an SRMA will restrict development of recreation facilities, and emphasize nonmotorized access and natural landscapes resulting in negligible impacts to vegetation by reducing surface disturbance.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to target shooting.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under the Common to All Alternatives for both Decision Areas for the designation of the Juan Bautista de Anza NHT and for wilderness.

There are no additional special designations under Alternative B for the Monument.

From Travel Management on Vegetation Resources

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to travel management.

From Visual Resources on Vegetation Resources

Impacts from VRM Class I would be the same as Alternative A for the Monument. A substantial increase in Class II acreage and a reduction in Class IV acreage would impose additional restrictions on surface disturbing developments which could reduce the impact intensity to negligible on vegetation communities by requiring mitigation or reducing the scope or location of projects.

4.8.5. ALTERNATIVE C

4.8.5.1. Both Decision Areas

No unique impacts are identified for both Decision Areas under Alternative C.

4.8.5.2. Lower Sonoran

From Lands & Realty on Vegetation Resources

Development of new energy projects under Alternative C would have the same impacts as Alternative B although over less acreage available for projects (274,000). The intensity of the impact would still likely be moderate to major.

Impacts from Land Use Authorizations, would be somewhat reduced from Alternative A within the Decision Area with 405,900 acres as avoidance areas and 246,100 acres as exclusion areas. The impacts from surface disturbing projects could range from negligible for small projects to moderate for large LUA's (such as utility-scale renewable energy development), depending on which vegetation community the project is located in. Impacts related to the designation of multiuse utility corridors would be the same as those described under Alternative A for the Lower Sonoran.

From Livestock Grazing on Vegetation Resources

The types of impacts from livestock use would be the same as Alternative A for perennial and ephemeral allotments, although within this alternative, no ephemeral authorizations would be permitted. This would eliminate the impacts associated with ephemeral grazing identified in Alternative A on those allotments. Allotments currently classified as ephemeral would remain the same and have the same impacts as Alternative A.

From Minerals Management on Vegetation Resources

Impacts would be the same as those described under Alternative A; however, the intensity would likely decrease due to substantial areas (324,100 acres) that require mitigation and do not allow surface occupancy. Development within the creosote bush bursage community would likely have negligible to moderate impacts and palo verde-mixed cacti communities would likely have negligible to minor impacts. Development within the less common communities could have negligible to major impacts.

From Priority Wildlife Species and Habitat Management on Vegetation Resources

Impacts would be the same as Alternative B; however 425,900 acres would be allocated for WHA's adding additional restrictions on surface disturbing activities which would limit impacts to vegetation to negligible levels.

From Recreation Management on Vegetation Resources

Under Alternative C the proposal is to provide a balance of recreational opportunities while moderating the impacts to vegetation resources through mitigation. The impacts on the vegetative communities from motorized recreation would be reduced to negligible from Alternatives A and B due to a reduction in route density and rehabilitation of closed routes. This would also serve to reduce the area of potential noxious/invasive species introduction.

Localized impacts to vegetative communities from the allocation of additional extended stay campgrounds would be the same as described under Alternative B.

Under Alternative C, the majority of the SRMA's would be retained and the impacts would be similar to Alternative B. The San Tan Mountains SRMA would now be managed as an ERMA along with the Sentinel Plain. The impacts would be the same as described in Alternative B for these areas.

The areas allocated as community interface and front country settings would be reduced and the areas allocated as back country and passage settings would be increased generally reducing the impacts as compared to Alternative B.

Alternative C would not allow wood harvesting permits throughout the Decision Area, eliminating minor impacts on vegetation communities by direct loss of vegetation.

Collection of dead and down wood for use in campfires would be the same as Alternative B.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under the Common to All Alternatives for both Decision Areas for the designation of the Juan Bautista de Anza NHT and for wilderness.

Management of 63,300 acres as the Coffeepot-Batamote Botanical ACEC would require the mitigation of mining practices and a restriction on grazing developments that would reduce potential minor impacts on vegetation resources by reducing surface disturbance and the loss of vegetation. Managing the Agua Caliente road as a Back Country Byway could increase traffic in the area resulting in minor impacts to vegetation from increase localized vegetation and soil disturbance.

From Transportation and Public Access on Vegetation Resources

The proposed route network under Alternative C could impact vegetation essentially the same as that described under Alternative B with approximately 100 fewer miles of routes open to the public. In addition, 154 miles of routes have seasonal closures or are open to administrative uses only that minimize impacts to vegetation.

Alternative C would designate the 40 acres in the Ajo area to ATV and motorcycle use only. This would have the same general impacts as Alternative B.

From Visual Resources on Vegetation Resources

Impacts from VRM Class I would be the same as Alternative A. An increase in Class II acreage would impose some additional restrictions on surface disturbing developments which could reduce impacts to vegetation communities by requiring mitigation or reducing the scope or location of projects. The expectation is that these restrictions would generally lead to only minor changes to projects and have a negligible or minor impact on vegetation resources.

From Wilderness Characteristics on Vegetation Resources

Alternative C has 128,100 acres of lands allocated as lands managed to protect wilderness characteristics. This allocation would be expected to limit impacts to negligible intensities by providing protection to vegetation communities by restricting, reducing, or mitigating surface and vegetation disturbing activities that could result in the loss of vegetation.

4.8.5.3. Sonoran Desert National Monument

From Lands & Realty on Vegetation Resources

Impacts would be the same as those described under Alternative A and B for the Monument, except, management towards surface disturbing activities is slightly more restrictive. The entire Monument would be designated as a LUA Avoidance area generally limiting the impacts to negligible.

The I-8 and SR-238 multiuse corridors would both narrow to a ½ wide and would only entertain underground facilities. Restricting the corridor to underground facilities could result in increased impacts as compared to Alternative B to vegetation from surface disturbance and the direct removal of vegetation. The intensity of the impact would be moderate as approximately 13,000 acres could potentially be disturbed from future projects.

From Livestock Grazing on Vegetation Resources

Impacts would be similar to those described under Alternative A for the Monument, except, far fewer acres would be available for livestock grazing (207,431) which is also fewer acres open than in Alternative B. For those acres open to grazing, all allotments would be reclassified as perennial only. Within the SDNM domestic sheep and goat grazing would be eliminated in Alternative C. This would eliminate the impacts associated with ephemeral grazing identified in Alternative A on those allotments. Allotments currently classified as ephemeral would remain the same and have the same impacts as Alternative A. Impacts overall to vegetation would be minor.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to AUM allocations in the SDNM. Approximately 44,800 acres would be unavailable to livestock, which would have positive impacts of vegetation within exclosure areas proposed in this alternative.

From Priority Wildlife Species and Habitat Management on Vegetation Resources

Impacts would be the same as those described under Alternative B for both Decision Areas.

From Recreation Management on Vegetation Resources

Impacts from recreation would be similar to Alternative B; however, fewer areas would be impacted within the RMZ's as the allocation of front country would decrease to 51,700 acres and back country would increase to 429,000 acres. As under Alternative B, extended-stay camping areas would not be allocated in the SDNM. Firewood collection would be allowed in the back country RMZ, except in wilderness areas; reducing impacts compared to Alternatives A and B.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to target shooting.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under the Common to All Alternatives for both Decision Areas for the designation of the Juan Bautista de Anza NHT and for wilderness.

Designating Highway 238 as a scenic byway could have a minor impact on vegetation by increasing traffic in the area resulting in negligible impacts to vegetation from increase localized vegetation and soil disturbance.

From Transportation and Public Access Management on Vegetation Resources

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to travel management.

From Visual Resources on Vegetation Resources

Impacts from VRM would be the same as Alternative A; however there would be an increase in 49,700 acres in Class II from Class III reducing impacts to vegetation to negligible.

From Wilderness Characteristics on Vegetation Resources

Alternative C allocates 112,200 acres in the SDNM as lands managed to protect wilderness characteristics. This allocation would be expected to limit impacts to negligible intensities by providing protection to vegetation communities by restricting, reducing, or mitigating surface and vegetation disturbing activities that could result in the loss of vegetation.

4.8.6. ALTERNATIVE D

4.8.6.1. Both Decision Areas

No unique impacts are identified for both Decision Areas under Alternative D.

4.8.6.2. Lower Sonoran

From Lands & Realty on Vegetation Resources

Development of new energy projects under Alternative D would have the same impacts as Alternative C although over less acreage available for projects (141,900). The intensity of the impact would likely be minor to moderate.

Impacts from Land Use Authorizations would be reduced from the other alternatives within the Decision Area with 239,800 acres as avoidance areas and 567,400 acres as exclusion areas. The impacts from surface disturbing projects could range from negligible for small projects to minor for large LUA's (such as utility-scale renewable energy development), depending on which vegetation community the project is located in.

This alternative would have the least impact (negligible) on vegetation since only 7 multiuse utility corridor would be allocated.

From Livestock Grazing on Vegetation Resources

Implementation of Alternative D would result in the elimination of livestock grazing through the management action to close all currently open grazing allotments. This decision would remove any livestock grazing impacts on the vegetative and soil resources. In most cases the impacts identified from livestock grazing on vegetation are negligible. The expectation is that the impacts to vegetation from eliminating grazing would generally be small and only slightly noticeable changes to vegetative resources would occur. Where the impacts from livestock grazing on vegetation are more noticeable the results of removing livestock would be more apparent (i.e. regrowth of heavily utilized vegetation, reestablishment of vegetation around watering facilities and heavily used livestock trails). During years of increased winter rainfall the fuel load created from the growth of annual species would not be subject reduction from livestock grazing, which could result in increased frequency and/or intensity of fire in these non-fire adapted ecosystems. Therefore, potential impacts to the vegetative communities could vary from negligible to minor in intensity.

From Minerals Management on Vegetation Resources

Impacts would be the same as those described under Alternative A; however under Alternative D, the majority of the Planning Area is closed to mineral entry. This would restrict surface disturbance and limit impacts to negligible.

From Priority Wildlife Species and Habitat Management on Vegetation Resources

Impacts would be the same as Alternative C for WHAs even though fewer acres (255,700) would be allocated for WHAs. This is due to the fact that the acres not allocated to WHAs would be allocated as ACECs and would have the same restrictions on activities and limit impacts to vegetation.

From Recreation Management on Vegetation

Resources In Alternative D, diverse recreation opportunities would still be provided; however, this alternative would stress more enhanced nonmotorized activities. The emphasis would also be to minimize or mitigate impacts to vegetation communities which would be less than those identified under Alternatives A, B and C.

Fewer SRMAs would be allocated under this alternative, with Ajo and Gila Bend Mountains being managed as ERMA's along with Sentinel Plain and San Tan. Impacts would be the same as those described under Alternative B for SRMA's; however with only 100,200 acres allocated.

Impacts would be the same as those described under Alternative B for ERMA's; however with 830,000 acres allocated. The type of impacts would be the same as Alternative A; however the areas allocated as SRMA's would be reduced from previous Alternatives. This would lead to fewer impacts, generally negligible to minor, to vegetation from Alternative C as the remaining acres would be managed as ERMA's.

No additional extended stay campgrounds would be established under Alternative D, reducing localized vegetation impacts to negligible when compared to Alternative B and C. Dispersed camping impacts could be greater than those identified in Alternative B.

From Special Designations on Vegetation Resources

Managing 77,600 acres as the Coffeepot-Batamote Botanical ACEC would have the same impacts as Alternative A, but over a larger area. Managing 58,500 acres as the Cuerda de Lena ACEC, 48,500 acres as the Saddle Mountain ACEC and 79,100 acres as the Gila River Terraces/Sonoran Desert Historic Trails ACEC would place limits on surface disturbing activities and reduce impacts to vegetation to negligible or minor levels by limiting the loss of vegetation and disturbance of soils.

From Transportation and Public Access Management on Vegetation Resources

The proposed route network under Alternative D could substantially reduce impacts to vegetation communities by closing approximately 777 miles of the 1,687 miles of routes. 799 miles would be open to the public. In addition, 103 miles of routes have seasonal closures and or are open to administrative use only. 163 of the 183 miles of routes in the desert washes are closed, which could reduce impacts from vegetation loss and soil disturbance.

Impacts to vegetation, as it pertains to ATV and motorcycle use within the 40-acre parcel in the Ajo Block, would not occur as the parcel is not allocated in Alternative D. Overall, impacts would be minor.

From Visual Resources on Vegetation Resources

Impacts from VRM Class I would be the same as Alternative A. A substantial increase in Class II acreage would impose additional restrictions on surface disturbing developments which would reduce impacts to vegetation communities, generally negligible, by requiring mitigation or reducing the scope of projects.

From Wilderness Characteristics on Vegetation Resources

As under Alternative C, allocating lands managed to protect wilderness characteristics would limit impacts to vegetation to negligible. Impacts, however, would be limited as more acres (276,500) would be allocated.

4.8.7. Sonoran Desert National Monument

From Lands and Realty Management on Vegetation Resources

Impact to vegetation from Lands and Realty under Alternative D would be negligible, as the entire Monument is designated as a LUA Exclusion Area, prohibited from any utility-scale renewable energy developments,

From Livestock Grazing on Vegetation Resources

Implementation of Alternative D would result in the elimination of livestock grazing through the management action to close all currently open grazing allotments in the Monument. This decision would remove any livestock grazing impacts on the vegetative and soil resources. In most cases the impacts identified from livestock grazing on vegetation are negligible to minor in intensity. The expectation is that the impacts to vegetation from eliminating grazing would generally be small and only slightly noticeable changes to vegetative resources would occur. Where the impacts from livestock grazing on vegetation are more noticeable the results of removing livestock would be more apparent (i.e. regrowth of heavily utilized vegetation, reestablishment of vegetation around watering facilities and heavily used livestock trails). During years of increased winter rainfall the fuel load created from the growth of annual species would not be subject reduction from livestock grazing, which could result in increased frequency and/or intensity of fire in these non-fire adapted ecosystems. Potential impacts to the vegetative communities would be negligible.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to AUM allocations in the SDNM.

From Priority Wildlife Species and Habitat Management on Vegetation Resources

Impacts would be the same as those described under Alternative B for both Decision Areas.

From Recreation Management on Vegetation Resources

The SDNM would be managed as a SRMA as under the other Alternatives, with Alternative D limiting impacts to vegetation by allocating all 486,400 acres as the SDNM RMZ. In addition, ATVs, RVs, trail bikes, motorcycles, and inappropriate new technological vehicles would be prohibited from using the SDNM. Prohibiting these vehicles would reduce impacts to negligible by reducing the potential for soil disturbance and vegetation loss.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to target shooting.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under the Common to All Alternatives for both Decision Areas for the designation of the Juan Bautista de Anza NHT and for Wilderness.

Designating Highway 238 and I-8 as scenic byways could have a minor impact on vegetation by increasing traffic in the area resulting in negligible impacts to vegetation from increase localized vegetation and soil disturbance.

From Transportation and Public Access Management on Vegetation Resources

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to transportation and access.

From Visual Resources on Vegetation Resources

Management of 457,900 acres within the Monument as VRM Class I and 28,500 acres as VRM Class II would severely limit any projects and would result in, at most, negligible impacts to vegetation resources from projects.

From Wilderness Characteristics on Vegetation Resources

As under Alternative C, allocating lands managed to protect wilderness characteristics would limit impacts from direct loss of vegetation resulting from surface disturbance. Impacts, however, would occur over fewer acres as 153,000 acres would be allocated. Impacts would be negligible.

4.8.8. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.8.8.1. Both Decision Areas

No unique impacts are identified for both Decision Areas under Alternative E.

4.8.8.2. Lower Sonoran

From Lands & Realty on Vegetation Resources

Impacts from multiuse utility corridors (8), utility-scale renewable energy projects (296,400 acres available) and LUAs (360,800 avoidance and 253,700 exclusion) on vegetation in the Decision Area would be similar to Alternative D due to similarities in the number, width, and location of energy projects, corridors and LUAs.

Impacts from land tenure decisions on vegetation communities in the Decision Area would be similar to Alternative C due to similar numbers of acres (30,900) that would be available for disposal, the majority of which lie within the creosote-bursage community.

From Livestock Grazing on Vegetation Resources

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Minerals Management on Vegetation Resources

Impacts would be the same as those described under Alternative C, except, more widespread, as 35,800 more acres would be open to mineral entry.

From Priority Wildlife Species and Habitat Management on Vegetation Resources

Impacts would be the same as those discussed under Alternative D for the Lower Sonoran.

From Recreation Management on Vegetation Resources

Impacts to vegetation from management of SRMA's would be the same as Alternative C, with the exception of the Saddle Mountain area managed as an ACEC and the Arlington Trials SRMA

managed under the Gila Bend Mountains SRMA. Impacts to vegetation from the termination of the wood harvesting program in the Lower Sonoran would be the same as described under Alternative C. Impacts associated with the collection of wood for on-site campfires in the Lower Sonoran would be the same as in Alternative B.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under the Common to All Alternatives for both Decision Areas for the designation of the Juan Bautista de Anza NHT and for wilderness.

Impacts from management actions for the Cuerda de Lena ACEC, Saddle Mountain ACEC and the Gila River Terraces/Sonoran Desert Historic Trails ACEC would be the same as Alternative D. Impacts from management actions for the Coffeepot-Batamote Botanical ACEC would be the same as Alternative C.

The Agua Caliente Road would be managed as a Back Country Byway and the impacts would be the same Alternative C.

From Transportation and Public Access Management on Vegetation Resources

Impacts from travel management on vegetation would be the same as Alternative C due to similar miles of open (1,134) and closed vehicle routes.

Alternative E would designate the 40 acres in the Ajo area the same as Alternative B with the same impact level.

From Visual Resources on Vegetation Resources

Impacts from VRM Class I would be the same as Alternative A. A decrease in Class II acreage could lead to an increase in surface disturbing activities and increased impacts to vegetative communities. The expectation is that these restrictions would generally lead to only minor changes to projects and have a negligible or minor impact on vegetation resources.

From Wilderness Characteristics on Vegetation Resources

As under Alternative C, allocating lands managed to protect wilderness characteristics would limit impacts to vegetation; however, impacts could occur of more acres in the Planning Area in Alternative E (55,400 acres allocated) as compared to Alternative C (128,100 acres) or Alternative D (276,500). The impact would likely be minor in intensity.

4.8.8.3. Sonoran Desert National Monument

From Lands & Realty on Vegetation Resources

Impacts from multiuse utility and LUAs would be the same as Alternative D.

From Livestock Grazing on Vegetation Resources

Outside of Alternative D (which eliminates grazing from the Monument), Alternative E would be the second most protective alternative for vegetation, as only 156,919 acres would be available for grazing. The entire Conley Allotment would be closed to grazing. Areas that would remain available to graze would have similar impacts to those described under Alternative A for the Monument, while the areas that are now closed would have similar impacts discussed in Alternative D. Domestic sheep and goat grazing would be similar to Alternative C. Overall impacts would be negligible to minor in all allotments except Conley. On the Conley allotment elimination of grazing would reduce pressure on vegetation resources, resulting in significant progress toward achieving progress toward achieving land health standards (see Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039) and Appendix F, *Arizona Land Health Evaluation for the Sonoran Desert National Monument* (p. 1081) for more details).

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to AUM allocations in the SDNM.

From Priority Wildlife Species and Habitat Management on Vegetation Resources

Impacts would be the same as those discussed under Alternative B for both Decision Areas.

From Recreation Management on Vegetation Resources

Impacts to vegetation from management of SRMA's would be the same as Alternative C. Impacts to vegetation from management of recreation settings would be similar to Alternative C; however with an increase of 23,300 acres in front country and 20,500 less acres in back country increasing the potential for minor impacts to vegetation and soils from increased recreation use.

As under Alternative B, vegetation in the SDNM would not be impacted by extended stay camping areas as they would not be allocated. Wood collection effects to vegetation would be the same as under Alternative D.

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to target shooting.

From Special Designations on Vegetation Resources

Impacts would be the same as those described under Alternative D for the Monument.

From Travel Management on Vegetation Resources

Refer to Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) for impacts related to travel management.

From Visual Resources on Vegetation Resources

Impacts from VRM Class I would be the same as Alternative A. Class II and III would have the same intensity of impacts as Alternative C, however with an increase of 27,900 acres in Class III from Class II.

From Wilderness Characteristics on Vegetation Resources

Managing wilderness characteristics in the SDNM would have the same impact as Alternative C, but with a decrease of 1,300 acres allocated as lands managed to protect wilderness characteristics.

4.9. IMPACTS ON VISUAL RESOURCES

This section discusses potential impacts of the alternatives on visual resources, specifically the potential for management decisions to create visual changes in or contrasts on the landscape. Visual resources are generally affected by activities that introduce new elements into the landscape, changing the features — the form, line, color, or texture of the landforms, water, vegetation, or structures — that characterize the existing landscape. Generally, the greater the surface disturbance, the greater the change to the landscape.

4.9.1. METHODS OF ANALYSIS

This impact analysis and conclusions are based on the visual resources inventory (VRI), knowledge of resources and the Planning Area, reviews of existing literature, spatial and temporal analyses, and information provided by other agencies. Effects are quantified where possible. In the absence of quantitative data, professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

4.9.1.1. Indicators

This impact analysis and conclusions are based on the visual resources inventory (VRI), knowledge of resources and the Planning Area, reviews of existing literature, spatial and temporal analyses, and information provided by other agencies. Effects are quantified where possible. In the absence of quantitative data, professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate.

4.9.1.2. Assumptions

The analysis is based on the following assumptions:

- The objectives of the VRM classes would be adhered to through project design, mitigation, or avoidance.
- Projects proposed in areas with VRM Class I and VRM Class II objectives may be more difficult to design and locate to meet visual objectives.
- The majority of changes to landscapes would be long-term impacts.
- The BLM will require mitigation measures to projects proposed in areas with VRM Class III and VRM Class IV objectives (areas with visual objectives that allow for more landscape modification) to reduce impacts on visual resources.
- VRM classes are designated and managed only on public lands, but visual impact analysis may extend to private lands in connected actions or split-estate situations. All surface disturbing activities, regardless of the chosen alternative or management action, would be subject to the VRM objectives of the area where those activities take place. The visual resource-contrast rating system would be used to analyze the potential site-specific impacts of surface disturbance as well as a facility's design and placement. Surface disturbing activities and facilities would be designed to mitigate their visual impacts and conform to the area's assigned VRM objective. Mitigation activities could include painting, facility design, and placement.

4.9.1.3. Program Areas with No Impacts on Visual Resources

No impacts to visual resources are anticipated for management actions relating to:

- Air Quality,
- Cave Resources,
- Cultural and Heritage Resources,
- Paleontological Resources,
- Priority Wildlife Species and Habitat Management,
- Special Designations,
- Vegetation Resources,
- Water Resources,
- Soil Resources,
- Wild Horse and Burro Management,
- Wilderness Characteristics,
- Hazardous Materials and Public Safety.

4.9.1.4. Qualitative Intensity Scale

The intensities of impacts are described using the following definitions:

Negligible: No known impacts to resources. Any change is undetectable. Activities create very low visual contrast. When the difference between the VRI acreage and proposed management class acreage is less than 10 percent of the Planning Area, impacts would be considered negligible.

Minor: Direct effects are apparent and measurable but small and localized or contained within the footprint of the action. Visual contrast from activities may be visible, but it creates only a small change in the landscape. When the difference between the VRI acreage and proposed management class acreage is between 11 percent and 35 percent, impacts would be considered minor.

Moderate: Direct effects would be readily apparent and measurable over a larger area but still mainly within the footprint of the action. Visual contrast from activities may be moderate. Changes in the landscape may attract the attention of a viewer from a distance. When the difference between the visual VRI acreage and proposed management class acreage is between 36 percent and 75 percent, impacts would be considered moderate.

Major: Direct effects would be highly noticeable and extend well beyond the footprint of the action. Visual contrast from activities may be high. Changes in the landscape may dominate views, even from a distance. When the difference between the VRI acreage and proposed management class acreage is greater than 76 percent, impacts would be considered major.

Because the scenic values in the Monument are not considered a Monument object, qualitative terms used for assessing impacts to visual resources form other resource activities are the same for the Monument as for areas outside the Monument.

4.9.2. COMMON TO ALL ALTERNATIVES

4.9.2.1. Both Decision Areas

From Visual Resources on Visual Resources

Allocating VRM classes establishes standards for managing the effects of surface disturbing activities on the visual resource. Comparing the management classes allocated by alternative to the VRI shows the potential for management decisions to change the current conditions and, hence, impact negatively or positively, the visual resource. As noted in ???, the inventory was completed by Otak, Inc. in May 2010.

Generally, the objectives of VRM Class III and IV allow for constructed facilities to attract the attention of an observer or even to dominate the landscape. Even in these VRM classes, project designs should be developed to try and mimic the line, color, form, and texture of the landscape as much as practical to minimize visual contrast. It is possible that visual character could degrade over time in these classes, although it is expected that no impact would exceed moderate.

Table 4.5, "VRM Classes by Alternative" (p. 521) shows the acreages of the four VRM classes in each alternative, with Alternative A representing the current situation. Managing lands for a lower class than its inventoried value could lead to the visual degradation of those lands. In this Decision Area, visual impacts could stem from valid and existing rights and activities associated with mining activities, land use authorization, and recreation facilities. Impacts are indicated by comparing the proposed management classes with the inventory classes.

Table 4.5. VRM Classes by Alternative

VRM Classes	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Lower Sonoran (Acres)					
VRM I	91,800	91,800	91,800	91,800	91,800
VRM II	116,300	64,900	387,800	622,400	71,900
VRM III	279,600	551,900	385,600	192,000	548,400
VRM IV	442,500	221,600	65,000	24,000	218,100
Total	*930,200*	*930,200*	*930,200*	*930,200*	*930,200*
SDNM (Acres)					
VRM I	158,700	158,700	158,700	457,900	158,700
VRM II	91,600	219,000	267,300	28,500	246,500
VRM III	116,400	108,700	60,400	0	81,200
VRM IV	119,700	300	300	0	300
Total	*486,400*	*486,400*	*486,400*	*486,400*	*486,400*
Lower Sonoran and SDNM (combined Acres)					
Total	*1,416,600*	*1,416,600*	*1,416,600*	*1,416,600*	*1,416,600*

From Wildland Fire Management on Visual Resources

In general, the Sonoran Desert is not fire adapted; therefore, the strategy for wildland fire in both Decision Areas is full suppression. Fires occur at a low frequency in both Decision Areas.

However, when fires do occur, they are fueled by abundant annual grass and are usually fast burning but relatively low intensity. Most fire suppression activities use engines on flat terrain and hand lines on steeper slopes. Use of heavy equipment is uncommon in most of the Planning Area and usually occurs near the Gila River, where heavy riparian fuels require it for successful suppression actions. The fast running nature of wildfires usually means that burning out from existing fuel breaks (such as existing roads or wide sandy washes) is the most successful suppression technique. Fire suppression techniques have the potential to impact visual resources if fire lines are placed directly up slopes where they are visible for long distances. This action may be necessary occasionally, but post-fire rehabilitation of fire lines will be used to minimize the visual impact. Since suppression techniques rarely require surface manipulation, and they are rehabilitated after the fire is over where they do, impacts from wildland fire management are expected to be minor.

4.9.2.2. Lower Sonoran

From Lands & Realty on Visual Resources

Utilities, communication facilities, and energy facilities, as well as ancillary facilities and structures for all of the above, could impact visual and scenic resources by necessitating construction and vegetation clearing. Overhead utilities, high-voltage electricity transmission lines, wind generation facilities, and cellular phone towers can be visible from long distances, while facilities such as solar energy, which are typically closer to the ground, may more directly affect middle-distance viewing. Adhering to VRM class objectives will assure that lands and realty-related developments are designed to blend into the line, form, color, and texture of landscapes as much as possible. Allocations for lands actions, such as communication sites and utility corridors, recognize the inherent design constraints of lands related structures. In those areas, VRM class objectives will allow for development needs while requiring or encouraging designs that minimize visual contrast. By requiring LUAs to conform to assigned VRM classes, most developments are expected to have minor to moderate affects on the visual resource.

Land tenure adjustments such as acquisitions or disposals can affect scenic quality or viewer sensitivity. Acquisitions can help protect visual and scenic values by bringing scenic areas into BLM management and protecting or restoring their visual and scenic values. Some disposals could affect visual resources by eliminating the BLM's management control over the parcels, resulting in potential development or loss of the natural landscape. Some disposals are to communities for recreational facilities, including parks. These disposals may have little effect on VRM objectives and may even improve or protect the visual character of those parcels by applying more intensive management of recreational users. Most parcels for disposal in the Lower Sonoran are isolated parcels surrounded by developed lands. In these cases, disposal is likely to diminish these parcels' visual and scenic values while increasing their value as recreational open space. Although changes to their baseline visual condition may be major, most change is expected to be consistent with the local setting.

From Livestock Grazing on Visual Resources

Areas of livestock concentration where vegetation is removed and soil compaction has occurred would continue to create a contrast with the landscape and potentially reduce scenic quality. Livestock management would require installation of range developments such as fences, windmills, wells, earthen dams, corrals, access roads, and stock tanks that could contrast with the

natural setting. However, because these facilities tend to be localized and difficult to see from a long distance away, impacts to the visual landscape are expected to be minor.

From Minerals Management on Visual Resources

Mining and mineral extraction could represent a major impact to visual resources by presenting high visual contrast to the surrounding landscapes. Depending on the location and nature of mining facilities and activities, they could be visible from a number of sensitive viewpoints and from long distances. Locatable mining operations in VRM Class I and II would develop mitigation measures to limit, to the extent feasible, the impacts on scenic quality. Reclamation could recover much of the visual character of an area, but change could still be minor to moderate for many years after mining has ceased. Since locatable and leasable mining allow more discretion by the agency, mining operations would have to conform to VRM Class I and II objectives where they would be allocated, thereby reducing impacts to the visual resource to minor.

Within VRM Class III areas, which allow for moderate changes that may attract attention, impacts from mining on visual and scenic quality could be fewer, as these areas tend to correspond with lower elevations and are not as visible from long distances. VRM Class IV allows significant changes to the visual resources, so activities in these areas would most likely degrade the visual and scenic quality from the current situation. Nonetheless, changes are anticipated to be no more than moderate.

From Recreation Management on Visual Resources

Impacts of recreation are often visible only in the foreground, but they also may be seen in the middle and background on landscapes such as mountains that are visible from long distances. In addition, uses that disturb a larger area, such as a motorized vehicle route as compared to a hiking trail, are more likely to be visible at the middle and longer distances. Recreation uses that would increase OHV travel and vehicle-based camping or other activities that would change the natural character of the landscape, could impact scenic and visual resources by creating contrasts to the color, form, texture, and line elements of scenic views. Improperly or carelessly sited or designed trailhead facilities such as restrooms, fences, information kiosks, and ramadas, as well as potential long-term visitor areas and extended stay or short-term camping areas, can affect scenic quality. Although recreational activities are temporary in nature, the impacts of these activities can be long-lasting and could have moderate to major impacts to the scenic quality of an area, particularly if they involve uses such as recreational target shooting, paintball and unauthorized cross country OHV travel.

Target shooting activities, allowed outside of developed areas, often leave behind targets, shells, and trash. They also have the potential to cause vegetation and surface impacts. Paintball activities often leave long-lasting paint spatters on vegetation and rocks that can be visible in the foreground and middle distances.

Through the active management of recreation uses, the allocation of SRMAs could provide for long-term protection of these areas from surface-disturbing activities that could limit loss of scenic and visual quality. The remaining areas, allocated as ERMAs, would be managed to meet custodial standards and would not provide structured recreational opportunities except where needed to attain custodial activity-based outcomes, address visitor health and safety or user conflicts, or resolve conflicts with other resources. Most of these public lands would be managed for recreational uses with few restrictions and minimal management oversight. In these cases,

changes in visual landscapes would be addressed through monitoring, restoration, and application of adaptive management.

It is recognized that the experience of recreational users on public lands is frequently dependent on the visual character of the areas being used. Most public land recreationists are seeking a recreation experience in a natural appearing landscape. To this end, facilities intended to support recreation management are designed to repeat the color, form, line and texture of the landscape as much as possible. Therefore, the effects of well managed, properly placed and designed recreational facilities are expected to be minor.

From Transportation Management on Visual Resources

The existing transportation network evolved primarily from routes leading to sites of authorized activities such as grazing management facilities or mine exploration and development, or from the proliferation of unauthorized recreational routes over time. In either case, the route designs that best fit with the natural landscape was usually not considered. In all alternatives except the No Action Alternative, the majority of the OHV allocations are in the limited to designated routes category. Areas closed to motorized access are generally designated wilderness areas, but Alternative D also includes allocated lands managed to protect wilderness characteristics. Route evaluation and designation considers conflicts to resources in the network design and is structured to minimize those impacts, including to visual resources. It is anticipated that, although the acreages of areas allocated as "closed" and "limited to designated routes" change very little by alternative, the actual number of miles of route eventually designated would vary. Table 4.6, "Lower Sonoran Travel Management RFD Scenarios" (p. 524) shows an approximation of route miles determined to represent an RFD scenarios for travel management if a particular alternative is chosen.

Table 4.6. Lower Sonoran Travel Management RFD Scenarios

Estimated Lower Sonoran Routes	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Roads Total	1,688	1,688	1,687	1,687	1,687
Roads Open	1,670	1,241	1,141	799	1,134
Roads Seasonally Closed	0	180	132	40	141
Roads Admin Only	0	8	22	63	12
Roads Closed	15	213	334	777	339
Trails Open to Vehicles	0	43	46	2	41
Trails Open to Nonmotorized Use	2	2	12	7	22
New	0	49	25	0	34

Generally, any attempt to manage a transportation network will improve its impact on the visual resource by considering the visual characteristics of line, form, color and texture in route design. Reducing the number of miles in the route network will also reduce its visual intrusiveness if the routes chosen for closure are selected because of their visual characteristics and if they are carefully reclaimed. Impacts would range from negligible to minor.

4.9.2.3. Sonoran Desert National Monument

From Lands & Realty on Visual Resources

In the SDNM, all alternatives have allocated VRM classes with the intent to minimize visual change. Few lands actions are anticipated aside from energy related LUAs and highway

expansions along I-8 and highway 238. Effects to the visual landscape are expected to be negligible to minor throughout the Monument, although the changes resulting from major LUAs in the two corridors mentioned above could have the potential for moderate impacts. However, since the visual landscape is not a Monument object, this change is not expected to result in more than minor effects to Monument objects. In the SDNM, no parcels would be identified for disposal under any of the alternatives, so no impacts from disposal are expected.

From Livestock Grazing on Visual Resources

In the SDNM, grazing south of I-8 would be terminated once current permits expire, thereby reducing impacts from grazing on visual resources in that area. Over time, many existing range management facilities will be removed, allowing recovery of natural appearing landscapes. Alternatives with continued grazing north of I-8 will have similar impacts to those described for grazing outside the Monument. Impacts from livestock grazing are expected to be minor.

From Minerals Management on Visual Resources

The entire SDNM will be closed to mining and mineral extraction except for valid existing rights, and no impacts from mining and mineral extraction are expected.

From Recreation Management on Visual Resources

On the SDNM, all alternatives have allocated VRM classes with the intent to minimize visual change. Different alternatives explore varying degrees of developed recreation facilities and experiences. However, since recreation is not a Monument object, all activities are constrained by the requirement to protect designated Monument objects. For this reason, recreation facilities within the Monument are anticipated to be small in size and unobtrusive in visual design and to have minor effects to the visual landscape.

From Transportation Management on Visual Resources

In the SDNM, management of travel and transportation may have the greatest impact to visual resources of all management activities on the Monument. Table 4.7, “SDNM Designated Route Mileage” (p. 525) shows the changes in route mileage by alternative within the Monument. The open road that shows in each alternative is the maintained road through Vekol Valley. As this are provides the major access points to the southern part of the Monument, it is expected to remain open. The continued existence of routes in this area is expected to have a negligible impact to the visual resource. Primitive roads are distributed throughout the Monument and are primarily located in the lower terrain. This position on the landscape reduces their visibility and limits their contrast with the surrounding landscape. Any reduction in road mileage will improve the visual landscape; however, it is anticipated that the change will be minor in most cases.

Table 4.7. SDNM Designated Route Mileage

SDNM Route Designations	Alternative A (Miles)*	Alternative B (Miles)	Alternative C (Miles)	Alternative D (Miles)	Alternative E (Miles)
Roads					
Roads Open	17.7	24.2	24.2	24.2	24.2
Roads Administrative Use Only	0	0.4	0.4	0.4	0.4
Roads Closed	0	0	0	0	0

Roads New	0	8	0	0	4.2
Roads Total	17.7	32.6			
Primitive Roads					
Primitive Roads Open	550.2**	494.4	358.1	200.0	331
Primitive Roads Admin	0	0	17.1	36.8	4.3
Primitive Roads Limited to 50”	0	3.9	0	0	0
Primitive Roads Open to Nonmotorized Use	0	2.1	7.2	11.0	8.3
Primitive Roads Seasonally Closed	0	0	37.3	0	32.7
Primitive Roads Closed	0	69.5	150.2	322.2	193.6
Primitive Roads Total	576.8			569.9	
Trails					
Trails Nonmotorized, non-mechanized only	37.0	37.0	37.0	37.0	37.0
Trails Total	.	37.0	37.0	37.0	37.0

*No transportation network would be designated under Alternative A. Therefore, other than total miles in the inventory, zeros are entered for all designated route types.

**The primitive roads reported as open in Alternative A show the entire inventory of available primitive roads since the current designation is limited to existing roads, trails, and washes.

4.9.3. ALTERNATIVE A (NO ACTION)

4.9.3.1. Lower Sonoran

From Lands & Realty on Visual Resources

Proposals for development of renewable energy facilities have primarily been in lower elevation areas with low slope and allocations in VRM Class III or IV, with approximately 53 percent and 58 percent of the acres respectively. In these areas, the technology proposed and its location may result in minor to moderate effects.

From Recreation Management on Visual Resources

Recreation management would continue to be generally unmanaged, except in a few small SRMAs. Impacts described above from unmanaged and improper uses would continue to occur and expand. It is expected that impacts to visual resources could occur from unauthorized casual uses that are not subject to conformance with VRM standards. Such impacts are expected to be minor but may rise to the level of moderate.

From Travel Management on Visual Resources

Travel management would continue to be primarily “Limited to Existing Roads and Trails.” The historic result of that management has been a proliferation of routes, leading to degradation of the visual resource. As in recreation, these impacts would come from sources not subject to authorization or analysis for conformance with VRM standards, which could lead to minor to moderate impacts.

From Visual Resources on Visual Resources

Alternative A would pose a moderate level of impact to visual resources within the Lower Sonoran. The comparison of the VRI and the current management prescriptions for VRM in the Lower Sonoran under Alternative A are presented in Table 4.8, "Comparison Between VRM and VRI under Alternative A in the Lower Sonoran" (p. 527).

Table 4.8. Comparison Between VRM and VRI under Alternative A in the Lower Sonoran

Alternative A	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	99.7%		0.3%
Class II	33.1%	20.0%	66.7%
Class III	36.7%	10.1%	53.2%
Class IV	58.4%	41.6%	-

In Alternative A, 99.7 percent of lands inventoried as Class I would be managed as Class I with only 0.3 percent managed at a lower level. This would likely have a negligible impact on Class I inventoried lands.

Approximately 33.1 percent of lands inventoried as Class II would be managed as Class II, while 20.0 percent would be managed at a higher level and 66.7 percent would be managed at a lower level. While some Class II Inventoried lands would be managed at a higher level, which could presumably improve the visual character of these lands, the bulk would be managed at a lower level, thereby having moderate negative impacts on Class II landscapes.

Approximately 36.7 percent of lands inventoried at Class III would be managed as Class III, while 10.1 percent would be managed at a higher level and 53.2 percent would be managed at a lower level. Despite some Class III lands being managed at a higher level, the bulk would be managed at the same or lower level, thus having moderate negative impacts to visual Class III landscapes.

Approximately 58.4 percent of lands inventoried as Class IV would be managed as Class IV, 41.6 percent would be managed at a higher level, and 0.0 percent would be managed at a lower level, having no negative impacts on Class IV landscapes.

4.9.3.2. Sonoran Desert National Monument

From Travel Management on Visual Resources

This alternative would have the greatest potential effect on visual resources. Past experience has shown that a lack of management of OHV use along with a limited to existing roads, trails and washes allocation has lead to resource damage, necessitating a closure for resource restoration. This use has had minor to moderate effects on the visual resource due to proliferation of routes and use off-road that removes vegetation and disturbs soils, leading to erosion damage. Continuing this management scheme could expand the size and magnitude of the damaged area, leading to moderate or major effects.

From Visual Resources on Visual Resources

Alternative A VRM poses the greatest potential impact to visual resources within the SDNM. Overall impacts are moderate.

The comparison of the VRI and the current management prescriptions for VRM in the SDNM under Alternative A are presented in Table 4.9, "Comparison Between VRM and VRI under Alternative A in the SDNM" (p. 528).

Table 4.9. Comparison Between VRM and VRI under Alternative A in the SDNM

Alternative A	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	99.3%		0.7%
Class II	43.8%	0.2%	56.0%
Class III	23.6%	13.2%	63.2%
Class IV	100.0%	0.0%	0.0%

In the SDNM, 99.3 percent of lands inventoried as Class I would be managed as Class I, with only 0.7 percent managed at a lower level. This would have a negligible impact on Class I inventoried lands. Approximately 43.8 percent of public lands inventoried as Class II would be managed as Class II. Approximately 0.2 percent would be managed at a higher level, and 56 percent would be managed at a lower level. This would have moderate negative impacts on Class II landscapes.

Approximately 23.6 percent of lands inventoried at Class III would be managed as Class III, 13.2 percent at a higher level, and 63.2 percent would be managed at a lower level, having moderate impacts to visual Class III landscapes.

All of lands inventoried at Class IV would be managed as Class IV, having no impacts on Class IV landscapes.

4.9.4. ALTERNATIVE B

4.9.4.1. Lower Sonoran

From Lands & Realty on Visual Resources

In Alternative B, VRM classes generally shift from classes IV and II into Class III. For areas formerly Class IV, this will result in greater constraints to development, which should result in designs better blended into the landscape. This could result in moderate levels of visual change to the landscape. In areas that shift from Class II to III, there is the potential for moderate levels of visual change to the landscape.

From Recreation Management on Visual Resources

Recreation management would become more developed, and this alternative would include the most areas of developed and intensively managed recreation. While the opportunity for degrading visual resource could exist in areas of greater recreation development, conformance with allocated VRM classes would manage the visual impacts in a manner consistent with the RMP land management decisions. Overall impacts would be moderate.

From Travel Management on Visual Resources

Travel networks are expected to be reduced slightly from the current inventory. The reduction in roads would result in a minor improvement to the visual resource. Some areas of more intensive recreation development may see route mileage stay the same or increase. However, current routes

that create high visual contrast, such as hill climbs, could be reclaimed and rerouted to reduce visual impairment of the area. A well managed route network would generally result in improved visual character, and impacts of travel management are expected to be minor.

From Visual Resources on Visual Resources

The comparison of the VRI and the current management prescriptions for VRM in the Lower Sonoran under Alternative B are presented in Table 4.10, "Comparison Between VRM and VRI under Alternative B in the Lower Sonoran" (p. 529).

Table 4.10. Comparison Between VRM and VRI under Alternative B in the Lower Sonoran

Alternative B	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	99.3%	0.0%	0.7%
Class II	15.2%	0.0%	84.8%
Class III	22.1%	78.0%	22.1%
Class IV	35.2%	64.8%	0.0%

In Alternative B, 99.3 percent of lands inventoried as Class I would be managed as Class I with only 0.7 percent managed at a lower level. This would have a negligible impact on Class I inventoried lands, similar to Alternative A.

Approximately 15.2 percent of lands inventoried as Class II would be managed as Class II. No lands would be managed at a higher level, and 84.8 percent would be managed at a lower level. Negative impacts to Class II visual resources would be similar to but more intense than under Alternative A. Approximately 22.1 percent of lands inventoried at Class III would be managed as Class III, 78 percent would be managed at a higher level, and 22.1 percent would be managed at a lower level. While many of the Class III lands would be managed at higher levels, thereby having potential for maintenance or improvement of the class, there is potential for a minor negative impact due to some lands being managed at lower levels. Impacts on Class II landscapes would be less severe than under Alternative A.

Approximately 35.2 percent of lands inventoried as Class IV would be managed as Class IV, 64.8 percent would be managed at a higher level, and no lands would be managed at a lower level. This management prescription should have no negative impacts on Class IV landscapes, similar to Alternative A.

4.9.4.2. Sonoran Desert National Monument

From Travel Management on Visual Resources

The route network, which would be designated in Alternative B, would reduce visual impacts in many areas, especially improving the visual character in the core of the Monument in the vicinity of Butterfield Pass and Gap Well. Impacts would range from negligible to moderate.

From Visual Resources on Visual Resources

The comparison of the VRI and the current management prescriptions for VRM in the SDNM under Alternative B are presented in Table 4.11, "Comparison Between VRM and VRI under Alternative B in the SDNM" (p. 530).

Table 4.11. Comparison Between VRM and VRI under Alternative B in the SDNM

Alternative B	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	100.0%	0.0%	0.%
Class II	82.0%	0%	18.0%
Class III	47.4%	52.6%	0%
Class IV	0%	100.0%	0.0%-

In Alternative B, 100 percent of lands inventoried as Class I would be managed as Class I. This would have little or no negative impact on Class I inventoried lands. Impacts on Class I lands managed in Alternative B would be similar to those in Alternative A.

Approximately 82 percent of lands inventoried as Class II would be managed as Class II, no lands would be managed at a higher level, and 18 percent would be managed at a lower level. This would have minor impacts on Class II landscapes, which poses considerably less impacts on Class II landscapes when compared to Alternative A.

Approximately 47.4 percent of lands inventoried at Class III would be managed as Class III, 52.6 percent would be managed at a higher level, and no lands would be managed at a lower level. This management prescription could have beneficial impacts on Class III landscapes and little to no negative impacts.

None of the lands inventoried at Class IV would be managed as Class IV. Instead, they would be managed at a higher class, having no negative impacts on Class IV landscapes and some positive impacts. Impacts would be more beneficial than those described under Alternative A for Class IV landscapes.

4.9.5. ALTERNATIVE C

4.9.5.1. Lower Sonoran

From Lands & Realty on Visual Resources

In Alternative C, VRM classes generally shift more to Class II. This will result in greater constraints to development than Alternative B, projects designs that blend into the landscape better, and some developments being denied. Better designs and fewer developments will reduce the contrast in line, color, form, and texture that create visual degradation to the landscape. Visual impacts due to development in this alternative would be minor.

From Recreation Management on Visual Resources

Recreation management would be less developed than in Alternative B but more developed then Alternative A. Several areas would include developed and intensively managed recreation. While the opportunity for degrading visual resource could exist in areas of greater recreation development, conformance with allocated VRM classes would manage the visual impacts in a manner consistent with the RMP land management decisions. Impacts would be negligible to moderate.

From Travel Management on Visual Resources

Travel networks are expected to be reduced further from the current inventory. Otherwise, impacts to visual resources may see a slightly reduced likelihood of visual degradation from recreational development, but impacts are still expected to be minor.

From Visual Resources on Visual Resources

The comparison of the VRI and the current management prescriptions for VRM in the Lower Sonoran under Alternative C are presented in Table 4.12, "Comparison Between VRM and VRI under Alternative C in the Lower Sonoran" (p. 531).

Table 4.12. Comparison Between VRM and VRI under Alternative C in the Lower Sonoran

Alternative C	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	98.3%	0.0%	1.8%
Class II	59.8%	0.0%	40.2%
Class III	50.3%	44.9%	4.8%
Class IV	10.3%	89.7%	0.0%

In Alternative C, 98.3 percent of lands inventoried as Class I would be managed as Class I, with only 1.8 percent managed at a lower level. This would have a negligible impact on Class I inventoried lands, similar to Alternative A.

Approximately 59.8 percent of lands inventoried as Class II would be managed as Class II, no lands would be managed at a higher level, and 40.2 percent would be managed at a lower level. Compared to Alternative A, more lands would be managed under Alternative C at the same level and less land would be managed at both higher and lower levels. Overall negative impacts to Class II inventoried landscapes would be moderate.

Approximately 50.3 percent of lands inventoried at Class III would be managed as Class III, 44.9 percent at a higher level, and 4.8 percent would be managed at a lower level, having negligible impacts to visual Class III landscapes. Alternative C would have fewer negative impacts on Class III landscapes than Alternative A.

Approximately 10.4 percent of lands inventoried as Class IV would be managed as Class IV, 89.7 percent would be managed at a higher level, and no lands would be managed at a lower level, having no negative impacts on Class IV landscapes. This would also have beneficial effects to visual Class IV landscapes. Impacts would be similar to Alternative A.

4.9.5.2. Sonoran Desert National Monument

From Travel Management on Visual Resources

Further reduction in routes would further improve visual resources by reducing visible surface disturbance, especially in the core of the Monument near Gap Well and Butterfield Pass. Effects would be minor.

From Visual Resources on Visual Resources

The comparison of the VRI and the current management prescriptions for VRM in the SDNM under Alternative C are presented in Table 4.13, "Comparison Between VRM and VRI under Alternative C in the SDNM" (p. 532).

Table 4.13. Comparison Between VRM and VRI under Alternative C in the SDNM

Alternative C	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	100.0%	0.0%	0.0%
Class II	93.9%	0.0%	6.1%
Class III	29.2%	70.8%	0.0%
Class IV	0.0%	100.0%	0.0%

Under Alternative C, Class I management would be the same as Alternative B, also having little or no impact on Class I inventoried lands.

Approximately 93.9 percent of lands inventoried as Class II would be managed as Class II, no lands would be managed at a higher level, and 6.1 percent would be managed at a lower level. This would have negligible impacts on Class II landscapes. Alternative C would have fewer impacts on Class II landscapes than Alternative A.

Approximately 29.2 percent of lands inventoried at Class III would be managed as Class III; 70.8 percent would be managed at a higher level and no land would be managed at a lower level. This would have little to no negative impact to visual Class III landscapes. Impacts would be considerably less than Alternative A in Class III landscapes.

Management actions and impacts on landscapes inventoried as Class IV would be the same as described in Alternative B.

4.9.6. ALTERNATIVE D

4.9.6.1. Lower Sonoran

From Lands & Realty on Visual Resources

In Alternative D, VRM classes largely shift to Class II. This will result in the greatest constraints to development of any alternative, which would result in greater number of projects rejected and designs that blend into the landscape better. Thoughtful development planning processes that consider and integrate the VRM class objectives into project design criteria will reduce the contrast in line, color, form, and texture with respect to the natural landscape setting. Impacts would range from negligible to minor.

From Recreation Management on Visual Resources

Alternative D has the least developed recreation management with the smallest areas of development. A couple areas would still include developed and intensively managed recreation, but most of the Decision Area would be managed for more primitive recreational experiences geared towards resolving conflicts. While visual resource may degrade in areas of greater recreation development or where development is required to resolve resource or user conflicts, conformance with allocated classes would manage visual impacts caused by surface disturbance consistent with the RMP land management decisions. Impacts would range from negligible to minor.

From Travel Management on Visual Resources

Alternative D has the smallest motorized travel network. Impacts to visual resources may see a slightly reduced likelihood of visual degradation from recreational development and may see a slight degradation due to the higher likelihood of unmanaged users creating visible unauthorized routes. But overall, impacts are expected to be minor and in conformance to the VRM class objectives.

From Visual Resources on Visual Resources

The comparison of the VRI and the current management prescriptions for VRM in the Lower Sonoran under Alternative D are presented in Table 4.14, "Comparison Between VRM and VRI under Alternative D in the Lower Sonoran" (p. 533).

Table 4.14. Comparison Between VRM and VRI under Alternative D in the Lower Sonoran

Alternative D	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	98.0%	0.0%	2.0%
Class II	87.7%	0.0%	12.4%
Class III	18.3%	79.9%	1.8%
Class IV	4.7%	95.3%	0.0%

In Alternative D, 98.0 percent of lands inventoried as Class I would be managed as Class I, with only 2 percent managed at a lower level. This would have a negligible impact on Class I inventoried lands, similar to Alternative A.

Approximately 87.7 percent of lands inventoried as Class II would be managed as Class II, no lands would be managed at a higher level, and 12.4 percent would be managed at a lower level. This would have minor impacts on Class II landscapes, much less of an impact than Alternatives A, B, or C. Approximately 18.3 percent of lands inventoried at Class III would be managed as Class III, 79.9 percent at a higher level, and 1.8 percent would be managed at a lower level. This would have negligible negative impacts to visual Class III landscapes, and is likely to have beneficial impacts.

Approximately 4.7 percent of lands inventoried as Class IV would be managed as Class IV, 95.3 percent would be managed at a higher level, and no lands would be managed at a lower level, having no negative impacts on Class IV landscapes. This would also have beneficial effects to visual Class IV landscapes.

Impacts would be considerably less than Alternative A in Class III landscapes.

4.9.7. Sonoran Desert National Monument

From Transportation and Access Management on Visual Resources

This alternative would reduce motorized routes the most, which would have the greatest potential to improve the visual landscape. The largest improvement would be in the core area in the vicinity of Gap Well and Butterfield Pass. Impacts would range from negligible to minor.

From Visual Resources Management

The comparison of the VRI and the current management prescriptions for VRM in the SDNM under Alternative D are presented inTable 4.15, "Comparison Between VRM and VRI under Alternative D in the SDNM" (p. 534).

Table 4.15. Comparison Between VRM and VRI under Alternative D in the SDNM

Alternative D	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	100.0%	0.0%	0.0%
Class II	1.5%	98.5%	0.0%
Class III	0.0%	100.0%	0.0%
Class IV	0.0%	100.0%	0.0%

In Alternative D, Class I management would be the same as Alternatives C and B. This would have little or no impact on Class I inventoried lands.

Approximately 1.5 percent of lands inventoried as Class II would be managed as Class II, 98.5 percent of lands would be managed at a higher level, and no lands would be managed at a lower level. This would have mostly beneficial effects on Class II landscapes. Alternative D would have fewer impacts on Class II landscapes than Alternative A.

None of lands inventoried at Class III would be managed as Class III, 100 percent would be managed at a higher level, and none would be managed at a lower level. This would also have beneficial effects to visual Class III landscapes. Impacts would be considerably less than Alternative A in Class III landscapes.

Impacts on Class IV would be the same as described in Alternative B and C.

4.9.8. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.9.8.1. Lower Sonoran

From Lands & Realty on Visual Resources

Impacts of Alternative E are expected to be similar to those described for Alternative C for the Lower Sonoran.

From Recreation Management on Visual Resources

Impacts of Alternative E are expected to be similar to those described for Alternative C for the Lower Sonoran.

From Travel Management on Visual Resources

Impacts of Alternative E are expected to be similar to those described for Alternative C for the Lower Sonoran.

From Visual Resources on Visual Resources

The comparison of the VRI and the current management prescriptions for VRM in the Lower Sonoran under Alternative E are presented in Table 4.16, "Comparison Between VRM and VRI under Alternative E in the Lower Sonoran" (p. 535).

Table 4.16. Comparison Between VRM and VRI under Alternative E in the Lower Sonoran

Alternative E	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	99.2%	0.0%	0.8%
Class II	17.2%	0.0%	82.7%
Class III	73.3%	4.6%	22.1%
Class IV	33.0%	67.0%	0.0%

In Alternative E, 99.2 percent of lands inventoried as Class I would be managed as Class I, with only 0.8 percent managed at a lower level. This would have a negligible impact on Class I inventoried lands and would be similar to all other alternatives.

Approximately 17.2 percent of lands inventoried as Class II would be managed as Class II, no lands would be managed at a higher level, and 82.7 percent would be managed at a lower level. This would have major impacts on Class II landscapes. This would have more negative impacts on Class II landscapes than Alternative A.

Approximately 73.3 percent of lands inventoried at Class III would be managed as Class III, 4.6 percent at a higher level, and 22.1 percent would be managed at a lower level. This would have minor impacts to visual Class III landscapes, less than Alternative A.

Approximately 33 percent of lands inventoried as Class IV would be managed as Class IV, 67 percent would be managed at a higher level, and 0.0 percent would be managed at a lower level, having no negative impacts on Class IV landscapes. This would also have beneficial effects on visual Class IV landscapes though less than Alternatives C and D. Impacts would be similar to Alternative A and B.

4.9.8.2. Sonoran Desert National Monument

From Travel Management on Visual Resources

Impacts of Alternative E are expected to be similar to those described for Alternative C for the Lower Sonoran.

From Visual Resources on Visual Resources

The comparison of the VRI and the current management prescriptions for VRM in the SDNM under Alternative E are presented in Table 4.17, "Comparison Between VRM and VRI under Alternative E in the SDNM" (p. 535).

Table 4.17. Comparison Between VRM and VRI under Alternative E in the SDNM

Alternative E	% Inventoried Lands Managed at Same Level	% Managed at Higher Level	% Managed at Lower Level
Class I	100.0%	0.0%	0.0%
Class II	88.5%	0.0%	11.5%
Class III	36.0%	64.0%	0.0%
Class IV	0.0%	100.0%	0.0%

In Alternative E, Class I management would be the same as Alternatives C, B and D. This would have little or no impact on Class I inventoried lands.

Approximately 88.5 percent of lands inventoried as Class II would be managed as Class II, none of the lands would be managed at a higher level, and 11.5 percent of the lands would be managed at a lower level. This would have minor impacts on Class II landscapes. Alternative E would have fewer impacts on Class II landscapes than Alternative A and B, though more impacts than C and D.

Approximately 36 percent of lands inventoried at Class III would be managed as Class III, 64 percent would be managed at a higher level, and no lands would be managed at a lower level. This would also have beneficial effects on visual Class III landscapes though less than Alternatives C and D. Impacts would be considerably less than Alternative A in Class III landscapes.

Impacts on Class IV would be the same as described in Alternative B, C and D.

4.10. IMPACTS ON WATER RESOURCES

The primary water resource characteristics that could be impacted by the alternatives are water flow in ephemeral channels (timing and quantity), surface and ground water quality, and ground water recharge. Sedimentation, nutrients in the form of fertilizer in irrigation return flows, temperature, flow alternation, and bacteria are the most common stream impairments in the Planning Area. However, the only impaired water bodies with hydrologic connections to drainages in the Decision Areas are those in the Gila River between its confluence with Salt River and Painted Rock Reservoir. The fragmented pattern of land ownership in the Planning Area makes linkage of existing impairments to specific sources or activities occurring on BLM-managed public lands difficult. Management actions that result in surface disturbance; mining; energy development; recreation, and the application of herbicides and pesticides near water bodies all have potential to affect water quality and quantity, including storm water runoff.

4.10.1. METHODS OF ANALYSIS

4.10.1.1. Indicators

The following indicators were used to comparatively assess impacts on water resources:

- Acres of surface disturbance
- Number of road stream crossings
- Miles of roads within close proximity (200 feet) to streams
- Miles of roads within stream channels

4.10.1.2. Assumptions

Assumptions used to assess the impacts of the alternatives on water resources include:

- Substantial surface disturbance to soil, including exposure of bare ground, loss of vegetative cover, or rutting on unsurfaced roads could increase water runoff and downstream sediment loads; thereby degrading water quality, altering channel structure, and affecting overall watershed health. Water resource impacts other than ground water impacts are closely associated with soils impacts.
- Special management designations, such as ACECs or SRMAs, that restrict use for the protection of one or more resources (and management actions for resource protection are properly implemented) have positive impacts on water resources. The positive impacts exceed any negative impacts that could accrue due to increased visitation caused by the designation itself.
- When a proposed management action requires monitoring and enforcement of use restrictions to be effective, such as routes designated as closed for travel management, resources will be available to assure that the necessary monitoring and enforcement occurs.

- Groundwater resources would be managed to protect environmentally sensitive areas and to be a good neighbor to adjoining well owners. All development would require a demonstrated need and would not conflict with other resource management goals.

4.10.1.3. Program Areas with No Impacts on Water Resources

No impacts on water resources are anticipated for management actions relating to:

- Cave Resources
- Cultural and Heritage Resources
- Paleontological Resources
- Public Safety and Hazardous Materials
- Visual Resources
- Wild Horse & Burro Management
- Wilderness Characteristics

4.10.1.4. Qualitative Intensity Scale

Impacts are described using ranges of potential impacts or in qualitative terms, if appropriate. When impacts are positive, it is so stated. The intensities of impacts are also described, where possible, using the following intensities:

Negligible: The amount of surface disturbance, number of stream crossings, miles of travel routes near and in channels resulting in changes to drainage patterns, storm water runoff volumes, or sediment delivery to channels would be very small. Changes in area of bare soil and removal of vegetative ground cover are below the level of detection.

Minor: The amount of surface disturbance, number of stream crossings, miles of travel routes in or near drainages, changes in volume of traffic in the Decision Areas, or changes in other indicators resulting in changes to drainage patterns, storm water runoff volumes, or sediment delivery to channels would be small, as would the area affected. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.

Moderate: The amount of surface disturbance, number of stream crossings, miles of travel routes in or near drainages, changes in volume of traffic in the Decision Areas, or changes in other indicators resulting in changes to drainage patterns, storm water runoff volumes, or sediment delivery to channels would be readily apparent and would occur over a relatively wide area. Mitigating measures probably would be necessary to offset adverse effects and would likely be successful.

Major: The amount of surface disturbance, number of stream crossings, miles of travel routes in or near drainages, changes in volume of traffic in the Decision Areas, or changes in other indicators resulting in changes to drainage patterns, storm water runoff volumes, or sediment delivery to channels would be readily apparent and long-term and would substantially change the indicators over a large area. Extensive mitigation measures to offset adverse effects would be needed, and their success could not be guaranteed.

4.10.2. COMMON TO ALL ALTERNATIVES

No unique impacts on water resources that are common to all alternatives exist.

4.10.3. ALTERNATIVE A (NO ACTION)

4.10.3.1. Lower Sonoran

From Air Quality Management on Water Resources

Creation of PM_{10} due to travel on un-surfaced roads or construction activities in the Decision Area is often mitigated with dust suppressants. Occasionally chemical palliatives such as magnesium chloride are used. If chemical dust palliatives are used anywhere in the Decision Area there is a moderate probability that a portion of those chemicals will be washed into drainages during periods of storm water runoff and eventually reach the Gila River. Due to the limited use of these chemicals (water is much more commonly used), infrequent flood events, and dilution factors, this impact is minor to negligible.

From Lands & Realty on Water Resources

Ten corridors for major linear LUAs would be designated under Alternative A through the Lower Sonoran. The designation of these corridors would lead to some localized impacts to water resources where surface disturbing activities occur during construction or maintenance. Containing these uses in the corridors would limit their areal extent and represent a minor impact if corridors are re-vegetated to reduce bare soil, which in turn would reduce runoff, erosion, and sedimentation.

LUAs for utility-scale renewable energy development also will have measurable, widespread effects on water resources. Blading of large acreages for solar energy facilities , estimated at greater than 150,000 acres over the life of the plan, is likely to disrupt drainage patterns, and cause surface disturbance and soil compaction, resulting in increased erosion, runoff and sedimentation over a large enough area to be a moderate impact. Use of large quantities of ground water, may be needed for renewable energy production and may have additional impacts on drainage patterns by causing subsidence in localized areas. Ground water pumping would likely lower water table elevations and potentially impact neighboring wells. Pumping impacts could be mitigated in future solar developments by use of dry cooling of the steam turbine system, or by using systems with entirely different means of generating electricity. Assuming that the solar energy development proposals that will be built under this plan are mostly the solar energy concentration facilities, the overall impact of LUAs for this use would be moderate.

Land disposal actions on up to 18,900 acres in the Lower Sonoran could potentially affect water resources, particularly if the proposed future land use involved surface disturbance or removal of vegetation, such as for housing development or solar energy facilities. Water resources could also be affected if development on these parcels increases ground water pumping that could potentially lower water table elevations. New surface water developments on these lands would require water rights and new ground water developments that pump more than 35 gallons per minute within Active Management Areas would require approval from the Arizona Department of Water Resources (ADWR). 8,000 acres of the 18,900 acres available for disposal would be available for

exchange, which would only occur under Alternative A. Impacts to water resources due to the disposal of these lands are likely to occur on most of the acres involved. Although land disposal itself has a negligible impact on water resources, the maximum potential impact from future development could be minor in terms of surface disturbance due to the small number of acres affected but potentially moderate in terms of groundwater impacts if developments such as solar energy facilities are constructed. Potential impacts should be assessed on a proposal specific basis.

From Livestock Grazing on Water Resources

Grazing would continue under the current management system, which would allow surface disturbing activities associated with livestock operations to continue and potentially impact runoff and sedimentation. Disturbance to sensitive surface covers such as desert pavement and cryptobiotic crusts would expose fine-grained sediments to erosion. Increased erosion of fine-grained sediments would increase their transport and delivery to ephemeral washes and, ultimately, the intermittent and perennial reaches of the Gila River. Limited area of these sensitive surfaces and stocking rates low enough to allow progress toward the desired plant community should keep disturbances small and site specific. Areas of greatest surface disturbance would be concentrated around watering sources and gathering areas. The small numbers of these sites would limit these effects. The impact would, therefore, be classified as minor.

In years when there is substantial recruitment of ephemeral spring forage species, ephemeral grazing is permitted. The surface disturbance around watering sources and gathering areas would increase during years when ephemeral grazing is authorized. The disturbance could cause compaction of soils resulting in moderate localized increases runoff, erosion and delivery of sediments to ephemeral stream channels. Increased stocking rates during periods of ephemeral use, and the widespread occurrence of ephemeral vegetation when ephemeral use is permitted increases the risk of erosion of fine sediments beneath sensitive soil covers to moderate for the periods of increased use.

Livestock trailing and disturbance (compaction and vegetation removal) around watering sources would be greatest in this alternative, though impacts would be minor due to the small number of sites affected.

From Minerals Management on Water Resources

In the Lower Sonoran, mineral development would be allowed to continue on all lands not currently withdrawn. Impacts of mineral development on water resources depend on the type of mineral development. Locatable mineral develop could result in a variety of water resource impacts ranging from disruption of natural drainage conditions due to development of pits, waste rock areas, leach pads, roads, etc; to substantial ground water impacts from pumping needed to support mining operations. Water quality impacts could also occur from chemical spills or erosion of waste or tailings piles making fine sediment and chemical waste product available for entrainment and transportation to major water courses. Impacts would need to be assessed on a site specific basis. Development of saleable minerals could also have a variety of impacts on water resources depending on location and scale of development. Sand and gravel operations in ephemeral wash bottoms could impact channel conditions by lowering channel bed elevations (potentially triggering head cutting) or disturbing channel banks. Each proposal would require site specific assessment. Impacts would range from negligible to moderate.

From Priority Wildlife Species and Habitat Management on Water Resources

Maintenance and redevelopment of existing wildlife waters and development of new wildlife waters and livestock waters would continue under Alternative A. The slight increase in soil compaction and surface disturbance from increased wildlife activity around existing wildlife water developments would result in negligible increases in runoff and sedimentation due to the limited number and of these sites. These impacts would be small compared to the increased runoff and erosion that occurs from soil compaction and vegetation removal that occurs around livestock waters, which are minor themselves due to their limited spatial extent. The additional water resource impacts of wildlife sharing livestock water would be negligible.

From Recreation Management on Water Resources

Under Alternative A, recreation uses would continue to be distributed throughout the Decision Area. Active management of recreation would occur in four SRMAs covering 379,400 acres in the Lower Sonoran. The remaining 893,300 acres would be allocated as an ERMA. Impacts to water resources would increase from the damage to soil resources that are expected to increase as recreation use increases throughout the Decision Areas in both s and ERMAs. However, the concentrated activity in the SRMAs increases the probability of water resources impacts due to erosion from increased storm water runoff that originates from impervious or compacted surfaces of parking areas, structures and trails. These impacts are limited in extent and minor. Mitigation and maintenance is planned for facilities and near historic sites. In the dispersed recreation occurring in the ERMAs, disturbed sites may be more numerous, but impacts to many of the individual disturbed sites will be minor. Dispersed recreation that occurs in the ERMAs and in undeveloped portions of the SRMAs is likely to result in increased water resource impacts due to use of previously unaffected areas for camping, hiking, mountain biking, and equestrian activities. Most of the affected areas will be used for short periods, and will be relatively small. Campers are encouraged to use existing sites. The impacts are expected to be minor.

Only one established campground and two additional unimproved areas that are currently used for camping exist in the Decision Areas. Alternative A includes the possibility of establishing an LTVA. If any LTVAs are created in Ajo or elsewhere, they would be in existing short-term use campgrounds, which would limit the impact on water resources to the approximate area of the campground. The risk of increased storm water runoff and sedimentation exists from increased compaction, rutting, and bare ground that exists in the designated camping areas. Increasing the stay limit to establish an LTVA could increase impacts if the area of the campground was also increased. Most impacts have already occurred, so designating an existing camping area as an LTVA would be a minor impact.

Parking and camping are permitted along existing roads for a distance of 100 feet from the road center line. This provision invites substantial expansion of the road surface impacts which increase the probability of erosion on and near the road, which often leads to further expansion of the affected area as vehicle operators drive around damaged road surfaces. These impacts result in increased runoff and delivery of sediments to ephemeral stream channels and, ultimately, the perennial and intermittent reaches of the Gila River. There is no data available on the current extent of this type of damage, or of the number of turnouts that have developed in the 100 foot zone on each side of the designated routes. The impacts are classified as minor, since they are individually small areas, and not numerous. However, there is a high probability that increased

activity will occur leading to an increased area of disturbance along the 950 miles of road in the Lower Sonoran.

From Special Designations on Water Resources

The Coffeepot Botanical ACEC is the only ACEC in Alternative A. An existing management decision closes the existing roads to all recreational use, which will greatly reduce the risk of unauthorized travel, widening of existing roads, and most other additional surface disturbance. On balance this designation will have minor positive water resource impacts.

From Travel Management on Water Resources

A decision to maintain the current allocations for OHV Area designations would have the effect of continuing to allow all inventoried routes to be used which could lead to a net increase over time of routes due to vagueness of existing routes, especially in xeroriparian or riparian corridors where brush and water flow may obscure routes year to year. No Open OHV areas are allocated currently, therefore there would be no effect from this allocation. OHV Closed allocations of 110,700 acres including Coffeepot ACEC would have a negligible effect on water resources since these areas have been closed for at least 10 years and resource conditions are stabilizing.

In addition to the impacts of travel routes within stream channels, travel routes that are located within close proximity to stream channels are a source of hydrologic connectivity between roads and channels. Hydrologic connectivity occurs where there is a continuous flow path from roads to streams. Examples include ditches that convey road derived or intercepted runoff to stream channels, cross drain features such as water bars or dips, that discharge sufficient water to create a gully, sediment plume, or both that extends to a stream channel, and fill slopes that encroach on stream channels. Routes that are hydrologically connected to the washes in the Decision Area increase the likelihood of introducing road derived sediments and contaminants to the channels. Under the existing conditions there are approximately 2,649 miles of roads within 200 feet of stream channels. The existing travel management system has an overall minor impact.

Motor vehicle use is currently limited to existing or designated routes with less than 3 percent of the Decision Area limited to designated routes, and most of the closed routes in the wilderness areas. Alternative A decisions on motorized vehicle use would generally leave the current OHV class designations and route system in place (see Map 2-15a). Under Alternative A, 15 miles of routes out of 1670 would be closed in the Lower Sonoran. Roads concentrate and channel storm water runoff and, unless properly drained and maintained, contribute a high proportion of sediment eventually reaching perennial streams. The density of roads excluding the largely roadless wilderness areas is 1.57 miles per section. That is a moderately low density by most standards, although it is enough to be a source of sediment. Overall, roads cause a moderate level of damage to water quality, and can elevate the impacts of high flows. The positive impact of 15 miles of road closures would be negligible.

Public travel in wash bottoms and dry streambeds that are part of the existing route system would continue. Use of these sites disturbs the bed and banks of these channels, damages, xeroriparian vegetation, and leads to greater sedimentation during storm water runoff. Wash bottoms are a major source of ground water recharge in the Decision Areas. Use of wash bottoms as travel routes exposes surface and ground water to the risk of contamination from spills and leaks of the fuels and oils used by Off Highway Vehicles. Use of wash bottoms as designated travel routes is likely to increase use of unauthorized routes as vehicle operators exit or reenter drainages.

However, streambeds in the Decision Area are usually sand, and the affected areas are locally small, resulting in a minor impact on wash bottoms overall. There are enough intersections between roads and drainages to cause a moderate impact locally where the intersections occur, including moderate impact on stream banks, which can cause accelerated erosion or even become damaging head cuts.

From Vegetation Resources on Water Resources

Decisions intended to protect special status species, particularly those that avoid surface disturbance or maintain vegetative cover, would also provide protection for water resources. Continued wood harvesting would reduce vegetation cover and increase bare ground resulting in increased runoff, erosion and sedimentation. Such impacts, however, would mainly be limited to the Ajo Block, where the majority of wood harvesting has been occurring. Impacts would be minor, since they would be site specific in a limited area, and would not require mitigation, unless vehicle traffic created ruts or disturbances on sensitive soils.

4.10.3.2. Sonoran Desert National Monument

From Air Quality Management on Water Resources

Impacts on water quality from air quality management are essentially the same as those in the Lower Sonoran Decision, although the probability of use of chemical palliatives in the SDNM may be lower. Construction projects and organized recreational vehicle activities, where chemical palliatives are more often used, are less likely to occur in the Monument.

From Lands & Realty on Water Resources

Three corridors for major linear LUAs would be designated under Alternative A in the SDNM. The designation of these corridors would lead to some localized, moderate impacts to water resources where surface disturbing activities occur during construction or maintenance. Containing these uses in the corridors would maintain a moderate level of impacts. Other land uses authorized by LUAs, that cause surface disturbance, would have similar localized impacts on water resources due to increased runoff from soil compaction, and increased sedimentation from accelerated erosion. Mitigation to re-vegetate, close and restore temporary roads and other construction disturbances and to maintain natural drainage pathways would reduce impacts over time.

Alternative A does not provide for utility-scale renewable energy development in the SDNM, However, some indirect effects to water resources on the SDNM could occur in the southeast section of the SDNM (southern Vekol Valley) from developments that increase storm water runoff and caused increased flow, erosion and sedimentation in drainages in the SDNM. These impacts would be minor and limited in extent.

From Livestock Grazing on Water Resources

Under Alternative A grazing will be discontinued south of I-8, since those permits have expired and the Monument Proclamation directs that they will not be renewed. Minor long term benefits to water resources would be expected from increases in vegetative ground cover and vegetative litter and perhaps small decreases in compaction that would be expected to increase water holding

capacity, and infiltration and reduce runoff, erosion, and sedimentation. The closures will have their greatest benefits in the Vekol Valley area where vulnerable soils are prevalent.

North of I-8, grazing would continue at current preference levels. A grazing compatibility analysis has shown negligible impacts from grazing in those SDNM allotments when compared with the same ecological sites on land formerly in the BMG military range, where no grazing has occurred in over 50 years. Therefore, grazing impacts are expected to be minor, and similar to those analyzed for the Lower Sonoran Decision Area. Minor negative impacts are due to effects of grazing where soils are most sensitive to erosion, those with cryptogamic crusts, desert pavement, or around stock watering sites.

From Minerals Management on Water Resources

The SDNM would remain closed to all forms of mineral entry. Any potential impacts from mining or mineral claims would occur only on existing valid rights and no rights exist with the potential to have any impact on water resources. Impacts from mining in the Monument are negligible. Restoration activities could reduce impacts of past mining (sedimentation, heavy metal occurrence) over time.

From Recreation Management on Water Resources

Alternative A has an SRMA that is intended to cover the portion of the Gila Trails SRMA that occurred within the SDNM. It has 143,900 acres which includes the Gila Trail, the Butterfield Stage Route, the Anza Trail and other historical points. Impacts to water resources would increase as additional miles of hiking, biking and equestrian trails are constructed that expose disturbed soils to erosion, and from surface disturbance that results from increased visitation of the area. However, management actions are planned that would protect resources values and limit OHV use to designated routes. The sum of these offsetting actions is likely to be a minor negative impact. The remaining 342,500 acres of the SDNM would experience minor impacts similar to those described above for the Lower Sonoran Decision Area.

From Special Designations on Water Resources

Alternative A does not include decisions that specifically address management of water withdrawals. Management of water under Alternative A would limit groundwater development within the Vekol Valley Grassland ACEC and other sensitive areas. Those limits would be a positive impact on water availability in the Vekol Valley ACEC, but otherwise impacts would not occur. The likelihood of development of groundwater resources beneath the SDNM is low. Should development occur, the disturbance associated with the infrastructure necessary to develop ground water resources (roads, pipelines, power) would cause minor increases in runoff, erosion, and sedimentation to local washes. Groundwater development could also lower water table elevations in any nearby adjoining wells.

From Travel Management on Water Resources

A decision to maintain the allocation of 161,200 acres as Closed OHV areas would have the minor effect of allowing xeroriparian areas to continue stabilization. Continuing the allocation of 247,200 acres as Limited to Existing Roads and Trails would have a minor effect on water resources since no riparian resources occur inside SDNM and 65 miles of the estimated 971 miles

of xeroriparian washes are used as vehicles routes. The assessment of minor impact is due to the lack of riparian and relatively sparse occurance of xeroriparian areas near heavily used areas such as Gap Well and Vekol Valley Road.

Under Alternative A, 6.6 miles out of 632 miles of routes would be closed in SDNM. Public travel in wash bottoms and dry streambeds that are part of the existing route system would continue, potentially damaging xeroriparian vegetation, destabilizing channel banks, and introducing contaminants from spills and leaks of fuels and oils into the ground water system. This would lead to a minor level of impact to water resources, including an increase in sedimentation in drainages during periodic storm water runoff events.

Restricting travel to existing routes will limit the impacts to generally minor levels over the entire Decision Area.

Closing 6.6 miles of routes represents approximately one percent of the routes in the SDNM. Recovery of watershed conditions (reduced compaction, increased ground cover) over time on these routes would have a minor beneficial impact on water resources due to reduced runoff, erosion, and sedimentation in local washes.

4.10.4. ALTERNATIVE B

4.10.4.1. Lower Sonoran

Alternative B generally allows and facilitates increased public access to and use of the Decision Area, which would allow a greater number of surface-disturbing activities. As a result, Alternative B would generally increase the potential for water resource impacts compared to Alternative A. Although mitigation will be planned when there is an acceptable probability of success, residual impacts, as measured by the water resource indicators, are likely to persist from grazing, recreation, travel, lands and realty, and mineral management.

From Air Quality Management on Water Resources

Impacts from air quality management under Alternative B would be the same as those under Alternative A.

From Lands & Realty on Water Resources

The number of multiuse corridors would be the same as those described in Alternative A. As in Alternative A, the impacts would be minor, assuming BMPs for mitigating corridor impacts are implemented. Other authorized land uses, including utility-scale renewable energy development, would have the same moderate impact to water resources as described under Alternative A.

Approximately 50,300 acres are available for disposal under Alternative B. If disposal of all available land occurred, the impact could be nearly twice the impact described under Alternative A, although the total potential impact would remain moderate.

From Livestock Grazing on Water Resources

Under Alternative B, impacts from grazing would be slightly less than Alternative A. Perennial and perennial-ephemeral allotments would receive a reduction in authorized grazing preference to account for the effects of continued ephemeral grazing. Reduced grazing preference would result in a minor decrease in the impacts of grazing on water resources from those experienced under existing conditions. All land health assessment data demonstrates little or no difference in progress toward meeting land health standards between areas with and without ephemeral grazing, assuming the special rule for ephemeral grazing is followed. Impacts would be minor.

From Minerals Management on Water Resources

Impacts from mineral development would be the same as described under Alternative A.

From Priority Wildlife Species and Habitat Management on Water Resources

Alternative B would develop a limited number of new wildlife waters in the Lower Sonoran. The number is not specified, but it is not likely to exceed the number (eleven) planned for Alternative A. Therefore, the impacts would be negligible compared to Alternative A. Where ground water is developed to provide wildlife waters, there may be a negligible drawdown of groundwater elevations. Surface water developments would impound a small volume of storm water runoff. Water rights would be necessary for any new surface water impoundments. Impacts on surface water resources would be negligible. Existing roads required to provide access to these water sources would be used when possible. Any new roads required would cause small increases in runoff, erosion, and sedimentation. They would be closed to public use and their overall impact on water resources would be negligible.

From Recreation Management on Water Resources

Recreation allocations in the Lower Sonoran would include 8 SRMAs. The effects of SRMAs on water resources are dependent on the proposed recreation uses and are described in Alternative A. The extent of impacts from SRMAs is increased in Alternative B, due to the additional management areas. Motorized travel within dry washes can destabilize banks, particularly where vehicles enter and exit the washes, damage xeroriparian vegetation, and introduce potential contaminants into surface and groundwater systems. Disturbing sensitive soils such as desert pavements and cryptogamic crusts may result in increased erosion due to exposure of bare soil. Management decisions intended to control motorized vehicle use, manage vehicle-based camping and recreational target shooting, and other intensive recreation uses, would help to mitigate impacts to water resources. Three of the SRMAs; Buckeye Hills East Trails, Painted Rocks Trails, and Ajo Trails, emphasize motorized recreation, which increases the likelihood of water resources impacts due to surface disturbance and damage to soils.

Areas with nonmotorized uses, including Cuerda de Lena, Sentinel Plains, San Tan, and Gila Bend Mountains are unlikely to impact water resources. The remaining four SRMAs, which would be managed for a balance of motorized and nonmotorized uses, would likely have minor effects on water resources from disturbance of sensitive soil covers that expose soils to erosion, from disturbances to the bed and banks of desert washes, and from disturbance to the natural drainage patterns on motorized routes.

Based on the provisions for visitor education and control, plans for mitigation in anticipated areas of higher use, and the limited spatial extent of expected impacts, the overall impact of the additional SRMAs in Alternative B will be minor.

From Special Designations on Water Resources

Under Alternative B, designation of the Coffeepot ACEC in the Lower Sonoran would be retained. Therefore, the impacts would be the same as those in Alternative A.

From Travel Management on Water Resources

Decisions to allocate OHV Closed Area designations on all designated wilderness areas, 101,800acres, would have a minor effect on water resources since those areas are currently closed. Maintaining the closures would have the effect of allowing all previously disturbed areas to continue their natural restoration thus allowing infiltration rates increase. A decision to allocate 40 acres as an Open travel area would have the effect locally, of increasing disturbance on the wash bank within this area. While the area can be suitably mitigated by restoration, impacts will be moderate to major locally, but minor regionally. It is possible that the motocross type of use expected to occur within this 40acres would be attracted to ths area. This could reduce use along washes in other areas, having a minor to moderate effect in other areas by stabilizing previously impacted areas elsewhere. Allocating the balance of acreage, 828,360acres, to Limited to Designated Routes would have the effect of limiting travel in xeroriparian and riparian corridors to only those routes analyzed and designated for travel and allowing for vegetation recovery and stabilization of water channels. Compared to Alt A, water resources would be expected to be less impacted due to the decision to have designated routes.

The miles of routes open to various categories of travel decline from Alternative A through D. Nearly all existing miles of roads are open in Alternative A (1,670 of the 1,688 miles in the Lower Sonoran). Only 1,241 miles are open in Alternative B, 1,141 miles in Alternative C, and 799 miles in Alternative D. Impacts will decline in each alternative as miles of open routes decline.

Alternative B has 198 more miles of closed routes and 180 more miles of seasonally closed roads than Alternative A. Many miles of those closures are to protect wildlife habitat management areas in the Gila Bend Mountains and in the Ajo area. These closures will reduce the impacts on water resources. Reductions in rutting, surface and vegetation disturbance and water erosion will occur wherever routes are closed. In those specific areas where the road closures are concentrated, the impact on water resources will decline from moderate to minor. However, even with the 12 percent reduction in road miles in Alternative B, the overall impact of travel on water resources in the Lower Sonoran will remain minor. Alternative B includes plans for only 5 acres with new roads, which will be a negligible impact. Designation of routes in most areas should decrease OHV impacts over time by decreasing uncontrolled road proliferation, assuming resources are available for enforcement of designations.

Indicators of water resources impacts decrease in Alternative B from those in Alternative A. Total miles of washes in the Lower Sonoran is 1,659 miles. The number of existing road miles within these washes is 182 miles, indicating that about 11 percent of the washes are occupied by roads. The numbers of miles of roads in washes decreases from 182 miles in Alternative A to 126 miles of open and seasonally closed roads in Alternative B, a 31 percent decrease. The number of wash crossings by open roads (which provides one indication of direct impacts of roads on washes, as well as an estimate of access points for vehicles to enter washes) decreases from 1038

in Alternative A to 915 in Alternative B, a 12 percent decrease. The number of miles of roads within a 200 foot buffer distance of ephemeral washes (an indication of hydrologic connectivity) decreases from 309 miles in Alternative A to 249 miles in Alternative B, a 19 percent decrease. The overall effect is a minor decrease in impacts from Alternative A to Alternative B and an overall minor impact of these alternatives on water resources due to the distance from intermittent or perennial water sources.

From Vegetation Resources on Water Resources

Alternative B would provide measures to actively manage the restoration and reclamation of disturbed areas and control invasive species. Control of invasive plant species may increase potential for erosion and increased turbidity in water courses during storms in the short term but would effectively increase vegetation and stabilize soils in the long term. Impacts from wood harvesting would be the same as under Alternative A. Other impacts compared to Alternative A would positive with small increased emphasis on native plant reestablishment, specific protection for priority species, and additional limits on collection of native plant material, including dead and down material. These practices will maintain the small amount of litter available as cover, reducing runoff and sedimentation of stream channels.

4.10.4.2. Sonoran Desert National Monument

From Air Quality Management on Water Resources

Impacts from air quality management under Alternative B would be the same as those under Alternative A.

From Lands & Realty on Water Resources

In the SDNM, the multiuse utility corridors would remain the same as Alternative A and the impacts would be the same.

From Livestock Grazing on Water Resources

Impacts would be the same as those described in Alternative A for the area south of I-8. Impacts for the area north of I-8 would be similar to Alternative A except for the reduced number of authorized perennial AUMs. Adverse impacts to watershed conditions would be less than Alternative A due to the reduced consumption of vegetation which would provide for greater vegetative ground cover. Net effect would be a negligible reduction in adverse effects from Alternative A.

From Minerals Management on Water Resources

Impacts from mineral development would be the same as described under Alternative A.

From Recreation Management on Water Resources

Compared to Alternative A, which only has 143,900 acres in an SRMA and no distinction among categories of use, management of SDNM recreation under Alternative B would be more active.

Under B recreation would probably increase, but most of the Monument would be managed for undeveloped, back country recreation. Therefore, the impacts on water would be similar to Alternative A and minor. In the SDNM, one SRMA equal to the acreage of the Monument would be allocated.

From Special Designations on Water Resources

Under Alternative B, designation of the Vekol Valley Grassland ACEC in the SDNM would be removed and vehicle use would be allowed on routes in these areas, which would increase the potential for impacts to water resources in this portion of the SDNM as compared to Alternative A. The overall impacts from special designations in the SDNM in Alternative B would be minor.

From Travel Management on Water Resources

Decision to allocate OHV areas of Closed and Limited to Designated Routes in Alt B would have a minor effect on water resources because all routes would be designated for vehicular travel, thus minimizing the effects of cross-country use, especially in xeroriparian washes. Compared to Alt A, Limited to Designated Route allocation would better protect water quality on all routes since the designated route system would be managed to include adding proper drainage, route signage and public maps to guide the public. Some routes would be designated in the Vekol Valley Grasslands area which has the OHV area designation of Limited to Designated Routes in this alternative, providing a minimal route network. Water quality would be minorly affected in this area due to mitigation by creation of earthen water control structures on open routes. All of these actions would combine to protect water resources and the functioning ecosystem.

All existing travel routes in the SDNM would be designated open, limited, or closed in Alternative B (and all other action alternatives). About 69 miles would be closed, which is comparable to the miles of closures in Alternative A (65 miles closed). The differences in impacts due to total route length and road density between the two alternatives would be negligible. The reduced impacts of motorized travel due to wilderness area restrictions would also be the same. The wilderness area size (157,700 acres) and management would be identical in Alternatives A and B. Closing 69 miles of routes represents approximately ten percent of the routes in the SDNM. Recovery of watershed conditions (reduced compaction, increased ground cover) over time on these routes would have a minor beneficial impact on water resources due to reduced runoff, erosion, and sedimentation in local washes.

All existing travel routes in the SDNM would be designated open, limited, or closed in Alternative B (and all other action alternatives). About 72 miles would be closed, which is about 65 more miles of closures than in Alternative A (6.6 miles closed). This would be a negligible change from existing conditions in Alternative A. Approximately 157,700 acres of the SDNM are in wilderness areas in both Alternatives A and B. Some routes would have increases in maintenance levels, but overall impacts on soils from travel in Alternative A and B would be similar.

In terms of the water resources indicators there are approximately 354 miles of ephemeral washes within the SDNM. There are currently 63 miles of open roads within these washes, indicating that about 5 percent of the washes are used as motorized travel routes. Under Alternative B, 34 miles of roads would occupy wash bottoms, a 27 percent decrease in mileage. There are 328 wash crossings by roads under Alternative A and a similar number of crossings under Alternative B. The number of miles of roads in close proximity to washes (hydraulically connected) changes from 114 miles in Alternative A to 106 miles in Alternative B, a 7 percent decrease. The net

effect is a negligible decrease in impacts to water resources between Alternatives A and B and an overall minor effect of this alternative on water resources due to the distance from intermittent or perennial water bodies.

4.10.5. ALTERNATIVE C

4.10.5.1. Lower Sonoran

From Air Quality Management on Water Resources

Impacts from air quality management under Alternative B would be the same as those under Alternative A.

From Lands & Realty on Water Resources

In the Lower Sonoran under Alternative C, the multiuse corridors would be the same as those described in Alternative A. As in Alternative A, the impacts would be minor, assuming BMPs for mitigating corridor impacts are implemented.

The number acres of excluded from utility-scale renewable energy development is greater in Alternative C than in Alternatives A or B. The reduced acreage available for utility-scale renewable energy development would reduce the potential for surface disturbance that would increase storm water runoff and sedimentation and reduce the potential for withdrawal of groundwater that could lower water table elevations. Impacts on water can be moderate to high, locally, for a large solar installation, particularly if it is using a wet cooling system that requires thousands of acre-feet of groundwater. However, other potential impacts on water resources, such as disruption of the natural drainage system of the area, can be mitigated. Overall, the impacts of utility-scale renewable energy development would be moderate.

Approximately 36,300 acres are available for disposal under Alternative C. If disposal of all available land occurred, the impact could be greater than the impact described under Alternative A, although the total impact would probably remain moderate. Although land disposal itself has a negligible impact on water resources, the maximum potential impact from future development could be minor in terms of surface disturbance due to the small number of acres affected but potentially moderate in terms of groundwater impacts if developments such as solar energy facilities are constructed. Potential impacts would be assessed on a proposal specific basis.

From Livestock Grazing on Water Resources

Impacts on water resources from Alternative C grazing proposals would be less than Alternative A, but greater than Alternative B. Perennial AUMs in Alternative A and C are the same, but ephemeral grazing allowed in Alternative A would not occur in C. The reduced perennial grazing in Alternative B would result in lower level of impact compared to C, even in years when ephemeral grazing was allowed in B due to the limited duration of ephemeral spring grazing. The additional impacts in Alternative C would be largely the result of the higher perennial stocking rate causing concentration of use near water and gathering areas. The risk of increased runoff and sedimentation from surface disturbance and possibly compaction would be increased, although overall impacts would remain minor. Higher intensity of ephemeral grazing in Alternative B, and

still higher intensity in Alternative A, when combined with a larger perennial herd, would reduce the positive impacts on water storage and infiltration of more organic matter and residual litter associated with the lower use of ephemeral forage in Alternative C.

From Minerals Management on Water Resources

Potential impacts from mineral development would be slightly less than described under Alternative A, due to mineral withdrawals proposed in some RMZs (Painted Rock RMZ, Gunsight Wash Campground). Also, mineral materials disposals would be prohibited in areas that contain cactus ferruginous pygmy owl habitat, eliminating potential impacts in these areas. These differences would have a negligible effect on the overall potential impact of mineral development on water resources. Impacts could potentially be major but would require site specific assessments of mineral development proposals. Impacts would be expected to range from negligible to moderate.

From Priority Wildlife Species and Habitat Management on Water Resources

Four areas encompassing 425,900 acres would be designated as wildlife habitat areas (WHAs) under Alternative C. Management activities that limit the size of surface disturbing activities, and place seasonal limitations on motorized uses in certain washes, and prohibit mineral material disposals in certain washes would result in reduced water resources impacts from this alternative compared to Alternatives A and B (which would not designate any wildlife habitat areas). Designating Category I desert tortoise Habitat as an avoidance area for all surface disturbing activities would also reduce impacts to water resources from those in Alternatives A and B. Limiting the size of surface disturbing activities in wildlife management corridors would also reduce water resource impacts.

Unlike Alternatives A and B, which allow for new wildlife water developments, wildlife water development under Alternative C would be limited to maintaining and redeveloping currently existing waters. This limitation would prevent surface-disturbances associated with the construction of new wildlife waters, but could result in localized impacts to soil and water resources due to maintaining and redeveloping existing waters. Overall impacts would be negligible.

From Recreation Management on Water Resources

Five SRMAs would be allocated in the Lower Sonoran under Alternative C. Total acres designated would be about 139,500 less than Alternative B. Managing recreation use areas for a balance between motorized and nonmotorized uses would decrease the likelihood of increasing runoff, and sedimentation by trampling, rutting, and erosion. Alternative C, would have SRMAs with a larger proportion of acres in the back country RMZ (423,100 acres) compared to community interface (19,900 acres) and front country (186,300 acres). Compared to Alternative B, this is an increase of 75,900 acres in back country, which focus on providing for nonmotorized, dispersed activities. Reduced motorized travel within dry washes and on sensitive soils would decrease the likelihood of altering surface flow, exacerbating bank erosion, damaging xeroriparian vegetation, increasing sedimentation, and introducing potential contaminants into ground water compared to Alternatives A and B. Proposed management actions in the Gila Bend Mountains RMZ to restore natural conditions of disturbed areas greater than 2 acres will reduce the impacts on water resources in these areas by increasing cover and reducing the risk of accelerated erosion from

roads and campgrounds. The overall impact of Alternative C recreation management in the will be minor, assuming planned road and campground maintenance actions are effectively implemented.

As under Alternative B, potential development of water resources for recreation purposes would have negligible impact on surface and ground water resources.

From Special Designations on Water Resources

Under Alternative C, designation of the Coffeepot ACEC in the Lower Sonoran would be expanded to the Coffeepot-Batamote ACEC covering 63,300 acres. Management decisions to avoid all surface disturbing activities including utility-scale renewable energy development, to prohibit routes within washes, and to close washes with suitable cactus ferruginous pygmy-owl habitat to mineral material sales would have positive impacts on watershed conditions. Compared to Alternative A, the positive impacts on water from Alternative C would be greater due to the increase in the area managed with ACEC protection by a factor of four. Impacts would be minor.

From Travel Management on Water Resources

A decision to allocate OHV areas similar to Alt B with the omission of the 40 acres Open area would have the same effects with exception of the effects from the open area. The 40 acres would have designated routes, which would have a minor effect on water resources by having a limited number of wash bank disturbances. Comparative to Alt A, the decisions to allocate most areas to Limited to Designated Routes would have the same effect as Alt B, impacting xeroriparian and riparian areas minorly through less use of washes as travel routes.

Alternative C would include a framework for vehicle and travel management that should, over time, decrease the affects of vehicle use on water resources compared to Alternative A.

Alternative C has 319 more miles of closed routes and 132 more miles of seasonally closed roads and roads closed to public use than Alternative A. Many miles of those closures are to enhance lands managed to protect wilderness characteristics and to protect wildlife habitat management areas in the Gila Bend Mountains and in the Ajo area. Other closures are in designated wilderness areas and in the area around the Painted Rocks Campground. These closures will reduce the impacts on soils, particularly on the sensitive areas of desert pavement and cryptobiotic crust that are common in undisturbed areas of the Ajo Block. Reduced soil impacts would result in reduced water resource impacts, particularly runoff and sedimentation. Reductions in rutting, surface and vegetation disturbance and water erosion will occur wherever routes are closed. In specific areas of concentrated road closures, impacts on water resources will decline from moderate to minor. However, even with the 18 percent reduction in road miles in Alternative C compared to Alternative A, the overall impact of travel on water resource conditions in the Lower Sonoran will remain minor. The probability that storm water runoff will be concentrated on un-surfaced roads, resulting in erosion on and off the road and sediment delivery to stream channels remains relatively high.

Alternative C includes plans for 25 miles of new roads, which will have a negligible impact.

In terms of water resources indicators the total miles of roads within washes decreases to 89 miles, a 40 percent decrease from Alternative A and a 13 percent decrease from Alternative B. The number of wash crossings decreases to 820, a 21 percent decrease from Alternative A and a 10 percent decrease from Alternative B. The number of miles of roads within close

proximity to streams decreases to 218 miles, a 29 percent decrease from Alternative A and a 13 percent decrease from Alternative B. The net effect is a minor reduction in impacts from both Alternatives A and B and a continued minor impact on water resources overall due to the distance from intermittent or perennial water sources.

From Vegetation Resources on Water Resources

Objectives, management actions, and impact under Alternative C would be the same as Alternative B.

4.10.5.2. Sonoran Desert National Monument

From Air Quality Management on Water Resources

Impacts from air quality management under Alternative C would be the same as those under Alternative A.

From Lands & Realty on Water Resources

In the SDNM, two multiuse utility corridors would be designated under Alternative C. The watershed disturbance associated with constructing underground utility corridors is greater than that associated with above ground utility corridors due to potential for disrupting natural drainage patterns and increased soil disturbance, which would increase erosion and sedimentation. The smaller number of utility corridors reduces the total area of disturbance. The net effect would be a negligible decrease in adverse watershed impacts from Alternative C as compared to Alternatives A or C. Prohibitions on new communication sites within the SDNM would limit the potential for construction of these sites to adversely affect watershed conditions. Impacts could range from negligible to moderate.

From Livestock Grazing on Water Resources

Impacts would be the same as those described in Alternative A for the area south of I-8. Impacts for the area north of I-8 would be similar to Alternative A, except that ephemeral grazing allowed in Alternative A would not occur in C. Eliminating grazing of ephemeral forage species would permit litter from these species to accumulate at greater rates than alternatives that permit ephemeral grazing. Increased vegetative litter would provide for greater ground cover for erosion protection and greater water holding capacity: however, it could lead to increased fuel loads, and the associated increased risk of wildfire. The net effect would be a negligible beneficial impact on runoff, erosion, and sedimentation from this alternative as compared with Alternative A. Adverse impacts on water resources from Alternative C would be negligibly greater than Alternative B due to the greater volume of perennial forage grazed in Alternative C.

From Minerals Management on Water Resources

In SDNM, impacts from mining would be the same as for Alternative A.

From Recreation Management on Water Resources

The entire SDNM is an SRMA consisting of the Desert back country RMZ and the Anza and Lower Gila Historic Trails RMZ. Although the Anza Trail is likely to attract increased visitation, two-thirds of that RMZ and nearly 90 percent of the Desert back country RMZ will be managed for undeveloped recreation activity. The undeveloped recreation includes four-wheel drive touring, which would have characteristic impacts on water resources. Overall, the impacts of Monument recreation are expected to be minor.

Groups will be limited in size and competitive motor sports will not be allowed. These management actions will reduce damage to the unsurfaced road prism, and reduce the risk of impacts from storm water runoff and erosion from the roads on nearby washes. These positive impacts will offset the minor impacts that could be caused by increased recreational activity.

From Special Designations on Water Resources

No special designations are planned for the SDNM under Alternative C. The impact of the removal of Vekol Valley Grassland ACEC designation would be the same as the impact of the same action in Alternative B.

From Travel Management on Water Resources

Decisions to allocate OHV areas the same acreages as Alt B, would have the same effects as Alt B. There would likely be less impact to sedimentation of water resources as a result of fewer open routes, however, additional engineering, possibly including the use of dust suppressants to minimize effects to air quality and visual resources and accommodate higher use on fewer routes could offset these impact improvements. For this reason, impacts are still assessed at minor.

In terms of the water resources indicators, the number of miles of roads within washes decreases to 30 miles under Alternative C. This decrease represents a 33 percent decrease from Alternative A and a 24 percent decrease from Alternative B. The number of wash crossings would decrease to 285, a 13 percent decrease from both Alternatives A and B. The number of miles of roads within close proximity to streams decreases to 90 miles, a 21 percent decrease from Alternative A and a 15 percent decrease from Alternative B. These impacts represent a minor decrease from Alternatives A and B and an overall minor impact on water resources due to the widespread nature of the impact.

Approximately 175 miles of roads would be closed in the Monument under this alternative. This represents about 28 percent of the roads in the Monument. Recovery of watershed conditions over time on these routes would have a minor beneficial impact on water resources due to reduced runoff, erosion, and sedimentation in local washes.

4.10.6. ALTERNATIVE D

4.10.6.1. Lower Sonoran

From Air Quality Management on Water Resources

Impacts from air quality management under Alternative D would be the same as those under Alternative A.

From Lands & Realty on Water Resources

The number of multiuse corridors would be reduced from ten in Alterative A to seven in Alternative D. The impacts would be minor, assuming BMPs for mitigating corridor impacts are implemented. Development of utility-scale renewable energy would be prohibited on 788,600 acres of excluded and high sensitivity areas in this alternative, more than any other alternative. Potential surface disturbance from utility-scale renewable energy development and potential ground water impacts would be less than other alternatives.

Approximately 26,200 acres are available for disposal under Alternative D. If disposal of all available land occurred, the impact could be similar to that described under Alternative A. Although land disposal itself has a negligible impact on water resources, the maximum potential impact from future development could be minor in terms of surface disturbance due to the small number of acres affected but potentially moderate in terms of groundwater impacts if developments such as solar energy facilities are constructed. Potential impacts would be assessed on a proposal specific basis.

From Livestock Grazing on Water Resources

Under Alternative D, all public lands within the Lower Sonoran would be closed to grazing, therefore impacts would be negligible. Eliminating grazing would reduce impacts to water resources by reducing surface disturbance and allowing ground cover to improve through increased canopy cover of perennial vegetation and by allowing litter from both perennial and ephemeral forage species to increase. Accumulation of litter would increase water holding capacity and improve infiltration. Areas of compacted surfaces would break down over time due to mechanical and biological activity, also providing for improved infiltration. The net effect on water resources would be a minor beneficial effect and a minor improvement over impacts from Alternatives A, B and C.

From Minerals Management on Water Resources

More areas would be excluded from mineral development under this alternative than any of the other alternatives. Excluding these areas would reduce the potential for minerals-related impacts on water resources more than any other alternative. Overall, impacts would be negligible to minor. Potential impacts from mineral development would depend on the development proposal and would be assessed on a site specific basis.

From Priority Wildlife Species and Habitat Management on Water Resources

Surface disturbing activities would be excluded from the Gila Bend Mountains Wildlife Habitat Area, Pronghorn Antelope habitat, Category I, II, and III desert tortoise habitat, and wildlife movement corridors. These exclusions would have a minor beneficial effect on water resources by allowing for recovery of vegetative ground cover in previously disturbed areas and by preventing future disturbance. This alternative is a minor improvement in water resource effects over those in Alternative A.

From Recreation Management on Water Resources

Recreation allocations in Alternative D would include establishing two SRMAs; the Buckeye Hills and Lower Gila Historic Trails. The effects of SRMAs on water resources are dependent on the proposed recreation uses and are described in Alternative A. Extent of the impacts from SRMAs in Alternative D are reduced from those in Alternative A, due to fewer acres of SRMAs and a different recreational opportunity emphasis. Recreational use in the Buckeye Hills SRMA would emphasize nonmotorized recreation opportunities in the Buckeye Hills East RMZ and dispersed recreational opportunities in the Buckeye Hills West RMZ. Reduced emphasis on facility development and motorized recreation would result in reduced water resource impacts from those in Alternatives A, B, C, and E.

Recreational use of the Lower Gila Historic Trails SRMA would emphasize a greater level of development and more extensive motorized travel than the Buckeye Hills SRMA. Management of this SRMA would be similar to management under the other alternatives and impacts would be similar. Increased development of facilities at this site would result in negligible increases in runoff, erosion and sedimentation. Management of other recreational activities in the Lower Sonoran would be similar to other alternatives. Management decisions intended to control motorized vehicle use, manage vehicle-based camping and recreational target shooting, and other intensive recreation uses, would help to mitigate impacts to water resources. Impacts would be negligible to minor.

From Special Designations on Water Resources

A total of 263,700 acres would be included in four areas designated as ACECs: Saddle Mountain, Coffeepot-Batamote, Cuerda de Lena, and r Gila Terraces and Historic Trails . Management decisions that limit motorized travel, surface disturbing activities, mineral development, utility-scale renewable energy development, and developed recreation sites in some or all of these areas will have positive impacts on watershed conditions.

From Travel Management on Water Resources

Decisions to allocate significantly more acres to the Closed OHV area designation would have the effect of eliminating current and future impacts on xeroriparian and riparian areas within these areas. Assuming areas and roads would be properly closed to achieve the potential, effects to water resources would be moderate due to 267,600 more acres closed to motor vehicle use, a primary cause of vegetation loss in washes. 40 acres would not be allocated to open use, therefore the effects would be the same as state in Alt C where this area is allocated to Limited to Designated Routes.

Alternative D has 777 miles of closed routes, 762 more miles of closed routes than Alternative A and substantially more than any of the other action alternatives. 799 miles of routes would remain open to motorized travel. Some routes would be seasonally closed and some would only be open for administrative access. Many miles of those closures are to enhance lands managed to protect wilderness characteristics and protect wildlife habitat management. These closures will reduce the impacts on water resources. Important reductions in rutting, surface and vegetation disturbance and water erosion will occur wherever routes are closed. In those specific areas where the road closures are concentrated, the impact on water resources will decline from moderate to minor. Alternative D includes plans for only 1 mile of new roads, which will be a negligible impact. Designation of routes in most areas should decrease OHV impacts over time by decreasing uncontrolled road proliferation.

Motorized travel within dry washes can destabilize banks, particularly where vehicles enter and exit the washes, damage xeroriparian vegetation, and introduce potential contaminants into the channels of these washes which are important groundwater recharge areas. In terms of the water resources indicators, the number of miles of roads within washes decreases to 17 miles under Alternative D. This decrease represents a 91 percent decrease from Alternative A and an 84 percent decrease from Alternative C. The number of wash crossings decreases to 531, a 49 percent decrease from both Alternatives A and a 35 percent decrease from Alternative C. The number of miles of roads within close proximity to streams decreases to 96 miles, a 69 percent decrease from Alternative A and a 55 percent decrease from Alternative C. These impacts represent a minor decrease from Alternatives A and C and an overall minor impact on water resources due to the reduction in the widespread nature of the impact

From Vegetation Resources on Water Resources

Vegetation treatments implemented to progress towards achievement of land health standards would benefit watershed conditions by providing appropriate cover levels to protect soils from water erosion and ensuring sufficient bank and floodplain vegetation is present along desert washes (Xeroriparian community) to provide for hydrologic function of the sites. Excluding surface disturbing activities within occupied acuna pineapple cactus habitat, and the habitat area of any threatened or special status species, would have positive impacts on watershed conditions in these areas. Impacts would be negligible to minor.

4.10.6.2. Sonoran Desert National Monument

From Air Quality Management on Water Resources

Impacts from air quality management under Alternative D would be the same as those under Alternative A.

From Lands & Realty on Water Resources

Multiuse utility corridors would not be permitted in the Monument under Alternative D and the entire Monument would be designated as an LUA exclusion area. These decisions result in reduced potential for adverse impacts to water resources under this alternative as compared to other alternatives. Minor benefits to water resource conditions should accrue from potential for reduced surface disturbance. Overall impacts would be negligible.

From Livestock Grazing on Water Resources

Under Alternative D, all public lands within the SDNM would be closed to grazing. Eliminating grazing would reduce impacts to water resources by reducing surface disturbance and allowing ground cover to improve through increased canopy cover of perennial vegetation and by allowing litter from both perennial and ephemeral forage species to increase. Accumulation of litter would increase water holding capacity and improve infiltration. Areas of compacted surfaces would break down over time due to mechanical and biological activity, also providing for improved infiltration. The net effect on water resources would be a minor beneficial effect and a minor improvement over impacts from Alternatives A, B and C. Overall impacts would be negligible.

From Minerals Management on Water Resources

Impacts would be the same as Alternative A except in areas withdrawn from mineral development and disposal due to wildlife considerations. Impacts in those areas would be negligible.

From Recreation Management on Water Resources

The entire Monument area would be designated as an SRMA with an emphasis on an undeveloped back country experience and resource-dependent activities such as hunting, camping, hiking, sightseeing, and four wheel drive touring. The designated motor vehicle system would consist entirely of primitive roads. The reduced level of development emphasized with this alternative would result in fewer water resource impacts than those associated with other alternatives. The net effect would be a small reduction in the adverse effects of surface disturbing activities on runoff, erosion and sedimentation. And a negligible benefit to water resources. Overall impacts would be minor.

From Special Designations on Water Resources

Under Alternative D, designation of the Vekol Valley Grassland ACEC in the SDNM would be removed and vehicle use would be allowed on routes in these areas, which would increase the potential for impacts to water resources in this portion of the SDNM as compared to Alternative A. The overall impacts from special designations in the SDNM in Alternative D would be minor.

From Travel Management on Water Resources

Decisions to allocate OHV areas with almost twice the acres of Closed designation, 310,700acres, as compared to Alt B and C,would have a minor effect on water resources. This would be due to the relative low route density of routes and widespread nature of the impacts. All other areas would be Limited to Designated Routes, which would have the same effects to water resources as described in Alts B and C where routes would be designated.

About 370 miles of motorized routes within the Monument would be closed under Alternative D. This amount is substantially more than the miles of roads closed under the existing conditions or any of the other action alternatives and represents closure of 59 percent of the routes within the Monument. This would be major change from existing conditions in Alternative A and a minor benefit to water resources.

In terms of the water resources indicators the number of miles of roads within washes decreases to 1.4 miles under Alternative D. This decrease represents a 98 percent decrease from Alternative A. The number of wash crossings decreases to 166, a 49 percent decrease from both Alternatives A and B and a 42 percent decrease from Alternative C. The number of miles of roads within close proximity to streams decreases to 31 miles, a 73 percent decrease from Alternative A and a 66 percent decrease from Alternative C. These impacts represent a moderate decrease from Alternatives A and C and an overall minor impact on water resources, such as runoff, erosion and sedimentation, due to the reduction in the widespread nature of the impacts.

Closure of 370 miles of currently open routes in this alternative represents more than 58 percent of the road mileage within the Monument and reduces water resource impacts more than any of the other alternatives.

4.10.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.10.7.1. Lower Sonoran

From Air Quality Management on Water Resources

Impacts from air quality management under Alternative E would be the same as those under Alternative A.

From Lands & Realty on Water Resources

Impacts on water resources from land tenure changes could be somewhat greater than Alternative A due to a larger number of acres available for disposal (36,800 acres versus 18,900 acres). Impacts would depend on development occurring on the transferred lands but potential for surface disturbance and water resource development would be greater. Lands available for disposal are less than 3 percent of the Decision Area. Overall potential for water resource impacts would be minor.

Impacts due to land use authorizations are essentially the same as Alternative C. LUA exclusion areas are nearly the same in total acreage. Compared to Alternative A, the impacts are positive, since surface disturbance associated with LUAs, would occur on about 137,300 fewer acres. The use of existing utility corridors would remain essentially the same, resulting in similar impacts.

Impacts on surface acres from solar energy development is similar to those described in Alternative C. Impacts are positive compared to Alternative A, since Alternative E would have an additional 172,500 acres in areas of high sensitivity, reducing the probable future surface disturbance and potential for ground water development under Alternative E.

From Livestock Grazing on Water Resources

Impacts from grazing on water resources within the Lower Sonoran would be essentially the same as Alternative A.

From Minerals Management on Water Resources

The potential for impacts to water resources from mineral development under Alternative E would be slightly less than under Alternatives A, B, and C due to closing the Saddle Mountain ACEC and areas near petroglyphs in the Gila River Terraces and Southern Historic Trails ACEC to mineral entry, Impacts would be greater than under Alternative D. Potential for impacts from mineral development continues under this alternative but would need to be assessed on a site specific basis. Overall impacts would be negligible to moderate.

From Priority Wildlife Species and Habitat Management on Water Resources

Alternative E would allow for maintenance and redevelopment of existing wildlife waters and development of new ones. It would also provide for removing wildlife waters. Impacts to water resources would be similar to Alternatives A and B. Small amounts of storm water runoff would be impounded and water rights would be necessary for new surface water developments.

Well permits would be required for ground water development. Net effect on water resources would be negligible.

From Recreation Management on Water Resources

The impacts on water resources of recreation management under Alternative E would be similar to the impacts analyzed under Alternative B although two SRMAs designated under Alternative B would not be designated in Alternative E. This could provide a minor positive impact under E, since less recreational activity would probably occur in the 48,100 acres in these SRMAs. One of the SRMAs, the San Tan Mountains SRMA, is relatively close to an urban area and would be likely to attract more use under Alternative B than E. The result for Alternative E would be reduced surface disturbance and less damage to vegetation. This would limit the increase in bare soil and water erosion. However, even as an ERMA, some use would occur, so the differences in impacts would be negligible. Limiting the San Tan Mountains SRMA to nonmotorized use would also minimize the differences between Alternatives B and E.

Some additional differences in management between Alternatives B and E also are proposed. Alternative E camping stay lengths and infrastructure would be more limited, possibly resulting in less soil compaction, vegetation and soil surface damage, and damage to banks and xeroriparian vegetation in adjacent Gunsight Wash, resulting in less runoff, erosion and sedimentation into the wash. This would be a negligible positive impact of Alternative E.

Differences in impacts from management under Alternatives B and E in the Buckeye Hills SRMA would be negligible.

From Special Designations on Water Resources

Alternative E proposes 247,400 acres for ACEC designation. Areas and designations are similar to Alternative D although limitations on disturbance in Alternative E are slightly less restrictive than those in Alternative D. Alternative E would create minor positive impacts on water resources due to limitations on surface disturbing activities and motorized travel. Net water resources impacts would be less than those in Alternative A. Overall impacts would be negligible.

From Travel Management on Water Resources

Decisions to allocate OHV areas in this alternative would have effects most similar to Alternatives B and C. A 40 acre Open area would be designated, having the same effects as Alt B. OHV Closed areas would be 152,800 acres, having the same effects as Alternatives B and C, just on more land. This additional land is mostly unroaded and functions well hydologically, however, and the effects to water resources would be negligible as a result.

In terms of the water resources indicators the number of miles of roads within washes increases from Alternative D to 111 miles under Alternative E. This change represents a 39 percent decrease from Alternative A, greater than a fivefold increase from Alternative D, a small decrease from Alternative B and an impact similar to Alternative C. The number of wash crossings increases from Alternative D to 818 in Alternative E. This change represents a 21 percent decrease from Alternative A, a 35 percent increase from Alternative D, and an impact similar to Alternative C. The number of miles of roads within close proximity to streams increases from Alternative D to 222 miles in Alternative E. This change represents a 28 percent decrease from Alternative A, more than double the road mileage from Alternative D and an impact similar to Alternative C.

These impacts represent a minor decrease from Alternatives A and an overall moderate impact on water resources due to the widespread nature of the impacts.

From Vegetation Resources on Water Resources

Impacts would be similar to Alternatives B, C, and D.

4.10.7.2. Sonoran Desert National Monument

From Air Quality Management on Water Resources

Impacts from air quality management under Alternative E would be the same as those under Alternative A.

From Lands & Realty on Water Resources

Impacts on water resources from use authorizations under Alternative E would be less than Alternative A because the SDNM would be a LUA exclusion area except in established corridors. Impacts would be essentially the same as those described in Alternative C and would be negligible.

From Livestock Grazing on Water Resources

Grazing impacts on water resources would be the same as Alternative A.

From Minerals Management on Water Resources

Impacts from mineral development in the SDNM would be the same as under Alternative A, except in areas withdrawn from mineral development and disposal due to wildlife considerations. Impacts in those areas would be negligible.

From Recreation Management on Water Resources

The entire SDMN will be managed as an SRMA under all action alternatives. Under Alternative A only about ¼ of the Monument would be an SRMA. Under Alternative E, most of the Decision Area would be managed as back country, which means undeveloped recreational activity. Impacts to water resources would be negligible, and similar to the other action alternatives. Impacts are positive compared to Alternative A.

From Special Designations on Water Resources

Impacts from special designations and the removal of the Vekol Valley Grassland ACECin the SDNM would be the same as the other action alternatives.

From Travel Management on Water Resources

Decisions to allocate OHV areas the same as Alt B would have similar effects as Alt B. Differences to the magnitude of the impacts under this alternative would be comparative to the number of wash crossings and miles of routes that would be designated for use. Effects would

be minor due to the low route density adding and addition of earthen drainage structures to help reduce concentrated flow and sedimentation.

In terms of the water resources indicators the number of miles of roads within washes increases from Alternative D to 16 miles under Alternative E. This change represents a 64 percent decrease from Alternative A, greater than a six fold increase from Alternative D, a 53 percent decrease from Alternative B and a 47 percent decrease from Alternative C. The number of wash crossings increases from Alternative D to 251 in Alternative E. This change represents a 23 percent decrease from both Alternatives A and B, a 34 percent increase from Alternative D, and a 12 percent decrease from Alternative C. The number of miles of roads within close proximity to streams increases from Alternative D to 78 miles in Alternative E. This change represents a 32 percent decrease from Alternative A, more than double the road mileage from Alternative D and a 13 percent decrease from Alternative C. These impacts represent a minor decrease from Alternatives A and an overall moderate impact on water resources due to the widespread nature of the impacts.

4.11. Impacts on Wild Horse & Burro Management

Currently, there are no herd management areas (HMAs) within the Planning Area. In 1971, the BLM classified the Painted Rocks Area as a herd area (HA) where, before 1971, wild horses and burros could have existed. The BLM currently manages this area with a “zero burro population.” This decision to remove/relocate all of the existing burros to a “zero burro population” within this HA was based on conflicts in the area with private landowners, agricultural interests, wildlife such as bighorn sheep, and other resources, and a lack of water available to wild burros on public lands. A “zero burro population” required the BLM to remove all the burros from this herd area. Funding, however, was not provided and all of the burros have not yet been removed. Nuisance burros have been removed on a case-by-case basis.

Due to the fact that the intent of the existing decisions and proposed alternative decision is to remove all wild horse or burros from the Painted Rocks Herd Area, any impacts from other program areas on these wild horses and burros would be negligible; therefore, impacts from other resources will not be discussed in detail.

4.12. IMPACTS ON WILDERNESS CHARACTERISTICS

4.12.1. METHODS OF ANALYSIS

Wilderness characteristics are influenced by a number of land and resource uses. Principally, they are influenced by the following actions occurring on the landscape over the life of the plan.

- Proximity of motorized travel corridors,
- Volume and type of traffic on travel corridors,
- Quantity and type of recreational users,
- Number, magnitude and location of mining actions,
- Number, size and location of ROWs and other land use authorizations.

Noise and the evidence from motorized travel can degrade solitude, motorized intrusions can cause surface disturbances that impact naturalness, and both types of impacts can reduce opportunities for primitive, unconfined recreation. Mining and LUAs sometimes result in large-scale impacts with long-term surface disturbance or permanent installations. New roads and transportation corridors can be proposed by communities and other land users. To a lesser extent, range and wildlife management projects can affect areas with wilderness characteristics. These impacts normally come from installation, maintenance, and use of range and wildlife catchments.

The analysis of potential impacts to wilderness characteristics considers wildlife habitat boundaries, range and wildlife developments, wilderness characteristic boundaries, transportation inventories and designations, ecological zones, vegetation types, and known historical and cultural sites. In the absence of data, analyses were based on the knowledge base of local planners. In the absence of quantifiable data, professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate.

Of the resource management elements to be addressed by the Lower Sonoran and SDNM RMP, air resources, priority wildlife species and habitat, vegetation resources, cultural and heritage resources, visual resources, minerals management, livestock grazing management, recreation management, lands and realty management, travel management, and special designations would impact wilderness characteristics the most directly. They are discussed below.

4.12.1.1. Indicators

Impacts on wilderness characteristics result from actions that maintain, enhance, or diminish the amount, distribution, and quality of the wilderness resource indicators. Wilderness characteristic indicators include the following:

- The extent, location, distribution, and quality of naturalness and natural conditions in the landscape. Naturalness is affected by surface disturbing activities and associated human uses and developments.
- Opportunities for the maintenance, enhancement, or diminishment of solitude and primitive, unconfined recreation. Opportunities for solitude are impacted by the sights and sounds of, or evidence of, other human beings and human activities. Opportunities for primitive,

unconfined recreation are affected by the presence of motorized activities and the availability, or non-availability, of landscapes conducive for such activities.

4.12.1.2. Assumptions

The following assumptions regarding the future management of wilderness characteristics are made:

- All guidelines for the maintenance of wilderness characteristics as identified in this document would be followed to the extent allowed by existing budget and available personnel.
- Any new surface disturbing activities proposed would be subject to NEPA analysis. Proposed activities that would not initially meet wilderness characteristic objectives for the area would be mitigated to the extent needed to meet the objectives.
- Uses and activities occurring both inside and outside these lands could influence wilderness characteristics, though such influences would generally be indirect.
- Impact analysis on lands managed to protect wilderness characteristics described under Alternative D are based on the assumption that all the lands contain wilderness characteristics, including all lands included in the citizen's proposal. It may not necessarily be the case, based on BLM's knowledge of the Planning Area, that the entire citizen's proposal addressed in Alternative D contains wilderness characteristics as defined in Section 2(c) of the Wilderness Act. Attributes are defined in Section 2(c) of the Wilderness Act including the area's size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation.

4.12.1.3. Program Areas with No Impacts on Wilderness Characteristics

There would be no impacts on wilderness characteristics from actions proposed under the following programs:

- Cave Resources,
- Paleontological Resources,
- Water Resources,
- Wild Horse and Burro Management.

4.12.1.4. Qualitative Intensity Scale

The intensities of impacts are the same as those described in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375).

The following analysis also considers a management action's potential to cause changes to a landscape that could alter naturalness, and maintain, reduce or enhance opportunities for solitude and opportunities for primitive, unconfined recreation. The terms "localized," "site-specific," and "landscape level" denote the extent to which impacts could occur. Site-specific impacts are generally small and described geographically when possible. Landscape-level impacts generally occur on a broad scale and affect large areas, such as the entire Monument.

4.12.2. COMMON TO ALL ALTERNATIVES

Some management decisions for elements of lands and realty management, wildlife and habitat resource management, minerals management, water resources, and wildland fire management are common to all action alternatives.

4.12.2.1. Both Decision Areas

From Lands & Realty on Wilderness Characteristics

No areas exhibiting wilderness characteristics have been identified for disposal under any of the action alternatives. There are no impacts on wilderness characteristics.

Acquiring land or mineral estate could increase the potential for protecting naturalness, opportunities for solitude, and opportunities for primitive, unconfined recreation in those areas exhibiting wilderness characteristics. In addition, acquiring land or mineral estate could provide indirect protection of wilderness characteristics because naturalness, and opportunities for solitude and primitive, unconfined recreation could be considered before land use authorizations and permits were granted for access or mineral extraction.

From Hazardous Materials & Public Safety on Wilderness Characteristics

Hazardous materials and solid waste issues occur on occasion within the Decision Areas. Containment and clean-up of these materials often involves the use of vehicles and equipment in surface disturbing activities. Wilderness characteristics would be impacted by the sights and sounds and associated damage of vehicle movements and removal of contaminated soils. With appropriate restoration and mitigation, these impacts would typically be temporary, and naturalness could be restored; however, some impacts could cause long-term degradation of naturalness. Overall, these impacts would be considered negligible as hazardous materials and solid waste issues are uncommon in these remote, roadless areas.

From Soil Resources on Wilderness Characteristics

Maintaining and improving soil cover and productivity could promote, to a minor degree, retention of naturalness by preventing erosion of soils. Naturalness would be retained to the extent that native plant communities are protected from direct mortality or indirect harmed due to invasive plants.

Management actions associated with fire, lands and realty, mineral development, wildlife projects, recreation uses, OHV travel, and damage or removal of vegetation would have moderate impacts, mainly through a failure to maintain plant communities or through degraded soil coverage and productivity in the Decision Areas. These actions also would fail to promote the retention of natural conditions due to increased erosion, loss of plant cover, a potential increase in invasive species, or localized loss of plant and ecological community diversity.

From Wildland Fire Management on Wilderness Characteristics

Wilderness characteristics could potentially be diminished, degraded, or lost altogether due to issues with fire and fuels management, but these impacts do not vary substantially by alternative. Fires destroy vegetation, which impacts the naturalness of an area and may allow soil erosion to damage or destroy areas. Fire suppression activities also impact wilderness characteristics such as naturalness and solitude when heavy earth-moving equipment and vehicles are used to cut fire lines. Fire-line scars can last for decades, even with reclamation. The use of fire retardants also can stain rocks and soils for up to a decade. Additionally, fire suppression activities could result in diminished naturalness and opportunities for solitude over the short term in localized areas.

Furthermore, burned landscapes denuded of vegetation are easily invaded by opportunistic, non-native invasive plants and weeds like buffelgrass. This is a potentially severe and permanent impact if Sonoran Desert fires convert fire-intolerant native desert habitats to non-native fire-tolerant grasslands. In summary, all the actions described can degrade or diminish naturalness over the long term and are considered major both in scope, scale and severity.

On the other hand, effective fire suppression can limit potential disturbances. Quick suppression action by by ground and air-based fire fighting organizations can minimize or eliminate the potential for adverse long-term effects of fire, including consequences on naturalness associated with large-scale mechanized fire fighting and the severe long-term potential for non-native ecosystem conversion. Overall, impacts would be negligible to major.

4.12.2.2. Lower Sonoran

From Recreation Management on Wilderness Characteristics

Providing signs for visitor information, regulations, or interpretation could diminish naturalness in localized areas. The provision of signs for visitor information, regulations, and interpretation can reduce naturalness in localized areas by increasing the appearance of structures in localized areas. However, it is likely that signs or facilities would be located near roads or access points, where the magnitude of such intrusions would be negligible.

Allowing dispersed, nonmotorized camping throughout the Lower Sonoran and SDNM would promote the retention of wilderness characteristics by providing opportunities for primitive, unconfined recreation.

Dispersed recreational target shooting throughout Lower Sonoran could contribute to a loss or impairment of naturalness and opportunities for solitude and primitive recreation. Mostly these impacts would accrue on the perimeter of wilderness characteristic areas along roads due to profuse shooter refuse (e.g., spent shells, targets, trash), destroyed or damaged vegetation and rock outcrops, and the unavoidable sound of gunfire. The sound of gunfire potentially impacts the largest land area with effects on naturalness being highly localized. Sound effects vary greatly based on distance and intensity and is influenced by the size and design of the firearm, terrain features, and weather.

4.12.2.3. Sonoran Desert National Monument

From Minerals Management on Wilderness Characteristics

There are 8,300 acres of non-Federal mineral estate overlapping areas with wilderness characteristics within the SDNM. Developing and mining these valid existing rights would entail disturbing the land surface and building roads for access and extraction activities. Use of Federal surface rights during development of state minerals would impact wilderness characteristics through the long-term loss of naturalness, both on the parcel itself and on surrounding public lands. The related sights and sounds of mining activity would degrade or eliminate opportunities for solitude and primitive, unconfined recreation on affected parcels. Mitigation strategies could be identified through discussions with the State of Arizona. Impacts also could be mitigated through Federal purchase of the State mineral estate. Consequently, impacts from potential development of state mineral estate would be considered negligible to moderate over both the short and long-term.

The likelihood of State minerals ownership being developed within the SDNM is considered extremely low as no such applications have ever been presented. As a result, impacts from potential development of State minerals would be unlikely and negligible over both the short and long-term. Consequently, State mineral ownership in the SDNM will not be discussed further in this analysis.

From Livestock Grazing on Wilderness Characteristics

The continued closure of grazing allotments south of I-8 would help maintain or enhance naturalness and opportunities for solitude and primitive, unconfined recreation over the long term. Impacts would be negligible.

From Recreation Management on Wilderness Characteristics

Providing signs for visitor information, regulations, or interpretation could diminish naturalness in localized areas. The provision of signs for visitor information, regulations, or interpretation could reduce naturalness in localized areas by increasing the appearance of structures. However, it is likely that signs or facilities would be located near roads or access points, where the magnitude of such intrusions would be negligible.

Allowing dispersed; nonmotorized camping throughout the Lower Sonoran and SDNM would promote wilderness characteristics by providing opportunities for primitive, unconfined recreation.

4.12.3. ALTERNATIVE A (NO ACTION)

No part of the Lower Sonoran or SDNM Decision Areas are allocated to lands managed to protect wilderness characteristics under Alternative A; however, other decisions of this alternative could impact the baseline conditions that support existing wilderness characteristics. Therefore, analysis of these potential impacts is focused on the likelihood that management decisions under Alternative A would affect these baseline conditions. Wilderness characteristics could be maintained under Alternative A, but this outcome would be an incidental byproduct of management actions implemented for other purposes.

Although some individual proposed decisions would act to maintain wilderness characteristics, the overall effect of Alternative A would be minor to moderate reductions in the extent, distribution, and quality of wilderness characteristics. The degrees of naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would decline over the expected life of the RMP.

This reduction would occur principally because Alternative A would not specifically establish lands managed to protect wilderness characteristics . Wilderness characteristics could be expected to degrade over time, principally from incremental impacts that would occur as consequences of:

- Allowing motorized land uses, mineral sales and leases, ROWs and other land use authorizations that are incompatible with maintaining wilderness characteristics;
- Generally managing affected areas without adequate resource allocations or special designations that, although established for other purposes, also would have the incidental effect of helping to maintain wilderness characteristics;
- Rapidly increasing demands for access to and use of public lands for multiple purposes that are projected to occur in the Decision Area, largely due to the region's population and development growth.

4.12.3.1. Both Decision Areas

From Cultural and Heritage Resources on Wilderness Characteristics

Although cultural and heritage resources are not included as primary attributes contributing to wilderness characteristics, future site development for public interpretive and educational purposes, excavation for scientific study, and similar activities may have negligible to minor effects on wilderness characteristics. Difficulty of access would relegate most site development or interpretation to the periphery of such areas. Impacts would be negligible.

4.12.3.2. Lower Sonoran

From Air Quality on Wilderness Characteristics

The use of motorized vehicles on paved and unpaved roads results in emissions of particulate matter and of CO, NO2, volatile organic compounds, and SO2 from the combustion of fuel. Under Alternative A, no specific measures are planned to control fugitive dust emissions that exceed regulatory limits, such as by lowering speed limits, using dust suppressants, reducing vehicle use intensity or duration, reducing route density, or considering temporary, seasonal, or permanent route closures. Instead, these measures would be taken on a case-by-case basis as problems are identified, which generally is not as effective as a proactive approach. Projected population growth is expected to result in increased use of motorized vehicles, potentially resulting in minor to moderate long-term impacts to naturalness through deteriorated air quality.

From Lands & Realty on Wilderness Characteristics

Utility corridors under Alternative A would be designated along the borders of the Batamote Mountains area of the Ajo Block and in the Saddle Mountain area. These corridors, if utilized, could have moderate impacts on naturalness along the extremities of wilderness characteristic areas. Impacts would accrue mainly through direct, long-term surface disturbances and indirect, residual impacts to visual resources. Up to 16,000 acres of areas exhibiting wilderness characteristics could be impaired or foregone over the long-term under full utilization of the utility corridors. Elsewhere, utility corridors would have negligible to minor effects on wilderness characteristic areas.

Eight to ten new solar energy plants of 8,000 to 10,000 acres each are expected to be constructed in the first 5 years of the plan, with one or two additional plants constructed every 5 years over the life of the plan. In addition, there will be an increase of requests for transmission lines and access for operations and maintenance of the solar farms. Naturalness and opportunities for solitude and primitive, unconfined recreation could be subject to major impacts, potentially completely foregone. Over the life of the plan, up to an estimated 21,500 acres known to have wilderness characteristics would be exposed to major impacts from energy development. These impacts would be located in the lower elevations of the Gila Bend Mountains and Saddle Mountain, with the effects mainly occurring on the lower desert plains and bajadas (areas with 5 percent elevation slope or less). These slopes are suitable for solar installations, utility infrastructure, and transportation alignments.

Transportation-corridor demand will increase with regional population growth over the life of the plan. Transportation corridors could be sited anywhere, as indicated by regional transportation planning over the preceding 10 years. Permanent transportation and associated LUA corridors could cause major to moderate degradation of wilderness characteristics. These impacts would mainly be found in the Gila Bend Mountains and Saddle Mountain areas, with road corridors sited in less mountainous terrain and often overlapping on lands subject to the solar and energy developments described previously.

From Livestock Grazing on Wilderness Characteristics

Efforts to minimize livestock impacts on rare plant and desert tortoise habitats could result in localized and moderate degradation of naturalness to the extent that livestock waters are moved to new areas where no manmade structures exist.

Indirect and moderate impacts on naturalness could result where livestock congregate around water sources, corrals, staging areas, or fence lines, leading to erosion, trampling, impairment of scenery and vistas, dust emissions, and damage to the plant communities. Conversely, naturalness in and around rare plant and desert tortoise habitats could be indirectly enhanced if livestock waters were modified or moved from such areas. This would result in a moderate, but localized, improvement in naturalness.

Implementation-level decisions that would increase the number or density of fences, livestock waters, or corrals could result in reduced naturalness where these livestock management structures are obvious features within the landscape.

Efforts to minimize livestock impacts on plants by moving or replacing livestock watering sites could result in localized degradation of naturalness in those areas where watering sites appear. However, naturalness could be partially restored from this action where livestock watering sites are removed.

Continuing the current livestock program could have localized impacts on naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. Taken as a whole, however, current-grazing regimes would not detract from nor greatly alter currently inventoried and documented wilderness characteristics over the life of the plan. Landscapes like Saddle Mountain and Face Mountain, documented to have wilderness characteristics in 1980, still retain wilderness character at the same or even greater levels today, after an additional 30 years of livestock grazing.

Localized impacts could occur with potential minor to moderate effects due to: (1) livestock-use adjustments with increased or fewer animals; (2) changes to grazing management systems; (3) potentially large ephemeral turnouts causing short-term impacts on naturalness and loss of solitude and primitive recreation opportunities from trail-cutting and damage to vegetation by livestock and cattle waste; and (4) construction or abandonment of rangeland developments. Such actions would degrade or enhance naturalness and opportunities for solitude and primitive, unconfined recreation.

From Minerals Management on Wilderness Characteristics

About 12,700 acres of state mineral rights overlap with Lower Sonoran areas known to have wilderness characteristics. Developing and mining these valid existing rights would entail disturbing the land surface and building roads for access and extraction activities. The use of Federal surface rights during development of state minerals would impact wilderness characteristics through the long-term loss of naturalness, both on the parcel itself and on surrounding public lands. The related sights and sounds of mining activity would degrade or eliminate opportunities for solitude and primitive, unconfined recreation on affected parcels. Impacts could be mitigated using strategies determined jointly with the State of Arizona or through Federal purchase of the mineral estate. The likelihood of State mineral ownership being developed is considered low to moderate in the Lower Sonoran. Consequently, impacts from potential development of State mineral estate would be considered negligible to moderate over both the short and long-term.

Implementation of Alternative A would leave all areas with wilderness characteristics open to entry under the mining laws. Mining claims could be located and minerals extracted, impacting naturalness and the opportunities for solitude and primitive, unconfined recreation. Mining claim location, assessment, and development could have negligible to major impacts on wilderness characteristics, not only from the mining itself, but also from access roads, transport, and increasing public access to remote areas.

It is impracticable to accurately assess impacts from locatable mineral development because these developments are driven by the location of mineral deposits. Accordingly, the loss or impairment of wilderness characteristics is more likely where there is moderate to higher locatable mineral potential, primarily the wilderness characteristic areas in the northern Gila Bend Mountains and Saddle Mountain areas and the central part of the Batamote Mountains. On the other hand, impacts are anticipated to be only minor to negligible, in areas with low locatable mineral potential.

Short- and long- term moderate impacts to wilderness characteristics could result from oil, gas, sodium and geothermal energy leasing; however, the potential for mineral leasing in these areas is low, reducing the likelihood of impacts. Wilderness characteristics in the southern part of Saddle Mountain could be degraded over the southern third of the area if geothermal energy is developed. Between 5,000 and 10,000 acres of wilderness characteristic lands could be subject to minor to moderate impairment from energy development under generous leasing development scenarios for geothermal or oil and gas.

Saleable mineral potential (mainly crushed stone, sand and gravel, decorative rock, granite, volcanic and stone) is present in nearly all of the Gila Bend Mountains, Saddle Mountain, and the Ajo Block (BLM 2004 and 2009).

The number of new mineral pits or quarries that might locate in areas with wilderness characteristics is not known; however, impacts to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would likely have major, long-term impacts in localized areas if they do. Both mountainous, wash, and bajada areas could be affected, depending on location, demand and salable mineral contracts. Over the life of the plan, areas such as Saddle Mountain and the north part of the Gila Bend Mountains and lands located near major county and state roads and communities, would potentially be more subject to mineral sales. Wilderness characteristics in more remote, mountainous interior areas and in the Ajo Block would be less likely to be impacted over the life of the plan.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

The lack of specific decisions intended to protect ecological, biological, soil and water resources would tend to cause the degradation of natural resources over the life of the plan and therefore degrade naturalness. Minor to moderate long-term impacts to naturalness would result from the lack of comprehensive, area wide allocations to protect core areas of wildlife habitat. Constructing facilities in wildlife movement corridors and sensitive habitats, not improving habitat connectivity, and not minimizing physical barriers to movement would impact wilderness characteristics by detracting from naturalness.

Minor long-term contributions to naturalness and primitive recreation may result if populations of native wildlife are maintained at current or enhanced levels. In the Saddle Mountain area, implementation of Alternative A would continue to restrict fencing in bighorn sheep lambing areas but would provide no other measures to protect the naturalness of this area through the protection of core wildlife habitat.

From Recreation Management on Wilderness Characteristics

Because Alternative A would not establish recreation standards and management prescriptions for visitation, facility development, or other recreation-related activities, recreation standards would not be employed to protect or maintain wilderness characteristics. Overall, long-term loss, impairment, or diminishment of wilderness characteristics due to recreation management would be minor to moderate in localized areas, and potentially impact up to 25 percent of wilderness characteristics. On the other hand, about 75 percent of such lands would be managed under compatable ROS classifications, offering protection to wilderness characteristics. These remaining areas would experience negligible to no effects from the absence of wilderness characteristics management emphasis.

Four existing SRMAs (Saddle Mountain, Ajo Trails, Gila Trails, and Sentinel Plain Lava Flow) would continue in the Lower Sonoran under Alternative A, overlapping 203,800 acres known to contain wilderness characteristics. (See Table 4.18, “Acres of Lands with Wilderness Characteristics Within SRMAs and ROS Settings, Alternative A” (p. 572)). Because Alternative A would not allocate any lands managed to protect wilderness characteristics, at some point in the future, these SRMAs might have standards established for visitation, facility development, or other recreation-related considerations that would not maintain wilderness characteristics, thus impairing or impacting them to a minor degree.

Table 4.18. Acres of Lands with Wilderness Characteristics Within SRMAs and ROS Settings, Alternative A

ROS	SRMA			
	Saddle Mountain	Sentinel Plain	Ajo Trails	Gila Trails
Rural	0	0	0	2,400
Roaded Natural	2,100	2,700	13,600	9,200
Semi-Primitive Motorized	34,400	4,300	88,200	38,500
Semi-Primitive Nonmotorized	0	8,300	0	100
Primitive	0	0	0	0
Total acres of Lands Managed to Protect Wilderness Characteristics	36,500	15,300	101,800	50,200

Areas outside these SRMAs would continue to be managed as an ERMA and would not have facilities or visitation standards established to conserve wilderness characteristics, potentially causing long-term impacts to wilderness characteristics on approximately 72,700 acres.

The existing recreation opportunity spectrum (ROS) management classes would be implemented under Alternative A and would interact with wilderness characteristics as identified in Table 4.18, "Acres of Lands with Wilderness Characteristics Within SRMAs and ROS Settings, Alternative A" (p. 572). Rural and roaded natural areas tend to have more intensive recreation and land uses that shift the landscape away from naturalness, are less remote, and provide less opportunity for solitude.

About 75 percent of wilderness characteristic acreage is located within semi-primitive motorized, semi-primitive nonmotorized, and primitive ROS classes. Semi-primitive motorized areas tend to have more dispersed motorized uses, providing moderate opportunities for solitude away from roads and generally maintaining naturalness. However, continued motorized access could degrade naturalness over time, particularly considering the expected population increases. Semi-primitive nonmotorized and primitive areas do not have motorized access and tend to support protection and maintenance of wilderness characteristics.

SRPs would continue to be authorized and may include competitive or commercial permits. Short- and long-term degradation of wilderness characteristics could result.

From Special Designations on Wilderness Characteristics

Because the Coffeepot Botanical ACEC in the Lower Sonoran is known to contain wilderness characteristics, maintaining this ACEC designation with existing restrictions on motorized vehicles and livestock developments would support the conservation of such characteristics.

Not designating the Agua Caliente Road as a 30-mile Back Country Byway would have no impact on wilderness characteristics.

From Travel Management on Wilderness Characteristics

The lack of a comprehensive travel management plan, combined with the expected increase in motorized recreation use, could result in moderate long-term losses or impairment of wilderness characteristics. Under Alternative A, off-highway vehicle use would be limited to existing or designated roads and trails except in wilderness areas and the Coffeepot Botanical ACEC. Wilderness areas and the ACEC would be closed to motorized travel.

Approximately 1,670 miles of road would be open for motorized use. Current route density and use intensities in the Ajo Block, the Gila Bend Mountains, and the Saddle Mountain areas would be maintained, potentially fragmenting wilderness characteristics, moderately reducing the amount of landscape in a natural condition, and diminishing opportunities for solitude and primitive recreation throughout. Wilderness characteristics would remain unchanged in the core areas away from roads and primitive roads, but the long-term amounts of acreage protecting wilderness characteristics over the long term could be potentially smaller than prescribed in any other alternative.

From Visual Resources on Wilderness Characteristics

VRM classifications on wilderness characteristics are detailed in Table 4.19, "Acres of Lands with Wilderness Characteristics Within Visual Resources Management Classes, Alternative A" (p. 573). Approximately 75,200 acres of wilderness characteristics in the Lower Sonoran would be managed to VRM Class II standards, which would support continued naturalness. Approximately 88,300 acres of wilderness characteristics in the Lower Sonoran would be managed as VRM Class III, and 113,000 acres of wilderness characteristics in the Lower Sonoran would be managed as VRM Class IV. VRM Class III and VRM Class IV would tend to allow the moderate degradation of naturalness and natural conditions, especially in more pristine areas, over the lifetime of the RMP.

Table 4.19. Acres of Lands with Wilderness Characteristics Within Visual Resources Management Classes, Alternative A

Visual Resource Management Classes				
Alternative	**Class I**	**Class II**	**Class III**	**Class IV**
Lower Sonoran				
Alternative A	0	75,200	88,300	113,000
Alternative B	0	65,300	199,500	11.700
Alternative C	0	103,645	44,655	100
Alternative D	0	0	0	0
Alternative E	0	97,400	125,800	1,900
SDNM				
Alternative A	0	62,800	67,000	23,200
Alternative B	0	146,000	7,000	0
Alternative C	0	40,800	0	0
Alternative D	0	0	0	0
Alternative E	0	42,000	100	0

From Vegetation Resources on Wilderness Characteristics

A lack of decisions in Alternative A specifically intended to protect or restore native vegetation could impact naturalness ranging from minor effects to major ecosystem conversion. Small, localized harvesting of plant materials would result in negligible short-term impacts on naturalness. Not minimizing the spread of nonnative, noxious species would impact the naturalness of the wilderness characteristic areas over the long term, with potential moderate to major effects. The loss of native plants and the spread of non-native vegetation would contribute to increased size and intensity of wildfires, which in turn would destroy the non-fire adapted native vegetation of the Sonoran Desert.

From Wilderness Characteristics on Wilderness Characteristics

Because Alternative A would not allocate any lands managed to protect wilderness characteristics, future standards and management prescriptions established for visitation, facility development, other recreation-related considerations, land use authorizations, visual resources, and other land uses would not be employed to protect or maintain wilderness characteristics. Overall, long-term loss, impairment, or diminishment of wilderness characteristics would be anticipated in localized areas, with major impacts happening on about 5 percent of land and minor impacts on wilderness characteristics on 23 percent. The remaining 72 percent of wilderness characteristics would experience minor, negligible, or no effects from the absence of management to protect wilderness characteristics.

4.12.3.3. Sonoran Desert National Monument

From Air Quality on Wilderness Characteristics

Impacts from air quality on wilderness characteristics would be similar to those discussed under Alternative A for the Lower Sonoran, except, the degree of potential impacts in the SDNM would be much less, trending from minor to negligible. Proclamation-stipulated management prescriptions, in and of themselves, consigns protective measures for the Monument's objects and landscapes, joined with stipulated limitations on OHV travel.

From Lands & Realty on Wilderness Characteristics

Utility corridors under Alternative A would be designated along State Route 238, I-8, and the TEP transmission lines, potentially impacting wilderness characteristics in the desert bajadas of the Sand Tank Mountains and along the Butterfield Stage corridor. The corridor, if utilized, could have moderate impacts on naturalness along the extremities of these wilderness characteristic areas, mainly through direct long-term surface disturbances and indirect visual resource aftereffects. Wilderness characteristics on up to 7,600 acres could be impaired or foregone over the long-term under full development scenarios for the utility corridors. Protection of Monument objects under the Proclamation, however, could mitigate these impacts to minor if only smaller parts of the corridors nearest the highways were utilized and strict visual mitigation applied.

From Livestock Grazing on Wilderness Characteristics

Impacts would be the same as those described under 4.11.2 Common to All Alternatives.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

Substantial protection of ecological, biological, soil, and associated Monument objects would occur due to the Monument management under the Proclamation, which in turn would offer greater protection to naturalness and opportunities for solitude and primitive recreation. Long-term enhancement of naturalness and primitive recreation may result if populations of native wildlife are maintained at current or enhanced levels. Enhanced wildlife populations might result from additional waters, which in turn would increase opportunities for primitive recreation opportunities like wildlife observation and hunting. Wildlife waters would continue to be developed and maintained on a case-by-case basis. The presence of new permanent waters or other structures would pose minor, albeit long-term, impacts to naturalness.

From Recreation Management on Wilderness Characteristics

The Gila Trail SRMA in the SDNM would cover some areas exhibiting wilderness characteristics in the central Maricopa Mountains north of Highway 238. Because Alternative A would not manage any lands to protect wilderness characteristics, this SRMA could have future standards established for visitation, facility development, and other recreation-related considerations that could fail to protect wilderness characteristics. Areas outside of this SRMA would continue to be managed as ERMAs and, as such, would not have facilities or visitation standards established to conserve wilderness characteristics, potentially causing minor long-term impacts.

Existing recreation opportunity spectrum (ROS) management classes would be implemented under Alternative A and would interact with wilderness characteristics as identified in Table 4.18, "Acres of Lands with Wilderness Characteristics Within SRMAs and ROS Settings, Alternative A" (p. 572). Impacts from implementation of ROS classes would be the same as described previously for the Lower Sonoran. Wilderness characteristics would be maintained unchanged in semi-primitive, nonmotorized areas and experience minor impairment along the Anza Trail. Elsewhere, the condition of wilderness characteristcs would mostly be unchanged over the life of the plan by maintaining current ROS classes.

Special recreation permits (SRPs) would continue to be authorized and may include commercial permits in areas with wilderness characteristics. Short-term degradation of wilderness characteristics could result, mainly for solitude opportunities.

Most current forms of recreation pursuits, with the exception of target shooting, travel management, and its associated OHV uses, would have negligible impacts on wilderness characteristics. Allowing dispersed nonmotorized camping throughout the SDNM would promote retention of wilderness characteristics by providing opportunities for primitive, unconfined recreation. Hunting, hiking, sightseeing, backpacking, orienteering, and horseback riding would have negligible to no impacts on wilderness characterisitcs.

The use of firearms throughout the SDNM could diminish naturalness and opportunities for solitude where shooter refuse (e.g., spent shells, targets, trash) or gunfire degrades the landscape. Target shooters damage rocks and destroy plants through the use of these items as targets or when they are located behind shooting areas or on backdrops. Areas closest to urban areas with decent road access could have moderate impacts with a complete loss of naturalness over localized areas. Remote areas with poor motorized access would experience negligible to minor effects over the life of the plan.

Impacts on wilderness characteristics from travel management and OHV use are subsequently addressed below in the From Travel Management analysis and will not be addressed further in this analysis.

From Special Designations on Wilderness Characteristics

Maintaining the Vekol Valley ACEC in the SDNM would have no impacts as the ACEC does not contain wilderness characteristics. Not designating I-8 or State Route 238 as National Scenic Byways would have no impact on wilderness characteristics.

From Travel Management on Wilderness Characteristics

Under Alternative A, OHV use would be limited to existing or designated roads and trails except in wilderness areas and the Vekol Valley ACEC. About 570 miles would be open for motorized use in the SDNM. The lack of a comprehensive travel management plan combined with the expected increase in recreation use could result in some long-term loss or impairment to wilderness characteristics along open roads. Moreover, there would be some fragmentation of wilderness characteristic acreage and landscapes from roads and primitive roads passing through or entering areas. Overall, these impacts would be negligible to minor, as the Monument Proclamation prohibits cross-country motorized travel and harm to or removal of Monument objects. Wilderness characteristics would remain undisturbed and generally unchanged in core areas removed from roads and primitive roads.

It is assumed most existing motorized vehicle roads, primitive roads, and wash routes would be kept open under this alternative. Motorized routes would continue into the Maricopa Mountains, the Butterfield Stage/Anza Trail area, the Sand Tank Mountains, and the White Hills. All these areas, with the exception of the White Hills and the western part of the South Maricopa Mountains, would be penetrated or crossed by the maximum number of vehicle routes in the desert plains, through washes, and across foothills and uplands. The amount of wilderness characteristics exposed to the sights and sounds of motorized travel would be the greatest under this alternative, and the moderate adverse effects on solitude and primitive recreation would be the maximum level presented by any alternative. Moreover, the wilderness characteristic landscapes and acreage represented within the Sand Tank Mountains would be subject to major fragmentation and segmentation into smaller areas under this alternative.

From Vegetation Resources on Wilderness Characteristics

Impacts would be the same as those described under Alternative A for the Lower Sonoran except that the collection of seeds, plant materials, flowers, dead or down plant materials, or other vegetative materials is generally prohibited in the SDNM. Long-term contributions to naturalness would result from the protection of the Monument's biological and ecological objects. Additionally, the use of native species and seeds in restoration projects and the control of invasive species would contribute to maintaining or enhancing naturalness and natural conditions. Limiting the spread of non-native vegetation would reduce the size and intensity of wildfires that destroy native vegetation, representing additional protection for the Monument's non-fire adapted plant communities.

From Visual Resource on Wilderness Characteristics

VRM classifications on areas that exhibit wilderness characteristics are identified in Table 4.19, "Acres of Lands with Wilderness Characteristics Within Visual Resources Management Classes, Alternative A" (p. 573). Approximately 62,800 acres of wilderness characteristics would be managed to VRM Class II standards, which would support continued naturalness. Approximately 67,000 acres of wilderness characteristics would be managed as VRM Class III, and 23,200 acres would be managed as VRM Class IV. However, the Monument Proclamation's restrictions on travel, mineral development, and other land use authorizations, as well as its restrictions on changing or impairing current visual and scenic landscape conditions means that impacts to visual resources are expected to be negligible. As a result, wilderness values directly and indirectly associated with scenery and visual resources would not be greatly influenced over the lifetime of the RMP.

From Wilderness Characteristics Management on Wilderness Characteristics

Because Alternative A would not allocate any SDNM to be managed to protect wilderness characteristics, no future standards or management prescriptions established for protection of management objects, visitation, facility development or other recreation-related considerations, land use authorizations, visual resources, or other land uses would be employed to protect or maintain wilderness characteristics. Overall, long-term loss, impairment or diminishment of wilderness characteristics would be anticipated in localized areas, with major impacts occurring on about 5 percent and minor impacts on 4 percent of wilderness characteristics. The remaining 91 percent of wilderness characteristics would experience minor, negligible, or no effects from the absence of wilderness characteristics management emphasis due to the overarching protection established by the Monument Proclamation.

4.12.4. ALTERNATIVE B

Alternative B identifies the greatest extent of uses on public lands and provides opportunities for those uses, including motorized recreational opportunities. As under Alternative A, no part of the Decision Areas would be allocated to protecting wilderness characteristics under Alternative B. Naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would be maintained only as an incidental by product of management actions implemented for other purposes. Although some individual proposed decisions would protect wilderness characteristics, the overall effect of Alternative B would be to moderately reduce the extent, distribution, and quality of naturalness and outstanding opportunities for solitude and primitive, unconfined recreation over the life of the RMP.

Nevertheless, Alternative B would contribute to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation to a greater degree than Alternative A. Implementation of measures to control fugitive dust emissions, emphasize wildlife habitat connectivity, assure use of native vegetation in restoration efforts, maintain native wildlife populations (especially sensitive species), and restrict motorized travel to a designated route system all would support maintaining naturalness. In contrast, increased development of cultural sites for public visitation and increased density of new wildlife and livestock water developments would detract from naturalness to a greater degree than would Alternative A.

4.12.4.1. Both Decision Areas

From Air Quality on Wilderness Characteristics

Compared to Alternative A, Alternative B would more effectively reduce impacts to naturalness due to deteriorated air quality by controlling excessive fugitive dust through a variety of methods. Moreover, the overall route system and road network would be reduced by 17 percent under Alternative B, further reducing areas subject to increased dust emissions and noncompliance.

From Cultural and Heritage Resources on Wilderness Characteristics

A framework for the proactive management of cultural and heritage resources would be enacted under all Action Alternatives. Under Alternative B, the development of cultural sites for public visitation would be emphasized. Future site development for public interpretive and educational

purposes, excavation for scientific study, or similar activities would reduce naturalness. Such impacts would be greater than under Alternative A due to Alternative B's emphasis on the development of cultural sites for public visitation.

4.12.4.2. Lower Sonoran

From Lands & Realty on Wilderness Characteristics

Impacts of multiuse utility corridors, LUAs and other land use allocations would generally be similar to those described under Alternative A except that Alternative B would allow major utilities to be developed outside of existing corridors, which would degrade wilderness characteristics where they occur. Wilderness characteristics near Saddle Mountain and the Batamote Mountains would be most impacted along their perimeters, with up to 8,000 acres impacted under maximum use of the utility corridors. Perimeter areas are most subject to the sights, sounds, surface disturbance and physical infrastructure found in utility corridors.

Impacts from utility-scale renewable energy development would be the same as described under Alternative A.

From Livestock Grazing on Wilderness Characteristics

Improved forage or vegetation conditions from modified grazing practices or reduced livestock numbers could result in long-term impacts that would maintain or improve naturalness because forage allocated to livestock would instead be available to native wildlife. Impacts from livestock infrastructure management would be similar as described under Alternative A.

From Minerals Management on Wilderness Characteristics

Impacts from mineral and energy management would generally be the same as under Alternative A.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

In general, ecological, biological, soil, and water resource decisions under Alternative B would contribute to naturalness to a greater degree than those under Alternative A by emphasizing the maintenance and restoration of natural landscapes, vegetation and soils, connectivity of wildlife habitat, use of native vegetation in restoration efforts, and maintaining or enhancing populations of native wildlife, especially sensitive species.

Limiting or restricting the construction of facilities in wildlife movement corridors and sensitive habitats, improving habitat connectivity, and minimizing physical barriers to movement would support wilderness characteristics by protecting naturalness. The density of artificial wildlife waters could be increased. Construction activities would detract from naturalness, causing short-term impacts to wilderness characteristics, while the presence of new permanent structures would detract from naturalness in the long term.

Reintroducing, transplanting, and supplemental stocking of native wildlife; using existing earthen livestock waters as refugia for native wildlife where livestock grazing is no longer permitted;

and restricting or mitigating the placement of LUAs, and fences to avoid adverse impacts to wildlife would occur under Alternative B to maintain populations of native wildlife. Long-term contributions to naturalness may result from such actions if populations of native wildlife would be maintained at natural levels or enhanced.

Under Alternative B, seasonal restrictions would be placed on competitive and speed events authorized by SRPs in Category I or Category II tortoise habitat; mining restrictions would be implemented to ensure no net loss of tortoise habitat; and conservation measures for endangered species such as Sonoran pronghorn and special status species such as cactus ferruginous pygmy owl would be enacted. Such management decisions may result in long-term, contributions to naturalness if native or sensitive wildlife species would be conserved.

From Recreation Management on Wilderness Characteristics

All areas with wilderness characteristics would be located within SRMAs, with the exception of the Sentinel Plain and Oatman Mountain areas. As Alternative B would not manage SRMA or ERMA areas to protect wilderness characteristics, no future standards would be established for visitation, facility development, or other recreation-related considerations that would necessarily consider naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. The lack of management actions specifically protecting wilderness characteristics could impact them.

Recreation management in the Gila Bend and Ajo SRMAs would focus on maintaining the low intensity, dispersed use, and natural character of the area and would tend to support protecting wilderness characteristics. Recreation management in the Saddle Mountain SRMA would support more intensive recreation uses and could include actions such as developing additional vehicle routes or hiking trails that would be less supportive of wilderness characteristics. Recreation management in the Ajo Trails SRMA would focus on providing enjoyable motorized recreation experiences, including the development of additional vehicle routes, thus slightly diminishing wilderness characteristics along roads and primitive roads over the long-term. Wilderness characteristics in the interior of these areas would be less affected by recreation management actions.

Existing ROS management classes would be replaced by back country, front country, and community interface settings under Alternative B. Approximately 76 percent of areas with wilderness characteristics would be allocated as back country, which are nonmotorized, dispersed recreation use areas that would support protecting wilderness characteristics. back country settings, nonetheless, would be intersected by passage zones, which would provide motorized recreation access into areas with wilderness characteristics. Impacts from passage zones would be similar in effect to the semi-primitive motorized ROS settings described under Alternative A.

The remaining portions of areas with wilderness characteristics would be allocated mainly to front country under Alternative B, which are settings for intensive resource-dependent recreation uses and not generally conducive for protecting wilderness characteristics in the long-term. Impacts from front country recreation uses would be similar in effect to the roaded natural and rural ROS settings under Alternative A.

Since Alternative B would not manage any lands to protect wilderness characteristics, future recreation standards and management prescriptions established for visitation, facility development, and other recreation-related considerations would not be employed to protect or

maintain wilderness characteristics. Overall, long-term loss, impairment or diminishment of wilderness characteristics due to recreation management would be minor to moderate in localized areas, or foregone altogether in localized areas subject to development, or on lands more heavily utilized by motorized users or by recreational target shooting. This could potentially affect up to 24 percent of areas with wilderness characteristics. On the other hand, about 76 percent of such lands will be managed as back country, offering protection for wilderness characteristics. These remaining areas with wilderness characteristics would experience negligible to no effects from the absence of wilderness characteristics management emphasis.

From Special Designations on Wilderness Characteristics

The Coffeepot Botanical ACEC, which contains wilderness characteristics, would lose its designation under Alternative B and vehicle travel through roads in the area would be allowed. Such actions would slightly threaten known wilderness characteristics in the area, with potential minor loss or diminishment of such values over the long term.

Designating the Agua Caliente Road as a 30-mile Back Country Byway would have no impact on wilderness characteristics.

From Travel Management on Wilderness Characteristics

Under Alternative B, vehicles would be limited to designated routes and a comprehensive travel management system would be developed. Route miles could be reduced by an estimated 25 percent over the life of the plan. This would allow for maintenance of wilderness characteristics, especially where wilderness characteristics are threatened or subject to heavy motorized use and the proliferation of vehicle routes. This protection would be offered by the selective closure of vehicle routes and/or re-routing of others.

Alternative B's closures and restrictions would primarily be on roads that provide duplicate access, so these changes would not substantially change the overall array of motorized vehicle access in areas with wilderness characteristics from Alternative A. However, where these route vehicle limitations, restrictions, or closures overlap with wilderness characteristics, long-term protective contributions to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would result.

From Vegetation Resources on Wilderness Characteristics

Decisions specifically intended to protect or restore native vegetation under Alternative B could impact naturalness ranging from minor to moderate effects, more than Alternative A. Minimizing the spread of nonnative, noxious species would impact the naturalness of the wilderness characteristic areas over the long term, with potential moderate protective effects. Hindering the spread of non-native vegetation would also assist with decreasing the size and intensity of wildfires, and limiting ecosystem conversions of the non-fire adapted native vegetation of the Sonoran Desert over the long-term. Long-term contributions to naturalness would result from the use of native species and seeds in all restoration.

From Visual Resources on Wilderness Characteristics

Approximately 65,300 acres would be managed to VRM Class II standards and 119,500 acres to VRM Class III standards, which would tend to support continued naturalness. Overall, Alternative B represents 90 percent fewer acres of wilderness characteristics managed to Class III or Class IV visual than under Alternative A, which would help to maintain naturalness and landscape-based sightseeing. In addition, the emphasis on use of dark skies technologies would help to protect wilderness and associated scenic characteristics under Alternative B.

From Wilderness Characteristics on Wilderness Characteristics

As under Alternative A, no lands would be allocated to protecting wilderness characteristics. Impacts would be slightly less than described under Alternative A due to more proactive management for Travel, recreation management, visual resources, and cultural and heritage resources. Overall, long-term loss, impairment or diminishment of wilderness characteristics would be anticipated in localized areas, with major impacts occurring on less than 2 percent and minor impacts on up to 23 percent of areas with wilderness characteristics. The remaining 75 percent of wilderness characteristics would experience minor to no effects from the absence of management emphasis for wilderness.

4.12.4.3. Sonoran Desert National Monument

From Lands & Realty on Wilderness Characteristics

Three above-ground, one mile wide utility corridors would be allocated. These impacts would accrue along the periphery of areas with wilderness characteristic. Impacts would be similar to those described under Alternative A, except the potential footprint of effects on wilderness characteristics would be smaller and more negligible. Acreage potentially affected would be reduced by 1,200 acres, and restricted to lands near Bender Wash south of I-8.

From Livestock Grazing on Wilderness Characteristics

The prospective for improved forage or vegetation conditions from modified grazing practices and a 31 percent reduction in AUMs could result in long-term vegetative and visual impacts on the landscape that would maintain or improve naturalness. Forage allocated to livestock would instead be available to native wildlife. The sights of cattle trailing, cow waste, and trampled vegetation would be moderately reduced, enhancing wilderness characteristics. Impacts from livestock infrastructure management would be similar as described under Alternative A.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Recreation Management on Wilderness Characteristics

Under Alternative B, all areas with wilderness characteristics would be located within SRMAs. As Alternative B would not allocate lands managed to protect wilderness characteristics, future standards established for visitation, facility development, and other recreation-related considerations would be established that would not necessarily consider naturalness and

outstanding opportunities for solitude and primitive, unconfined recreation; thus impacting wilderness characteristics. Recreation management, however, would focus on maintaining the low intensity, dispersed use, and natural character of the area and would tend to support protecting wilderness characteristics.

Existing ROS management classes would be replaced by RMZs settings under Alternative B. The principal advantage of SRMA allocations under Alternative B would be that wilderness characteristic would be managed subject to the RMZs displayed in Table 4.20, "Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative C" (p. 586) (although not managed to protect them).

Most current forms of dispersed recreation use, with the exception of target shooting, would have negligible impacts on wilderness characteristics, as described previously under Alternative A.

The overall impact on wilderness characteristics from recreational target shooting would be negligible under Alternative B. The use of firearms would has the same impacts as described under Alternative A, except these effects would be limited to a much smaller area of the Monument. The area most impacted would be located on lands west of the South Maricopa Mountains wilderness. The reduced road network under this alternative would further offer fewer suitable landscapes available for target shooting, limiting the breadth and scope of associated impacts in potentially suitable target shooting areas. On the other hand, target shooters could be more concentrated along the fewer miles of open road, thus increasing impacts in localized areas.

From Special Designations on Wilderness Characteristics

The Vekol Valley ACEC designation would be removed; however, no impacts would occur because the ACEC does not have wilderness characteristics. Along the Juan Bautista de Anza NHT, emphasis would be placed on motorized access to interpretive facilities. Motorized access would impact wilderness characteristics directly adjacent to the Anza NHT. Such impacts would be similar to Alternative A and are considered inconsequential. Not designating I-8 or State Route 238 as National Scenic Byways would have no impact on wilderness characteristics.

From Travel Management on Wilderness Characteristics

Under Alternative B, vehicles would be limited to designated routes and a comprehensive travel management system would be developed. This would allow for maintenance of wilderness characteristics, especially where wilderness characteristics are threatened by heavy motorized use and proliferation of vehicle routes. The selective closure of vehicle routes or re-routing of others would constitute most specific route designations.

Alternative B would reduce vehicle route system miles by over 12 percent. Route closures and restrictions would primarily be on roads that provide duplicate access, so these changes would not considerably change the motorized vehicle access from Alternative A. However, where these route limitations, closures, or restrictions overlap with wilderness characteristics, long-term contributions for maintaining naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would result.

Potential impacts from use of existing roads to wilderness characteristics are reflected by reductions in the opportunity for solitude, changing the quality of primitive, unconfined recreational experiences, and detracting from the naturalness of an area.

The motorized vehicle travel route network designated in Alternative B represents slightly more protection for wilderness characteristics than provided by Alternative A. Closures or restrictions on about 70 miles of road and primitive road would protect or enhance wilderness characteristics, mainly in the Sand Tank Mountains and White Hills areas. Wilderness characteristics elsewhere would not be as well protected.

The use of designated roads and primitive roads by motorized vehicles could impact the opportunity for solitude most of all. These types of impacts are most often found and most intense during the winter months (November through April). The greater the number of routes within areas of wilderness characteristics, the greater the potential to impact wilderness characteristics. Under existing guidance, motorized vehicles were generally allowed to pull off from the centerline of an existing trail as far as 300 feet onto public land. Under this alternative, the vehicle would only be allowed to travel 25 feet from centerline, greatly reducing the potential disturbance footprint on wilderness characteristics.

From Vegetation Resources on Wilderness Characteristics

Impacts are similar to those described for Alternative A.

From Visual Resources on Wilderness Characteristics

Approximately 146,000 acres in the SDNM would be managed to VRM Class II standards, which would support continued naturalness. Approximately 7,000 acres would be managed as VRM III. Overall, Alternative B represents fewer acres of wilderness characteristics managed to Class III and IV than under Alternative A, which would help to maintain naturalness. In addition, the emphasis on use of dark skies technologies would help to protect wilderness characteristics under Alternative B. However, due to the Proclamation and protection of Monument objects, coupled with associated restrictions on travel, mineral development, and other land use authorizations, degradation of current visual and scenic landscape conditions is not expected.

From Wilderness Characteristics on Wilderness Characteristics

Like Alternative A, no lands would be managed to protect wilderness characteristics. Impacts would slightly less than described under Alternative A due to more proactive management for travel, recreation management, visual resources, and cultural and heritage resources. Overall, long-term loss, impairment or diminishment of wilderness characteristics would be anticipated in localized areas, with major impacts occurring on less than 1 percent and minor impacts on up to 4 percent of areas with wilderness characteristics. The remaining 95 percent of wilderness characteristics would experience minor, negligible or no effects from the absence of wilderness characteristics management emphasis, due to the overarching protection established by the Monument Proclamation.

4.12.5. ALTERNATIVE C

In general, Alternative C would contribute to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation to a much greater degree than Alternatives A and B. This is due primarily to the allocation of 240,300 acres (128,100 acres in Lower Sonoran and 112,200 acres in SDNM) as lands managed to protect wilderness characteristics (see Map 2-4c).

In the Lower Sonoran, although land uses, such as major mineral extraction or new LUAs servicing valid existing rights, could still occur in areas of wilderness characteristics, managing these lands would place a priority on directing incompatible land uses to other locations or requiring that they be implemented in a manner that would minimize or mitigate impacts to naturalness and opportunities for solitude and primitive, unconfined recreation.

In the SDNM, protecting wilderness characteristics would be a priority for lands allocated for this purpose when approval of other land uses or management actions is being considered.

Under Alternative C, private or state inholdings would be acquired when available; closed vehicle routes would be converted for use by bicycle, equestrian, or hiking trails, as appropriate; existing, unused disturbed areas would be rehabilitated to meet natural resource restoration objectives; recreation facilities would be developed when compatible with protecting wilderness characteristics; new LUAs would be excluded to minimize impacts on lands managed to protect wilderness characteristics; compatibility of other proposed projects with maintenance of wilderness characteristics would be evaluated on a case-by-case basis; and commercial recreation operations would be permitted only if consistent with wilderness characteristics. Such actions in both Decision Areas would result in contributions to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation within lands managed to protect wilderness characteristics.

Under Alternative C, the allocation of WHAs (Lower Sonoran), removal of ineffective wildlife water developments, lack of new wildlife water construction, prohibition on wood harvesting, allocation of the Saddle Mountain SCRMA (Lower Sonoran), greater allocation of VRM Classes II and III, reclassification of all livestock grazing allotments to perennial use only, allocation of SRMAs coinciding with all areas of wilderness characteristic, restrictions to motorized travel, and enlargement of the Coffeepot - Batamote Botanical ACEC all would contribute substantially to maintenance or enhancement of naturalness.

4.12.5.1. Both Decision Areas

From Air Quality on Wilderness Characteristics

Actions and impacts from air quality decisions would be the same as under Alternative B.

From Cultural and Heritage Resources on Wilderness Characteristics

Implementation of Alternative C measures for cultural and heritage resources would contribute to naturalness to a greater degree than Alternatives A and B due to increased emphasis on cultural resource protection and less emphasis on development for public visitation.

4.12.5.2. Lower Sonoran

From Lands & Realty on Wilderness Characteristics

In the Lower Sonoran, impacts from lands and realty would be similar to those described under Alternative B. However, lands managed to protect wilderness characteristics allocations would be exclusion areas for utility-scale renewable energy development, LUAs and multiuse utility

corridors. Accordingly, impacts from such LUAs would mainly be indirect, chiefly visual and overall considered negligible.

From Livestock Grazing on Wilderness Characteristics

Impacts would be the same as described under Alternative B.

From Minerals Management on Wilderness Characteristics

Impacts from management of minerals resources would be the same as those described under Alternative B, with one exception. Lands managed to protect wilderness characteristics would be closed to mineral material sales. Naturalness, solitude and primitive, unconfined recreation indicators would not be impacted by discretionary mineral material sales for rocks, gravel, sand, granite and other common materials.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

Four expansive WHAs would be allocated to protect core areas of wildlife habitat and would moderately contribute to the naturalness and outstanding opportunities for solitude and primitive, unconfined recreation exhibited on lands managed to protect wilderness characteristics. The allocation of WHAs would overlap and moderately support the maintenance of wilderness characteristics on approximately 48 percent (117,100 acres) of lands managed to protect such characteristics, especially in the Gila Bend and Ajo Block areas.

Impacts from reintroductions, transplants, and supplemental stockings of native species using existing earthen livestock waters as refugia for native wildlife, where livestock grazing would no longer permitted; and the restricting or mitigating the placement LUAs, and fences to avoid adverse impacts to wildlife would be the same as under Alternative B.

Impacts under Alternative C due to restrictions placed on competitive and speed events authorized by SRPs in Category I and/or Category II tortoise habitat, mining restrictions (Lower Sonoran) in tortoise habitat, and conservation measures for sensitive species such as Sonoran pronghorn and cactus ferruginous pygmy owl would be enacted. Such management decisions may result in long-term contributions to naturalness on lands managed to protect wilderness characteristics. If native, sensitive wildlife species would be conserved, more so than under Alternative B as additional management actions aimed at this goal would be implemented under Alternative C.

Overall, implementation of the ecological and biological resources measures under Alternative C would contribute to naturalness to a greater degree than would implementation of Alternatives A and B by protecting core areas of wildlife habitat, emphasizing connectivity of wildlife habitat, removing ineffective wildlife water developments, lack of new wildlife water construction, prohibiting wood harvesting, requiring use of native vegetation in restoration efforts, and applying measures to maintain populations of native wildlife, especially sensitive species.

From Recreation Management on Wilderness Characteristics

Under Alternative C, nearly all areas with wilderness characteristics would be located within SRMAs, with the exception of the Sentinel Plain area south of I-8. Compared to Alternative B,

with its focus on motorized recreation opportunities, recreation management in Alternative C would be more compatible with protecting wilderness characteristics with a more balanced set of motorized and nonmotorized recreation opportunities. The future standards established for visitation, facility development, and other recreation-related activities in the SRMAs would consider naturalness and outstanding opportunities for solitude and primitive, unconfined recreation.

Areas with wilderness characteristics that are not allocated as lands managed to protect wilderness characteristics would be released from such management considerations. This action could result in a gradual impairment or loss of wilderness characteristics in unallocated areas over the life of the plan, totaling up to 148,400 acres, or 39 percent of all lands with wilderness characteristics. These figures represent a worst case scenario. Actual impacts are anticipated to be much less than described under Alternatives A and B due to other land use operational procedures and protective prescriptions.

Impacts from front country, back country, community interface and passage zones would be similar to Alternative B. On areas with wilderness characteristics not established to protect such characteristics, approximately 66 percent of lands would be managed as back country. Allocated back country settings would support protecting naturalness and opportunities for solitude and primitive recreation. Approximately 95 percent of lands managed to protect wilderness characteristics would be located in back country settings, which would support protecting these characteristics as identified in Table 4.20, "Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative C" (p. 586).

Table 4.20. Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative C

SRMA	Recreation Management Setting			Lands Managed to Protect Wilderness Characteristics
	Back Country	Front Country	Community Interface	
Ajo	58,200	600	0	58,800
Gila Bend Mountains	50,100	1,300	0	51,400
Saddle Mountain	14,700	3,200	0	17,900
SDNM	110,200	2,000	0	112,200

SRMA allocations under Alternative C would substantially contribute to naturalness and opportunities for solitude and primitive, unconfined recreation than would Alternatives A and B. Impacts from the Gila Bend Mountains SRMA would be similarly compatible with protecting wilderness characteristics as described under Alternative B. Management of the Saddle Mountain and Ajo SRMAs under Alternative C would be more compatible with protecting wilderness characteristics due to a greater focus on nonmotorized recreation uses.

Actions and impacts resulting from administration of SRPs would be similar to Alternative B.

From Special Designations on Wilderness Characteristics

Alternative C would enlarge the Coffeepot – Batamote ACEC to 63,300 from Alternative A and B's 8,900 acres, overlapping with approximately 12,800 acres of lands managed to protect wilderness characteristics. Measures to conserve the outstanding botanical diversity and sensitive plant and wildlife species in the ACEC would preserve naturalness. Designating the Agua Caliente Road as a 30 mile Back Country Byway would have no impact on wilderness characteristics.

From Travel Management on Wilderness Characteristics

Alternative C would close, limit, limit seasonally, or administratively restrict up to 30 percent (estimated 500 miles) of currently existing road mileage than would be instigated under Alternative A, and an estimated 101 road miles limited or close to public use than under Alternative B. Route closures in the Ajo SRMA would moderately contribute to protecting wilderness characteristics by decreasing motorized vehicle access and increasing naturalness and opportunities for primitive, unconfined recreation.

Projected road closures in the Saddle Mountain SRMA would moderately contribute to protection of wilderness characteristics by closing a few key routes and increasing naturalness and opportunities for primitive, unconfined recreation. Route designation projections for the Gila Bend Mountains SRMA could support protecting wilderness characteristics if certain routes are closed during travel management planning. Long-term contributions to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would for the most part occur in areas where projected route restrictions or closures to motorized travel overlap with lands managed to protect wilderness characteristics.

From Vegetation Resources on Wilderness Characteristics

As under Alternative B, localized harvesting of plant materials in the Lower Sonoran would result in short-term, minor, detractions from naturalness. Under Alternative C, long-term impacts pacts from vegetation resources would be similar to those described under Alternative B, including long-term contributions to naturalness resulting from the prohibition on wood harvesting, use of native species in restoration projects, and control of invasive species which would limit the spread of non-native vegetation and reduce the size and intensity of wildfires.

From Visual Resources on Wilderness Characteristics

Under Alternative C, lands managed to protect wilderness characteristics would be managed under VRM Class II, as identified in Table 4.21, "Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternative C" (p. 587). Accordingly, there would be few noticeable visual intrusions to distract from the naturalness of the areas. VRM Class II allocations would safeguard naturalness and scenic vistas in lands managed to protect wilderness characteristics, more so than under Alternative A and B. Alternatives A and B do not contain lands managed to protect wilderness characteristics.

Table 4.21. Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternative C

Alternative	Class I	Class II	Class III	Class IV
Lower Sonoran				
Alternative C	0	128,100	0	0
Alternative D	0	276,500	0	0
Alternative E	0	55,400	0	0
SDNM				
Alternative C	0	112,200	0	0
Alternative D	153,000	0	0	0
Alternative E	0	110,900	0	0

From Wilderness Characteristics on Wilderness Characteristics

Naturalness, solitude, and the opportunity for unconfined and primitive recreation would be maintained and receive priority management attention on 128,100 acres of lands managed to protect wilderness characteristics, representing 46 percent of lands with wilderness characteristics in the Lower Sonoran. For the most part, this would prevent the any level of impairment or loss of naturalness, the depreciation of scenic values, or loss or dilapidation of solitude and primitive recreation opportunities through resource development, motorized use, or increased visitor or commercial uses on lands managed to protect wilderness characteristics.

Wilderness characteristics on the remaining 54 percent of area with wilderness characteristics could be diminished or foregone over the long-term. Impacts, whatever their varying magnitudes, would derive primarily from increased motorized recreation use, mining, utility-scale renewable energy development and lands and realty actions. However, a designated and implemented travel route management system would further mitigate or diminish impacts on lands managed to protect wilderness characteristics. Overall, impacts to areas of wilderness characteristics not allocated as lands managed to protect wilderness characteristics would be considered minor to major.

4.12.5.3. Sonoran Desert National Monument

From Lands & Realty on Wilderness Characteristics

No new multiuse utility corridors and only underground LUA uses in the Gila Bend to Santa Rosa and I-8corridor would be authorized. No communication sites would be allowed. These actions would contribute to maintaining naturalness more than Alternatives A and B.

Impacts along I-8 would be similar as described under Alternative B, affecting lands managed to protect wilderness characteristics along the northern parts of Bender Wash. The sights, sounds and intrusion of roads, utilities and communication facilities in this corridor would be less apparent in areas of wilderness characteristics to the south allocated as lands managed to protect wilderness characteristics.

From Livestock Grazing on Wilderness Characteristics

Impacts would be the same as described under Alternative A and B, except no ephemeral grazing would occur. This re-classification would enhance naturalness in the long term as ephemeral forage would not be removed and would become available to wildlife. The sight, sound, smell and other impacts from large ephemeral turnouts on the SDNM would not occur, enhancing naturalness and maintaining opportunities for primitive recreation in a more natural appearing and untrammeled environment. Compared to Alternatives A and B, Alternative C would have both amplified and proactive contributions to naturalness, solitude and primitive recreation values.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

Overall, implementation of the ecological, biological and vegetative resources measures under Alternative C would contribute to naturalness to a greater degree than would implementation of Alternatives A and B by protecting core areas of wildlife habitat, emphasizing connectivity of wildlife habitat, removing ineffective wildlife water developments, lack of new wildlife water construction, prohibiting wood harvesting, requiring use of native vegetation in restoration efforts, and applying measures to maintain populations of native wildlife, especially sensitive species.

From Recreation Management on Wilderness Characteristics

SRMA allocation of the entire SDNM under Alternative C would substantially contribute to naturalness and opportunities for solitude and primitive, unconfined recreation than would Alternatives A and B. Compared to Alternative B, with its focus on motorized recreation opportunities, recreation management in Alternative C would be more compatible with protecting wilderness characteristics with a more balanced set of motorized and nonmotorized recreation opportunities. Future standards established for visitation, facility development, and other recreation-related activities in the SDNM would consider naturalness and outstanding opportunities for solitude and primitive, unconfined recreation.

Existing ROS management classes would be replaced by zones under Alternative C. Areas with wilderness characteristics not allocated as lands managed to protect wilderness characteristics would be managed as the RMZs displayed in Table 4.20, "Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative C" (p. 586).

Most current forms of recreation use, with the exception of target shooting, would have negligible impacts on areas with wilderness characteristics, as described in Alternative A.

The overall impact on wilderness characteristics from recreational target shooting would be negligible under Alternative C. The use of firearms would have the same impacts as described under Alternative B. except adaptive and proactive management would be applied to these lands to manage shooting. The reduced road network under this alternative would further offer fewer suitable landscapes available for target shooting, limiting the breadth and scope of associated impacts in potentially suitable target shooting areas. On the other hand, target shooters could be more concentrated along open roads, thus increasing impacts in localized areas.

From Special Designations on Wilderness Characteristics

Removal of the Vekol Valley ACEC would have the same lack of affect on wilderness characteristics as under Alternative B. The Juan Bautista de Anza NHT would be managed with a priority on scientific research opportunities while protecting the historic landscape elements and cultural resources, while providing compatible public use and interpretive opportunities. Impacts to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation are not anticipated on areas of wilderness characteristics adjacent to the Anza NHT.

Designation of State Route 238 as a National Scenic Byway would maintain naturalness, through the prescription and maintenance of more natural appearing Sonoran Desert landscapes along I-8 and State Route 238. Impacts would moderate along I-8 and negligible along State Route 238.

From Travel Management on Wilderness Characteristics

Closure of over 36 percent of road miles in the SDNM, as compared with the road network prescribed under Alternative A, would contribute to wilderness characteristics maintenance or enhancement by closing key routes and increasing naturalness and opportunities for primitive, unconfined recreation. Long-term contributions to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would occur in areas where these route restrictions or closures to motorized travel overlap with lands managed to protect wilderness characteristics. Compared with Alternative A, Alternative C represents a moderate protective enhancement

for lands managed to protect wilderness characteristics, both in lands allocated, and lands not allocated, to protect wilderness characteristics.

The motorized vehicle route network presented in Alternative C represents considerably more protection for wilderness characteristics than provided by the travel management networks under Alternative A and B. Closures or restrictions on over 212 miles of road and primitive road would protect wilderness characteristics in all lands managed to protect wilderness characteristics. The Alternative C route management network reduces impacts from road use on lands managed to protect wilderness characteristics, increases solitude values, and improves the extent and quality of primitive, unconfined recreational experiences. Under this alternative, vehicles would be allowed to travel only 25 feet from the centerline, thus greatly reducing the potential footprint of staging and camping disturbances within areas of wilderness characteristics.

From Vegetation Resources on Wilderness Characteristics

Impacts are similar to Alternative B with one exception; ephemeral forage would remain on the lands, enhancing naturalness and maintaining current aesthetic values valued by primitive recreationists.

From Visual Resources on Wilderness Characteristics

No impacts are anticipated on wilderness values from VRM management. Under Alternative C, lands managed to protect wilderness characteristics would be managed under VRM II, as identified in Table 4.21, "Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternative C" (p. 587). This VRM allocation would contribute toward naturalness of lands managed to protect wilderness characteristics, appreciably more so than under Alternatives A and B.

From Wilderness Characteristics on Wilderness Characteristics

Naturalness, solitude, and the opportunities for unconfined and primitive recreation would be maintained and receive priority management attention on 112,200 acres of lands managed to protect wilderness characteristics, representing 73 percent of Monument areas with wilderness characteristics. For the most part, this allocation would have moderate influence in preventing the loss of naturalness, the depreciation of scenic values, or loss or degradation of solitude and primitive recreation opportunities, whether through increased visitor use, increasing motorized activity, land use authorizations, or commercial uses.

Areas with wilderness characteristics not managed to protect wilderness characteristics total 40,800 acres, representing 27 percent of the Monument's areas with wilderness characteristics. Over the life of the plan, wilderness characteristics on up to 12,200 acres, or about 25 percent of unallocated lands, could experience minor loss or diminishment due to recreation uses, infrastructure installed to protect Monument objects, cultural resource management, and other land use authorizations. Overall, Alternative C represents more potential loss of 38 percent more wilderness characteristics than described under Alternative A due to more proactive visitor use, cultural resource, and travel route management, along with associated infrastructure.

Unallocated areas with wilderness characteristics would be managed to VRM Class II (see Table 4.21, "Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternative C" (p. 587)). The VRM classifications would, for the most part, maintain naturalness

within areas of wilderness characteristics not allocated as lands managed to protect wilderness characteristics. Protection visually would be much greater than presented by Alternatives A and B, because all acreage would be managed as VRM Class II.

4.12.6. ALTERNATIVE D

Alternative D would place the greatest emphasis on resource protection and conservation and on opportunities to visit remote settings and experience nonmotorized, primitive recreation opportunities. All areas with wilderness characteristics in both Decision Areas would be allocated as lands managed to protect wilderness characteristics under Alternative D, or approximately 429,500 acres (276,500 acres in the Lower Sonoran and 153,000 acres in the SDNM, see Map 2-4d). Management under Alternative D would be the most protective of naturalness and outstanding opportunities for solitude and primitive, unconfined recreation among all alternatives.

Under Alternative D, any proposed developments, actions, or other uses would be required to consider and maintain naturalness and outstanding opportunities for solitude and primitive, unconfined recreation within the 429,500 acres that would be managed to protect wilderness characteristics. Additionally, a prohibition on wood harvesting, widespread allocation of VRM Class I in the SDNM, discontinuance of all livestock grazing, maximum restrictions and closures to motorized travel, and designation of certain expansive ACECs would contribute substantially to protecting wilderness characteristics.

Impact analysis on lands managed to protect wilderness characteristics described under Alternative D are based on the assumption that all the units contain wilderness characteristics, including all lands included in the citizen's proposal. It may not necessarily be the case, based on BLM's knowledge of the Planning Area, that the entire citizen's proposal addressed in Alternative D contains wilderness characteristics.

4.12.6.1. Both Decision Areas

From Air Quality on Wilderness Characteristics

Impacts for air quality decisions would be the same as under Alternative B.

From Cultural and Heritage Resources on Wilderness Characteristics

Cultural resource decisions under Alternative D would likely contribute to naturalness to a greater degree than under Alternatives A, B, and C due to increased emphasis on resource protection and less emphasis on development for public visitation.

4.12.6.2. Lower Sonoran

From Lands & Realty on Wilderness Characteristics

Impacts from allocation of utility-scale renewable energy development and utility corridors would be similar as described under Alternative C. All lands managed to protect wilderness characteristics in the Lower Sonoran would be exclusion areas. Such decisions would contribute to maintaining naturalness and natural landscapes to a greater degree than all other alternatives.

From Livestock Grazing on Wilderness Characteristics

Under Alternative D, closing all livestock grazing allotments when current permits expire would support long-term maintenance of naturalness. All forage allocated to livestock would instead be available to native wildlife. Compared to Alternatives A, B, and C, implementation of the Alternative D grazing management would result in increased contributions to naturalness. Fencing, corrals, roads, wells, staging areas and other infrastructure affiliated with livestock operations could be removed and the landscapes restored or reclaimed. There would be no visual, aesthetic, trampling, or olfactory evidence of large turnouts of livestock, creating more natural and undeveloped landscapes.

From Minerals Management on Wilderness Characteristics

Restrictions, prohibitions, exclusions and closures on mining, leasing, saleables and exploration would provide the maximum protection to all 276,500 acres of lands managed to protect wilderness characteristics. Impacts could still occur from leasable and locatable minerals, but these would represent minor to moderate localized impacts and be similar to those described under Alternatives B and C.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

Under Alternative D, dispersed, undeveloped recreation opportunities would be emphasized. Route systems would be designated that decrease wildlife habitat fragmentation, wildlife disturbance, and vegetation damage. Unlike Alternative A, B and C, land use authorizations, mining sites, developments, facilities, and activities would be mitigated with particular attention to maintaining wildlife habitat and movement corridors. Such actions would support protecting wilderness characteristics on approximately 119,800 additional acres (27 percent) of lands managed to protect wilderness characteristics. Impacts could be moderate to major depending on location. Impacts would take the form of added protection to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. Hunting and wildlife viewing opportunities could especially improve.

The removal of all wildlife water developments would provide moderate long-term enhancements to naturalness due to the removal of man-made structures in lands managed to protect wilderness characteristics; however, a potential major long-term loss of naturalness, hunting and wildlife observation opportunities, would result due to loss of wildlife populations cut off from natural water sources and dependent on removed artificial wildlife waters.

Impacts from reintroductions, transplants, and supplemental stockings of native wildlife; existing earthen livestock waters being used as refugia for native wildlife where livestock grazing is no longer permitted; and the restricting or placing LUAs, and fences to avoid adverse impacts to wildlife would be similar to Alternatives B and C. Overall, however, implementation of the ecological and biological resources decisions under Alternative D would detract from naturalness in contrast to B and C due to the removal of all wildlife water catchments, but would contribute to naturalness compared to Alternative A due to decision.

From Recreation Management on Wilderness Characteristics

Overall, recreation management in the Lower Sonoran under Alternative D would contribute to naturalness and opportunities for solitude and primitive, unconfined recreation to a substantially greater degree than all other alternatives under consideration. Alternative D would focus on nonmotorized, low intensity recreation, which would help protect wilderness characteristics. All lands managed to protect wilderness characteristics would be managed in concert with ERMA areas, with approximately 276,500 acres overlapping (see Table 4.22, "Acres of Lands Managed to Protect Wilderness Characteristics within Recreation Management Areas and Settings, Alternative D" (p. 593)). Allocating lands to ERMA in the Saddle Mountain, Gila Bend Mountains, and Ajo areas could, in some circumstances, contribute in loss or damage to wilderness characteristics, primarily because proactive planning and management of recreation uses supporting and protecting wilderness characteristics to meet resource goals and objectives that are lacking under Alternative A would not occur. SRPs would not be issued for commercial, competitive, or vending under Alternative D, further enhancing solitude and primitive recreation.

Table 4.22. Acres of Lands Managed to Protect Wilderness Characteristics within Recreation Management Areas and Settings, Alternative D

SRMA or ERMA	Setting			Lands Managed to Protect Wilderness Characteristics
	Back Country	Front Country	Community Interface	
ERMA (no SRMAs would be allocated in Alternative D).	0	0	0	276,500
SDNM	149,500	3,500	0	153,000

From Special Designations on Wilderness Characteristics

Under Alternative D, four ACECs would be designated to protect and conserve cultural and natural resource values. These ACECs overlap approximately 148,100 acres (34 percent) of lands managed to protect wilderness characteristics; thus contributing substantially to naturalness. Unlike Alternative A, ACEC management prescriptions under Alternative D would have moderate to major effect on preserving lands managed to protect wilderness characteristics.

Not designating the Agua Caliente Road as a 30 mile Back Country Byway would have no impact on lands managed to protect wilderness characteristics. Effects would be as described under Alternative A.

From Travel Management on Wilderness Characteristics

Closure of an estimated 53 percent of motorized road network miles prescribed under Alternative A to motorized recreation use through travel management decisions and coinciding with lands managed to protect wilderness characteristics would decrease impacts of motorized vehicles and human uses. Moreover, Alternative D's potential travel management motorized network would support long-term maintenance of naturalness and primitive, unconfined recreation, with unroaded tracts to a greater extent than any other alternative.

From Vegetation Resources on Wilderness Characteristics

Under Alternative D, long-term impacts from vegetation resources would be similar to those under Alternative B and C, including long-term contributions to naturalness resulting from the prohibition on wood harvesting, use of native species in restoration projects, and control of

invasive species which would limit the spread of non-native vegetation and would reduce the size and intensity of wildfires.

From Visual Resource Management on Wilderness Characteristics

Under Alternative D, all lands managed to protect wilderness characteristics would be managed with VRM Class II designations. These lands would receive nearly the highest visual and scenic resource protection, with greater wilderness characteristic acreage under VRM Class II than under any other alternative.

From Wilderness Characteristics on Wilderness Characteristics

All areas with wilderness characteristics in the Lower Sonoran would be managed to protect those characteristics. Naturalness, solitude, and the opportunity for unconfined and primitive recreation would be maintained and receive priority management attention on 276,500 acres. For the most part, this allocation would prevent the loss of naturalness, the depreciation of scenic values, or loss or degradation of solitude and primitive recreation opportunities, whether through increased visitor use, increasing motorized activity, or prohibited commercial uses.

All Lower Sonoran lands with wilderness characteristics would be managed for protection of wilderness characteristics over the long term, with management augmented by VRM Class II visual resource protection allocations. Alternative D represents the largest contiguous extent of lands managed to protect wilderness characteristics allocations under any of the alternatives.

4.12.6.3. Sonoran Desert National Monument

From Lands & Realty on Wilderness Characteristics

No multiuse utility corridors would be designated and no new LUAs would be allowed. These decisions would contribute to naturalness to a greater degree than all other alternatives and protect wilderness characteristics over the largest possible area.

From Livestock Grazing on Wilderness Characteristics

Under Alternative D, closing all livestock grazing allotments when current permits expire would support long-term maintenance of naturalness as all forage allocated to livestock would instead is available to native wildlife. Compared to Alternatives A, B, and C, implementation of Alternative D's grazing management would result in increased naturalness. Fencing, corrals, roads, wells, staging areas and other infrastructure affiliated with livestock operations would be removed and the landscapes restored or reclaimed. Evidence of livestock trampling and waste would disappear over time as well. Temporary sights, sounds, smells and aesthetic impacts associated with large ephemeral turnouts would be avoided. Consequently, opportunities for solitude and primitive recreation would be maintained or even enhanced due to the absence of human activity and infrastructure associated with livestock grazing management.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

Impacts are similar to Alternative D, described under the Lower Sonoran.

From Recreation Management on Wilderness Characteristics

Compared with Alternative A, impacts on lands managed to protect wilderness characteristics from recreation management would be considered negligible.

In the SDNM, 100 percent of allocated lands managed to protect wilderness characteristics would be within the SDNM SRMA, of which 98 percent are in the back country RMZ as identified in Table 4.22, "Acres of Lands Managed to Protect Wilderness Characteristics within Recreation Management Areas and Settings, Alternative D" (p. 593). Allocation of SRMAs would have impacts on lands allocated to protect wilderness characteristics. Future standards established for visitation, facility development, and other recreation-related activities must consider naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. In addition, Alternative D would focus on nonmotorized and low intensity recreation, which would help protect and add to wilderness characteristics. All wilderness characteristic lands would be allocated as such, with these values paramount, with the exception of Monument objects, in all land use decisions, allocations and planning.

The prohibition of target shooting throughout the SDNM would maintain naturalness and opportunities for solitude because copious shooter refuse (e.g., spent shells, targets, trash), damage or destruction of plants, rocks and protected Monument objects, and the unrestrained and inescapable sound of gunfire would be removed from the SDNM landscape. All direct and indirect recreational target shooting impacts would be eliminated under this alternative, as opposed to the more wide-spread, but localized, target shooting impacts described under Alternative A.

From Special Designations on Wilderness Characteristics

Removal of the Vekol Valley ACEC would have the same lack of impact to lands managed to protect wilderness characteristics as described under Alternative B. The Juan Bautista de Anza NHT would be managed with a priority on protecting cultural resources while providing some scientific research opportunities that are non-ground disturbing. Impacts to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation are not expected on allocated lands managed to protect wilderness characteristics next to the Anza NHT.

Designation of I-8 and SR-238 as National Scenic Byways would have no impact on wilderness characteristics except to emphasize maintenance of current scenic values in the Bender Wash area along the south side of the highway.

From Travel Management on Wilderness Characteristics

Closure of over 62 percent of road miles within the SDNM to motorized recreation use through travel management decisions where routes traverse lands managed to protect wilderness characteristics would eliminate impacts of motorized vehicles and human uses in these areas. Alternative D's travel management prescriptions support long-term maintenance and protection of naturalness and primitive, unconfined recreation to a greater extent than any other alternative. The landscapes with wilderness characteristic are the largest and most intact land areas brought forward in the range of action alternatives due to the road and travel management decisions under Alternative D.

All lands managed to protect wilderness characteristics within the SDNM would be closed OHV allocation areas. No new roads could be constructed, providing the maximum protection over the long-term from new roads or primitive roads.

The motorized vehicle route network designated in Alternative D represents considerably more protection for lands managed to protect wilderness characteristics than provided by the travel management networks under Alternative A, B and C. Closures or restrictions on over 370 miles of road and primitive road would protect or have major enhancing effects on wilderness characteristics on all lands managed to protect wilderness characteristics. The Alternative D travel management network eliminates impacts from road use on wilderness characteristics; increases solitude values to the broadest extent in the SDNM wilderness characteristic areas, presents the largest and least fragmented wilderness characteristic areas, and improves the extent and quality of primitive, unconfined recreational experiences across the largest scope of any of the alternatives.

From Vegetation Resources on Wilderness Characteristics

Impacts are the same as those described under Alternative C for the Monument.

From Visual Resource Management on Wilderness Characteristics

Under Alternative D, all SDNM lands managed to protect wilderness characteristics would be managed under VRM Class I. These lands would receive the strongest visual and scenic protection.

From Wilderness Characteristics on Wilderness Characteristics

All areas with wilderness characteristics in the SDNM would be managed to protect those characteristics. Naturalness, solitude, and the opportunity for unconfined and primitive recreation would be maintained and receive priority management attention on 153,000 acres allocated as lands managed to protect wilderness characteristics. For the most part, this allocation would prevent the loss of naturalness, the depreciation of scenic values, or loss or degradation of solitude and primitive recreation opportunities, whether through increased visitor use, increasing motorized activity, or by commercial or recreation uses.

All SDNM areas with wilderness characteristics would be managed as lands managed to protect wilderness characteristics over the long term, with management augmented by a closed OHV area designation, maximum visual resource protection, and the most acreage allocated as lands managed to protect wilderness characteristics. Moreover, the lands allocated under Alternative D encompass five large tracts. This represents the largest contiguous extent of lands managed to protect wilderness characteristics allocated under any of the alternatives.

4.12.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

Under Alternative E, approximately 166,300 (55,400 acres in the Lower Sonoran and 110,900 acres in the SDNM) would be allocated as lands managed to protect wilderness characteristics (Map 2-4e). Implementation of Alternative E would contribute to protecting wilderness characteristics to a lesser degree than would Alternatives C and D, but would support protecting wilderness characteristics to a substantially greater degree than would Alternatives A and B. This is due primarily to the allocation of lands managed to protect wilderness characteristics,

within which any proposed developments, actions, or other uses, would be required to consider and maintain naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. In addition, the allocation of one WHA to protect core areas of wildlife habitat, case-by-case management of artificial wildlife waters, prohibition on wood harvesting, allocation of VRM Class II, allocation of SRMAs, restrictions or closures to motorized travel, and designation of four ACECs all would contribute substantially to safeguarding wilderness characteristics in areas not allocated to protect wilderness characteristics.

4.12.7.1. Both Decision Areas

From Air Quality on Wilderness Characteristics

Actions and impacts from air quality decisions would be the same as under Alternative B.

From Cultural and Heritage Resource on Wilderness Characteristics

Overall impacts from cultural resource management including an emphasis on resource protection, scientific research, and inventory with some sites would be made available for public use, group use, and heritage sites would be similar to Alternative C.

4.12.7.2. Lower Sonoran

From Lands & Realty on Wilderness Characteristics

Impacts from decisions relating to utility-scale renewable energy development, multiuse utility corridors, LUAs, and other lands uses would be similar to Alternative D on lands managed to protect wilderness characteristics and similar to Alternative B for areas with wilderness characteristics not managed to protect those characteristics.

From Livestock Grazing on Wilderness Characteristics

Under Alternative E in the Lower Sonoran, lands managed to protect wilderness characteristics would be managed under a perennial-ephemeral grazing regime, which would have impacts similar to a combination of Alternatives A and C. Livestock forage allocations, livestock use adjustments, changes to grazing management systems, and construction or abandonment of rangeland developments would include strong consideration for wilderness characteristics.

Areas with wilderness characteristics that would not be allocated to protect those characteristics (225,500 acres) would be subject to impacts similar to those described under Alternatives A and C. Implementation of Alternative E would contribute to naturalness to a lesser degree than Alternative D (where all allotments would be closed), similar to Alternatives B and C, and to a small but greater degree than Alternative A (current management practices) due to consideration and protection offered allocated lands managed to protect wilderness characteristics.

From Minerals Management on Wilderness Characteristics

Impacts from mineral management would be similar to Alternative C.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

Impacts from reintroductions, transplants, and supplemental stockings of native wildlife; using existing earthen livestock waters as refugia for native wildlife where livestock grazing is no longer permitted; maintenance of wildlife habitat connectivity; and restricting or mitigating the placement of LUAs, and fences to avoid adverse impacts to wildlife would be similar to all other Action Alternatives. Overall, implementation of the ecological and biological resources measures under Alternative E would contribute to naturalness to a similar degree as under Alternative C and a to greater degree than under Alternatives A, B, and D due to emphasizing connectivity of wildlife habitat, use of native vegetation in restoration efforts, measures to maintain populations of native wildlife, and a lack of measures to unnaturally manipulate native wildlife populations.

As under Alternative D, the Gila Bend Mountains WHA would be allocated and managed to protect native vegetation and expansive, un-fragmented wildlife habitat and movement corridors. Under Alternative E; however, there would be no overlap between lands managed to protect wilderness characteristics and the WHA as there would be under Alternative D. The Gila Bend Mountains WHA would contribute to the naturalness of lands with wilderness characteristics not managed to protect such characteristics under Alternative E.

Development of wildlife waters on a case-by-case basis would have impacts on areas with wilderness characteristics similar to those described in Alternative A.

From Recreation Management on Wilderness Characteristics

Allocation of SRMAs would have moderate impacts to lands managed to protect wilderness characteristics as future standards established for visitation, facility development, and other recreation-related considerations would consider and be guided by maintaining naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. The Saddle Mountain SRMA would help protect lands managed to protect wilderness characteristics, although its emphasis on community recreation with a balance of motorized and nonmotorized recreation would allow moderate degradation of some unmanaged wilderness characteristics. The Ajo SRMA would help maintain lands managed to protect wilderness characteristics by focusing intensive motorized recreation outside of these areas. In both SRMAs, Backcountry recreation settings will maintain wilderness characteristics of lands managed to protect such characteristics (see Table 4.24, “Alternative A Mineral Entry Status” (p. 668)). In summary, impacts from SRMA allocations under Alternative E are similar to Alternative A, except that the SRMAs under Alternative E are driven by benefit-based prescriptions and outcomes.

Table 4.23. Acres of Lands Managed to Protect Wilderness Characteristics Within SRMAs and Recreation Management Settings, Alternative E

SRMA	Setting			Lands Managed to Protect Wilderness Characteristics
	Back Country	Front Country	Community Interface	
Ajo	45,500	0	0	45,500
Saddle Mountain	4,600	0	0	5,500
SDNM	107,400	3,500	0	110,900

Management of SRMAs where no areas are managed to protect wilderness characteristics may maintain such characteristics as an incidental result of recreation decisions; however, the focus

of management would not be intended to protect characteristics and could likely result in loss of those characteristics in the long-term. The Gila Bend SRMA would contribute to protecting wilderness characteristics to an extent similar to Alternative B.

All 55,400 acres allocated as lands managed to protect wilderness characteristics would be assigned to the back country (46,400 acres in the Ajo SRMA and 4,600 acres in the Saddle Mountain SRMA), which would help protect wilderness characteristics, ensuring maximum protection. This is similar to Alternative A, where ROS classifications were applied.

From Special Designations on Wilderness Characteristics

Under Alternative E, four ACECs would be designated. The Coffeepot-Batamote-Sauceda ACECand the Saddle Mountain ACECwould, respectively, overlap 44,400 and 4,600 acres of lands managed to protect wilderness characteristics and would overlap adjoining area with wilderness characteristics that would not be allocated as lands managed to protect wilderness characteristics. The Cuerda de Lena ACEC would also overlap with areas with wilderness characteristics that would not be managed to protect wilderness characteristics. The focus on protection and conservation of cultural and natural resource values of these ACECs would contribute to maintaining naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. Under Alternative E, prospective impacts would be greater than under Alternatives A, B, and C but less than under Alternative D because fewer acres would be allocated as lands managed to protect wilderness characteristics under Alternative E than under Alternative D.

Designating the Agua Caliente Road as a 30 mile Back Country Byway would have no impact on wilderness characteristics.

From Travel Management on Wilderness Characteristics

Alternative E would close, limit or seasonally restrict motorized use on an estimated 275 more miles (31 percent) of road miles than under Alternative A and 140 more miles than under Alternative B, and would open 10 more miles than under Alternative C and 260 more miles than under Alternative D.

lands managed to protect wilderness characteristics totaling 55,400 acres, would be limited OHV use areas, which would assist in the protection of naturalness and outstanding opportunities for solitude and primitive, unconfined recreation in such areas. Overall, route closures and restrictions would generally have the same effect as described under Alternative C for lands managed to protect wilderness characteristics. Areas with wilderness characteristics not managed as such would be much less protected than described under Alternative D, but much more protected by a designated travel route network than described under Alternatives A or B.

From Vegetation Resources on Wilderness Characteristics

As under Alternatives B and C, small, localized harvesting of plant materials would result in short-term detractions from naturalness. Under Alternative E, long-term supporting impacts from vegetation resources would be similar to those under Alternative B, C, and D including long-term contributions to naturalness resulting from the prohibition on wood harvesting, use of native species in restoration projects, and control of invasive species which would limit the spread of non-native vegetation and would reduce the size and intensity of wildfires.

From Visual Resources on Wilderness Characteristics

Lands managed to protect wilderness characteristics would be managed to VRM classes as depicted in Table 4.21, "Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternative C" (p. 587). VRM allocations would support protecting wilderness characteristics on lands managed to protect wilderness characteristics with all acres assigned to VRM II. Alternative E would provide less continuance to naturalness than Alternatives C and D, but more than under Alternatives A or B.

From Wilderness Characteristics on Wilderness Characteristics

Naturalness, solitude, and the opportunity for unconfined and primitive recreation would be maintained and receive priority management attention on 55,400 acres, or 18 percent of Lower Sonoran lands. For the most part, allocations to lands managed to protect wilderness characteristics would prevent the loss of naturalness, the depreciation of scenic values, or loss or degradation of solitude and primitive recreation opportunities on allocated lands, whether through increased visitor use, increasing motorized activity, or prohibited commercial uses.

A total of 225,500 acres, representing 82 percent of area with wilderness characteristics in the Lower Sonoran would not be managed to protect wilderness characteristics. Protecting wilderness characteristics would not be a management priority for these lands. Moderate impacts on areas with wilderness characteristics would be anticipated from mineral and energy development, new roads and utility corridors, increased motorized recreation uses, and other land use authorizations. However, major loss or impairment of wilderness characteristics would be localized to surface disturbing activities.

Areas with wilderness characteristics not managed to protect such characteristics would be managed to the VRM classes as listed in Table 4.21, "Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternative C" (p. 587) described under Alternative E. In areas with wilderness characteristics, VRM classifications would contribute to protecting wilderness characteristics and associated naturalness more so than under Alternatives A and B, similar to Alternative C, and much less than under Alternative D.

4.12.7.3. Sonoran Desert National Monument

From Lands & Realty on Wilderness Characteristics

Impacts from lands and realty decisions under Alternative E would be similar to those described for Alternative C.

From Livestock Grazing on Wilderness Characteristics

Areas with wilderness characteristics not allocated to protect those characteristics (42,100 acres in the SDNM) would have impacts as described under C, except that ephemeral grazing would occur. Ephemeral grazing would temporarily detract from or impair naturalness in the short term, as ephemeral forage would be removed and not available to wildlife. The sights, sounds, smells, and other impacts from large ephemeral turnouts on the SDNM would occur, detracting from naturalness and hindering visitors seeking opportunities for primitive recreation in a more natural and untrammeled environment.

From a livestock grazing management perspective, implementation of Alternative E would contribute to naturalness to a lesser degree than Alternative D, similar to Alternative C, and to a small but greater degree than Alternatives A and B.

From Priority Wildlife Species and Habitat Management on Wilderness Characteristics

Overall, implementation of the ecological and biological resources measures under Alternative E would contribute to maintaining naturalness to a similar degree as under Alternative C and a to greater degree than under Alternatives A, B, and D. This result is primarily due to emphasizing connectivity of wildlife habitat, use of native vegetation in restoration efforts, measures to maintain populations of native wildlife, and a lack of measures to unnaturally manipulate native wildlife populations. Development of wildlife waters on a case-by-case basis would have minor impacts on areas with wilderness characteristics as described under Alternative A, but only in localized areas. Impacts would be boosted to moderate in localized areas if new road access were required to access new water developments.

From Recreation Management on Wilderness Characteristics

Continuance of naturalness and opportunities for solitude and primitive, unconfined recreation would be similar to Alternative C. Lands managed to protect wilderness characteristics would include 107,400 acres (or 99 percent) of back country and 3,500 acres of front country. In areas of wilderness characteristics that would not managed to protect those characteristics, 1,600 acres would be assigned to the back country zone, which would tend to protect wilderness characteristics. About 1 percent of these wilderness characteristics would be allocated to the front country and thus much more likely to incur a degradation of wilderness characteristics. Impacts resulting from authorization of SRPs would be similar to those described under Alternative B.

Impacts from any specific recreation use on lands managed to protect wilderness characteristics would be considered negligible and easily corrected or mitigated through adaptive management. Areas not managed to protect wilderness characteristics would, for the most part, retain wilderness characteristics over the long term, as described under Alternative C, along with their associated primitive recreation and solitude opportunities.

The prohibition of target shooting throughout the SDNM would maintain naturalness and opportunities for solitude because copious shooter refuse (e.g., spent shells, targets, trash), damage or destruction of plants, rocks and protected Monument objects, and the sound of gunfire would be removed from the landscape.

From Special Designations on Wilderness Characteristics

Removal of the Vekol Valley ACEC would have the same impacts as those described under Alternative B. Impacts from managing the Juan Bautista de Anza NHT would be the same as described under Alternative D.

Designation of I-8 and State Route 238 as National Scenic Byways, of 30 miles or 18 miles length respectively, would have a slight protective effect due to prescriptions and management oversight over the maintenance of scenic values along these highways.

From Travel Management on Wilderness Characteristics

Route closures and restrictions, representing a 40 percent reduction in road and primitive road miles than presented by Alternative A, would have the same effects as described under Alternative C.

Impacts from the SDNM Route Designation would be identical to those described under Alternative C.

From Vegetation Resources on Wilderness Characteristics

Impacts to areas with wilderness characteristics are similar to those described under Alternatives A and B.

From Visual Resources on Wilderness Characteristics

Lands managed to protect wilderness characteristics would be managed to VRM Class II as depicted in Table 4.21, "Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternative C" (p. 587). This VRM allocation would support protecting wilderness characteristics in lands allocated to protect those characteristics. Due to fewer acres managed to protect wilderness characteristics, Alternative E would offer less protection for visually-related wilderness characteristics than Alternatives C and D, but more so than under Alternatives A or B.

From Wilderness Characteristics on Wilderness Characteristics

Naturalness, solitude, and the opportunities for unconfined and primitive recreation would be maintained and receive priority management attention on 110,900 acres allocated to lands managed to protect wilderness characteristics, representing 72 percent of Monument lands identified to possess wilderness characteristics. Impacts would be similar to those described under Alternative C, with only 1 percent less acreage allocated to lands managed to protect wilderness characteristics than for that alternative. For the most part, this allocation would prevent the loss of naturalness, the depreciation of scenic values, or loss or degradation of solitude and primitive recreation opportunities, whether through increased visitor use, increasing motorized activity, or commercial uses.

Areas with wilderness characteristics but not allocated as lands managed to protect wilderness characteristics total 42,100 acres, representing 28 percent of the total Monument lands identified to possess wilderness characteristics. Minor to negligible changes to the nature of these lands would be anticipated, as fully described under Alternative C.

Proposed VRM classifications would maintain naturalness within areas known to possess wilderness characteristics, but not allocated as lands managed to protect wilderness characteristics. Scenic and visual resource protection visually would be much greater than brought forward by Alternatives A and B, because all acreage under Alternative E would be managed as VRM Class II, but less than the visual resource protection prescriptions represented by Alternative D.

4.13. IMPACTS ON WILDLAND FIRE MANAGEMENT

This section analyzes the impacts from resource management actions on Wildland Fire Resources. Impacts on fire and fuels management would result from actions that would affect the type and abundance of fuels, increase or limit sources of ignition, and affect fire-suppression activities. Non-native plant establishment and spread can greatly increase the amount of fuels, the intensity and size of fires, as well as shorten fire-return intervals. Short-term effects on fire and fuels management, which are defined as those lasting no more than 5 years, are important, but the more critical impacts would be those that would endure throughout and past the life of the RMP.

The largest factor contributing to increased desert wildland fires stems from the increased population growth of Metropolitan Phoenix. Fuel conditions fluctuate greatly due to annual precipitation levels and the presence of non-native plants. Due to establishment and spread of non-native plants, Sonoran desert scrub and riparian areas within the Planning Area, which are not adapted to fire, are now at high risk of major, long-term changes to the native plant communities (BLM 2003).

Illegal border activity will also continue to provide increased human-caused fires. Military training operations over and adjacent to the Planning Area will also continue to be and additional source of human-caused fires. All of these sources of wildfires are exacerbated by the fact that annual exotic grasses and forbs continue to spread throughout the planning, area providing a continuous fuel bed for wildfires especially in above average rainfall years.

4.13.1. METHODS OF ANALYSIS

4.13.1.1. Indicators

The following impact indicators were used in this assessment:

- Amount of annual exotic grasses or forbs, measured pounds per acre
- Fire frequency – This indicator is measured by the change in the number of human-caused wildland fires. This indicator measures the effectiveness of management actions which are preventative such as education and restrictions to travel and use within and outside the WUI. The number of human-caused starts is dependent on access and development.
- Fire Regime Condition Class (FRCC) - This indicator measures the effectiveness of fuels, ES and other vegetation treatments. Change in FRCC is dependent on changes in fire return interval and fire severity and is a measure of the degree of departure from an historical reference condition as it pertains to both vegetation seral classes and fire frequency. BLM policy requires current and desired resource conditions related to fire management to be described in terms of three condition classes known as FRCC.

4.13.1.2. Assumptions

The following assumptions regarding the future management of wildland fire are made:

- A direct relationship exists between the density of human use within the Planning Area and the frequency of human-ignited fires (and the intensity of use is expected to increase over the life of the plan),

- A direct relationship exists between fuel loading and potential fire size and intensity.
- Invasive species will carry fire and an increase in invasive species will decrease fire return intervals and increase fire intensities.
- Livestock and water supply developments could be used for fire suppression when water is present.
- Increased motorized vehicle activity or increased number of motor vehicle routes will result in an increased number of starts within the Planning Area.
- If non-fire adapted vegetative communities experience wildland fire, they will move into the CC 3 category.

4.13.1.3. Program Areas with No Impacts on Wildland Fire Management

There would be no impacts to wildland fire management from actions proposed under the following resource management programs:

- Caves and Cave Resources
- Paleontological and Geological Resources
- Water Resources
- Wild Horse & Burro Management

4.13.1.4. Qualitative Intensity Scale

The intensities of impacts are the same as those described in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375). In terms of changes to a plant community, as described by Fire Regime Condition Class, a negligible or minor impact would result in no change to condition class. A plant community currently in CC1 would remain in CC 1 if it experienced a minor change. A moderate impact would be represented by a change in CC from CC1 to a CC2 or a change in CC2 to a CC3. A major impact would be represented by a change in CC from the current condition class to a CC3.

4.13.2. Common to All Alternatives

4.13.2.1. Both Decision Areas

From Air Quality on Wildland Fire Management

Air resources may have a general impact on fire and fuels management in areas that are nonattainment for PM_{10}. Within these areas it may not be practical to utilize prescribed fire as a management tool. Following AZDEQ smoke permitting requirements will ensure that impacts to air quality are minor.

From Cultural and Heritage Resources on Wildland Fire Management

Cultural and heritage resources may have an impact on fire and fuels management activities in areas where cultural resources are present. This will require close cooperation with a cultural resources resource advisor during suppression operations. Fuels treatment activities will need to be designed to avoid known cultural and heritage sites while implementing mitigation measures to protect unknown occurrences of these resources. Close coordination with cultural resource specialists and following the Section 106 consultation process will ensure that impacts to cultural and heritage resources are in most cases minor.

From Priority Wildlife Species and Habitat Management on Wildland Fire Management

Priority Wildlife Species and Habitat management may have an impact on fire and fuels management in areas where these resources are present. This resource will require close cooperation with resource advisors and implementation of conservation measures where appropriate. Fuels treatment activities will need to be designed to avoid, mitigate these resources and may result in treatments being modified or relocated to avoid major consequences. Close coordination with resource specialists and following the Section 7 consultation process will ensure that impacts to Priority Wildlife Species and Habitat are minor.

From Public Safety and Hazardous Materials on Wildland Fire Management

Public safety and hazardous materials considerations will have an impact on fire and fuels management activities in areas where known or suspected hazards are present. This will require closed coordination with resource advisors and may result in modified suppression tactics being used to prevent firefighters from being exposed to hazardous materials. Fuels treatments may require surveys for hazardous materials prior to treatment as well as mitigation measures for encounters with previously unknown contaminated areas. Use of mitigation measures and coordination with resource advisors will result in most impacts being minor, but in certain cases wildfire suppression operations will have to be indirect allowing larger areas of desert plant communities to burn and the impact will be major.

From Special Designations on Wildland Fire Management

Special designation areas will have an impact on fire suppression and fuels treatment activities. Activities will have to follow the restrictions for each of these areas (Wilderness, ACECs, NHT) and may restrict the use of mechanized suppression tactics and fuels treatments. Most restrictions do allow exceptions for restricted uses with prior authorization from line managers, in most situations this will mitigate the impacts to fire suppression activities and allow impacts to be relatively minor (e.g. with line manager approval we can utilize aviation resources in a wilderness to keep a fire small).

From Soil Resources on Wildland Fire Management

Soil resources may have a general, localized impact on fire and fuels that would remain the same across all alternatives. Sensitive soil types or areas where run-off is a management concern could reduce the ability to conduct prescribed fires in some areas. The management of wilderness areas, cultural and heritage resources, and special status species would also have an impact on fire and fuels in all alternatives as treatment methods would be constrained particularly with regard

to use of equipment. From Wildland Fire Management on Wildland Fire Management Fuels treatment activities will reduce the size and severity of wildfires within the Planning Area and will improve the fire regime condition class rating for lands within the Planning Area. Prevention and mitigation activities will reduce the number of human-caused starts and thus maintain condition class rating for the lands within the Lower Sonoran Planning Area. A full suppression response will reduce the size of fires within the Planning Area. Fire and fuels management activities and treatments could result in damage to resources by spreading weeds and creating soil disturbance, but by following mitigation measures and close coordination with resource advisors these negative impacts should remain minor.

From Wildland Fire Management on Wildland Fire Management

Fuels treatment activities will reduce the size and severity of wildfires within the Planning Area and will improve the fire regime condition class rating for lands within the Planning Area. Prevention and mitigation activities will reduce the number of human-caused starts and thus maintain condition class rating for the lands within the Lower Sonoran Planning Area. A full suppression response will reduce the size of fires within the Planning Area. Fire and fuels management activities and treatments could result in damage to resources by spreading weeds and creating soil disturbance, but by following mitigation measures and close coordination with resource advisors these negative impacts should remain minor.

4.13.2.2. Lower Sonoran

No unique impacts are described for All Alternatives in the Lower Sonoran.

4.13.2.3. Sonoran Desert National Monument

No unique impacts are described for All Alternatives in the Monument.

4.13.3. ALTERNATIVE A (NO ACTION)

4.13.3.1. Both Decision Areas

From Lands & Realty on Wildland Fire Management

While corridors could serve as areas of non-native plant establishment, associated roads may increase access to areas to where fire suppression is needed. If fuel levels in corridors are maintained at low levels, they could also be used as fire breaks during fire-suppression activities. Overhead utility lines and aboveground pipelines in corridors would continue to present hazards to fire fighters during suppression operations in site-specific areas. The establishment of solar energy farms will reduce the incidence of fire in the immediate vicinity of the solar panels, but an increased road network in and around the perimeter of the solar fields may lead to non-native plant establishment and an increased incidence of fires.

From Livestock Grazing on Wildland Fire Management

The Cameron allotment in the Lower Sonoran would remain closed and all grazing allotments south of I-8 and within the SDNM would be permanently terminated at the expiration of current

permits. All other allotments in both Decision Areas would be open and classified as perennial, ephemeral, or perennial-ephemeral. In years of higher precipitation and vegetation growth, ephemeral grazing would reduce fuel levels from annual and perennial plants, although not enough to alleviate the risk of fire in non-fire adapted communities in these high-growth years. Allotments classified as perennial and perennial-ephemeral would also have year-long livestock use which would likely decrease fuel production somewhat. Conversely, continued livestock use would cause the introduction and continued spread of invasive species, increasing the fire load. A few existing range water sources for livestock could provide sources of water for use in fire-suppression activities.

From Minerals Management on Wildland Fire Management

Mineral development and associated roads would increase the spread of invasive species but also provide improved access for fire suppression.

From Vegetation Resources on Wildland Fire Management

Ecological and biological resources management under Alternative A would target populations of invasive and noxious weeds and restrict uses in areas of importance to special status and T species. This could decrease sources of non-native plant populations and minimize establishment and spread near targeted areas, which may decrease fuel levels, fire intensity, and lengthen fire-return intervals in the long term.

From Visual Resources on Wildland Fire Management

Visual resources would be managed using Class I (91,800 acres in the Lower Sonoran and 158,700 acres in the SDNM Decision Areas), Class II (116,300 acres in the Lower Sonoran and 91,600 acres in the SDNM), Class III (279,600 acres in the Lower Sonoran and 116,400 acres in the SDNM Decision Areas) and Class IV (442,500 acres in the Lower Sonoran and 119,700 acres in the SDNM) VRM designations. Class I and Class II designations require the highest level of restoration and reclamation when activities that disturb the visual landscape occur, which could require more restoration and reclamation activity to preserve the scenic quality.

From Wilderness Characteristics on Wildland Fire Management

A lack of protection for wilderness characteristics would not limit activities that increase the potential for non-native plant establishment and spread and, in the long-term, would likely lead to increases in fuel levels, intensity, size of areas burned, human-ignited fires, and shortened fire-return intervals.

From Wildland Fire Management on Wildland Fire Management

Impact from wildland fire management are the same across all alternatives with the exception of Alternative A which allows for the management of wildfire for multiple objectives. Fire and fuels management under Alternative A would use wildfire as a tool to achieve resource goals in areas adapted to and tolerant of fire and use MIST when possible. In Alternative A, use of fire as a tool is restricted to the interior chaparral community in the Miami-Globe area. Specific management

actions also would include a reduction in fuel levels using guidelines in the Arizona Statewide LUP Amendment for Fire, Fuels, and Air Quality Management (BLM 2004).

4.13.3.2. Lower Sonoran

From Recreation Management on Wildland Fire Management

Increased levels of recreation would likely increase the level of human-ignited fires, surface disturbance, and fuel levels associated with non-native plant establishment and spread. Increased recreation would be expected in all areas, but particularly in SRMAs, totaling 379,400 acres in the Lower Sonoran, as well as along the Juan Bautista de Anza NHT.

Under Alternative A, the lack of facilitated recreational management on designated access point requirements, recreation (e.g. user selected camping sites, campfires, and target shooting) could increase potential for human-ignited fires from sparks, escaped fires, and firebrands.

From Travel Management on Wildland Fire Management

The Coffeepot Botanical ACEC, 8,900 acres in the Lower Sonoran would be closed to motorized vehicle use. Such restrictions could limit access to areas for fire suppression and limit surface disturbance and non-native plant establishment.

Under Alternative A, the current OHV-class designation and route system would generally remain in place. Motorized vehicles would be limited to existing or designated routes on 819,500 acres of the Lower Sonoran, and approximately 110,700 acres of the Decision Area would be closed to motorized-vehicle use. Emergency and administrative uses off-road, such as for fire suppression would be authorized. These limits would help limit increases in fuel levels from non-native plant establishment. Although motor-vehicle use is limited to existing or designated routes, few routes have been designated as open, limited, or closed to use. This could increase fuel loads because the lack of such designations would mean the absence of a clearly delineated travel network, increased route proliferation, and an elevated degree of surface disturbance and associated increase in non-native plant establishment.

4.13.3.3. Sonoran Desert National Monument

From Recreation Management on Wildland Fire Management

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except 143,900 acres would be allocated as an SRMA in the Monument.

From Travel Management on Wildland Fire Management

The Vekol Valley Grasslands ACEC, 3,500 acres in the SDNM would be closed to motorized vehicle use. Such restrictions could limit access to areas for fire suppression and limit surface disturbance and non-native plant establishment.

Under Alternative A, the current OHV-class designation and route system would generally remain in place. In SDNM, approximately 325,200 acres would be limited to existing or designated routes and 161,200 acres would be closed. Emergency and administrative uses off-road, such

as for fire suppression would be authorized. These limits would help limit increases in fuel levels from non-native plant establishment. Although motor-vehicle use is limited to existing or designated routes, few routes have been designated as open, limited, or closed to use. This could increase fuel loads because the lack of such designations would mean the absence of a clearly delineated travel network, increased route proliferation, and an elevated degree of surface disturbance and associated increase in non-native plant establishment.

4.13.4. ALTERNATIVE B

4.13.4.1. Both Decision Areas

From Lands & Realty on Wildland Fire Management

The effects on fire and fuels that would occur from multiuse utility corridors and LUAs would be similar to those described in Alternative A, Utility-scale renewable energy sites and other lands uses would similarly impact fire and fuels over the long term by increasing the potential for non-native plant establishment and spread and increasing access for fire-suppression activities, as described in Alternative A.

Effects of land use and disposal in the SDNM would be similar those identified under Alternative A.

From Livestock Grazing on Wildland Fire Management

Under Alternative B, impacts from livestock-utilization levels would be the same as described under Alternative A. Except, fewer livestock would cause an increase in fuel load.

From Minerals Management on Wildland Fire Management

Impacts from mineral resource decisions would be the same as Alternative A.

From Vegetation Resources on Wildland Fire Management

Vegetation resources management under Alternative B would target populations of invasive and noxious weeds, actively restore disturbed areas, and restrict uses in areas of importance to special status and T species. Compared to Alternative A, these actions could decrease sources of non-native plant propagules and minimize establishment and spread near targeted areas, which may decrease fuel levels and fire intensity and lengthen fire-return intervals in the long term. Development and maintenance of wildlife waters in both Decision Areas would involve the need for access roads associated with these waters. While such roads would increase access for fire suppression activities, they would also increase access for other activities, which could increase the occurrences of human-ignited fires, as well as fuel levels associated with non-native plant establishment and spread.

From Visual Resources on Wildland Fire Management

In terms of VRM, 51,400 more acres would be assigned to VRM Class I and II in the Lower Sonoran and 127,400 more acres would be assigned to VRM Class II in the SDNM compared to

Alternative A. Such increases in VRM Class I and/or Class II areas would proportionally decrease overall changes to the vegetation communities from surface disturbing activities, thus decreasing spread of non-native plants that increase fuel loads.

From Wildland Fire Management on Wildland Fire Management

Fire/fuels management decisions provided by Alternative B are similar to those of Alternative A, with the exception that wildfire would not be managed to meet multiple objectives. Under Alternative B, all wildfires would be suppressed regardless of whether the plant community is fire adapted or not. The fire adapted communities make up less than one percent of the public lands within the Planning Area making managing wildfire for multiple objectives an impractical option. Prescribed fire may still be implemented to benefit fire-adapted plant communities such as the desert grassland areas (such as those found in the Vekol Valley of the SDNM) and chaparral/mid-elevation scrub areas. Full suppression of wildfires in plant communities that are not adapted to fire, such as Sonoran Desert scrub, would decrease their conversion into non-native grasslands. This, in turn would reduce the size wildfires occurring within the Planning Area. Fuels management treatments would be integrated with vegetation management activities to reduce the occurrence and density of weed species, restore plant communities damaged by wildfire, and to protect areas from future fire occurrence.

From Wilderness Characteristics on Wildland Fire Management

Impacts would be the same as those described under Alternative A for both Decision Areas.

4.13.4.2. Lower Sonoran

From Recreation Management on Wildland Fire Management

Impacts from SRMA allocations in the Lower Sonoran would be the same as described under Alternative A, although more widespread as 779,800 acres would be designated as SRMAs under Alternative B. As the recreation uses increase in the Decision Area, more widespread active management of recreation users could help decrease fire danger by reducing the spread of invasive species, improper use of campfires, and inappropriate target shooting. In addition, about 45 percent of the Lower Sonoran would be allocated as back country RMZ, which would limit activities that lead to increases in fuel levels from non-native plant establishment in disturbed areas.

Alternative B would also allocate 34 percent of the Decision Area as front country RMZ and 9 percent as community interface RMZ, which are the main settings for intensive resource-dependent recreational uses and thus would not be as conducive to limiting fuel levels and minimizing human-ignited fires over the long term as the back country RMZ. Front country and community interface RMZ allocations would be similar in effect to the roaded-natural and semi-primitive, nonmotorized settings under Alternative A. The remaining areas not allocated as SRMAs in the Lower Sonoran under Alternative B would be managed as ERMAs with impacts similar to those described in Alternative A, although impacts would be much less widespread as only about one-fifth the Decision Area would be within the ERMA allocation under Alternative B.

From Travel Management on Wildland Fire Management

Under Alternative B, vehicle use in the Lower Sonoran would be limited to designated routes within the 828,360 acres outside of wilderness areas, and closed on 101,800 acres in wilderness areas. Designated access points for motorized and mechanized entry is recommended for entry into public lands, particularly near metropolitan areas. Limiting motorized/mechanized uses would help limit or contain the amount of surface disturbance and non-native plant establishment. In each of the Decision Areas, 70 miles of routes would be closed, which would eliminate the impacts of motorized-vehicle use on fire and fuels management along the closed routes; however, it would also decrease access for fire suppression activities along the same routes.

Under Alternative B, agencies involved in fire-suppression activities may drive off-road in time critical situations. This would allow access to areas such as closed-routes and aid in reducing time needed to access and suppress fires. Accessing a fire sooner may decrease the overall size of the area that would burn, decrease risk to fire fighters, and decrease the cost of fire suppression. Native vegetation not adapted to fire in burned areas may not be able to compete with non-native plants, especially grasses that respond favorably to fire. Reducing the size of burned areas would lower the overall potential for non-native plant establishment and spread and limit associated increases in fuel levels.

4.13.4.3. Sonoran Desert National Monument

From Recreation Management on Wildland Fire Management

The entire SDNM would be allocated as one SRMA under Alternative B, with 76 percent of SDNM being allocated as back country RMZ and 22 percent allocated as front country RMZs. While the majority of the Decision Area would be in the back country RMZ, thus limiting activities that lead to fuel levels, Alternative B would also allocate the largest area among the alternatives to the front country RMZ that would not place such limits on fuel levels.

From Travel Management on Wildland Fire Management

In the SDNM, 328,700 acres would be limited to designated routes and 157,700 acres in wilderness areas would be closed. Designated access points for motorized and mechanized entry is recommended for entry into public lands, particularly near metropolitan areas. Limiting motorized/mechanized uses would help limit or contain the amount of surface disturbance and non-native plant establishment. In each of the Decision Areas, 70 miles of routes would be closed, which would eliminate the impacts of motorized-vehicle use on fire and fuels management along the closed routes; however, it would also decrease access for fire suppression activities along the same routes.

Under Alternative B, agencies involved in fire-suppression activities may drive off-road in time critical situations. This would allow access to areas such as closed-routes and aid in reducing time needed to access and suppress fires. Accessing a fire sooner may decrease the overall size of the area that would burn, decrease risk to fire fighters, and decrease the cost of fire suppression. Native vegetation not adapted to fire in burned areas may not be able to compete with non-native plants, especially grasses that respond favorably to fire. Reducing the size of burned areas would lower the overall potential for non-native plant establishment and spread and limit associated increases in fuel levels.

4.13.5. ALTERNATIVE C

4.13.5.1. Both Decision Areas

From Lands & Realty on Wildland Fire Management

In the Lower Sonoran, impacts from multiuse utility corridors and LUAs would be similar to Alternatives A and B. Impacts from considering requests for major utilities outside of designated corridors and proposals for utility-scale renewable energy sites and other uses would be similar to Alternative B.

In the SDNM, the Santa Rosa-Gila Bend and I-8 multiuse utility corridors would be designated; however, impacts would be reduced as only transportation and underground utilities would be allowed. Underground utilities would be less of a hazard to fire fighters than the overhead and aboveground utilities authorized under Alternative B.

Finally, impacts on fire and fuels from land use authorizations would be further decreased as uses that dedicate more than 1 acre over the long term would not be approved.

From Livestock Grazing on Wildland Fire Management

The types of impacts from the continuation of livestock utilization levels would be the same as described under Alternatives A and B. However, under Alternative C, supplemental ephemeral grazing would not be allocated on allotments that are presently classified as perrenial/ephemeral. This wouldcausee an increased fuel load during abundant ephemeral forage years.

From Minerals Management on Wildland Fire Management

Mineral resource decision impacts would be the same as Alternatives A and B.

From Vegetation Resources on Wildland Fire Management

Impacts would be similar to those described in Alternative B.

From Visual Resources on Wildland Fire Management

More acres in both decisions areas would be assigned to VRM Class I and II than under Alternatives A or B. Such increases in VRM Class I and/or Class II areas would proportionally decrease overall changes to the vegetation communities from surface disturbing activities, thus decreasing spread of non-native plants that increase fuel loads.

From Wilderness Characteristics on Wildland Fire Management

Approximately 128,100 acres in the Lower Sonoran and 112,200 acres In the SDNM would be allocated as lands managed to protect wilderness characteristics. These special designations and allocations, combined with the back country RMZ designation, would minimize non-native plant establishment, thus decreasing associated fuel levels and fire intensities.

From Wildland Fire Management on Wildland Fire Management

The impacts of fire management decisions on fire and fuels resources is the same as Alternative B.

4.13.5.2. Lower Sonoran

From Recreation Management on Wildland Fire Management

In the Lower Sonoran, Alternative C would allocate 640,300 acres of SRMAs, which is slightly less than those allocated in Alternative B. Impacts due to the active management of recreation uses in SRMA allocations would be similar to but less widespread than under Alternative B.

In addition, 66 percent of the SRMAs would be assigned to the back country RMZ under Alternative C, which would further reduce impacts in the form of increased fuel loads and human-ignited fires associated with front country and community interface RMZs. Impacts from management of ERMAs in the Lower Sonoran under Alternative C would be similar in nature to Alternative B, except the scope would decrease proportionately as ERMAs would only cover 20 percent of the area covered under Alternative B.

From Travel Management on Wildland Fire Management

Under Alternative C, impacts from limiting motorized/mechanized vehicles to existing or designated routes as well as designating routes as open, limited, or closed to OHV use would be the same as described under Alternative B.

Impacts from encouraging designated access point use for entering public lands would be the same as under Alternative B.

Specific impacts from closing routes would be the same as under Alternatives A and B, although more widespread as 319 more miles of routes would be closed compared to Alternative A; and 121 more miles of routes would be closed compared to Alternative B. Impacts from allowing agencies involved in fire-suppression activities to drive off-road in time critical situations would be the same as described under Alternative B.

4.13.5.3. Sonoran Desert National Monument

From Recreation Management on Wildland Fire Management

As under Alternative B, the entire SDNM would be allocated as an SRMA; however, five percent more lands in the Monument would be assigned to the back country RMZ, which would slightly decrease the area exposed to a greater potential of increased fuel loads and human-ignited fires. In addition, actions that would decrease surface disturbance and opportunities for non-native plant establishment would occur due to a change in management emphasis to be more protective of Monument resources. In the SDNM, limits on camping site locations and campfires could limit the extent of human ignited fires. Limits on target shooting in both Decision Areas could have a similar impact.

From Travel Management on Wildland Fire Management

Under Alternative C, impacts from limiting motorized/mechanized vehicles to existing or designated routes as well as designating routes as open, limited, or closed to OHV use would be the same as described under Alternative B.

Impacts from encouraging designated access point use for entering public lands would be the same as under Alternative B.

Specific impacts from closing routes would be the same as under Alternatives A and B, although more widespread as 252 more miles of routes would be closed compared to Alternative A; and 80 more miles of routes would be closed compared to Alternative B. Impacts from allowing agencies involved in fire-suppression activities to drive off-road in time critical situations would be the same as described under Alternative B.

4.13.6. ALTERNATIVE D

4.13.6.1. Both Decision Areas

From Lands & Realty on Wildland Fire

Management Impacts from multiuse utility corridors and LUAs in the Lower Sonoran would be similar to those under Alternative C, although not as widespread as there would only be seven multiuse utility corridors allocated.

ACECs would be exclusion areas outside of utility corridors which would limit vehicles and reduce the opportunities for non-native vegetation establishment and spread, resulting in fewer human-induced ignitions. Smaller test sites could be located within the ACECs which would result in impacts similar to Alternative B.

From Livestock Grazing on Wildland Fire Management

Under Alternative D, all grazing allotments would be closed when their current permits expire. As allotments are closed, there would be the potential for an increase in fuel levels, which could lead to increases in fire intensities and a shortening of fire-return intervals. Conversely, livestock would no longer be present to introduce and spread invasive species thus avoiding a further increase in fuel load.

From Minerals Management on Wildland Fire Management

The types of impacts from mineral resource decisions would be the same as Alternatives A, B, and C, but much less area would be impacted due to the large areas closed to mineral development.

From Vegetation Resources on Wildland Fire Management

Impacts would be similar to those described in Alternative B.

From Visual Resources on Wildland Fire Management

Alternative D provides the most acres assigned to VRM Class I and II (77 percent in the Lower Sonoran and 100 percent in the SDNM) among all of the alternatives. These allocations would minimize the potential for non-native plant establishment and associated increases in fuel levels and fire intensities, as well as require restoration to a greater extent than under any of the other alternatives.

From Wilderness Characteristics on Wildland Fire Management

Approximately 276,500 acres in the Lower Sonoran and 153,000 acres in the SDNM would be allocated as lands managed to protect wilderness characteristics, which would involve the largest area protected under these designations among the alternatives. These allocations would minimize the potential for non-native plant establishment and associated increases in fuel levels and fire intensities, as well as require restoration to a greater extent than under any of the other alternatives.

From Wildland Fire Management on Wildland Fire Management

The impacts of fire management decisions on fire and fuels resources is the same as Alternative B.

4.13.6.2. Lower Sonoran

From Recreation Management on Wildland Fire Management

Alternative D would allocate a total of 100,200 acres of SRMAs, which is the smallest area allocated as SRMAs among the Action Alternatives. Impacts would be similar to Alternative B; however, impacts from allocating front country and community interface RMZs would be greatly contained due to 256,500 fewer acres devoted to these RMZs under Alternative D. These management prescriptions would greatly decrease non-native plant establishment and associated increases in fuel levels, fire intensities, and shortened fire-return intervals. The remaining 830,000 acres not allocated as SRMAs in the Lower Sonoran would be managed as ERMAs. While general impacts would be similar in nature to Alternative B, the scope would be reduced under Alternative D because a much reduced route network would limit motorized access to these areas, this limiting the spread of invasive species and human-ignited fires.

From Travel Management on Wildland Fire Management

Impacts from limiting vehicles to existing or designated routes in both Decision Areas would be the same as under all other Action Alternatives. Alternative D would close the most acres and the greatest number of miles among the alternatives, which would cause the greatest decrease in surface disturbance and non-native plant establishment in the Decision Area. Impacts from allowing agencies involved in fire-suppression activities to drive off road in time critical situations would be the same described under Alternative B.

4.13.6.3. Sonoran Desert National Monument

From Recreation Management on Wildland Fire Management

Overall impacts of allocating none of the SDNM as SRMAs would be decreased non-native plant establishment and associated increases in fuel levels, fire intensities, and shortened-return

intervals. Impacts from vehicle camping restrictions would reduce human-ignited fires from sparks, escaped fires, and firebrands due to limiting camping to existing and designated sites in the SDNM. Closure of areas to target shooting would eliminate this use as a cause of fire ignitions.

From Travel Management on Wildland Fire Management

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

4.13.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.13.7.1. Both Decision Areas

From Lands & Realty on Wildland Fire Management

In the Lower Sonoran, impacts from multiuse utility corridors and LUAs would be similar to Alternatives A and B. Impacts from considering requests for major utilities outside of designated corridors and proposals for utility-scale renewable energy sites and other uses would be similar to Alternative B. In the Lower Sonoran, Alternative E would designate 8 corridors, thus decreasing impacts. In the SDNM impacts from utility corridors, future LUA, utility-scale renewable energy development sites, and other land uses would be similar to Alternative C with a few exceptions, The Gila Bend-Santa Rosa utility corridor would allow above-ground utility lines with impact to fire and fuels similar to Alternative B.

From Livestock Grazing on Wildland Fire Management

Under Alternative E, effects from grazing would be similar to Alternative B in both Decision Areas.

From Minerals Management on Wildland Fire Management

Mineral resource decision impacts would be the same as Alternatives A, B, and C.

From Vegetation Resources on Wildland Fire Management

Impacts would be similar to those described in Alternative B.

From Visual Resources on Wildland Fire Management

The types and extents of impacts from VRM in both Decision Areas would be the similar to Alternative C.

From Wilderness Characteristics on Wildland Fire Management

In the Lower Sonoran, 55,400 acres would be allocated as lands managed to protect wilderness characteristics, and 110,900 acres would be managed as such in the SDNM, which would be less than under Alternatives C and D (but more than Alternatives A and B, where no lands managed to protect wilderness characteristics would be allocated). These special designations

and allocations would minimize non-native plant establishment and associated increases in fuel levels and fire intensities.

From Wildland Fire Management on Wildland Fire Management

The impacts of fire management decisions on fire and fuels resources is the same as Alternative B.

4.13.7.2. Lower Sonoran

From Recreation Management on Wildland Fire Management

Impacts from SRMA allocations would be most similar to Alternative C. This would support avoiding an increase in non-native plant establishment and associated increases in fuel levels, fire intensities, and shortened fire-return intervals.

From Travel Management on Wildland Fire Management

The types of impacts from limiting vehicles to designated routes in both Decision Areas would be the same as under all other Action Alternatives. Requiring vehicles to utilize designated access points in the metropolitan areas would have the same impacts as in Alternative B. Impacts from closing 200 miles of routes in the Lower Sonoran would be the same as under Alternative C, and would result in more area of impact compared to Alternatives A, B, and C, but a smaller area of impact compared to Alternative D. Impacts from allowing agencies involved in fire-suppression activities to drive off-road in time critical situations would be the same as those described in Alternative B.

4.13.7.3. Sonoran Desert National Monument

From Recreation Management on Wildland Fire Management

Impacts from SRMA allocations would be most similar to Alternative C. This would support avoiding an increase in non-native plant establishment and associated increases in fuel levels, fire intensities, and shortened fire-return intervals.

As under Alternative B, C and D, the entire SDNM would be managed as one SRMA . Impacts would be similar to Alternative C. Approximately 16 percent of the area would be allocated to the front country RMZ and 84 percent to back country RMZ. This would decrease non-native plant establishment and associated increases in fuel levels, fire intensities, and shortened-return intervals. Impacts from restrictions that would be placed on recreational uses, including limiting camping to existing and designated sites and closing the SDNM to target shooting. These types of restrictions would decrease the likelihood of invasive species spread and human ignited fires.

From Travel Management on Wildland Fire Management

Impacts would be the same as those described under Alternative E for the Lower Sonoran, except closing 194 miles of the routes in the SDNM would result in more area of impact compared to Alternatives A, B, and C, but a smaller area of impact compared to Alternative D.

4.14. IMPACTS ON LANDS & REALTY MANAGEMENT

The analysis of impacts on lands and realty from the alternatives considered is focused on the effects on land tenure (ownership) and the opportunities for land use authorizations (including utility-scale renewable energy development) within the Lower Sonoran and SDNM Decision Areas.

Land tenure adjustments include acquisition of non-public lands as well as disposals of identified parcels. The amount of land managed by the BLM could increase or decrease depending on the availability of land to acquire and the ability of the BLM to dispose of land. For the SDNM, all public lands will remain under Federal ownership.

4.14.1. METHODS OF ANALYSIS

4.14.1.1. Indicators

Management actions described in the alternatives could result in impacts to the lands and realty program. Indicators used to quantitatively assess management changes include:

- Acres retained in public lands base,
- Acres identified as being suitable for disposal,
- Acres identified as land use authorization (LUA) avoidance and exclusion areas,
- Acres avoided and excluded from utility-scale renewable energy development, and
- Public land acres proposed for withdrawal.

4.14.1.2. Assumptions

The following assumptions regarding the future management of lands and realty are made:

- Alternatives A through E identify specific parcels potentially suitable for disposal. It is expected that over the next 20 years, all acres identified will be removed from Federal ownership.
- Lands not designated as potentially suitable for disposal will be retained.
- Withdrawals are completed for many types of uses, including power-site reserves, power projects, administrative sites, stock driveways, and irrigation projects. In some cases, other Federal agencies pursue and hold withdrawals, including the Bureau of Indian Affairs, U.S. Department of the Interior, Bureau of Reclamation (BOR) and Federal Energy Regulatory Commission (FERC). With such withdrawals, surface management jurisdiction may actually be transferred to the other Federal agency. However, for the purposes of analysis, only the acres of public lands (withdrawals) retained under BLM management are analyzed or used as an indicator to determine availability of public land for multiple-use purposes in this document.
- LUAs, including ROWs, leases, and permits, are used for roads, water pipelines, natural gas pipelines, power lines, telephone lines, fiber-optic cables, railroads, highways, canals, ditches,

apiary sites, and communications sites. Acres of open, avoidance, and exclusion areas are used as indicators to determine the availability for LUAs.

- Lands that fall under the low sensitivity conflict analysis areas are assumed to be fully developed over the next 20 years.

4.14.1.3. Program Areas with No Impacts on Lands & Realty Management

There would be no impacts to lands and realty from actions proposed under the following program areas:

- Public safety & hazardous materials management,
- Wild horse and burro management.

4.14.1.4. Qualitative Intensity Scale

In addition to the description of qualitative terms for the intensity of impacts discussed in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375), the qualitative intensity levels from impacts from other program areas on lands and realty are further described below through a range of varying thresholds, based on the indicators described above.

Negligible: 100 acres or less potentially would be disposed, acquired, avoided to LUAs, excluded to LUAs, or withdrawn, and conflicts with LUAs would be nonexistent.

Minor: 100 to 5,000 acres potentially would be disposed, acquired, avoided to LUAs, excluded to LUAs, or withdrawn, and conflicts with LUAs would be limited.

Moderate: 5,000 to 10,000 acres potentially would be disposed, acquired, avoided to LUAs, excluded to LUAs, or withdrawn, and conflicts with LUAs would occur but could be mitigated.

Major: 10,000 acres or more potentially would be disposed, acquired, avoided to LUAs, excluded to LUAs, or withdrawn, and conflicts with LUAs would be of concern.

4.14.2. COMMON TO ALL ALTERNATIVES

4.14.2.1. Both Decision Areas

From Air Quality on Lands & Realty Management

The lands and realty program must follow policy, regulations, and laws at all levels of government to minimize fugitive dust when processing all lands actions. Proposals for actions that could potentially degrade air quality would have to be mitigated, sited in acceptable alternative locations, or, in some rare cases, be denied. According to ADEQ, there are currently three PM_{10} nonattainment zones in the Planning Area (the Ajo, Miami, and the Phoenix areas). Approximately 79,900 acres of BLM-managed surface estate lie within these nonattainment areas. This makes up 6 percent of Lower Sonoran BLM-managed acres, which requires the BLM to include mitigating stipulations within the grants of new authorization in these nonattainment zones. This could potentially increase the number of LUA applications rejected if they do not agree to the terms and conditions established in the offered grants.

Complying with laws and regulations that govern air quality could affect LUAs and BLM actions to obtain physical and legal access; however, there are currently no known impacts, and change is undetectable. Therefore impacts would be negligible.

From Cave Resources on Lands & Realty

There are currently no known impacts from cave resources to land tenure, LUAs, withdrawals, or utility-scale renewable energy development. However identification of additional caves within the Planning Area could potentially decrease BLM-managed surface acres available for disposal, limit LUA processing, or prevent utility-scale renewable energy development in site specific areas. Due to the relatively small scale of these sites, impacts to lands likely would be negligible.

From Livestock Grazing on Lands & Realty

LUAs that traverse areas where livestock grazing occurs could occasionally require mitigation that involves excluding livestock grazing during the construction and rehabilitation phases of the project. Mitigation could also be required to facilitate livestock movement or provide for public safety (e.g. fencing and cattle guards) throughout the effective period of the authorization. Impacts from livestock grazing would be negligible, as grazing would be unlikely to prohibit LUAs or disposals.

From Paleontological Resources on Lands & Realty

As with cave resources, there are currently no known impacts from paleontological resources to land tenure, LUAs, withdrawals, or utility-scale renewable energy development. However, identification of additional paleontological sites within the Planning Area could potentially decrease the BLM surface acres available for disposal, LUA processing, and utility-scale renewable energy development. However, even if sites were to be discovered, impacts to lands would be small and localized and therefore are considered negligible.

From Soil Resources on Lands & Realty

Soils management would call for developments and ground disturbing activities to be located away from areas of significant desert pavement, cryptogamic crust, and other sensitive or fragile soils that are vulnerable to disruption or have high wind or water erosion potential. This would affect the authorization of LUAs and the BLM's actions to obtain physical and legal access. Proposals for actions that could potentially impact these soil types would be mitigated, sited in acceptable alternative locations, or, in some rare cases, denied. In all alternatives, efforts to minimize impacts to watersheds and soils would result in increased project costs and may result in project redesign or a shifted location. Overall, impacts would be minor.

From Vegetation Resources on Lands & Realty

Managing for vegetation calls for the avoidance of all surface disturbing activities (which include any development related to LUAs) within Acuna cactus habitat. Acuna cactus habitat constitutes 3 percent of the Planning Area (approximately 37,600 acres), and avoiding these areas would presumably cause moderate impacts to lands and realty, however, due to the fact that this habitat is isolated from population and utility service areas, impacts would be negligible.

Vegetation clearing in and around utility corridors would be restricted across all action alternatives. This would present conflict for LUA holders and future proponents who need to access utility lines for operation and maintenance purposes. Impacts would be minor.

From Water Resources on Lands & Realty

Management actions to avoid degradation to water resources and limit water developments through all of the alternatives could affect LUAs by limiting the number of LUAs processed to obtain legal and physical access to new water developments. Proposals for facilities and LUAs that would potentially degrade water resource quality would be mitigated, sited in acceptable alternative locations, or, in some rare cases, denied. Due to limited water resources within the Planning Area, impacts would be minor.

From Wildland Fire Management on Lands & Realty

Wildland fire management would generally help protect facilities on public lands authorized through the lands and realty program by reducing fuel loads and suppressing fires. However, there would be a possibility of losing control of prescribed fire treatments and damaging aboveground facilities. Overall, these impacts would be negligible to minor.

4.14.2.2. Lower Sonoran

From Minerals Management on Lands & Realty

The management of fluid minerals, solid leasable minerals, mineral materials, and locatable minerals could result in requests for s such as ROWs and permits for utilities and access roads. Direction to pursue a mineral entry withdrawal would require a lands action to process the withdrawal. Therefore, the more lands that are available to mineral entry, the higher the potential for an increase work measures for the lands and realty program.

From Vegetation Resources on Lands & Realty

The Fred J. Weiler Green Belt, which is designated in every alternative, consists of 41,907 acres (approximately 5 percent of the Decision Area). This area would be allocated as an LUA avoidance area and would be excluded from potential renewable development, which could potentially increase land use activities on nearby Federal lands. As an LUA avoidance area and an exclusion area for renewable utility-scale energy development, impacts would be moderate.

4.14.2.3. Sonoran Desert National Monument

From Minerals Management

The Monument Proclamation prohibits mineral activities within the Monument, which would eliminate the need for authorizing mineral-development LUAs. This would have a minor impact on the lands and realty program.

4.14.3. ALTERNATIVE A (NO ACTION)

4.14.3.1. Both Decision Areas

No unique impacts are identified for the both Decision Areas under Alternative A.

4.14.3.2. Lower Sonoran

From Cultural and Heritage Resources on Lands & Realty

LUAs, land tenure adjustments, acquisition of access to public lands, and utility-scale renewable energy LUAs could be affected by cultural resources management direction. Lands and realty actions are considered Federal undertakings and must avoid inadvertent damage to Federal and non-Federal cultural resources through compliance with Section 106 of the NHPA. When a lands action is proposed, an inventory is conducted, and impacts to important cultural sites are avoided by project redesign/rerouting, project rejection, or mitigation of adverse impacts through data recovery. Such actions to avoid adverse impacts could increase processing costs and processing time for both the Federal and non-Federal parties, which could dissuade the proponent from utilizing Federal lands for their proposed project if the suggested mitigation strategies are too cumbersome. However, these types of impacts would be negligible as a whole.

Under Alternative A, land use authorizations (including renewable utility-scale renewable energy authorizations) would continue to be permitted on a case-by-case basis with appropriate mitigation measures to protect cultural resources. Impacts to lands and realty would be negligible as there are no major restrictive allocations, only site specific concerns.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Small distribution systems (including communication sites) within the Lower Sonoran would be authorized on an as-needed case-by-case basis. This would have a negligible impact on the lands and realty program, as there are no allocations placed upon the program itself, which would restrict these types of facilities from being authorized in certain resource vulnerable areas.

Ten 1-mile wide utility corridors would be designated under Alternative A. Large distribution systems would be encouraged to be situated within these utility corridors. The confinement of all major linear LUAs within the utility corridors would present minor impacts, as it would assist the lands and realty program in managing these facilities, while also limiting resource degradation throughout the Planning Area. Conflicts between LUA holders and other uses within these corridors would be possible.

Land Tenure. In Alternative A, there is the potential that approximately 30,800 acres (3 percent of the public lands within the Decision Area) would leave Federal ownership. Impacts from land tenure actions are anticipated to be moderate to major, as the disposal of Federal lands would mean that the Federal lands base would be minimized, thus limiting the amount of lands eligible for potential authorizations. Impacts from the potential acquisition of non-Federal lands would result in the opposite impact, as the Federal land base in the Planning Area would be increased, thus increasing the potential for more LUAs on these additional lands.

Utility-Scale Renewable Energy Development. Renewable energy facilities were not specifically addressed in previous planning efforts; therefore, impacts would be negligible.

From Priority Wildlife Species and Habitat Management

Priority species direction would have several impacts on the lands and realty program by restricting authorizations in certain areas to avoid impacts to priority wildlife species' habitats, (e.g., Sonoran pronghorn antelope, lesser long-nosed bat, and Acuña cactus); Categories I, II, and III desert tortoise habitat; or other important habitats. Decisions throughout the action alternatives could require new facilities to be installed in less than desirable locations to avoid such habitats. Since pronghorn antelope habitat is located in an area not likely subject to land use authorizations, restrictions in such habitat would not be significant. Restrictions in Sonoran desert tortoise habitats, however, would likely impact LUAs that use utility corridors as most mountains in the Decision Areas where these developments occur include Sonoran desert tortoise habitat.

Where seasonal restrictions limit the time available to complete activities, relocation of surface facilities may be required. Proposed activities such as land tenure changes or requests for LUAs would be evaluated to ensure that they do not allow a net loss in Sonoran desert tortoise habitat (Categories I, II and III). In addition, appropriate mitigation measures would be required for approval of land use authorizations on a case-by-case basis to protect tortoise habitat, long-nosed bat habitat, Acuña cactus habitat, or other important habitats.

Facilities proposed to be constructed under various LUAs or access easements in areas where special status species (or their habitat) are present may need to be mitigated, constructed in alternative locations, or, in some rare cases, dropped from consideration. Land tenure adjustments such as exchanges or sales proposed in areas where special status species could be adversely affected may need to be restructured or eliminated from consideration. Such actions could increase processing costs and time for the Federal and non-Federal parties.

From Recreation Management on Lands & Realty

Implementation of Alternative A would retain the allocations of 379,400 acres of the Lower Sonoran in four SRMAs. The placement of power lines, pipelines, or communication facilities outside existing utility corridors and other land use authorizations, such as apiary permits, could be restricted to specific locations or excluded from certain locations within the SRMAs to support maintaining the desired recreational setting, accommodate recreation facilities and developments, or avoid public safety concerns. Specifically, land use authorizations could be restricted within ¼-mile of historic and prehistoric trail segments within the Lower Gila Trail Historic SRMA and in the southern and western portions of the Saddle Mountain SRMA that are managed for remote and undeveloped recreation. Impacts would are anticipated to be minor.

From Special Designations on Lands & Realty

The Juan Batista de Anza NHT (consisting of 7,300 acres, less than 1 percent of the Decision Area) and designated wilderness areas (consisting of 91,750 acres, approximately 10 percent of the Decision Area) are LUA exclusion areas and areas closed to utility-scale renewable energy development throughout all Action Alternatives. These congressional designations pose a major impact to lands and realty, due to the large amount of acres that prohibit new LUAs.

These exclusions could trigger more extensive use on nearby Federal lands or discourage utility developments from developing in local areas.

The Coffeepot Botanical ACEC (consisting of 8,900 acres) would be an LUA avoidance area, which could require new facilities to be installed in less than desirable locations to avoid sensitive areas. The Coffeepot Botanical ACEC would also be an area that prohibits utility-scale renewable energy development. These restrictions would concentrate use on public lands designated as low sensitivity for utility-scale renewable energy development and lands outside LUA exclusion and avoidance areas within the Planning Area. Impacts would be minor to moderate.

All public lands within the ACECs and the Anza Trail would be retained, and state and private lands would be acquired if there is a willing seller. This would prevent any lands within these areas from being "suitable for disposal," thus limiting the agency's ability to use funds to acquire highly desired parcels in accordance with FLFTA. However, by retaining and managing consolidated tracts of land, the agency's ability to meet many of the program specific objectives would become less cumbersome and could result in more efficient and cost effective management. Impacts would be minor to moderate.

From Travel Management on Lands & Realty

Under Alternative A, 110,700 acres would be closed to vehicle use. These closures could effectively be a moderate to major impact to the lands and realty program, as they could restrict land use authorizations in these areas.

Approximately 798,100 acres would be restricted to existing routes, and 21,400 acres would be limited to designated routes. These restrictions could have a moderate to major impact on the lands and realty program as they would limit opportunities for land use authorizations to areas along existing or designated routes if the authorization (e.g., ROW) required motorized vehicle access for construction, operation, or maintenance (unless administrative access was granted for such purposes).

From Visual Resources on Lands & Realty

Alternative A has 91,800 acres within Class I, all of which lie within wilderness areas; therefore, impacts from visual VRM Class I designations would be negligible. For impacts from wilderness, refer to Impacts from Special Designations.

Within Alternative A, 116,300 acres (approximately 13 percent of the Decision Area) would be allocated to VRM Class II. LUAs (particularly ROWs)s would be buried or relocated as needed or otherwise designated to be compatible with their surroundings to ensure scenic integrity in VRM Class II. The BLM would not approve LUAs that are inconsistent with VRM Class I and Class II, thus creating the need to select a more suitable location. Such a situation could prove to be costly to certain proposals and deter utility development in the Planning Area. Designating VRM Class II areas in the Lower Sonoran could increase stipulations or mitigation on LUAs, though not necessarily excluding them in these areas. Typical stipulations or mitigation could include imposing greater design and sitting requirements during development. Portions of the designated multiuse utility corridor that crosses the Batamote and Coffeepot Mountains in the Lower Sonoran would overlap with VRM Class II areas, which could trigger the need for higher mitigation standards for major utilities and other LUAs. However, there is little likelihood of

demand for such authorizations in this area, so there would be little practical effect on land use authorizations. Impacts are anticipated to be minor to moderate.

From Wilderness Characteristics on Lands & Realty

No lands managed to protect wilderness characteristics would be allocated under Alternative A.

4.14.3.2.1. Sonoran Desert National Monument

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described in Alternative A for the Lower Sonoran.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Land use authorization would be allowed within the Monument if the surface disturbing activity does not disturb any Monument objects. Impacts from this action would be moderate, as the mitigation required to limit the impacts to the objects could promote more intensive use on nearby Federal lands or would dissuade proponents from developing on Federal lands altogether.

Three 1-mile wide utility corridors would be designated under Alternative A. Large distribution systems would be encouraged to be situated within these utility corridors. The confinement of all major linear LUAs within the utility corridors would present minor impacts, as it would assist the lands and realty program in managing these facilities while also limiting resource degradation throughout the Planning Area. Conflicts between LUA holders and other uses within these corridors would be possible.

Land Tenure. No lands would be allocated as suitable for disposal in the Monument. Impacts would be negligible from this action, as there are few lands within the Monument that meet the criteria for determining which lands are suitable for disposal.

The potential acquisition of non-Federal lands within the Monument would result in the increase and greater consolidation of Federal lands. This would assist management in fulfilling the objectives set forth in the Monument Proclamation but would also increase the potential for more LUAs on these additional lands. Impacts from potential acquisitions within the Monument would be major.

Utility-Scale Renewable Energy Development. Renewable energy facilities were not addressed in previous planning efforts; therefore, impacts would be negligible.

From Priority Wildlife Species and Habitat Management on Lands & Realty

Impacts would be the same as those described under Alternative A for the Lower Sonroan, with the exception that varying wildlife habitats are protected as a Monument object by the Monument Proclamation, which could limited LUAs from being authorized in the Monument. Impacts would be minor.

From Recreation Management on Lands & Realty

In the SDNM, retaining the Lower Gila Historic Trail SRMA (137,100 acres) could place restrictions on land use authorizations as described for the Lower Sonoran, although these would be unlikely to be different from those required throughout the SDNM based on the Monument Proclamation. Impacts are anticipated to be minor.

From Special Designations on Lands & Realty

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except that the Juan Batista de Anza NHT would consist of 7,800 acres, approximately 2 percent of the Decision Area) and designated wilderness areas would consist of 157,700 acres, approximately 32 percent of the Decision Area). There also is only one ACEC (Vekol Valley Grasslands) allocated under Alternative A in the SDNM. Because the ACEC lies within the SDNM, the prescription set forth for the ACEC are met by the designation of the SDNM. The SDNM as a whole is an exclusion area to utility-scale renewable energy development and an LUA avoidance area; therefore, impacts would be negligible.

From Travel Management on Lands & Realty

Under Alternative A, 161,200 acres would be closed to vehicle use. These closures could restrict land use authorizations in these areas as a result of access limitations. Approximately 247,200 acres would be restricted to existing routes, and 78,000 acres would be limited to designated routes, which could limit opportunities for land use authorizations to areas along existing or designated routes if the authorization (e.g., ROW) required motorized vehicle access for construction, operation, or maintenance (unless administrative access was granted for such purposes).

Not having a designated route network within the Monument could create minor impacts to current LUA holders who hold LUAs within the I-8 and Santa Rosa to Gila Bend utility corridors, as access roads to their facilities are not designated for administrative purposes only and are open to the public. This leaves their facilities susceptible to vandalism. However, not designating routes within the utility corridors also minimizes potential conflicts with future LUAs within the corridors.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under impacts from Alternative A in the Lower Sonoran, with exception that 158,700 acres (all within wilderness areas) would be allocated as VRM Class I and 91,600 acre would be designated as VRM Class II. Impacts would be minor to moderate.

From Wilderness Characteristics on Lands & Realty

No lands managed to protect wilderness characteristics would be allocated under Alternative A.

4.14.4. ALTERNATIVE B

4.14.4.1. Both Decision Areas

No unique impacts are identified for the both Decision Areas under Alternative B.

4.14.4.2. Lower Sonoran

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described for Alternative A in the Lower Sonoran, except that Alternative B calls for the assurance that easements will be retained in Federal ownership to assure long term use, protection, and access to important sites that occupy a particular and definitive role in the cultural landscape or are important to the local Native American tribes. This action would limit the amount of acreage allocated as suitable for disposal. Impacts from this action would be negligible to minor.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Unlike Alternative A, LUA restrictions from resource program areas have been consolidated in the lands and realty program through two allocations: LUA exclusion areas and LUA avoidance areas. Exclusion areas are areas where new land use authorizations would be prohibited (except within designated multi-use utility corridors or for public safety purposes, as permitted by the authorizing official). LUA exclusion areas include designated wilderness areas, Sentinel Plain (military land relinquished back to the BLM), the Juan Bautista de Anza NHT, and lands designated under VRM Class I. LUA avoidance areas would be areas where new land use authorizations would be strongly discouraged. Authorizations made in these avoidance areas would have to be compatible with the purpose for which the area was designated, not be otherwise feasible on lands outside the avoidance area. LUA avoidance areas include ACECs, BLM threatened and endangered species habitats (including desert tortoise habitats), VRM Class II lands, SCRMAs, the Fred J. Weiler Green Belt, and cultural sites allocated to a use category (such as public and conservation use sites).

Under Alterative B, 126,500 acres (approximately 13 percent of the Decision Area) would be designated as LUA exclusion areas, and 520,900 acres (approximately 51 percent of the Decision Area) would be designated as a LUA avoidance areas. Impacts from the designation of LUA exclusion areas would be moderate to major, as no new authorizations would be prohibited within these areas. This restriction would promote more intensive use on nearby Federal lands or would dissuade proponents from developing on Federal lands altogether. While less restrictive, LUA avoidance areas would have a minor to moderate impact on the lands and realty program because it could potentially dissuade proponents from utilizing Federal lands for their facilities because extensive mitigation strategies would be required to meet the purposes for which the area was initially designated for.

Similar to Alternatives C, D, and E, communication facilities in Alternative B would be authorized only within the designated Oatman Mountain Communication Site or within previously disturbed areas on an as–needed, case-by-case basis. Newly designated communication site locations would be evaluated within the Decision Area to meet future demands if needed. The small number of communication sites in the Planning Area could dissuade proponents from placing facilities on Federal lands. However, impacts would be anticipated to be negligible to minor, as there is still ample space on the Oatman Mountain Communication Site for future development and designated sites would be considered if the demand for communication facilities drastically increase.

Ten 1-mile wide multiuse utility corridors would be designated under Alternative B (the same number of multi-use corridors as Alternative A, but more than any other action alternative),

in which all compatible utility uses (including transportation, telephone, irrigation, water/gas pipelines, fiber-optic and electrical transmission lines) would be allowed unless otherwise specified by the authorizing official. The confinement of all major linear LUAs within the multi-use utility corridors would present moderate impacts, as it would assist the lands and realty program in managing these facilities while also limiting resource degradation throughout the Planning Area. In some cases, the requirement that all major linear LUAs be placed within these corridors could dissuade proponents from placing facilities on Federal lands as these corridors may not be the most direct or feasible route to their desired facility connections.

Land Tenure. Impacts would be the same as those described in Alternative A, except that there is the potential that approximately 41,600 acres (4 percent of the public lands within the Planning Area) would leave Federal ownership. Among the alternatives, Alternative B would propose the most acres suitable for disposal. Impacts would be major.

Utility-Scale Renewable Energy Development. Management decisions related to the authorization of utility-scale renewable energy developments was guided by the Analysis of Renewable Energy Development (Appendix N, *Analysis for Renewable Energy Sensitivity* (p. 1263)), which used GIS data to depict varying degrees of resource sensitivity to utility-scale renewable energy development on Federal lands. The Analysis for Utility-scale Renewable Energy Sensitivity (Appendix N, *Analysis for Renewable Energy Sensitivity* (p. 1263)) characterizes public lands in one of four sensitivity categories used to make decisions on where to permit utility-scale renewable energy developments on Federal lands. These sensitivity categories include: prohibited, high, moderate, and low known sensitivity. The categories were then use to identify utility-scale renewable energy development exclusion and avoidance areas.

In Alternative B, potential renewable energy developments would be prohibited on lands that fall under the "excluded" areas. Applications for renewable energy developments in "high or moderate sensitivity" categories would be avoided. The areas prohibited from renewable energy development constitute 16 percent of the Decision Area (approximately 145,000 acres). The impacts would be minor to moderate, as this action would promote more intensive use on nearby Federal lands or would dissuade proponents from developing on Federal lands altogether.

From Priority Wildlife Species and Habitat Management on Lands & Realty

Impacts would be the same as those described under Alternative A for the Lower Sonoran except that wildlife movement corridors would be allocated to assist in the protection of priority species movement throughout the Planning Area under Alternative B. In Alternative B, 332,300 acres (totaling approximately 36 percent of BLM-managed land in the Lower Sonoran) would be allocated as wildlife movement corridors. This would concentrate use on public lands that lie under the low sensitivity allocation. This would have a minor impact on the lands and realty program, as LUAs would not be excluded within wildlife movement corridors, but avoided if possible.

From Recreation Management on Lands & Realty

Under Alternative B, the general impacts of allocating SRMAs and ERMAs would be similar to those described under Alternative A. However, under Alternative B, nearly three times the acres would be allocated to nearly three times the number of SRMAs. Over the life of the plan, substantial increases in recreational use are expected. An increased number of SRMAs may help to manage recreation uses to avoid conflicts with land use authorizations. Conflicts are most likely

in SRMAs near the urban interface and those planned for intensive recreation activity, including the Buckeye Hills East Trails, Ajo Trails, and Arlington Trails SRMAs that would be allocated primarily for motorized recreation uses, as well as the other urban interface SRMAs (Saddle Mountain, Rainbow Valley, and Buckeye Hills West) that would be allocated for mixed motorized and nonmotorized uses. Recreation within the SRMAs would be managed to maintain or produce various recreation settings and opportunities; which could restrict, limit or require that land use authorizations be mitigated in active recreation areas. Impacts would be moderate.

From Special Designations on Lands & Realty

Impacts would be the same as those discussed for Alternative A in the Lower Sonoran, except that Alternative B would allocate approximately 21 miles of the Agua Caliente Road as a Back Country Byway. In an effort to protect the view shed from the byway, no above-ground surface-disturbing activities would be allowed within sight of Agua Caliente Road. This would prevent above-ground utilities such as communication sites, power lines, or telephone lines from crossing or running parallel to the road. Therefore, these types of uses would be directed to the nearest multi-use utility corridor, which might not be the optimal location for these uses and could potentially saturate the available space in the corridor. Anticipated impacts would be minor.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative A for the Lower Sonoran, except that slightly fewer acres (101,800) would be closed to OHV use and slightly more acres (828,360) would be restricted to designated routes. Impacts would still be moderate to major.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative A in the Lower Sonoran, except fewer acres (64,900 acres) would be managed as VRM Class II (7 percent as compared to 13 percent in Alternative A). Decreasing the total VRM Class II acres could lessen restrictions on LUAs. Impacts would be expected to be minor.

From Wilderness Characteristics on Lands & Realty

No lands managed to protect wilderness characteristics would be allocated under Alternative A.

4.14.4.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described in Alternative B for the Lower Sonoran.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Unlike Alternative A, LUA restrictions from resource program areas have been consolidated in the lands and realty program through two allocations: LUA exclusion areas and LUA avoidance areas. LUA Exclusion areas are areas where new land use authorizations would be prohibited (except within designated multi-use utility corridors or for

public safety purposes, as permitted by the authorizing official). LUA exclusion areas include designated wilderness areas, the Juan Bautista de Anza NHT, and lands designated under VRM Class I. LUA avoidance areas would be areas where new land use authorizations would be strongly discouraged. Authorizations made in these avoidance areas would have to be compatible with the purpose for which the area was designated and not be otherwise feasible on lands outside the avoidance area. LUA avoidance areas would include, ACECs, VRM Class II lands, SCRMAs, the Fred J. Weiler Green Belt, and cultural conservation and public use sites.

Under Alternative B, 164,900 acres (approximately 33 percent of the Monument) would be designated as LUA exclusion areas. The remaining portions of the Monument, consisting of 321,500 acres (approximately 60 percent of the Monument), would be designated as LUA avoidance areas. This restriction would have moderate to major impacts, as it would promote more intensive use on nearby Federal lands or would dissuade proponents from developing on Federal lands altogether. While less restrictive, LUA avoidance areas would have a minor to moderate impact on the lands and realty program because they could potentially dissuade proponents from utilizing Federal lands for their facilities, due to the fact that they would have to use extensive mitigation strategies to meet the purposes for which the area was initially designated for.

No communication sites are designated within the Monument. Impacts would be anticipated to be negligible to minor. The lack of communication sites in the Monument could dissuade proponents from placing facilities on Federal lands or would inundate the Oatman Mountain Communication Site with new facilities if there were an increase in demand for this use.

Three 1-mile wide multiuse corridors would be designated under Alternative B (the same number of multiuse corridors as Alternative A, but more than any other action alternative). All compatible utility uses (including transportation, telephone, irrigation, water/gas pipelines, fiber optic and electrical transmission lines) would be allowed in these corridors unless otherwise specified by the authorizing official. The confinement of all major linear LUAs within multiuse utility corridors would present moderate impacts, as it would assist the lands and realty program in managing these facilities, while also limiting resource and Monument object degradation. In some cases, the requirement that all major linear LUAs be placed within these corridors could dissuade proponents from placing facilities on Federal lands as these corridors may not be the most direct or feasible route to their desired facility connections.

Land Tenure. Impacts would be the same as those described in Alternative A for the Monument.

Utility-Scale Renewable Energy Development. Potential utility-scale renewable energy development and other large-scale LUAs would be prohibited within the Monument. This would have a moderate impact to the lands and realty program, as this action would promote more intensive use on nearby Federal lands outside of the Monument boundaries or would dissuade proponents from developing on Federal lands altogether.

From Priority Wildlife Species and Habitat Management on Lands & Realty

Impacts would be the same as those described in Alternative A for the SDNM.

From Recreation Management on Lands & Realty

The impacts of the SRMA allocation in the SDNM are similar to those in the Lower Sonoran. Differences include subsuming the Gila Trails SRMA into the larger SDNM SRMA, which

includes a back country RMZ, the Lower Gila Historic Trails RMZ, and the Sonoran Desert RMZ. Impacts would still be minor.

From Special Designations on Lands & Realty

Impacts would be the same as those discussed in Alternative A for the Monument, except that the Vekol Valley ACEC would not be carried forward. Due to the fact that the Monument is already allocated as an LUA avoidance area and prohibits utility-scale renewable energy development, impacts would be negligible.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative A for the Monument, except that slightly fewer acres (157,700) would be closed to OHV use and slightly more acres (328,700) would be restricted to designated routes. Impacts would still be moderate to major.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative A for the SDNM, except that under Alternative B, inserting the Gila Bend to Santa Rosa multiuse utility corridor into a VRM Class III area would reduce the restrictions placed on associated land use authorizations within the corridor. However, outside the corridor, designating approximately 219,000 acres of the Decision Area as VRM Class II (26 percent percent increase in VRM Class II acres compared to Alternative A) could restrict land use authorizations by imposing greater design and siting requirements. Impacts would be minor, as the Monument is already a LUA avoidance area under Alternative B.

From Wilderness Characteristics on Lands & Realty

No lands managed to protect wilderness characteristics would be allocated under Alternative B.

4.14.5. ALTERNATIVE C

4.14.5.1. Both Decision Areas

No unique impacts are identified for the both Decision Areas under Alternative C.

4.14.5.2. Lower Sonoran

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described under Alternative B for the Lower Sonoran, except that Alternative C contains two cultural resource allocations referred to as SCRMAs. These designations would impact approximately 124,600 BLM acres, or 13 percent of the Decision Area. Because SCRMAs are moderate sensitivity renewable energy conflict areas, utility-scale renewable energy development would be avoided within SCRMAs. This in turn would place more strain on low sensitivity areas within the Planning Area. Similarly, SCRMAs would be designated

as LUA Avoidance areas, preventing certain LUAs from being authorized in these SCRMAs, resulting in the same impacts as to utility-scale renewable energy development potential.

According to the management prescription in Alternative C for SCRMAs, all lands within the SCRMAs would be required to be retained in Federal ownership. The potential acquisition of lands in the SCRMAs could increase the amount of land managed by the BLM. These newly acquired lands would hold the same restrictions on utility-scale renewable energy developments and other LUAs; therefore impacts from the potential acquisition of inholdings would be the same. By retaining and managing consolidated tracts of land, the agency's ability to meet many of the program specific objectives would become less cumbersome and could result in more efficient and cost effective management. Impacts would be minor to moderate.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Impacts would be that same as those described in Alternative B for the Lower Sonoran, except that more acres (604,300 acres, approximately 65 percent of the Decision Area) would be designated as a LUA avoidance areas. Impacts would be major.

Impacts related to communication sites would be the same as those described in Alternative B.

Impacts related to multiuse utility corridors would be the same as those described in Alternative B; however, Alternative C would remove the Gila Bend to Ajo corridor and a section of the El Paso Natural Gas and TEP corridors that travel from Ajo, AZ to the Tohono O'odham Indian Reservation. Impacts would be moderate.

Land Tenure. Impacts would be the same as those described in Alternative A, except that there is the potential that approximately 39,600 acres (4 percent of the public lands within the Planning Area) would leave Federal ownership. Alternative C would propose more acres suitable for disposal than in Alternative A, B, and E, but less than Alternative D. Impacts would be major.

Utility-Scale Renewable Energy Development. Impacts would be the same as those described in Alternative B for the Lower Sonoran, except that more acres would be excluded from renewable energy development under Alternative C. Impacts would be major.

From Priority Wildlife Species and Habitat Management on Lands & Realty

Impacts would be the same as those described under Alternative B for the Lower Sonoran. except that the Saddle Mountain and Gila Bend Mountains WHAs' management prescriptions for placement of LUAs would concentrate land uses to already developed or disturbed areas and avoid core wildlife areas. For the Batamote Mountains and Cuerda de Lena WHAs, management prescriptions would require avoidance to the maximum extent possible of land uses within the WHAs, except within the designated corridor that traverses the Batamote WHA or if no other appropriate location could be found. These decisions could restrict land uses and authorizations and increase stipulations and mitigation on projects located within the WHAs. However, the practical effects of these limitations, are expected to be minimal due to the remoteness of the WHAs, which hold little potential for such land uses. In addition, restrictions in the Cuerda de Lena area due to the presence of Sonoran pronghorn antelope would likely preclude any such land uses regardless of the WHA allocation.

From Recreation Management on Lands & Realty

Impacts from establishing six SRMAs, two ERMAs, and one SMA in the Lower Sonoran would be similar to those discussed under Alternative B, although slightly more widespread due to a 10 percent increase in area covered by the SRMAs under Alternative C. Alternative C would allocate the San Tan Mountains as an ERMA, not an SRMA. Impacts would remain moderate.

From Special Designations on Lands & Realty

Impacts would be the same as those discussed in Alternative Bfor the Lower Sonoran except that the Coffeepot ACEC would be replaced with the Coffeepot-Batamote ACEC , which consist of 63,300 acres, an area larger than under Alternative A or B but less than under Alternatives D or E. Impacts would be moderate to major from this designation.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative A for the Lower Sonoran, except that fewer acres (101,800) would be closed to OHV use and more acres (828,360) would be restricted to designated routes. Alternative C would be the least restrictive alternative to the LUAs, due to the fact that the fewest acres would be closed to vehicle use, potentially increasing access in certain areas of the Lower Sonoran. Impacts would be moderate.

From Visual Resources on Lands & Realty

Under Alternative C, impacts from VRM would be similar to Alternative A in the Lower Sonoran, with the exception that substantially more acres would be managed under VRM Class II (42 percent of the Decision Area, compared to 13 percent in Alternative A). This would present minor to moderate impacts to the lands and realty program.

From Wilderness Characteristics on Lands & Realty

Under Alternative C, 128,100 acres would be allocated as lands managed to protect wilderness characteristics. These lands constitute approximately 14 percent of the Decision Area. Under Alternatives C, these areas would be LUA avoidance areas where proposed LUAs, including communication sites, permits, LUAs, and utility-scale renewable energy development, would be discouraged. If placement in these areas is necessary, holders would be required to meet additional mitigation measures to meet the objectives set forth for lands managed to protect wilderness characteristics. In many cases, applicants may be discouraged to utilize Federal lands for these purposes altogether.

Alternative C calls for the acquisition of all state and private land inholdings within these areas when there is a willing seller. As with all land acquisitions, adding more land to Federal management would place additional financial responsibility on the agency, as it will have more land to manage.

Under Alternative C, additional restrictions would be placed on LUA holders who already have authorizations for facilities. All maintenance procedures on these existing LUAs would be required to be compatible with protecting wilderness characteristics and protecting or improving natural or heritage resource conditions. This could become a financial burden on current LUA and permit holders within these areas, and in select cases, some might vacate existing authorizations.

Impacts from wilderness characteristics would be moderate, due to the fact that these areas are for the most part secluded from high intensity population areas.

4.14.5.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described from cultural and heritage resources in the Lower Sonoran, except that 17,700 acres would be allocated as a SCRMA under Alternative C in the Monument. Impacts would be minor to moderate.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Impacts would be that same as those described in Alternative B for the Monument.

Impacts related to communication sites would be the same as those described in Alternative B.

Only two ½-mile wide multiuse utility corridors (underground facilities only) would be designated in Alternative C. As a result, there would be even less space for additional utility lines to be placed in these corridors compared to Alternatives A and B, which could spur conflicts between LUA holders. Impacts would be moderate.

Land Tenure. Impacts would be the same as those described in Alternative A for the Monument.

Utility-Scale Renewable Energy Development. Impacts would be the same as those described in Alternative B for the Monument.

From Priority Wildlife Species and Habitat Management on Lands & Realty

Impacts would be the same as those described in Alternative B for the Monument.

From Recreation Management on Lands & Realty

Impacts from establishing the SDNM as an SRMA would be similar to Alternative B.

From Special Designations on Lands & Realty

Impacts would be the same as those described in Alternative B for the Monument, except that State Highway 238 would be designated as scenic byway under Alternative C in the SDNM. Impacts from these designations would be negligible, as no visual impacts from overhead utility lines would exist because all LUAs would be required to be placed underground along the I-8 and Gila Bend to Santa Rosa Multiuse Utility Corridors (where the byway runs). For impacts related to this lands and realty action, refer to the Impacts from Lands & Realty under Alternative C.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative B for the Monument.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative A for the SDNM, except that approximately 267,300 acres of VRM Class II (55 percent of the Monument, an increase of about 37 percent over Alternative A) designations could prohibit, restrict, or modify the location of other land use authorizations, as VRM Class II are allocated as LUA avoidance areas. Impacts would be minor to moderate.

From Wilderness Characteristics on Lands & Realty

Impacts would be the same as those described in Alternative C for the Lower Sonoran, except that 112,200 acres would be allocated as lands managed to protect wilderness characteristics (approximately 23 percent of the Monument).

4.14.6. ALTERNATIVE D

4.14.6.1. Both Decision Areas

No unique impacts are identified for the both Decision Areas under Alternative D.

4.14.6.2. Lower Sonoran

From Cultural and Heritage Resources on Lands & Realty

Because more emphasis would be placed on the protection of cultural resources under Alternative D, it may be more difficult for LUAs to be approved than under any other alternative. More LUAs would be restricted in areas of sensitive cultural resources under Alternative D than under Alternatives B or C due to the management of priority areas and cultural resource allocations. While there are no SCRMA designations within the Decision Area for Alternative D, these areas have been designated as ACECs within this alternative. For impacts related to these ACEC designations, refer to the Impacts from Special Designations Management section for Alternative D.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Impacts would be that same as those described in Alternative B for the Lower Sonoran, except that under Alternative D, the greatest number of acres (510,700 acres, approximately 60 percent of the Decision Area) would be designated as LUA exclusion areas. Impacts would be major.

Impacts related to communication sites would be the same as those described in Alternative B.

Impacts related to multiuse utility corridors would be the same as those described in Alternative C; however, Alternative D would propose the fewest multiuse utility corridors (7 corridors). The Palo Verde Devers and Santa Rosa to Gila Bend corridors would be eliminated from this alternative. Impacts would be moderate.

Land Tenure. Impacts would be the same as those described in Alternative A, except that there is the potential that approximately 22,800 acres (2 percent of the public lands within the Decision area) would leave Federal ownership. Alternative D would propose the least amount of acres suitable for disposal, compared to any other alternative. Impacts would be major.

Utility-Scale Renewable Energy Development. Impacts would be the same as those described in Alternative B for the Lower Sonoran, except that Alternative D would prohibit the greatest amount of acres available for utility-scale renewable energy development (511,500 acres, approximately 55 percent of the Decision Area). Impacts would be major.

From Priority Wildlife Species and Habitat Management on Lands & Realty

Impacts would be the same as those described in Alternative C for the Lower Sonoran.

From Recreation Management on Lands & Realty

Impacts from establishing four SRMAs, four ERMAs, and one SMA in the Lower Sonoran would be similar to those under Alternative B but would occur over a smaller area (a 60 percent decrease in acres compared to Alternative B and a 64 percent decrease compared Alternative C).

From Special Designations on Lands & Realty

Impacts would be the same as those discussed under Alternative A for the Lower Sonoran, except that the number of acres allocated as ACECs would be substantially greater. Under Alternative D, 263,700 acres (approximately 28 percent of the Decision Area) would be designated as ACECs. Unlike Alternatives A, B, and C, all ACECs are LUA exclusion areas and LUAs would be restricted to designated multiuse utility corridors within these ACECs. Impacts from these allocations would be major.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative A for the Lower Sonoran, except that substantially more acres (378,300) would be closed to OHV use and substantially fewer acres (551,900) would be restricted to designated routes. Alternative D would be the most restrictive alternative to LUAs, due to the fact that the most amount of acres are closed to vehicle use, potentially increasing the access limitations in certain areas of the Lower Sonoran. Impacts would be major.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except that 622,400 acres (67 percent of the Decision Area, compared to 13 percent in Alternative A) would be designated VRM Class II lands. Alternative D would be the most restrictive alternative to the lands and realty program, as almost 87 percent of the Decision Area is either an LUA avoidance or exclusion area. All designated multiuse utility corridors would be located within VRM Class III areas, which would not result in such restrictions. Impacts would be moderate.

From Wilderness Characteristics on Lands & Realty

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except that 276,500 acres would be allocated as lands managed to protect wilderness characteristics (approximately 30 percent of the Decision Area compared to 14 percent in Alternative C). Under Alternative D, lands managed to protect wilderness characteristics would be LUA exclusion areas, which makes it the most restrictive alternative to the lands and realty program.

4.14.6.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described in Alternative D for the Lower Sonoran.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Alternative D would be the most restrictive alternative to LUAs in the Monument, with major impacts expected. The entire Monument (486,400 acres) would be designated an LUA exclusion area, and there would be no multiuse utility corridor designations, which means that no major linear LUAs would be allowed to traverse the Monument. As a result, no LUAs would be allowed in the Monument (with the exception of authorizations related to public safety). This action would promote more intensive use on Federal lands outside of the Monument boundaries or would dissuade proponents from developing on Federal lands altogether. The lack of multiuse utility corridors in the Monument also could disrupt future proposals for major utility lines from the eastern to the western portions of the State.

Impacts related to communication sites would be the same as those described in Alternative B.

Land Tenure. Impacts would be the same as those described in Alternative A for the Monument.

Utility-Scale Renewable Energy. Development Impacts would be the same as those described in Alternative B for the Monument.

From Priority Wildlife Species and Habitat Management on Lands & Realty

Impacts from Priority Wildlife Species and Habitat management would be negligible to lands and realty, as the entire Monument would be designated an LUA exclusion area, and lands within the SDNM would not be available for disposal. These impacts from this action can be found in the Impacts From Lands & Realty.

From Recreation Management on Lands & Realty

Due to the fact the Monument is a LUA exclusion area and prohibited from utility-scale renewable energy development and disposals, the impacts from recreation would be negligible. From Special Designations on Lands & Realty Impacts would be the same as those discussed in the Alternative B of the SDNM.

From Special Designations on Lands & Realty

Impacts would be the same as those discussed in Alternative C for the Monument, except that I-8 would also be allocated as a scenic byway. Impacts would be negligible under Alternative

D, as I-8 is not allocated as a multiuse utility corridor and the entire Monument would be a LUA exclusion area.

From Travel Management on Lands & Realty

Impacts from travel management would be negligible, as the entire Monument would be designated an LUA exclusion area.

From Visual Resources on Lands & Realty

Impacts from VRM would be negligible under Alternative D, as the entire SDNM would be an LUA exclusion area that prohibits utility-scale renewable energy development and land disposals.

From Wilderness Characteristics on Lands on Lands & Realty

Impacts would be negligible under Alternative D, as the entire Monument would be an LUA exclusion area that prohibits utility-scale renewable energy development and land disposals.

4.14.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.14.7.1. Both Decision Areas

No unique impacts are identified for the both Decision Areas under Alternative E.

4.14.7.2. Lower Sonoran

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described in Alternative D for the Lower Sonroan.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Impacts would be that same as those described in Alternative B for the Lower Sonoran, except that more acres (380,100 acres, approximately 40 percent of the Decision Area) would be designated as LUA exclusion areas and fewer acres (310,200 acres, approximately 28 percent of the Decision Area) would be designated as LUA avoidance areas. Impacts would be major.

Impacts related to communication sites would be the same as those described in Alternative B.

Impacts related to multiuse utility corridors would be the same as those described in Alternative C.

Land Tenure. Impacts would be the same as those described in Alternative A, except that there is the potential that approximately 33,900 acres (3 percent of the public lands within the Planning Area) would leave Federal ownership. Alternative E proposes more acres suitable for disposal than Alternative D but fewer than Alternatives B and C. Impacts would be major.

Utility-Scale Renewable Energy. Development Impacts would be the same as those described in Alternative B for the Lower Sonoran, except that more acres would be prohibited from utility-scale renewable energy development (380,800 acres, approximately 41 percent of the Decision Area) under Alternative E. This total is more than that proposed under Alternatives C, but less than Alternative D. Impacts would be major.

From Priority Wildlife Species and Habitat Resources on Lands & Realty

Impacts would be the same as those described in Alternative D for the Lower Sonoran.

From Recreation Management on Lands & Realty

Impacts would be the same as discussed under Alternatives C for the Lower Sonoran.

From Special Designations on Lands & Realty

Impacts would be the same as those discussed in Alternative D for the Lower Sonoran, except that Agua Caliente Road would be designated as a back country byway. Impacts from this byway are the same as those described under Alternative C.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative A for the Lower Sonoran, except that more acres (152,800) would be closed to OHV use and fewer acres (777 ,360) would be restricted to designated routes, which would slightly decrease the access limitations in certain areas of the Lower Sonoran. Impacts would be moderate to major.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Wilderness Characteristics on Lands & Realty

Impacts would be similar to those described under Alternative C. Under Alternative E, 55,400 acres would be allocated as lands managed to protect wilderness characteristics. These lands constitute approximately 5 percent of the Planning Area.

4.14.7.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described in Alternative D for the SDNM.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Impacts related to LUA exclusion and avoidance Areas would be that same as though described in Alternative D.

Impacts related to communication sites would be the same as those described in Alternative B.

Impacts related to multiuse utility corridors would be the same as those described in Alternative D.

Land Tenure. Impacts would be the same as those described in Alternative A for the Monument.

Utility-Scale Renewable Energy Development. Impacts would be the same as those described in Alternative B for the Monument.

From Priority Wildlife Species and Habitat Management on Lands & Realty

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

From Recreation Management on Lands & Realty

Impacts from recreation decisions under Alternative E in the SDNM would be similar to those described under Alternative C.

From Special Designations on Lands & Realty

Impacts would be the same as those discussed in Alternative D for the Monument.

From Travel Management on Lands & Realty

Impacts from travel management would be negligible, as the entire Monument would be designated an LUA exclusion area.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative D for the SDNM.

From Wilderness Characteristics on Lands & Realty

Impacts would be negligible, as the entire Monument under Alternative D is already an LUA exclusion area that prohibits utility-scale renewable energy development and land disposals. For impacts related to these actions, refer to ???.

4.15. IMPACTS ON LIVESTOCK GRAZING

Impacts on livestock grazing are generally the result of activities that affect forage levels, the ability to construct range improvements, human disturbance of livestock, and costs associated with livestock management to the operators. In general, management actions to improve or protect resources could increase the amount of forage available for livestock grazing. Management actions that increase surface disturbance and destroy vegetation would decrease the amount of forage available for livestock grazing. Management actions that restrict the location, extent, or type of rangeland projects may reduce the efficiency of the livestock management program and reduce the area available for livestock grazing.

4.15.1. METHOD OF ANALYSIS

4.15.1.1. Indicators

Management actions described in the alternatives could result in impacts to the grazing program. Indicators used to quantitatively assess management changes include the following:

- Reduction or increase of acres available for livestock grazing
- Reduction or increase of forage resources available to livestock grazing
- Limitations or restrictions on the access to, placement of, type of or scale of livestock management facilities, including watering facilities and pipelines, livestock handling facilities, and/or fencing.

4.15.1.2. Assumptions

The following assumptions regarding the future management of livestock grazing are made:

- All existing leases and permits would be subject to Terms and Conditions by the authorizing officer.
- Although some areas are more suitable for different classes of livestock, the impacts from different classes of livestock would be similar and would not be discussed separately.
- Grazing is likely to directly impact the surface in areas where livestock concentrate.
- Construction of range improvements (e.g., fences, pipeline, water wells, troughs, and reservoirs) would result in a localized loss of vegetation throughout their useful life.
- Range improvements generally lead to improved livestock distribution and improved resource conditions.
- Livestock grazing management actions will comply with the Land Health Standards (Appendix W, *Land Health Standards* (p. 1339)) and Guidelines for Grazing Administration (Appendix L, *Guidelines for Grazing Administration* (p. 1253)).
- Requiring livestock operators to remove livestock during periods of drought for up to 1 year would potentially impact livestock operator flexibility and viability. However, over the long term this could maintain or improve the vegetative communities and forage conditions.

4.15.1.3. Program Areas with No Impacts on Livestock Grazing

There would be no impacts to livestock grazing management from actions proposed under the following program areas:

- Air Quality
- Wild Horse & Burro Management

4.15.1.4. Qualitative Intensity Scale

The intensities of impacts are described using the following definitions:

Negligible: The impact would not be detectable or measurable. There would be no appreciable change to available forage or the grazing operations.

Minor: The impact would be slightly detectable and measurable. There would be a slight change to available forage and the grazing operations.

Moderate: The impact would be very apparent and measureable. There would be a limited change to available forage and the grazing operations.

Major: The impact would be severe. There would be a substantial change to the grazing operations.

4.15.2. COMMON TO ALL ALTERNATIVES

4.15.2.1. Both Decision Areas

From Cave Resources on Livestock Grazing

Impacts would be the same as those described in the Cultural and Heritage Resources analysis, Common to All Alternatives for both Decision Areas.

From Paleontological Resources on Livestock Grazing

Impacts would be the same as those described in the Cultural and Heritage Resources analysis, Common to All Alternatives for both Decision Areas.

From Soil Resources on Livestock Grazing

Restricting developments and ground disturbing activities from areas of significant desert pavement, cryptogamic crust, and soils that are vulnerable to disruption or have high wind or water erosion potential could have a minor impact by limiting the location of livestock management facilities. Allowing projects in these areas if mitigation occurs could offset this impact. Limiting developments in these areas could reduce surface disturbance and retain forage for livestock grazing.

From Special Designations on Livestock Grazing

Managing the Juan Bautista de Anza National Historic Trails consistent with National Park Service standards would help protect the historic landscape and visual values of this historic trail. This would have minor impacts to livestock operations by restricting range improvement projects designed to improve livestock distributions (e.g. water developments, fences, etc.) on or near the Anza Trail. This impact to improved livestock distribution could be offset by locating range improvement projects 1/4 to 1/2 mile away from the trail and restricting salts and supplements on or near the trail, as well.

Managing 249,500 acres as wilderness areas in both Decision Areas to maintain naturalness would reduce surface disturbance and retain forage for livestock grazing. However, management decisions intended to limit human intrusions and permanent facilities could have a minor impact on livestock operations by restricting livestock use and the location of new rangeland improvement projects to locations outside of the wilderness area.

From Water Resources on Livestock Grazing

Restricting facilities not related to water management :(a) outside riparian areas and the 100-year floodplain of washes or water ways, (b) in a manner that avoids changing natural water flow or watershed dynamics, and (c) consistent with other resource and public safety goals could restrict the development of livestock management facilities or could require existing facilities to be relocated or modified if they are significantly affecting watershed or floodplain function. The intensity of the impact would generally be minor, but could vary based on the necessity of the project.

From Wildland Fire Management on Livestock Grazing

Managing areas as suitable for wildland fire and allowing naturally ignited wildland fire, prescribed fire, and treatments would have impacts, such as reducing the amount of forage and area available for livestock grazing in the short term, but could improve vegetation condition in the long term in fire-adapted communities. The level of impact would vary depending upon the size of the area burned. Fire in Sonoran Desert communities that are not fire adapted would reduce the amount of forage available to livestock on a longer term. Suppression of wildfires in the Sonoran Desert would have short term-impacts by removing vegetation, but would reduce overall impacts to livestock forage in the long term by retaining the vegetative communities and stabilizing the soil. Impact intensities could range from negligible to major, depending on the size of the burn.

4.15.2.2. Lower Sonoran

From Vegetation Resources on Livestock Grazing

Under all alternatives, emphasis is placed on protection of the vegetative communities across the Decision Area. Management actions, such as requiring mitigation or avoidance of vegetation removal for projects in order to protect vegetation resources, would protect or restore vegetation communities and would generally increase available forage for livestock grazing. Actions that would reduce, damage, or destroy vegetation communities, such as burning or thinning, would generally decrease available forage for livestock grazing. Any of these actions are likely to be negligible to minor in scale and in some cases may be short term.

From Special Designations on Livestock Grazing

Management of the Fred J. Weiler Green Belt to protect riparian habitat for Southwestern willow flycatcher and the yellow-billed cuckoo may limit or exclude use of the riparian area. However, this would have a negligible impact on livestock management, as currently only one allotment makes use of the Green Belt. All other allotments have the Green Belt fenced off to livestock for the enhancement of riparian vegetation and important wildlife habitat.

From Recreation on Livestock Grazing

The entire Lower Sonoran would be open to recreational target shooting under all alternatives. Impacts from this would be negligible in areas of light use, and minor in areas of moderate to heavy use. Direct and indirect impacts would include soil disturbance from vehicular traffic to and from the sites and loss of vegetation from vehicles and human trampling. Additionally, litter from shell casings and targets are often left behind, impacting the quality and quantity of vegetation and soils affected. Additionally, impacts could be moderate to major if livestock are wounded and/or killed, which would become a financial loss to the livestock operator.

4.15.2.3. Sonoran Desert National Monument

From Minerals on Livestock Grazing

New mineral development is not allowed within the Monument. Therefore no impacts from mineraal management on livestock grazing are expected from any of the alternatives.

From Vegetation Resources on Livestock Grazing

Within the SDNM emphasis is placed on protection of the vegetative communities and the vegetative objects of the Monument. Grazing management changes, such as requiring deferred or seasonal grazing, could be required as mitigation if the intensity of the impact to the vegetation from grazing (i.e. changes in vegetation composition, structure and diversity) is determined to be at moderate levels. The impact to the livestock operators will depend on the scale of the management change required and could vary from negligible to major and could include the elimination of livestock grazing within parts or all of the Monument.

4.15.3. ALTERNATIVE A (NO ACTION)

4.15.3.1. Both Decision Areas

From Cultural and Heritage Resources on Livestock Grazing

Management Identification and protection of significant cultural resources would tend to protect vegetation and maintain available forage. Activities associated with management of cultural and paleontological resources would affect relatively small, localized areas and would not have measurable impacts on livestock forage. Even under the most intense management (i.e. site excavation), the amount of acreage disturbed would likely be very small. Fencing cultural resource sites and excluding grazing from these sites would result in a minimal loss of forage. Impacts would be negligible to minor.

4.15.3.2. Lower Sonoran

From Lands & Realty on Livestock Grazing

Land tenure adjustments could impact livestock operations and management. The potential disposal of (30,800) acres would have impacts that range from negligible to major and vary by allotment due to the loss of parcels that contain important range developments or facilities and/or a reduction of forage available for livestock. Replacement or relocations of these facilities could mitigate some of the impacts. Acquisition of parcels within allotments could help livestock operations by eliminating or avoiding incompatible uses and facilitating management.

Development of energy projects, mainly solar, would have impacts ranging from moderate to major on some livestock operations by removing acreage and associated forage available for livestock grazing (AUM's) and potentially remove livestock developments needed for the appropriate management of livestock operations.

The designation of up to 10 multiuse utility corridors throughout the Decision Area could lead to new access roads and associated increased vehicle traffic. The impacts would likely be negligible from conflicts between vehicles and livestock (direct collision or harassment) where the corridors are limited to administrative access only or current projects that already exist.

From Livestock Grazing on Livestock Grazing

Under Alternative A,grazing allotments in the Lower Sonoran would continue to be allocated as perennial, perennial/ ephemeral, or ephemeral, as currently designated. Grazing permit renewals would be based on rangeland health evaluations, with associated NEPA analysis, as appropriate to allotment-specific characteristics and multiple use requirements. Because this alternative is the least restrictive to livestock grazing, impacts to livestock operators are expected to be negligible, and would be addressed on a case-by-case basis through the permit renewal process. Approximately 830,200 acres, with a total of 17,541 corresponding AUMs, would remain available for livestock grazing. Approximately 100,000 acres, comprised of the Cameron Allotment, the Fred J. Weiler Green Belt, the Sentinel Plain, Ajo parcels, and other areas that are currently unavailable for grazing, would remain so for wildlife habitat and other uses. Existing and proposed management actions would continue to involve each livestock operator, stakeholder, and the interested public for individual allotments on a case-by-case basis.

Range improvement projects would be developed and analyzed pursuant to 43 CFR 4120-3. Surface disturbance from constructing rangeland development projects and water sources would cause negligible impacts from short-term losses of vegetation for forage, but would support appropriate distribution and management of livestock in the long term.

From Minerals Management on Livestock Grazing

Mineral development within the 614,900 acres currently open to mineral entry could impact livestock operations by disturbing surfaces and decreasing vegetation. Livestock could be excluded during active mineral operations, thus reducing available forage. The level of impact on livestock operations will vary by the size of the mineral development, but are generally expected to be minor in scale.

From Priority Wildlife Species and Habitat Management on Livestock Grazing

Management actions that limit projects, such as requiring mitigation or relocation of projects within ¼ mile of active cactus ferruginous pygmy-owl nest sites, within 300 feet of the edge of desert washes in wildlife corridors, within 4 miles of known lesser long-nosed bat roosts and in category I and II desert tortoise habitat, could affect livestock grazing operations with impacts that vary from negligible to minor by limiting the placement of or requiring mitigation for new range improvement projects.

The requirement to keep domestic sheep grazing as far as practicable from bighorn sheep habitat would effectively eliminate the possibility of sheep grazing within the majority of the Decision Areas. However, this would likely only be a minor impact as all current grazing permits are for cattle or horses.

Wildlife management actions that serve to support wildlife populations, such as not allowing new fencing in bighorn sheep habitat, can impact livestock grazing by making livestock operations less efficient, limiting livestock management options, or closing or restricting areas to livestock grazing. The intensity of the impact would vary by the area restricted by the action. Constructing new wildlife waters could have minor impacts from increased roads and road density and increased conflicts between vehicles and livestock.

From Recreation Management on Livestock Grazing

As recreational use is expected to increase throughout the Decision Areas due to an increase in the region's population, the greatest impacts to livestock grazing would likely occur from recreation management.

The areas outside SRMAs would be allocated as ERMAs, which are managed to custodial standards and do not provide structured recreational opportunities except where needed to attain custodial activity based outcomes, visitor health and safety conflicts, user conflicts, or resource stewardships objectives/standards. ERMAs would not typically include the proactive development of facilities or specific management actions that would prevent conflicts between grazing operations and recreation uses.

Under Alternative A, requiring SRPs and establishing camping facilities could control the areas where surface disturbance from recreation occurs and reduce the loss of forage available for livestock grazing. Managing recreation use and evaluating recreation impacts on resource conditions could increase the amount of forage available for livestock grazing by restricting increased recreation use. Managing areas to protect visual and scenic resources or as semi-primitive nonmotorized and primitive areas could have a minor impact by restricting the location, extent, or type of rangeland improvement projects.

Existing ROS management classes would be retained under Alternative A. Areas that have an ROS classification of rural or roaded natural, which are relatively rare in the Decision Areas, are more likely to have moderate impacts with intensive recreation use that may displace livestock. Areas that have a ROS classification of semi-primitive nonmotorized and primitive would have minor impacts and be less likely to have intensive recreation use that would displace or harass livestock, but decisions intended to maintain these classifications could restrict the location, extent, or type of rangeland improvement projects.

Increased human activity including vehicular traffic, noise, OHV operation, and camping could have a minor impact to grazing operations by increasing the likelihood of harassment, injury, or displacement of livestock. This avoidance or displacement could negatively affect livestock distribution patterns. In general, SRMAs would be more likely to have the type of intensive uses that would cause these impacts. However, over the lifetime of this Plan, increases in population and recreation would cause similar impacts in ERMAs, particularly near urban areas.

Under Alternative A, four existing SRMAs (totaling 285,000 acres) would be retained in the Lower Sonoran. Recreation facilities could have minor impacts by displacing or harassing livestock, limiting range developments, or impeding livestock operations. However, the SRMAs would provide opportunities for active management of recreation, including directing uses to avoid conflicts or minimizing uses that might harm livestock operations, potentially limiting the impact.

From Special Designations on Livestock Grazing

Managing the 8,900-acre Coffeepot Botanical ACEC would have a minor impact by reducing grazing management flexibility and limit grazing in the area through the decision to not allow new range developments.

From Travel Management on Livestock Grazing

Allocation of 1670 miles of open routes under Alternative A in the Lower Sonoran could lead to minor impacts due to conflicts between livestock and vehicles. This route system also supports livestock operations by providing access to livestock developments. Fifteen miles of closed or limited routes would minimize the level of conflict and the impact to livestock operations.

From Visual Resource Management on Livestock Grazing

Under Alternative A, only wilderness areas would be managed as VRM Class I. Restrictions on range developments would occur from the Wilderness designation and VRM I would not add to these impacts significantly. These requirements, such as restricting the height or location of a project, would likely require only minor changes to any potential projects. Managing 19 percent of the Decision Area under VRM Class II standards would place additional requirements on range developments to comply with the visual protection requirements of the class. Managing 80 percent of the Lower Sonoran to meet VRM Class III or IV objectives would support range developments with few requirements to comply with visual protection requirements.

From Wilderness Characteristics on Livestock Grazing

No lands managed to protect wilderness characteristics would be allocated under Alternative A.

4.15.3.3. Sonoran Desert National Monument

From Lands & Realty on Livestock Grazing

The designation of 3 utility corridors within the Monument could lead to new access roads and associated increased vehicle traffic. However impacts from the corridors would likely be negligible from conflicts between vehicles and livestock, and may improve livestock distribution

across the Monument's allotments. New land use authorizations could have impacts to livestock operations that vary from negligible to moderate, based on the size of the surface disturbance, due to loss of forage and potential increase in conflicts between vehicles and livestock (direct collision or harassment). Development of energy projects, mainly solar, is not expected to have impacts on livestock operations as it is not likely any projects will be developed due to the emphasis placed on protection of the objects of the Monument.

From Livestock Grazing on Livestock Grazing

Under Alternative A, livestock grazing permits on the SDNM south of I-8 would remain closed, pursuant to the Presidential Proclamation. Livestock grazing on 252,500 acres north of I-8 would continue to be allocated as perennial, perennial/ ephemeral, or ephemeral, for a total of 8,703 AUMs. Under current management, grazing permit renewals would be based on Rangeland Health Evaluations, with associated NEPA analysis, as appropriate to allotment-specific characteristics and if determined to be compatible with protecting Monument resources. Because this alternative is the least restrictive to livestock grazing, impacts to livestock operators are expected to be negligible, and would be addressed on a case-by-case basis through the permit renewal process. Those areas (8,500 acres) where livestock grazing was found to be incompatible with the protection of Monument objects would be addressed in individual allotment evaluations and permit renewals. Existing and proposed management actions would continue to involve each livestock operator, stakeholder, and the interested public for individual allotments on a case-by-case basis.

Range improvement projects would be developed and analyzed pursuant to 43 CFR 4120-3. Surface disturbance from constructing rangeland development projects and water sources would cause negligible impacts from short-term losses of vegetation for forage, but would support appropriate distribution and management of livestock in the long term.

From Priority Wildlife Species and Habitat Management on Livestock Grazing

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except within the SDNM emphasis is placed on protection of the biological objects of the Monument. Grazing management changes, such as requiring deferred or seasonal grazing, could be required as mitigation if the intensity of the impact to wildlife from grazing (i.e. changes in vegetation composition, structure and diversity) is determined to be at moderate levels. The impacts to the livestock operators will depend on the scale of the management change required to mitigate the impact and could vary from negligible to major and could include the elimination of livestock grazing within parts or all of the Monument. However, these actions would be facilitated through the rangeland health evaluation/ permit renewal process and/or a habitat management plan for specific allotments or areas.

Domestic sheep grazing would be prohibited within the Monument which could reduce the flexibility of the operators. However, this impact would be negligible because all current grazing permits are for cattle.

From Recreation Management on Livestock Grazing

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except that in the SDNM, the Gila Trail SRMA would be retained to protect resource values and to

restore surface disturbance from recreation uses within ¼ mile of historic and prehistoric trails segments, which could have a minor impact to livestock operations by increasing forage available for livestock grazing.

Under Alternative A, the entire Monument (approximately 482,334 acres of public land) is currently open to recreational target shooting. Impacts from this would be negligible in areas of light use, and minor in areas of moderate to heavy use. Direct and indirect impacts would include soil disturbance from vehicular traffic to and from the sites and loss of vegetation from vehicles and human trampling. Additionally, litter from shell casings and targets are often left behind, impacting the quality and quantity of vegetation and soils affected. Additionally, direct impacts could be moderate to major if livestock are wounded and/or killed, which would become a financial loss to the livestock operator.

From Special Designations on Livestock Grazing

There are no special designations in the Monument that impact current livestock grazing operations. The Vekol Valley Grassland ACEC is located in an area south of I-8 that is currently closed to livestock grazing.

From Travel Management on Livestock Grazing

Managing 568 miles of open routes in the SDNM under Alternative A could cause minor impacts due to conflicts between livestock and vehicles. However this route system would also support livestock operations by providing access to livestock and range improvements across the allotments. Closed or limited routes would minimize the level of conflict with livestock and the impact to livestock operations.

From Visual Resources on Livestock Grazing

Managing 19 percent of the Decision Area under VRM Class II standards would place some requirements on range developments to comply with the visual protection requirements of the class. These requirements, such as restricting the height or location of a project, would likely require minor to moderate changes to any potential projects. Managing 49 percent of the SDNM to meet VRM Class III or IV objectives would not place any substantial restrictions on range developments, such as requiring the project be relocated. Only wilderness areas would be managed as VRM Class I under Alternative A and would restrict future range developments.

From Wilderness Characteristics on Livestock Grazing

No lands managed to protect wilderness characteristics would be allocated under Alternative A.

4.15.4. ALTERNATIVE B

4.15.4.1. Both Decision Areas

There are no unique impacts for both decision areas under Alternative B.

4.15.4.2. Lower Sonoran

From Cultural and Heritage Resources on Livestock Grazing

Identification and protection of significant cultural resources in the Lower Sonoran Decision Area would tend to protect vegetation and maintain available forage. Activities associated with management of cultural and paleontological resources would affect relatively small, localized areas and would not have measurable impacts on livestock forage. For example, the Butterfield West Public Use Site along the Anza-Butterfield Trail proposed under Alternative B may affect the Amavisca Allotment, which is an ephemeral allotment. The Sundad Public Use Site proposed for the Gable Ming Allotment may affect more vegetation and forage availability because the Gable Ming is a perennial allotment (see Map 2-1b), However, impacts from these public use sites are expected to be negligible because very little acreage is involved. Even under the most intense management (i.e. site excavation), the amount of acreage disturbed would likely be very small. Fencing cultural resource sites to exclude grazing from these sites would result in a minimal loss of forage. Impacts would be negligible to minor.

From Lands & Realty on Livestock Grazing

In general, impacts from multiuse utility corridors, energy projects and Land Use Authorizations (LUAs) on livestock operations would be similar to Alternative A. Development of new energy projects could lead to moderate to major impacts on 452,000 acres due to the removal of acreage available for livestock grazing and the loss of range improvement projects. The fewest amount of LUA Exclusion areas (among the action alternatives) have been allocated in Alternative B, therefore, development of new LUAs to be located outside of designated corridors could lead to minor impacts on grazing operations due to the removal of forage for livestock and the likelihood of additional road development and access leading to the potential increase in conflicts between vehicles and livestock (direct collision or harassment).

Impacts from land tenure adjustment on livestock operations in the Lower Sonoran would be the same scale of impact as described under Alternative A, However, more allotments would be impacted due to the increase in acres (38,300 acres total) that would available for disposal under Alternative B.

From Livestock Grazing on Livestock Grazing

Alternative B identifies the greatest amoount of public lands sutiable for appropriate multiple uses, with an empahsis on motoriazed and developed recreational uses. In the Lower Sonoran, only this alternative proposes a decrease in AUMs except for Alternative D, which eliminates grazing. Under Alternative B, approximately 830,200 acres would remain available for livestock grazing, but perennial stocking rates would be reduced by approximately 41 percent. Approximately 10,431 AUMs would still be available as forage for cattle. Ephemeral grazing applications would continue to be considered to supplement the base herds in years of above-average precipitation.

This alternative could make forage more available in the long run, which in turn would increase weight gains in cattle. Conversely, however, managing perennial grazing allotments with a reduction of 41% in the authorized grazing preference could have moderate to major impacts by reducing the long-term viability of some livestock operations. The reduction in livestock numbers could leave some operators with herd sizes too small to support their current operations.

Operators would have to acquire additional lands in order to support a viable operation, which, in some cases, could be cost-prohibitive. Other impacts would be similar to Alternative A.

From Mineral Management on Livestock Grazing

Impacts from mineral development on livestock operations would be similar to Alternative A, but potentially occurring over more acres (653,200). The level of impact on livestock operations will vary by the size of the mineral development, but are generally expected to be minor in scale because livestock and mineral development often coincide on the same lands. Fencing of specific developments would continue to occur, but these are typically small in scale, with minor impacts to livestock grazing.

From Priority Wildlife Species and Habitat Management on Livestock Grazing

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except where new roads are required for constructing new wildlife waters, which could cause minor impacts from increased conflicts between vehicles and livestock,.

From Recreation Management on Livestock Grazing

The overall focus of Alternative B is on identifying the greatest extent of public land area suitable for the widest potential array of appropriate uses, and on providing opportunities for those uses, including an emphasis on motorized recreation opportunities. The overall effects on livestock operations would be similar in nature to Alternative A. However, impacts would increase to moderate levels as there would be a greater than a three-fold increase over Alternative A in the area designated for SRMAs. Under Alternative B, impacts from front country and community interface RMZ allocations would have moderate impacts and be similar to those from the roaded natural ROS settings under Alternative A. Impacts from back country and passage RMZs would be most similar to semi-primitive motorized and semi-primitive nonmotorized ROS settings under Alternative A and have only minor or negligible impacts on grazing operations and livestock/recreation user conflicts. In particular, allotments in the SRMAs allocated for motorized recreation use (Buckeye Hills East Trails, Ajo Trails, and Painted Rocks Trails SRMAs) and those along the urban interface (Rainbow Valley/North Vekol, Saddle Mountain, and Buckeye Hills West SRMAs) would experience the greatest conflicts with recreation use. The specific allotments that would be impacted include Kirian, Lower Vekol, Palo Verde Mountains, Conley, Beloat, Arnold, Powers Butte, Turner, Saddle Mountain, Ward, Carter-Herrera, Clem, Artex, and Childs.

From Special Designations on Livestock Grazing

Management of the 8,900 acre Coffeepot Botanical ACEC would the same as Alternative A. This would have a minor impact to grazing operations by reducing grazing management flexibility by limiting new range developments. Increased vehicle traffic associated with designating the Agua Caliente Road as a backcountry byway could have minor impacts to the livestock operations by increased conflicts between vehicles and livestock and potential increased vandalism of rangeland improvement projects.

From Travel Management on Livestock Grazing

The proposed route network under Alternative B would cause conflicts similar to those described under Alternative A on open routes, but slightly less widespread because approximately 70 fewer miles of routes would be open to the public under Alternative B. This route system would continue to support livestock operations by providing access to livestock and livestock developments.

From Visual Resources on Livestock Grazing

Impacts from the allocation of VRM Classes on livestock operations would be similar (minor) to those described under Alternative A. However, a 40 percent increase in areas managed under VRM Class II standards would increase the area that additional mitigation, such as restricting the height or location of a project, would be required on range developments.

From Wilderness Characteristics on Livestock Grazing

No lands managed to protect wilderness characteristics would be allocated under Alternative B, resulting in no impacts.

4.15.4.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Livestock Grazing

For the SDNM Decision Area, land use allocations reflect the findings of the livestock grazing Compatibility Analysis (Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)). Based on the results of the Compatibility Analysis, livestock grazing has been determined to be incompatible with 8,498 acres, some of which are cultural and heritage resources (the Anza and Morman Battalion trails, for example). Under Alternatibe B, these 8,500 acres would be specifically fenced off to ensure that non-compatible areas are protected, per the Monument proclamation. Approximately 83 miles of fencing would be needed to exclude these areas to livestock grazing. Included in this areaa would be approximately 10 acres around the North Tank on the Conley Allotment along the Anza NHT.

Identification and protection of additional cultural resources and Monument objects would tend to protect vegetation and maintain available forage. Activities associated with management of cultural and paleontological resources would affect relatively small, localized areas and would not have measurable impacts on livestock forage. For example, four developed interpretive sites are proposed under Alternative B. These include the Christmas Camp Public Use Site and the Anza-Butterfield Interpretive Trail Area in the Conley Allotment, and the Bighorn and Happy Camp Public Use Sites on the Bighorn Allotment (see Map 2-1b), However, impacts loss of vegetation and available forage from these public use sites are expected to be negligible because very little acreage would be involved in the development of these sites. Even under the most intense management (i.e. site excavation), the amount of acreage disturbed would likely be very small. Fencing additional cultural resource sites to exclude grazing from these sites would result in a minimal loss of forage. Impacts would be negligible to minor.

From Lands & Realty on Livestock Grazing

Impacts from multiuse utility corridors on livestock operations would be the same as Alternative A. New land use authorizations could have impacts to livestock operations; however, impacts

would likely be negligible, as the Monument is an avoidance area for projects. There will be no impacts from the development of energy projects as the Monument is an exclusion area from large renewable energy developments.

From Livestock Grazing on Livestock Grazing

Alternative B identifies the greatest amount of public lands suitable for appropriate multiple uses, with an empahsis on motorized and developed recreational uses. In the SDNM, this alternative proposes the greatest decrease in AUMs except for Alternative E, which eliminates grazing on the Conley Allotment and makes slight reductions on other Monument allotments, and Alternative D, which eliminates grazing in the entire Planning Area.

Under Alternative B, those areas south of I-8 that were closed under the Presidential Proclamation would remain closed. Stocking rates on grazing allotments north of I-8 would be allocated as perennial grazing and would be reduced by approximately 39 percent. Ephemeral grazing applications would continue to be considered. This alternative also eliminates approximately 8,500 acres currently available for grazing that have been determined to be incompatible with the protection of Monument objects from livestock grazing. These 8,500 acres would be made unavailable by fencing off these specific areas. This would leave approximately 244,000 acres of the Monument still open, with an associated 5,321 AUMs of forage for livestock use. Approximately 83 miles of fencing would be needed to exlude these specific areas to livestock grazing. Included in this area would be approximately 10 acres around the North Tank on the Conley Allotment.

Additional water developments would likely be necessary to offset the loss of water sources within the exclosures. Managing 8,500 fewer acres with more fence lines, fewer waters, and a reduction of 39% in the authorized grazing preference could have a major impact by reducing the long-term viability of some livestock operations, especially when considered with the cumulative impacts of the closure of those areas south of I-8, as well. The reduction in livestock numbers could leave some operators on the SDNM with herd sizes too small to support their current operations. Operators would have to acquire additional lands in order to support a viable operation, which, in some cases, could be cost-prohibitive. All associated range improvement projects within and outside the fenced exclosuses would have to be addressed on a case-by-case basis. Other impacts would be similar to Alternative A. Combined impacts from this alternative would likely be minor to moderate for allotments such as Beloat, Arnold, Hazen, and Lower Vekol, but could be moderate to major for operators of the Bighorn and Conley Allotments.

From Priority Wildlife Species and Habitat Management on Livestock Grazing

Most impacts would be similar those described under Alternative B for the Lower Sonoran. However, on the SDNM, 8,500 acres, with 83 miles of fencing, is proposed to be fenced off to protect Monument objects from livestock grazing. This is the most fencing proposed in any of the alternatives. Water sources within this exclosure may remain available for wildlife, which could impact livestock that have come to rely on those water sources. This could result in livestock tearing down fences to get to their habitual water holes, which in turn would result in downed barbed wire and cattle trespassing into exclosures.

Diligence would be required from all parties to ensure fencing is maintained and adequate water sources are provided for cattle and wildlife outside the exclosures. In general, direct impacts from wildlife on livestock grazing would remain negligible, and resemble those described in

Alternative A. However, indirect impacts from the fence exclosure would require additional water sources for the benefit of both livestock and widlife.

From Recreation Management on Livestock Grazing

The overall focus of Alternative B is on identifying an increase of public land area suitable for the widest potential array of appropriate uses, and on providing opportunities for those uses, including an emphasis on motorized recreation opportunities. The overall effects on livestock operations would be similar in nature to Alternative A; however, impacts would increase over Alternative A as the area designated for SRMAs increases. Under Alternative B, impacts from Front Country and Community Interface RMZ allocations would likely be similar to those from the roaded natural ROS settings under Alternative A. Impacts from Back Country and Passage RMZs would be most similar to semi-primitive motorized and semi-primitive nonmotorized ROS settings under Alternative A.

Managing the entire SDNM as a destination SRMA would restrict recreation facilities, and emphasize nonmotorized access and natural landscapes potentially increasing forage available for livestock grazing compared to Alternative A. Managing 84 percent of the SDNM SRMA to meet Back Country RMZ objectives, however, could restrict the location, extent, or type of rangeland improvement projects compared to Alternative A. This would likely have, at most, a minor impact to livestock operations.

Under Alternative B, impacts from recreational target shooting would be similar to Alternative A. However, only about 95,900 acres would be available for target shooting activities. This is approximately 386,434 fewer acres available for target shooting than under Alternative A, and a significant decrease (80.3%) in potential impacts to forage and vegetative cover available for livestock, as well as a decrease in the chances of the animals themselves being injured or killed by target shooters. Therefore, impacts from target shooting under alternative B is expected to be negligible to minor. This alternative would not impact licensed hunting in the Monument.

From Special Designations on Livestock Grazing

Impacts would be similar to those described under Alternative A for the SDNM. However, under Alternative B, the Vekol Valley Grasslands ACECwould no longer be designated because the Monument Proclamation provides adequate protection for the resources intended to be protected under the original ACEC. Additionally, approximately 10 acres of the Anza NHT around North Tank on the Conley Allotment would be fenced off. Livestock grazing was found to be incompatible with this Monument object and would be excluded from this site. Mitigation in the form of an alternate water source for livestock may be required.

From Travel Management on Livestock Grazing

The proposed route network under Alternative B would cause conflicts similar to those described under Alternative A resulting in minor impacts, but slightly minimized because approximately 100 fewer miles of routes in the SDNM would be open to the public. This route system would continue to support livestock operations by providing access to livestock and livestock developments. However, the additional 83 miles of fencing could restrict some access to recreationists, who could cut fences or leave gates open, creating management issues for livestock operators. Impacts would depend on the scale and frequency of vandalism by allotment. For

example, impacts would be negligible for the Beloat, Hazen, and Arnold Allotments where no additional fencing is proposed. Impacts for the Bighorn Allotment permittee would be minor, with an additional 14 miles of fencing to maintain, and impacts to the Conley Allotment operator would be moderate, with 69 miles of fencing to maintain. Installation of cattleguards and strategically located gates in heavily trafficked areas would help mitigate this impact.

From Visual Resources on Livestock Grazing

Managing 39 percent more of the Decision Area as VRM Class II as compared to Alternative A could reduce surface disturbance from human uses but also would restrict operator flexibility by impacting the location, extent, or type rangeland improvement projects. The impact could range from minor changes to the project design to a moderate impact from requiring relocation of the project.

From Wilderness Characteristics on Livestock Grazing

No lands managed to protect wilderness characteristics would be allocated under Alternative B, resulting in no impacts.

4.15.5. ALTERNATIVE C

4.15.5.1. Both Decision Areas

No unique impacts exists for both decision areas under Alternative C.

4.15.5.2. Lower Sonoran

From Cultural and Heritage Resources on Livestock Grazing

Impacts would be the same as those described under Alternative B, except for the allocation of the Gila River Terraces and Lower Gila Historic Trail Special Cultural Resource Management Areas (SCRMA) that runs through much of the Lower Sonoran Decision Area (see Map 2-1c). Additionally, the Saddle Mountain SCRMA is proposed under Alternative C, and would impact several grazing allotments in the Saddle Mountain area, including the Clem (South) , Saddle Mountain, and Ward Allotments. (The Carter-Herrera and Turner Allotments would also be affected, but they are managed by the Hassayampa Field Office). These SCRMAs would have minor impacts to these livestock operations by placing additional restrictions on the location of livestock developments, numbers, and operations to reduce wildlife and livestock conflicts in these areas. Increased restrictions on vehicle uses and mineral material development in washes could help protect these areas for livestock use and decrease livestock harassment from vehicles.

From Lands & Realty on Livestock Grazing

In the Lower Sonoran, the intensity of the impacts from multiuse utility corridors, energy projects and LUAs on livestock operations would be similar to Alternative B, but would occur over less area due to fewer acres available for these projects.

Impacts from land tenure adjustment on livestock operations would be greater than under Alternative A, and less than Alternative B due to 36,600 acres available for disposal under Alternative C.

From Livestock Grazing on Livestock Grazing

Alternative C attempts to balance resource protection with human use and influence. The proposed combination of natural processes and "hands on" techniques would reduce the need for intensive livestock management and mitigation efforts needed to avoid or reduce impacts to and from livestock grazing.

Under this alternative, grazing allotments that are currently designated as perennial/ephemeral would be allocated as perennial only, with no supplemental ephemeral grazing applications considered when additional forage is available. This alternative would impact 14 allotments that are currently designated as perennial/ephemeral. These allotments would instead be managed similar to the 9 allotments in the Lower Sonoran that are currently perennial only. This alternative would not apply to the 21 allotments that are designated ephemeral only. Those allotments would continue to be managed in accordance with the Special Ephemeral Rule.

Alternative C further proposes to restrict the portion of the Bighorn Allotment that is in the Lower Sonoran (outside the SDNM boundaries) to winter season of use only (Oct 1-April 30). This would have a minor impact on the livestock operator by not permitting utilization of any summer forage. Additionally, this alternative proposes to close the portion of the Table Top Allotment to livestock grazing. This would result in negligible impacts to livestock or the permittee because this portion of the allotment has been managed with the remainder of the allotment that was closed to livestock grazing through the Presidential Proclamation.

Seasonal adjustments in grazing on perennial allotments would be considered during the permit renewal process, and would propose approximately 65 percent use during the winter-spring season [October 1 to April 30] and approximately 35 percent use during the summer season [May 1 to September 30]. These management changes, and any decisions to adjust livestock numbers or require more intensive management (pasture rotations, seasonal removals, etc.), would likely have moderate to major impacts to operator costs. For example, increased pasture rotations and seasonal removals could increase the number of employees needed to facilitate this intensive management. While this would provide income for these employees in the short term, it could eventually bankrupt some livestock operators. However, individualized consultation, coordination, and cooperation with the affected parties during the permit renewal process could help lessen financial impacts to the operator while also decreasing impacts of grazing on rangeland resources.

From Mineral Management on Livestock Grazing

The intensity of the impacts from mineral development on livestock operations would be the same as Alternative A; however this would occur over substantially less acreage in the Planning Area (340,600).

From Priority Wildlife Species and Habitat Management on Livestock Grazing

Impacts would be the same as those described under Alternative B for the Lower Sonoran, except, not allowing for the development of new wildlife waters would eliminate any minor impacts

associated with increased roads and road density and increased conflicts between vehicles and livestock from new waters.

In addition, allocation of four WHAs in the Lower Sonoran could have minor impacts to livestock operations by placing additional restrictions on the location of livestock developments and operations to reduce wildlife and livestock conflicts in these areas. Increased restrictions on vehicle uses and mineral material development in washes could reduce impacts to vegetation and retain forage for livestock use and decrease livestock harassment from vehicles.

From Recreation Management on Livestock Grazing

General impacts from recreation on livestock operations would be similar to Alternative B. Alternative C proposes manageing for nearly equal access for motorized and non-motorized uses. In comparison to Alternative B, this would entail a 45 percent increase in the Backcountry and Passage RMZs, a 20 percent decrease in Front Country and Community Interface RMZs, and more than 50 percent fewer ERMAs. These actions would result in a decrease of certain intensive recreation uses and the associated minor impacts on livestock and livestock operations. Allotments in the urban interface would continue to see increased recreational use as populations grow resulting in minor to moderate impacts.

From Special Designations on Livestock Grazing

Managing grazing allotments within all ACEC's as perennial only will have a major impact by reducing the livestock operator's ability to utilize ephemeral forage with additional permitted livestock, which could reduce the long-term viability of some livestock operations. Managing 14,400 acres as the Coffeepot-Batamote Botanical ACEC could have a minor impact to grazing operations by reducing grazing management flexibility through the management action to limit all surface disturbing activities. This could restrict new range developments that could improve livestock distribution within the allotment. Impacts from designation of the Agua Caliente Road as a backcountry byway would be the same as Alternative B.

From Travel Management on Livestock Grazing

A decrease in the miles of open routes in the Lower Sonoran compared to Alternative A and B would minimize conflicts between vehicles and livestock. This route system would continue to support livestock operations by providing access to livestock and livestock developments.

From Visual Resources on Livestock Grazing

General impacts from VRM Class allocations on livestock operations would be similar to those described under Alternative A and B. However, a substantial increase in VRM II (approximately 387,800 acres) over Alternatives A and B, as well as an additional 91,800 acres under VRM I standards could reduce surface disturbance and increase the amount of forage available for livestock grazing. These allocations would also necessitate additional mitigation on range developments on more than half of the Decision Area in order to make less of a visual impact to humans, but this would have only minor impacts on livestock.

From Livestock Grazing on Livestock Grazing

Impacts would be the same as those described under Alternative C for both Decision Areas, except, restricting the portion of the Big Horn allotment south of I-8 and outside of the SDNM to winter season of use only (Oct. 1 – April 30) would have a minor impact on the operator by reducing the flexibility to utilize the area during the summer season. Closing the portion of the Table Top allotment south of I-8 and outside of SDNM to livestock grazing will have a negligible impact since this portion of the allotment was managed with the remainder of the allotment that was closed to livestock grazing through the SDNM proclamation.

From Wilderness Characteristics on Livestock Grazing

Managing 132,100 acres in the Lower Sonoran as allocated lands managed to protect wilderness characteristics could reduce surface disturbance from activities and maintain available forage in these areas, such allocations would also have a minor impact to some livestock operations by increasing the mitigation requirements and potential changes in type and location for range developments in these areas.

4.15.5.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Livestock Grazing

Impacts would be the same as those described under Alternative B, except for the allocation of the Gila River Terraces and Lower Gila Historic Trail Special Cultural Resource Management Areas (SCRMA) that runs along the Anza-Butterfield Trail, primarily through the Conley and Bighorn Allotments (see Map 2-1c). This SCRMA proposed under Alternative C would increase the width of the Anza-Butterfield Interpretive Trail proposed under Alternative B. The SCRMAs would have minor impacts to these livestock operations by placing additional restrictions on the location of livestock developments, numbers, and operations to reduce wildlife and livestock conflicts in these areas.

From Lands & Realty on Livestock Grazing

Impacts from utility corridors would be similar to Alternative A (negligible), except somewhat reduced due to a ½ mile wide limit on the corridor size and the elimination of the TEP corridor. Impacts from new land use authorizations and the development of energy projects would be the same as Alternative B.

From Livestock Grazing on Livestock Grazing

Under Alternative C, grazing allotments within the SDNM south of I-8 would remain closed. Those allotments in the Monument that are north of I-8 would be allocated as perennial only, with no ephemeral grazing applications considered. (The Arnold Allotment, which is designated as ephemeral only, would not be affected by this alternative, and would continue to be managed in accordance with the Special Ephemeral Rule.)

Additionally, Alternative C proposes to fence off the 8,500 acres of Monument objects determined to be incompatible with livestock grazing, plus an additional 36,300 acres that connect and/or surround those 8,500 acres. Although a total of 44,800 acres is proposed to be removed from livestock use, only about 47 miles of new fencing would be required to accomplish this. These

new fences would tie into existing fences and make use of topographic barriers, such as cliffs, gorges, and rocky outcrops to decrease the amount of fencing needed, and thus decrease the impacts from the fence line. This would result in fewer breaches by livestock and require about half the maintenance of the fence proposed in Alternative B, which in turn would decrease materials and operational costs to both the permittee and the BLM. Range improvement projects within the exclosed areas would be addressed on a case-by-case basis, pursuant to 43 CFR 4120. Any range improvement projects within the exclosure would likely have to be removed or modified for the benefit of wildlife and vegetation resources. Affects from the loss of water sources inside the exclosure would be mitigated by installing other water sources outside the exclosure for the benefit of livestock and wildlife.

Requiring changes to allotment grazing management systems could have impacts to livestock operators that would vary depending upon the scale of the change. Management changes resulting in adjusting livestock numbers or requiring more intensive management (pasture rotations, seasonal removals, etc.) would affect operator costs and would likely have moderate to major impacts. For example, the closure of portions of allotments south of I-8 has already impacted the management and finances of those permittees affected by the Proclamation. Cumulatively, more intense management of those areas north of I-8, including increased pasture rotations and seasonal removals, could bankrupt some livestock operators or make future operations untenable. However, individualized consultation, coordination, and cooperation with the effected parties would help lessen financial impacts to the operator while also decreasing impacts of grazing on rangeland resources and Monument objects.

From Priority Wildlife Species and Habitat Management on Livestock Grazing

The impacts from priority wildlife species and habitat management would be similar to those described under Alternative B for the SDNM except that 47 miles of fence line would exclose a total of 44,800 acres, rather than the 8,500 acres proposed in Alternative B. This is significantly less acreage and AUMs available for livestock use, which would result decrease in grazing fences as well. In general, direct impacts from wildlife on livestock grazing would remain negligible, and resemble those described in Alternative A. However, indirect impacts from the fence exclosure would require an AUM reduction, more fencing, and additional water sources for the benefit of both livestock and widlife.

From Recreation Management on Livestock Grazing

General impacts from recreation on livestock operations would be similar to Alternative B, except that managing for a balance of uses between motorized and nonmotorized recreational uses with more Back Country and Passage RMZs would decrease certain intensive recreation uses and the associated impacts on livestock and livestock operations that were described in Alternative B. Allotments in the urban interface would continue to see increased recreational use as populations grows, resulting in minor to moderate impacts from conflicts between recreationists and livestock.

Under Alternative C, impacts from target shooting would be similar to Alternative A and B. However, less than 1,134 acres would be open to target shooting and in limited, designated areas. This would decrease direct and indirect impacts to livestock and livestock grazing by as much as 99.8 percent. Therefore, impacts are expected to be negligible.

From Special Designations on Livestock Grazing

Impacts would be the same as those described under Alternative B for the SDNM, except designating Highway 238 and Interstate 8 as scenic byways may have a minor impact on grazing permittees by restricting the location, extent, or type of livestock developments allowed.

From Travel Management on Livestock Grazing

The proposed route network under Alternative C would minimize conflicts between vehicles and livestock as compared to Alternative A and B with approximately 183 miles of routes in the SDNM open to the public. This route system would continue to support livestock operations by providing access to livestock and livestock developments. However, the additional 47 miles of fencing could restrict some access to recreationists, who could cut fences or leave gates open, creating management issues for livestock operators. Impacts would depend on the scale and frequency of vandalism by allotment. For example, impacts would be negligible for the Beloat, Hazen, and Arnold Allotments where no additional fencing is proposed. Impacts for the Conley Allotment permittee would be minor, with an additional 18 additional miles of fencing to maintain, and impacts to the Bighorn Allotment opertor would be moderate, with 27 more miles of fencing to maintain. Installation of cattleguards and strategically located gates in heavily trafficed areas would help mitigate this impact.

From Visual Resources on Livestock Grazing

General impacts from VRM Class allocations on livestock operations would be similar to those described under Alternative B, but with a 48,300 acre increase in VRM II. This could reduce surface disturbance and increase the amount of forage available for livestock grazing. Such allocations would also necessitate additional mitigation on range developments. The impact could range from minor changes to the project design to a moderate impact from requiring relocation of the project.

From Wilderness Characteristics on Livestock Grazing

Managing 153,000 acres in the SDNM north of I-8 as allocated lands managed to protect wilderness characteristics could reduce surface disturbance and maintain available forage; however this allocation would also have a minor impact to livestock operations by increasing the mitigation requirements and potentially changes in type and location for range developments in these areas.

4.15.6. ALTERNATIVE D

4.15.6.1. Both Decision Areas

Under Alternative D, all allotments would become unavailable to livestock grazing as permits expire. All livestock grazing would eventually be eliminated across both Decision Areas.

Under Alternative D, all livestock on BLM-administered land would be removed and allotments would become unavailable for grazing when current permits expire. Approximately 1,780 miles of fence line across the entire planning area could potentially be removed to enhance wildlife habitat, visual resources, and recreational opportunities. Approximately 130 miles of fencing in the SDNM, and 1,647 miles of fencing in the Lower Sonoran could potentially be removed.

The burden of removing fences would fall on State and Federal wildlife managers. Fences along rights-of-way, such as highways, roads, railways, and utility corridors, would remain in place.

Range improvement projects, such as wells, corrals, pipelines, troughs and water catchments would also become the responsibility of State and Federal employees. All range improvement projects, including but not limited to fencelines and water developments, would either be removed or modified on a case-by-case basis, and the BLM would be required to reimburse the permittees for the cost of the range improvement, in accordance with 43 CFR 4120.

During years of increased winter rainfall the fuel load created from the growth of annual species (up to 2000 lbs./ acre + air dry weight) would not be subject reduction from livestock grazing, which could result in increased frequency and/or intensity of fire in these non-fire adapted ecosystems. This could have moderate to major impacts on all other vegetation across the Planning Area.

This decision would eliminate any impacts to or from livestock grazing across the entire Planning Area, including on Monument objects. Approximately 1,416,600 acres would no longer be used for livestock grazing and approximatley 26,244 AUMs would become available for wildlife forage and habitat. This would have major impacts on the economic viability of cattle operations because permittees would be required to turn to other means to sustain their herds or get out of the ranching business altogether. In turn, those towns and communities that are dependent on the ranching industry could see moderate to major economic impacts, as well.

4.15.6.2. Lower Sonoran

No unique impacts have been identified for the Lower Sonoran in Alternative D.

4.15.6.3. Sonoran Desert National Monument

No unique impacts have been identified for the SDNM in Alternative D.

4.15.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.15.7.1. Both Decision Areas

No unique impacts have been identified for Both Decision Areas under Alternative E.

4.15.7.2. Lower Sonoran

From Cultural and Heritage Resources on Livestock Grazing

Impacts of Alternative E would be the same as those described under Alternative C for the Lower Sonoran, except the allocation of the Lower Gila Terraces and Historic Trails SCRMAs would be developed through the SDNM, but not in the Lower Sonoran.

From Livestock Grazing on Livestock Grazing

Alternative E incorporates elements from each of the other alternatives, and offers a prescription for managing grazing on the Lower Sonoran Decision Area while providing long-term protection and resource conservation. Under Alternative E, grazing allotments would be allocated as perennial, perennial/ ephemeral, or ephemeral, as appropriate to allotment-specific characteristics. Impacts from these allocations would be similar to Alternative A by providing more flexibility to appropriately manage livestock, as compared to the allocation restrictions proposed under Alternatives B and C.

Similar to Alternative C, Alternative E proposes to restrict the portion of the Bighorn Allotment that is in the Lower Sonoran (outside the SDNM boundaries) to winter season of use only (Oct 1-April 30). This would have a minor impact on the livestock operator by not permitting utilization of any summer forage. Additionally, this alternative proposes to close the portion of the Table Top Allotment to livestock grazing. This would result in negligible impacts to livestock or the permittee because this portion of the allotment has been managed with the remainder of the allotment that was closed to livestock grazing through the Presidential Proclamation.

Managing perennial grazing allotments with slight reduction in the authorized grazing preference could have a major impact by reducing the long-term viability of some livestock operations. Allowing supplemental ephemeral authorizations could offset some of the impact to the livestock operations by allowing additional livestock during years of ephemeral production.

Seasonal adjustments in grazing on perennial allotments would be considered during the permit renewal process, and would propose approximately 65 percent use during the winter-spring season [October 1 to April 30] and approximately 35 percent use during the summer season [May 1 to September 30]. These management changes, and any decisions to adjust livestock numbers or require more intensive management (pasture rotations, seasonal removals, etc.), would likely have moderate to major impacts to operator costs. For example, increased pasture rotations and seasonal removals could increase the number of employees needed to facilitate this intensive management. While this would provide income for these employees in the short term, it could eventually bankrupt some livestock operators. However, individualized consultation, coordination, and cooperation with the affected parties during the permit renewal process could help lessen financial impacts to the operator while also decreasing impacts of grazing on rangeland resources.

From Lands & Realty on Livestock Grazing

Impacts from multiuse utility corridors would be the same as Alternative D. Impacts from energy projects on livestock operations in the Lower Sonoran would be similar to Alternative C due to similarity in acres available for projects. Impacts from land use authorizations would decrease from Alternative C, because 45,100 fewer acres would be set aside as LUA Exclusion areas.

Impacts from land tenure decisions on livestock operations in the Lower Sonoran would be similar to Alternative A due to similar numbers of acres that would be available for disposal.

From Minerals Management on Livestock Grazing

The level of impact from mineral development on livestock operations would be the same as Alternative C, although there is an increase of 35,800 acres available for development for a total of 376,400 acres.

From Priority Wildlife Species and Habitat Management on Livestock Grazing

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Recreation Management on Livestock Grazing

Impacts from recreation on livestock operations would be the same as those under Alternative C due to similar RMZ acres.

From Special Designations on Livestock Grazing

Management actions for the 61,300 acre Coffeepot-Batamote ACEC, the 58,500 acre Cuerda de Lena ACEC and the 48,500 acre Saddle Mountain ACEC would have a negligible impact on grazing allotments. Management actions for ACECs allow livestock facilities to be developed if they improve natural resource conditions by improving livestock distribution.

Approximately 79,100 acres would be designated as the Lower Gila Terraces and Historic Trails ACEC. Designation of the ACECwould have minor impacts to livestock operations by placing some restrictions on the location of livestock developments to protect the cultural resources. Impacts from designation of the Agua Caliente Road as a backcountry byway would be the same as Alternative B.

From Travel Management on Livestock Grazing

Impacts from travel management on livestock operations would be similar to those under Alternative C for the Lower Sonoran, due to similar miles of open vehicle routes.

From Visual Resources on Livestock Grazing

Impacts from the allocation of VRM Classes on livestock operations would be the same as those described under Alternative B for the Lower Sonoran.

From Wilderness Characteristics on Livestock Grazing

As under Alternative C, lands allocated as lands managed to protect wilderness characteristics would increase the mitigation requirements and potentially change the type and location for range developments in these areas. Impacts under Alternative E would be the same, however, would be somewhat less widespread as fewer acres (55,400) would be allocated as lands managed to protect wilderness characteristics compared to Alternative and D.

4.15.7.3. Sonoran Desert National Monument

From Cultural and Heritage Resources on Livestock Grazing

Impacts would be similar to those described under Alternative C, However, because the Conley Allotment would be closed to livestock grazing, North Tank would not have to be fenced off. The Anza NHT and interpretive / public use sites would likely be expanded because their impacts

would be negligible, since there would be no cattle in Conley. Impacts from the public use sites proposed on the Bighorn Allotment would have the same impacts as described for Alternative C.

From Lands & Realty on Livestock Grazing

Impacts from multiuse utility corridors would be the same as those described in Alternative D. Impacts from the development of energy projects would be the same as Alternative B. There would be no impacts from land use authorizations as the Monument is excluded from any new projects.

From Livestock Grazing on Livestock Grazing

Alternative E incorporates elements from each of the other alternatives, and it offers a prescription for managing grazing on the SDNM Decision Area while providing long-term protection and resource conservation. Impacts from grazing decisions would be similar to Alternative A by allowing a full suite of allocations to perennial, perennial-ephemeral, and ephemeral permits north of I-8. This would provide flexibility to appropriately manage livestock compared to Alternatives B and C. Grazing would be adjusted as needed in the permit renewal process, in accordance with grazing regulations and in response to the grazing determinations required by the Proclamation. Impacts from seasonal adjustments would be similar to Alternative C. Likewise; this alternative reflects the exclosures and associated impacts described in Alternative C.

Additionally, Alternative E proposes making the entire portion of the Conley Allotment within the SDNM boundaries unavailable to livestock grazing. The Conley Allotment had the largest departure from Standard 3 and the most acreage found to be incompatible with current grazing practices. Impacts from this alternative would have major impacts to the permittee of the Conley Allotment by decreasing the preference inside the SDNM to 0 AUMs, and proportionately decreasing remaining AUMs allocated for portions outside the Monument boundary.

Range improvement projects would experience the same impacts as described in Alternative C, except that projects across the entire allotment would be affected. Water developments would be removed or modified for the enhancement of wildlife and other uses. The permittee would be reimbursed for the range improvement projects that would be removed, in accordance with 43 CFR 4120.

From Priority Wildlife on Livestock Grazing

Impacts would be the same as those described under Alternative C for the SDNM, except that the Conley Allotment would be unavailable for grazing, and associated AUMs would be allocated to wildlife.

From Recreation Management on Livestock Grazing

Impacts would be similar to and have the same intensity as those described in Alternative B for the SDNM. However, recreational target shooting would be prohibited on the Monument. Therefore, impacts from target shooters on livestock would be negligible.

From Special Designations on Livestock Grazing

Impacts would be the same as those described Alternative C for the SDNM.

From Travel Management on Livestock Grazing

The proposed route network would minimize conflicts between vehicles and livestock as compared to Alternative A, B and C, with approximately 243 miles of routes in the SDNM open to the public. This route system would continue to support livestock operations by providing access to livestock and livestock developments.

From Visual Resources on Livestock Grazing

General impacts from VRM Class allocations on livestock operations would be similar to those described under Alternative C, but with a 27,900 acre decrease in VRM II going to VRM III. This could reduce surface disturbance and increase the amount of forage available for livestock grazing. Such allocations would also necessitate additional mitigation on range developments. The impact could range from minor changes to the project design to a moderate impact from requiring relocation of the project.

From Wilderness Characteristics on Livestock Grazing

Managing lands with wilderness characteristics in the SDNM by allocating them as lands managed to protect wilderness characteristics would have the same impacts as Alternative C, but with a slight decrease of 1,300 acres.

4.16. IMPACTS ON MINERALS MANAGEMENT

An evaluation of the effects on mineral resources from the proposed management decisions focuses on actions that would alter, restrict, or prohibit disturbance or damage to the ground surface and associated resources that would be expected to occur during mineral exploration and development activities.

The proclamation creating the SDNM closed the Monument to all forms of mineral entry, subject to valid existing rights. A search on June 14, 2010 of the BLM's mining claim records (LR2000) showed that all previously existing mining claims within the SDNM have been allowed to lapse by the claimants. Also there are no existing mineral leases or mineral materials contracts or permits within the SDNM. Therefore there are no valid existing mineral rights within the SDNM. There are three Title 23 Materials Site Rights-of-Way LUAs, which are realty actions, within the Monument.

4.16.1. METHODS OF ANALYSIS

4.16.1.1. Indicators

No indicators were used during the analysis of this section.

4.16.1.2. Assumptions

The following assumptions regarding the future management of minerals management are made:

- Demand for mineral commodities, construction materials, and energy resources will increase over the long term in the U.S. and within the Planning Area.
- Increased demand for energy and minerals will stimulate exploration for potential resources, predominately within areas of known high and moderate potential within the Planning Area.
- It is assumed there will be no major change in the legal framework under which locatable, leasable, and salable minerals are administered.
- The BLM will ensure alternatives in this plan will not compromise valid and existing mineral rights,.
- There will continue to be controversy surrounding mineral development associated with a range of societal pressures. This controversy will require more BLM Federal land managers' time and resources as they attempt to move Federal properties forward through mineral exploration, permitting, and development.
- The BLM will provide for timely permit evaluation and processing of all mineral exploration and development proposals, subject to personnel and administrative constraints.

4.16.1.3. Program Areas with No Impacts on Minerals

There would be no impacts to minerals management from actions proposed under the following program areas:

- Caves Resources
- Livestock Grazing
- Paleontological Resources
- Soil Resources
- Wild Horse & Burro Management
- Wildland Fire Management

4.16.1.4. Qualitative Intensity Scale

The intensities of impacts are the same as those described in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375).

4.16.2. COMMON TO ALL ALTERNATIVES

4.16.2.1. Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas for all Action Alternatives.

4.16.2.2. Lower Sonoran

From Air Quality on Minerals Management

All mineral development would be required to meet air quality standards as set by law. Such requirements can result in delays in permitting and added compliance/mitigation costs or outright denial of mining. Mineral development proposals that cannot meet standards would not be allowed to proceed.

From Water Resources on Minerals Management

All mineral development would be required to meet water quality standards as set by law. Such requirements can result in delays in permitting and added compliance/mitigation costs or outright denial of mining. Mineral development proposals that cannot meet standards would not be allowed to proceed.

4.16.2.3. Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.16.3. ALTERNATIVE A (NO ACTION)

Under this alternative, the current situation would continue with acreages (approximate, rounded to nearest 100) as shown in Table 4.24, "Alternative A Mineral Entry Status" (p. 668). Since

none of the decisions in this plan affect non-BLM surface, the BLM subsurface with non-Federal surface acres situation will not change under the various alternatives but will continue to be managed in accordance with existing laws, regulations, and policy.

Table 4.24. Alternative A Mineral Entry Status

Status	Total Acres (Both Decision Areas)	Acres currently open to minerals activities	Acres currently closed to minerals activities
BLM subsurface with BLM surface	1,338,300	713,300	625,000
BLM subsurface with non-Federal surface	210,000	139,000	71,000

4.16.3.1. Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative B.

4.16.3.2. Lower Sonoran

From Cultural and Heritage Resources on Minerals Management

All mineral development would be required to identify and avoid or mitigate, through documentation or collection, impacts to cultural resources. These requirements will add delays and additional costs to mineral development.

From Lands & Realty on Minerals Management

As described in existing planning. The area available for mineral development under BLM administration would be reduced by as much as 20,000 acres (3 percent of currently open lands) through disposal of public lands by any means. This includes an existing mineral materials operation (Arizona Pacific Materials II, LLC) and a mineral materials site used by the Maricopa County Department of Transportation (Courthouse Pit) through a free use permit. Ten utility corridors could interfere with or eliminate mineral exploration and development within their boundaries.

Utility-scale renewable energy facilities in the valley areas could remove large tracts of land from availability for mineral development, primarily of salable sand and gravel resources.

From Priority Wildlife Species and Habitat Management on Minerals Management

Specific management decisions for priority wildlife species and habitat resources that would affect mineral resources development include discretionary authority to restrict leasable and salable mineral development to areas that would result in no net loss of desert tortoise habitat and locatable mineral development which could require mitigation or other compensation when tortoise habitat could not be avoided. Conflicts between desert tortoise habitat and mineral development would be widespread on the landscape due to the substantial overlap of desert tortoise habitat with locatable mineral and decorative rock salable mineral potentials. Conservation measures associated with T & E species, particularly within the pronghorn habitat area in the Ajo Block, which has moderate mineral potential, could limit mineral resource development.

From Recreation Management on Minerals Management

Implementation of Alternative A would retain the four SRMAs (Gila Trail, Saddle Mountain, Ajo, and Sentinel Plain) totaling 379,400 acres. Allocation of SRMAs could restrict mineral development when such development conflicts with recreation facilities and developments that support the recreation purposes of the area. This limit is likely to be minor since recreation facilities require a negligible percentage of the landscape. Conversely, active management of recreation could be used to direct recreation use away from energy and mineral development areas thus decreasing conflicts, this capability would likely become increasingly important as the population grows and recreation use increases. Areas outside of these four SRMAs would continue to be managed as an ERMA (totaling 550,800 acres) and would not have facilities, visitation standards, or specific management decisions. The ERMA allocation would thus be unlikely to impact mineral development in the short-term. However, recreation use would not be regulated to any great extent, thus eliminating the opportunity to direct increasing recreation use away from energy and mineral development areas in the long-term.

From Special Designations on Minerals Management

Designation of the Coffeepot—Botanical and Vekol Valley Grasslands ACECs(13,440 acres total) could place limitations on leasable and salable minerals exploration and production and would require plans of operations for all operations beyond casual use for locatable minerals.

From Travel Management on Minerals Management

Motor vehicle use would be limited to existing or designated roads and trails, except in approximately 91,750 acres of wilderness areas and 8,900 acres of the Coffeepot ACEC that would remain closed to motorized travel. Approximately 1,670 miles of existing routes would remain open for motorized use and 15 miles would remain closed to motorized use. Maintaining all existing routes open for vehicle use would maintain current vehicle access for mineral exploration and development opportunities throughout the area.

From Vegetation Resources on Minerals Management

Impacts to mineral development related to restoration objectives for vegetation reestablishment, and control of invasive species could result in increased expenditures by companies or individuals needed to achieve the required standards.

From Visual Resources on Minerals Management

In general, VRM classifications could cause surface disturbance restrictions to be put in place to maintain the specified VRM class, or impose additional rehabilitation requirements to return an area to its VRM class after mineral development is completed. In areas of VRM I or II classification, discretionary minerals activities could be prohibited. VRM I and II aim to retain the visual character of viewsheds and typically require more stipulations or rehabilitation. VRM III allows for changes to the visual character or viewshed and requires fewer stipulations or rehabilitation to maintain the VRM class. VRM IV rarely requires stipulations or rehabilitation to maintain the VRM class.

Under Alternative A, 116,300 acres would be allocated as VRM II, 279,600 acres would be allocated as VRM Class III and 442,500 acres would be allocated as VRM Class IV. In addition, 91,800 acres allocated to VRM I in the Lower Sonoran are within wilderness areas closed to mineral entry. VRM classification would have little impact to energy and mineral operations, since most acres are allocated as VRM III or IV.

From Wilderness Characteristics on Minerals Management

No lands with wilderness characteristics would be allocated as lands managed to protect wilderness characteristics, therefore impacts would be nonexistent.

4.16.3.3. Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.16.4. ALTERNATIVE B

The various land use allocations and prescriptions proposed under Alternative B, including for wildlife, lands, recreation, cultural resources, VRM, and wilderness characteristics, will affect the BLM mineral estate under BLM surface as shown in Table 4.25, "Alternative B Mineral Entry Status" (p. 670). Special stipulations refer primarily to seasonal or year-round no surface occupancy closure intended for the protection of other resources.

Table 4.25. Alternative B Mineral Entry Status

BLM subsurface with BLM surface	Available Acres	Acres with New Special Stipulations	Acres of New Closures
Currently open	713,300 acres		
Locatable Minerals		0	2,600
Leasable Minerals		74,700	200
Salable Minerals		61,800	13,300

4.16.4.1. Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative B.

4.16.4.2. Lower Sonoran

From Cultural and Heritage Resources on Minerals Management

Under Alternative B, a framework for pro-active management of cultural resources would be established and include management of sites at Sundad, Butterfield West, Painted Rock and for public visitation. Increased public visitation could increase conflicts with cultural heritage tourism and have a minor impact on mineral development. Designation of the sites would reduce lands available for development, but only by a small amount

From Lands & Realty on Minerals Management

The area available for mineral development pursuant to BLM administration would be reduced by as much as 29,300 acres (4 percent of currently open lands) through disposal of public lands by any means. This includes an existing mineral materials site operated by Arizona Pacific Materials II through mineral materials sales contracts.

Impacts from multiuse utility corridors would be the same impacts as those described for the 10 utility corridors designated under Alternative A.

Potential development of utility-scale renewable energy generating plants could interfere with or eliminate mineral exploration and development.

From Priority Wildlife Species and Habitat Management on Minerals Management

As in Alternative A, proposed mineral activities would be evaluated to ensure that they do not allow a net loss in desert tortoise habitat (Categories I, II and III). Under Alternative B, the land use authorization process for projects involving any surface disturbing activities would involve mitigation measures, construction methods, and restoration and reclamation plans that minimize habitat fragmentation and impacts to wildlife movement corridors. This could cause additional expense, require special stipulations, or even eliminate discretionary minerals activities. An existing Maricopa County mineral materials site (Narramore Pit), operating under a free use permit, which is located within the Fred J. Weiler Green Belt Resource Conservation Area will be required to cease operations and reclaim following completion of any existing valid permit.

From Recreation Management on Minerals Management

Allocating seven SRMAs, covering 779,800 acres in the Lower Sonoran would have similar impacts to mineral development as those described under Alternative A, except the impacts would be more widespread due to more acres falling within SRMA boundaries under Alternative B. Conflicts are most likely in SRMAs near to the urban interface and those planned for intensive recreation activity, including Buckeye Hills East Trails, Ajo, and Arlington SRMAs that would be allocated primarily for motorized recreation uses, as well as the other urban interface SRMAs (Saddle Mountain and Buckeye Hills West) that would be allocated for mixed motorized and nonmotorized uses. However, the increase in SRMA acres would increase the opportunity to direct recreation use away from areas of high mineral potential and mineral development. In addition, the SRMAs allocated under Alternative B would include management decisions that are more specific and intended to maintain the desired recreation settings. An ERMA of 150,400 acres would be similar to the impacts described under Alternative A, but not as widespread as it would be smaller in size.

From Special Designations on Minerals Management

Under Alternative B, the Coffee Pot ACEC restrictions would be the same to those under A. Direct impacts from the designation of the Agua Caliente Backcountry Byway are expected to be minimal unless viewshed management restrictions are implemented on surface disturbing activities which could restrict or eliminate minerals activities, especially discretionary ones.

From Travel Management on Minerals Management

Overall impacts from limiting motorized vehicle travel to designated routes in the Lower Sonoran would similar to Alternative A. Travel would be restricted to the designated route system, however, with the appropriate land use authorization, permitted users could develop new roads to access facilities. Compared to Alternative A, there would be fewer miles open and more miles closed (consist primarily of duplicate routes) in the Lower Sonoran. On a case-by-case basis, users with a valid authorization would be allowed to use administrative only or closed routes or create new routes. Motorized access to the Coffeepot ACEC would only be available on designated routes. Under Alternative B, motorized vehicle travel would be allowed on fewer miles of routes compared to Alternative A, while more miles of routes would be closed.

From Vegetation Resources on Minerals Management

Goals and objectives under Alternative B to maintain and restore ecological and biological resources and soil and water resources could place additional avoidance or reclamation requirements on mineral development. Objectives include specific restoration objectives for vegetation reestablishment and control of invasive species.

From Visual Resources on Minerals Management

General impacts from VRM would be similar to Alternative A, although VRM allocations would vary. Under Alternative B in the Lower Sonoran, fewer acres would be managed as VRM II (64,800 acres) and more acres to VRM III (551,000), while fewer acres would be managed to VRM IV (222,600 acres) than under Alternative A. Therefore, impacts would be similar to Alternative A since most acres remain in VRM III or VRM IV; however, increasing total VRM Class II acres could expand restrictions on mineral sites by imposing greater design and siting requirements during development. Areas designated Class III or Class IV under Alternative B would require fewer stipulations and mitigation requirements. Mineral sites could be subject to increased mitigation requirements compared to Alternative A due to the larger area covered by VRM II.

While reducing VRM IV areas could impact mining operations, the north side of the Gila Bend Mountains and the Buckeye Hills-Stanfield area, which have somewhat higher mineral potential than other parts of the Decision Area, would remain under VRM IV allocation. This would allow mineral development in those areas without additional restrictions. The allocation of more acres as VRM II in the Gila Bend Mountains could increase mitigation requirements on mineral development; however, stipulations associated with desert tortoise habitat in the same area would likely be adequate to maintain VRM class without requiring additional stipulations.

From Wilderness Characteristics on Minerals Management

Similar to A, as no lands managed to protect wilderness characteristics would be allocated.

4.16.4.3. Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.16.5. ALTERNATIVE C

The various land use allocations and prescriptions proposed under Alternative C, including for wildlife, lands, recreation, cultural resources, VRM, and wilderness characteristics, will affect the BLM mineral estate under BLM surface as shown in Table 4.26, "Alternative C Mineral Entry Status" (p. 673). Special stipulations refers primarily to seasonal or year-round no surface occupancy closures intended for the protection of other resources.

Table 4.26. Alternative C Mineral Entry Status

BLM subsurface with BLM surface	Available Acres	Acres with New Special Stipulations	Acres of New Closures
Currently open	713,300 acres		
Locatable Minerals		0	2,350
Leasable Minerals		417,400 (includes 61,400 of No Surface Occupancy)	250
Salable Minerals		61,800	184,800

4.16.5.1. Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative C.

4.16.5.2. Lower Sonoran

From Cultural and Heritage Resources on Minerals Management

Specific decisions for cultural resources would place an emphasis on protecting cultural resources in place, which could put additional stipulations and avoidance or mitigation requirements on mineral development.

Under alternative C, two areas, Saddle Mountain and the Lower Gila Terraces & Historic Trails encompassing 127,600 acres, would be designated as SCRMAs, which would place emphasis on protecting sensitive cultural resources. Both areas would be closed to mineral material disposals. Portions of the Lower Gila Terraces & Historic Trails SCRMA would be closed to leasable minerals actions while the rest of it ,and all of the Saddle Mountain SCRMA, would remain open but with a no surface occupancy stipulation which would effectively render impracticle most leasable minerals activity. Both areas would remain open to locatable minerals activity but additional requirements and stipulations would be necessary to attempt to mitigate damage to other resources. This could cause additional delays and costs to any locatable minerals proposals.

From Lands & Realty on Minerals Management

The area available for mineral development pursuant to BLM administration would be reduced by as much as 36,300 acres (5 percent of currently open lands) through disposal of public lands by any means. This includes an existing mineral materials site operated by Arizona Pacific Materials II through mineral materials sales contracts.

Nine multiuse utility corridors could interfere with or eliminate mineral exploration and development within their boundaries.

Potential development of utility-scale renewable energy generating plants could interfere with or eliminate mineral exploration and development.

From Priority Wildlife Species and Habitat Management on Minerals Management

Four WHAs would be designated under Alternative C, totaling 425,900 acres, which could place additional stipulations and mitigation requirements on mineral development to maintain wildlife corridors, un-fragmented wildlife habitat, and sensitive wildlife habitat.

From Special Designations on Minerals Management

Under Alternative C, the Coffeepot Batamote ACEC restrictions would be similar to those under A except that the area is increased significantly to 63,300 acres. Impacts of the Anza NHT would be the same as in Alternative A. Direct impacts from the designation of the Agua Caliente Backcountry Byway are expected to be minimal unless viewshed management restrictions are implemented on surface disturbing activities which could restrict or eliminate minerals activities, especially discretionary ones.

From Recreation Management on Minerals Management

Impacts from implementing recreation management under Alternative C would be similar to Alternative B, with the exception that more acres in the Lower Sonoran (approximately 640,300 acres) would be within an SRMA as opposed to an ERMA. In general, the SRMAs under Alternative C would be aimed at a more balanced recreation management, considering both motorized and nonmotorized settings with more back country RMZ which would be intended to provide a more dispersed, undeveloped recreation experience. Conflicts between nonmotorized and undeveloped recreation experience users and mineral development may be somewhat more intense compared to Alternative B in the SRMAs because these users would tend to be looking for a more natural experience; conversely, nonmotorized users require fewer acres and would be more easily directed away from mineral development, thus decreasing conflicts.

From Travel Management on Minerals Management

Impacts of route closures and limits would be similar to Alternative B. Under Alternative C, in the Lower Sonoran 334 miles of the existing route system would be closed to motorized use, more than Alternative A and Alternative B. These and other limitations placed on route use under Alternative C (e.g., routes limited seasonally or to administrative use) would restrict access to certain areas potentially limiting mineral exploration and development, to the extent that mineral exploration is accomplished via driving across the public lands. General impacts from travel management in both Decision Areas would be similar to those described under Alternative B, except that fewer routes would be open, which would result in a greater likelihood that additional access would have to be created for mining sites.

From Vegetation Resources on Minerals Management

Impacts would be the same as those described in Alternative B for the Lower Sonoran.

From Visual Resources on Minerals Management

General impacts from VRM would be similar to Alternatives A and B. Under Alternative C, 91,800 acres would be managed as VRM I, 387,800 acres would be managed as VRM II, 385,600 acres would be managed as VRM III; and 65,000 acres would be managed as VRM IV. The allocation of substantially more acres to VRM II could increase the stipulation and mitigation requirements for mineral development, particularly in areas of Saddle Mountain and Gila Bend Mountains where salable and geothermal leasable mineral development is more likely, however, stipulations associated with desert tortoise habitat would likely encompass any stipulations associated with visual resources. As discussed under Alternative B, the changes in acres managed under VRM III would have little practical effect on mineral development, similar to Alternative B.

From Wilderness Characteristics on Minerals Management

Alternative C would result in the allocation of 128,100 acres (19 percent of currently open lands) of the Lower Sonoran Decision Area as lands managed to protect wilderness characteristics. Costs to explore for or develop locatable mineral resources could become prohibitive and could reduce or eliminate development. The lands would be closed to all leasable and saleable mineral activities.

4.16.5.3. Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.16.6. ALTERNATIVE D

The various land use allocations and prescriptions proposed under Alternative D, including for wildlife, lands, recreation, cultural resources, VRM, and wilderness characteristics, will affect the BLM mineral estate under BLM surface as shown in Table 4.27, “Alternative D Mineral Entry Status” (p. 675) below. Special stipulations refer primarily to seasonal or year-round no surface occupancy closures intended for the protection of other resources.

Table 4.27. Alternative D Mineral Entry Status

BLM subsurface with BLM surface	Available Acres	Acres with New Special Stipulations	Acres of New Closures
Currently open	713,300 acres		
Locatable minerals		0	381,500 acres
Leasable minerals		206,800 acres	381,500 acres
Salable minerals		0	521,400 acres

4.16.6.1. Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative D.

4.16.6.2. Lower Sonoran

From Cultural and Heritage Resources on Minerals Management

While no SCRMAs would be allocated under Alternative D, however, 267,100 acres would be designated as ACECs which would place emphasis on protecting sensitive cultural and biological resources. Portions of the ACECs would be closed to some or all minerals activities and the remaining areas would be subject to varying levels of additional restrictions or mitigation above what is now in effect, which could effectively render minerals activities impractical or impossible. Some minerals activities currently exist in proposed ACECs and could need to be shut down and reclaimed following termination of valid existing rights.

From Lands & Realty on Minerals Management

The area available for mineral development pursuant to BLM administration would be reduced by as much as 34,800 acres (5 percent of currently open lands), through disposal of public lands by any means. These lands include parcels containing three active mineral materials operations: Red Mountain Mining, Arizona Pacific Materials II, and Treasure Chest Granite Pit.

Seven multiuse utility corridors could interfere with or eliminate mineral exploration and development within their boundaries.

Potential development of utility-scale renewable energy generating plants could interfere with or eliminate mineral exploration and development.

From Priority Wildlife Species and Habitat Management on Minerals Management

Impacts from establishing one WHA would be similar to Alternative C but with fewer acres allocated, as many of the WHAs are now ACECsin Alternative D.

From Recreation Management on Minerals Management

Implementation of recreation management under Alternative D would be similar to Alternative B and C in terms of the impacts on mineral development, except that fewer acres would be managed as SRMAs (100,200 acres, the least among the Alternatives in the Lower Sonoran and more would be managed as ERMAs (830,000 acres). In general, the SRMAs under Alternative D would be focused on providing more nonmotorized and some motorized, dispersed recreation settings, which could cause impacts as described in Alternative C. The increased acres in ERMAs would eliminate the opportunity to manage and direct recreation use away from mineral developments thus increasing the likelihood of conflict.

From Special Designations on Minerals Management

While no SCRMAs would be allocated under Alternative D, the same area would be under ACEC designation, which would place similar emphasis on protecting sensitive cultural and biological resources in these areas, could require additional stipulations and mitigation for mineral development and could restrict authorization of renewable mineral sites similar to Alternative C. Several active mineral materials operations exist in proposed ACECs and would need to be shut down and reclaimed following expiration of the current contract or permit. These include two sites used by the Maricopa County Department of Transportation (Courthouse Pit & Narramore Pit), Kilauea Crushers' Estrella Pit, and the Bush Sand & Gravel site north of Ajo.

From Travel Management on Minerals Management

The impacts of route closures and limits would be similar to Alternative B and C; however, the impacts would be greater as the most miles of routes would be closed. These and other limitations placed on route use under Alternative D (e.g., routes limited seasonally or to administrative use) would substantially restrict access to much of the Decision Area and limit mineral exploration more than the other alternatives, to the extent that mineral exploration is accomplished by driving across the public lands.

From Vegetation Resources on Minerals Management

Impacts would be the same as those described in Alternative B for the Lower Sonoran. From Visual Resources on Minerals Management

From Visual Resources on Minerals Management

General impacts from VRM would be similar to Alternatives A, B, and C. In the Lower Sonoran except for the difference in acreages which are 91,800 acres managed as VRM I, 622,400 acres as VRM II, 192,000 acres as VRM III, and 24,000 acres as VRM IV.

From Wilderness Characteristics on Minerals Management

Impacts would be the same as those described under Alternative C for the Lower Sonoran, except that 276,500 acres of lands managed to protect wilderness characteristics (twice as many acres as proposed in Alternative C) would be allocated as lands managed to protect wilderness characteristics.

4.16.6.3. Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.16.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

The various land use allocations and prescriptions proposed under Alternative E, including for wildlife, lands, recreation, cultural resources, VRM, and wilderness characteristics, will affect the BLM mineral estate under BLM surface as shown in Table 4.28, “Alternative E Mineral Entry Status” (p. 677). Special stipulations refers primarily to seasonal or year-round no surface occupancy closures intended for the protection of other resources.

Table 4.28. Alternative E Mineral Entry Status

BLM Subsurface with BLM Surface	Available acres	Acres with New Stipulations	Acres of New Closures
Currently open	713,300 acres		
Locatable minerals		0	2,350 acres
Leasable minerals		274,900 acres (includes 15,400 acres of No Surface Occupancy)	53,700 acres
Salable minerals		0	192,300 acres

4.16.7.1. Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative E.

4.16.7.2. Lower Sonoran

From Cultural and Heritage Resources on Minerals Management

No SCRMAs would be designated under Alternative E. Those identified in other alternatives would be designated as ACECs in this alternative. Under alternative E, 250,800 acres would be designated as ACECs which would place emphasis on protecting sensitive cultural and biological resources. Portions of the ACECswould be closed to some, or all, minerals activities and the remaining areas would be subject to varying levels of additional restrictions or mitigation above what is now in effect, which could effectively render minerals activities impractical or impossible. Some minerals activities currently exist in proposed ACECs and could need to be shut down and reclaimed following termination of valid existing rights.

From Lands & Realty on Minerals Management

The area of public lands available for mineral development would be reduced by as much as 36,800 acres (5 percent of currently open lands) through disposal of public lands by any means. These parcels include three existing mineral materials operations: Red Mountain Mining, Treasure Chest Granite Pit, and Arizona Pacific Materials II.

Eight multiuse utility corridors could interfere with or eliminate mineral exploration and development within their boundaries.

Potential development of utility-scale renewable energy generating plants could interfere with or eliminate mineral exploration and development.

From Priority Wildlife Species and Habitat Management on Minerals Management

Impacts from allocating one 255,700 acre WHA would be similar to Alternative C but cover more acres.

From Recreation Management on Minerals Management

Impacts from recreation management on mineral development under Alternative E would be substantially the same as under Alternative C due to similarities in both acres and management intent. Under Alternative E, the impacts of route closures and limits would be similar to Alternative C due to similarities in the number of miles closed or restricted.

From Special Designations on Minerals Management

Similar to Alternative D, no SCRMAs would be allocated under Alternative E, although the same area would be under ACEC designation, however, with a reduced boundary to avoid areas with locatable mineral potential in the Gila Bend Mountains. The ACECdesignation would place an emphasis on protecting sensitive cultural and biological resources in these areas, and could require additional stipulations and mitigation for minerals development. In particular, as under Alternative C, lands within 500 feet of the cliff faces with petroglyphs on the Gila River would be closed to salable minerals. As in Alternative C, this would have little practical effect as this restriction is currently in place through site specific decisions. Two recently active mineral materials sites are located within proposed Special Designation areas. The Maricopa County Department of Transportation (MCDOT) previously operated mineral materials sites through Free Use Permits within a part of the Fred J. Weiler RCA (Narramore Pit) and within a portion of the proposed Saddle Mountain ACEC (Courthouse Pit). Permits for both sites are currently expired, but MCDOT has expressed an interest in operating the sites again. The site within the RCA will not be allowed to resume operation. Within the ACEC there are no significant resource conflicts so the location would be available for mineral materials disposal to MCDOT through a new free-use permit provided that no new surface is disturbed.

From Travel Management on Minerals Management

The impacts of route closures and limits would be similar to Alternative C due to similarities in the number of miles closed or restricted.

From Vegetation Resources on Minerals Management

Impacts would be the same as those described in Alternative B for the Lower Sonoran.

From Visual Resources on Minerals Management

General impacts from VRM would be similar to all other alternatives. Impacts from the distribution of VRM classes under Alternative E in the Lower Sonoran would fall between Alternatives B and C with acreages as follows: 91,800 as VRM I, 71,900 as VRM II, 548,400 as VRM III, and 218,100 as VRM IV. Under Alterative E, substantially fewer acres would be managed under VRM I and II than under Alternative D, with VRM I being limited to wilderness areas. Nearly as many acres as under Alternative B would be managed under VRM III, and only a small amount of public lands would be assigned to VRM IV. The increase in VRM III would decrease the stipulation and mitigation requirements for mineral development compared to Alternative C and D, but would be more than under Alternatives A and B. VRM II would be used selectively under Alternative E to protect particularly sensitive visual resources in Saddle Mountain, Coffeepot and Batamote Mountains, and parts of Gila Bend Mountains.

From Wilderness Characteristics on Minerals Management

Impacts would be the same as those described under Alternative D for the Lower Sonoran except that fewer acres (55,400) would be allocated as lands managed to protect wilderness characteristics.

4.16.7.3. Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.17. IMPACTS ON RECREATION MANAGEMENT

Impacts from alternate strategies for management of recreation and visitor services ultimately are about trade-offs in the potential outcomes experienced by visitors. Outcomes range from individual benefits (such as developing outdoor skills and abilities, greater self-reliance, and improved physical fitness) to group and community benefits (such as greater appreciation of cultural heritage, less juvenile delinquency, and enhanced lifestyle), and are produced by visitor experiences during recreation activities. The BLM provides settings in response to market demand for recreation experiences and the benefits such experiences generate. Trade-offs in potential outcomes may be inferred from a) differences in opportunities and experiences anticipated to result from alternate market strategies; b) the objectives established to achieve those market strategies; and c) from the varying setting characters designed to provide the physical, social, and administrative environment in which recreation opportunities are offered and outcomes produced.

Impacts to recreation resources from alternate strategies for management of other resources, such as livestock grazing, designation of multiuse utility corridors, and wildlife habitat management, also affect visitor outcomes by influencing the settings in which recreation occurs. Setting character may range from the most primitive and undisturbed natural landscape where encounters with other visitors are rare (back country) to areas of highly developed sites that include paved access and parking, visitor centers, and other amenities, and where encounters with other visitors are commonplace (community interface). A description of prescribed setting character is provided in Appendix Q, *Recreation Settings and Descriptions* (p. 1285) and Appendix R, *Benefits Based Recreation Worksheets* (p. 1295).

In the Lower Sonoran, more opportunities for beneficial outcomes would be produced through implementation of the action Alternatives (B, C, D, and E) for the management of other resources as well as recreation resources – particularly for benefits such as increased individual and community awareness of cultural heritage resources, enjoyment of natural landscapes, enjoying exploration and risk-taking, and appreciating easy access to recreation opportunities. Under these alternatives, allocations for management of other resources would be complemented by management of the recreation resource as a SRMA.

Implementation of management actions for recreation resource under Alternatives B, C, or E would produce outcomes in slightly varying degrees based on relative proportions of front country and back country settings. Sharply contrasting opportunities for beneficial outcomes would be produced by implementation of Alternatives B, C, and E versus implementation of Alternative D. Alternatives B, C, and E would produce more opportunities for beneficial outcomes derived from development and interpretation of cultural heritage resources than would Alternative D, which would produce proportionately more opportunities derived from remote, undeveloped, back country experiences.

In the SDNM, Alternatives B, C, and E would allocate the SDNM to a Destination SRMA managed to produce benefits for visitors derived from opportunities for heritage and cultural tourism and remote back country settings, and would be marketed to regional and national tourism markets. Alternative D would allocate all of the SDNM to produce experiences and outcomes derived from undeveloped public lands. This Undeveloped SRMA would also be marketed to regional and national tourism markets; however, emphasis on cultural heritage tourism would not be included and setting character would ensure that access, facilities, and educational offerings would be minimal and support primitive recreation experiences derived from remote, largely pristine public lands throughout the SDNMDecision Area.

4.17.1. METHODS OF ANALYSIS

Impact analysis and conclusions are based on IDT knowledge of the Planning Area and review of literature. Impacts on recreation resources and travel management activities are discussed separately unless otherwise specified. Both effects are quantified where possible, and, in the absence of quantitative data, qualitative effects are presented based on professional judgment.

4.17.1.1. Indicators

- Number of SRMAs identified and the total acreage included within SRMAs;
- Management actions within SRMAs that result in changes to the physical, social, or administrative setting character;
- Change in the availability, or area of availability, of types of recreation opportunities, particularly motorized and nonmotorized opportunities.

4.17.1.2. Assumptions

The following assumption regarding the future management of recreation management are made.

- Over the planning period, demand for and use of recreational opportunities will increase on public lands • Motorized recreation would likely experience the greatest increase;
- The incidence of resource damage and conflicts among recreationists involved in mechanized, motorized, and nonmotorized activities would increase with increasing use of public lands;
- Following completion of these RMPs, comprehensive travel management plans would be prepared for the Decision Areas and would include public involvement, NEPA analysis, and the designation of routes in limited areas.

4.17.1.3. Program Areas with No Impacts on Recreation

There would be no impacts to recreation management from actions proposed under the following program areas:

- Vegetation Resources,
- Wild Horse & Burro Management

4.17.1.4. Qualitative Intensity Scales

The intensities of impacts are the same as those described in Table 4.1, “Qualitative Terms for the Intensity of Impacts” (p. 375).

4.17.2. COMMON TO ALL ALTERNATIVES

4.17.2.1. Both Decision Areas

From Air Quality on Recreation Management

Management of air resources could have a major impact on recreation opportunities, settings, use levels, and management. Management of air resources could restrict recreation uses and activities in localized areas and impact recreation opportunities, settings, use levels, and management. This would result from the emission of fugitive dust from unpaved roads that affect attainment of Maricopa County air quality standards. Mitigation, restriction, or closure to recreation entry and travel could be used to correct fugitive dust violations, especially where public land recreation uses are adjacent to communities and residences, resulting in moderate to major impacts to recreation benefits and outcomes.

From Cave Resources on Recreation Management

Decisions to protect unique or significant cave and cave resources (if such resources are found) may increase opportunities for users to visit and learn about these resources. Certain localized areas could have specific restrictions intended to protect such resources that could restrict or displace certain uses. Overall impacts would be negligible over the long term.

From Lands & Realty on Recreation Management

Under all alternatives, there is a potential for conflict between the purpose of individual land use authorizations and the specific objectives of SRMAs. In the Lower Sonoran, utility-scale development of renewable energy projects would occur on a case-by-case basis and has the potential to displace recreational uses from up to 150,000 acres of public lands over the life of the plan (due to approximately 15 energy projects at 10,000 acres each).

From Minerals Management on Recreation Management

Most of the Lower Sonoran (except designated wilderness areas) would remain open for locatable and saleable mineral resource development. In ERMAs, mining could impact the existing recreational setting and experience by changing the natural character of the landscape as a result of surface disturbance. Recreational settings could change corresponding to the scale of mining landscape modifications; however, site-specific mitigation measures identified during NEPA analysis would reduce long-term impacts on the natural landscape and restore recreational settings and related opportunities when the mining activity is completed. In SRMAs, minerals projects would need to comply with prescribed setting prescriptions; therefore, there would be little or no impact to recreation resources.

There would be no impacts from mineral management in the SDNM because the Monument is withdrawn from mineral entry.

From Paleontological Resources on Recreation Management

Decisions to protect unique or important paleontological and geological resources would increase opportunities for users to visit and learn about these resources. On the other hand, localized areas could have specific restrictions imposed that are intended to protect these resources that could restrict or displace certain uses. Impacts to paleontological and geological resources management are expected to be negligible over the long term.

From Priority Wildlife Species and Habitat Management on Recreation

Management In wildlife habitat areas, surface-disturbing activities (including recreation developments) would be limited to 40 acres or less and habitat for the Sonoran pronghorn would be closed seasonally. Minor reductions to opportunities for beneficial outcomes would ensue.

Seasonal closures enacted due to conflicts with wildlife in wildlife movement corridors would reduce opportunities for beneficial outcomes. Depending upon the season and area, such impacts on recreation could be major (for example, if a seasonal closure occurred during the cool weather, high visitation period from October to April).

From Hazardous Materials & Public Safety on Recreation Management

Recreation visits to public lands, especially dispersed uses, would continue to entail risk from natural and human hazards, including unmaintained vehicle routes, infrequent patrol, exposure to criminal activity, exposure to unsafe practices by other recreation users (particularly related to target shooting and OHV use), poisonous plants and animals, flash floods, and cliffs and mining shafts. Some visitors may realize enhanced benefits, such as a sense of challenge or exhilaration in exploring remote areas, from situations of relative risk; however, others with less inclination to enjoy risky adventures would experience fewer benefits as public lands would discourage visitation by these individuals. Impacts to public safety and access are expected to be minor, depending on the number of incidents during the long term.

For example, under all alternatives, visitors to the Sentinel Plain area may encounter unexploded ordnance (UXO) or other hazardous military hardware due to proximity to active U.S. Air Force training areas. To provide for increased public awareness and safety, all entry into the area requires a mandatory permit, viewing of a safety video, a signed hold harmless agreement, and receipt of other user safety information. For some users, obtaining the permit could be viewed as cumbersome and detract from the experience. For others, the impact may be that they decide to recreate elsewhere. Impacts to public safety and access are expected to be minor, depending on the number of incidents during the long term.

Trash, litter, and hazardous materials could impact and displace recreation visitors from an area. Management decisions in all alternatives to mitigate such areas could help to restore recreation settings and provide renewed public access. If mitigation is warranted, including closing areas to entry, localized recreation opportunities could be lost. Impacts to recreation are expected to be minor depending on the number of incidents during the long term.

From Soil Resources on Recreation Management

Decisions related to avoiding and mitigating surface-disturbing activities to protect soil and water resources could restrict recreation uses and activities in localized areas. In the short term, major surface disturbances to soils could moderately impact the recreational experience; however, in the long term, impacts are expected to be negligible to minor.

From Special Designations on Recreation Management

Outstanding opportunities and natural settings for users to experience primitive, unconfined recreation and solitude would be maintained on 91,750 acres within the Sierra Estrella, Signal Mountain, and Woolsey Peak designated wilderness areas in the Lower Sonoran and on 157,700 acres within the Table Top, South Maricopa Mountains, and North Maricopa Mountains Wilderness Areas in the SDNM. In all alternatives, opportunities for nonmotorized recreational experiences would exist while motorized vehicle recreation experiences would not be allowed. These areas would continue to be managed under their existing wilderness plans. Impacts to opportunities for beneficial outcomes are expected to be negligible as no changes to these Federal designations are foreseen.

From Travel Management on Recreation Management

Sonoran pronghorn closure near the Painted Rock Petroglyph Site and Campground would only have minor impacts because other public lands nearby are available for dispersed recreation activities.

From Visual Resources on Recreation Management

Impacts from allocating designated wilderness to VRM Class I would be negligible. These areas are allocated to the back country setting and the degree of development for facilitated recreation opportunities would be low to none.

From Wildland Fire Management on Recreation Management

Managing for full suppression of all fires, in accordance with applicable conservation measures, would help maintain existing recreational settings, as would implementation of programs to reduce unwanted ignitions and emphasize wildfire prevention. Closures of localized areas during fire suppression activities and seasonally required special fire restrictions could limit recreational opportunities and uses in the short term. When such restrictions or closures are ordered, recreation opportunities are displaced or diminished, including public access, the use of vehicles and engines, campfires, and smoking. Impacts would be minor over the long term; however, depending on the number of acres that are affected, this intensity could change.

4.17.3. ALTERNATIVE A (NO ACTION)

4.17.3.1. Lower Sonoran

From Cultural and Heritage Resources on Recreation Management

Allocation of individual cultural sites to the Public Use category on a case-by-case basis would increase, to a minor extent, the potential for increased visitation and education opportunities at specific sites. This would increase the likelihood of achieving benefits from experiences relating to the study or observation of cultural resources.

From Livestock Grazing on Recreation Management

Under Alternative A, grazing management could reduce opportunities for appreciation of natural landscapes to a minor degree due to trailing, bovine waste, and trampled vegetation at areas of livestock concentration, and from potential surface disturbances due to construction of new rangeland improvements such as fences cattle guards, and gates. Large numbers of cattle present in years of ephemeral use could potentially cause such impacts to opportunities for appreciation of natural landscapes to be moderate in intensity.

Conversely, grazing management provides opportunities for visitors to see and learn about diverse uses of the public lands and may enhance opportunities for appreciation of cultural heritage and public lands management to a minor degree.

From Recreation Management on Recreation Management

Under Alternative A, recreation resources would be actively managed in four SRMAs: Saddle Mountain, Gila Trail, Sentinel Plain Lava Flow, and Ajo. The remainder of the public lands in the Lower Sonoran Planning Area would be encompassed within ERMAs and managed in a custodial fashion. The four SRMAs would continue to be managed with current levels of motorized and nonmotorized access. Competitive speed events would remain authorized, based on site-specific conditions and concerns. Overall, with implementation of Alternative A, no change to the baseline recreation resource would occur and the impact to recreation would be negligible.

From Special Designations on Recreation Management

The Coffeepot Botanical ACEC and three wilderness areas (Woolsey Peak, Signal Mountain, and Estrella) would continue to provide major nonmotorized recreation benefits from appreciation of natural landscapes.

From Travel Management on Recreation Management

Under Alternative A, the existing travel system of 1,670 miles of routes open for motorized use in the Lower Sonoran would maintain existing motorized recreation opportunities throughout the Decision Area. More routes would be made available for public use under Alternative A than all other alternatives. As motorized recreational demand and uses increase, the frequency of conflicts between motorized and nonmotorized recreational users would likely increase to a moderate degree over the life of the RMP.

From Visual Resources on Recreation Management

Under Alternative A, approximately 78 percent of the Decision Area would be managed to Class III or Class IV VRM objectives. These standards allow for noticeable changes to the existing visual character of the landscape, potentially leading to visible surface disturbances and a gradual decline in scenic and natural qualities. Impacts to Recreation, particularly experiences and benefits from appreciation of natural landscapes, would be minor to moderate depending on the area.

From Wilderness Characteristics on Recreation Management

No lands would be allocated as lands managed to protect wilderness characteristics under Alternative A. Approximately 276,500 acres of the Decision Area identified to have wilderness character would possibly lose all or part of that character over the life of the plan. Such loss

would have moderate impacts to recreation from loss of opportunities for appreciation of natural landscapes.

4.17.3.2. Sonoran Desert National Monument

From Cultural and Heritage Resources on Recreation Management

Current management guidance does not include allocations, allowable uses, and management actions at the land-use plan level for cultural resources that interact with recreation allocations to produce targeted visitor outcomes. Allocation of cultural sites is handled administratively on a case-by-case basis, and only the area of the Anza NHT has been allocated as a SRMA (a portion of the Gila Trails SRMA). Under Alternative A, recreation opportunities derived from cultural resources would be produced on approximately 143,900 acres, or 30 percent, of the SDNM coinciding with the Gila Trails SRMA, yielding minor production of recreation benefits such as increased individual and community awareness of cultural heritage resources. Recreation benefits would not be produced from cultural resources on the remaining 70 percent of the SDNM as this area would not be managed as a SRMA and recreation resources would continue to be managed custodially in response to conflicts with cultural resources.

From Livestock Grazing on Recreation Management

Current management guidance allocates all or part of six livestock grazing allotments from public lands of the SDNM. Five of these allotments are "perennial-ephemeral," meaning a base herd is authorized for year-long grazing and in seasons of particularly high forage production, additional livestock grazing may be authorized. The sixth allotment is ephemeral grazing only. In the area of the Gila Trails SRMA, where recreation benefits would be actively managed and produced, livestock grazing during normal years would be expected to have negligible to minor impacts to such benefits as enjoyment of natural landscapes, appreciation of environmental benefits, and appreciation of cultural heritage resources. During years of above average annual precipitation, increased livestock grazing would have moderate impacts to such recreation-derived beneficial outcomes as the effects of grazing would be evident over a larger area, but still concentrated in specific areas. On approximately 252,200 acres, or 52 percent, of the SDNM where recreation activities would be managed custodially, impacts to the production of recreation benefits from livestock grazing would be minor.

From Recreation Management on Recreation Management

Implementation of Alternative A would carry forward current management guidance that allocates approximately 137,100 acres, or 28 percent of the SDNM to the "Gila Trails SRMA" with goals to provide facilities and maintenance, protect resource values, and provide visitor safety. In the area of the Anza NHT, facilities for visitation such as improved access, day-use and overnight activities, and education and interpretation of the natural and cultural values of the SDNM would be provided. The goals and objectives of the SRMA, and subsequent production of recreation benefits, would not be updated to provide active recreation management reflecting Proclamation 7397. On the remaining 70 percent of the SDNM, recreation resources would be managed custodially in response to conflicts arising from management issues other than recreation, and targeted benefits from recreation resources would not be actively produced. A moderate impact to recreation resources would occur from unresolved conflicts between users.

Under Alternative A, the impacts of recreational target shooting would be dispersed throughout the Monument; however, target shooting would continue in areas that are known to be unsuitable for this activity. Conflicts between shooters and non-shooters would also likely increase to a moderate degree as target shooting activities occurred over larger areas of the Monument. The lack of target shooting restrictions within the Monument would provide recreationist more opportunity for target shooting, therefore impacts on recreation would be minor.

From Travel Management on Recreation Management

Under current management guidance, 161,200 acres (or 33 percent of the SDNM) would remain closed to motor vehicles and unavailable for designation of vehicle routes. This would cause a minor impact to opportunities for attaining beneficial outcomes such as enjoying exploration and easy access to natural landscapes.

Under Alternative A, opportunities for attaining beneficial outcomes such as enjoying exploration, risk-taking, and easy access to natural landscapes would be reduced at a moderate to major degree. Of 632 miles of routes available for motorized use, approximately 568 miles, or 90 percent, would remain open for such use; however, a system of designated travel routes would not be placed into effect. This would may lead to substantial closures of routes from misuse and over-use as impacts to resources of the SDNM become unmanageable.

From Visual Resources on Recreation Management

Proclamation 7397 precludes management of the Monument such that major changes to the visual character of the landscape would occur; however, moderate change where direct and indirect impacts to the objects of the SDNM would be localized and not widespread would be acceptable. Under Alternative A, the total of VRM classes III and IV (236,100 acres, or 49 percent) could be managed as VRM Class III, which allows for moderate change to the landscape. Benefit opportunities produced from active management of recreation resources, such as appreciation of natural landscapes, would potentially be reduced to a minor degree in the area of the Gila Trail SRMA because portions of the SRMA would be managed to VRM Class III standards. In that part of the SRMA managed to VRM Class II standards, and over the remainder of the SDNM, benefit opportunities derived from recreation resources would be impacted to a negligible degree, either because the higher standards of VRM Class II and Class I would preclude substantial impacts from management of visual resources, or because recreation resources would be managed custodially.

4.17.4. ALTERNATIVE B

4.17.4.1. Lower Sonoran

From Cultural and Heritage Resources on Recreation Management

Under Alternative B, major opportunities for beneficial outcomes, such as opportunities for individual and community awareness and appreciation of cultural heritage resources, would be realized in comparison to Alternative A. These beneficial outcomes would result from emphasis on the allocation of cultural sites for public use and maximizing the community interface and front country settings. These settings allow intense visitation and interpretive development and allocation of sites to the public use category could lead to increased visitation and education

opportunities. Development at three cultural public use sites (Butterfield West Site, Painted Rock Petroglyph Site, and Sundad) would produce opportunities for a variety of recreational experiences relating to the study or observation of cultural resources and heritage tourism. Access would be improved and sites would be stabilized and managed for future recreational opportunities.

From Livestock Grazing on Recreation Management

In comparison to Alternative A, livestock grazing would be perennial-ephemeral with fewer animal unit months available annually. With fewer livestock seasonally, fewer impacts to recreation experience outcomes would be anticipated. Minor opportunities for beneficial outcomes, such as enjoyment of natural landscapes and appreciation of environmental benefits, would be realized.

From Recreation Management on Recreation Management

Alternative B emphasizes targeted benefits-based outcomes through allocation of the maximum extent of SRMAs. The widest range of diverse recreation opportunities, particularly related to motorized and intensive recreation uses, would be provided under this Alternative. Relative to the other alternatives, fewer locations for primitive recreational experiences would be provided. Alternative B includes many group use opportunities, a focus on developing cultural sites for heritage tourism, and developing interpretative sites for public education and appreciation.

Under Alternative B, approximately 779,800 acres in the Lower Sonoran would be part of eight designated SRMAs, acknowledging each area's unique and valuable recreational settings and opportunities. This equates to approximately 84 percent of public lands in the Lower Sonoran targeted for recreation management.

Through the allocation of SRMAs and RMZs with focused markets and niches, uses would be directed to appropriate areas, capable of supporting the use and would direct recreation development and management in an efficient manner. Management prescriptions such as route designations, visitor information and signing, visitor services development, user education, application of Tread Lightly practices, and active restoration efforts would help to maintain recreation settings and opportunities. Some visitors would discern more regulated and structured recreation environments than they have previously encountered on public lands and could perceive these circumstances negatively.

While many of the SRMAs under Alternative B emphasize trail-based and motorized activities, about 45 percent of the public lands in the Lower Sonoran would be allocated to nonmotorized recreation opportunities in the back country setting where motorized use would be in the passage zone that provides motorized access to the back country. Other allocations include 34 percent in the front country setting and 9 percent in the community interface setting.

About 12 percent of the Lower Sonoran would be classified as an ERMA, be available for unstructured and self-directed recreation activities, and managed in a custodial fashion. Recreational settings could change over the long term in ERMAs due to increasing use, urban growth, and damage to natural resources, and increased vandalism.

In general, opportunities for and use levels of OHV travel, vehicle-based camping, hunting, hiking, equestrian use, picnicking, cultural/historic study, photography, sightseeing, nature study, wildlife observation, and miscellaneous motorized-dependent activities would be maintained or

increased under Alternative B. In contrast, backpacking, primitive camping, wilderness-dependent recreation, target shooting, sky watching/astronomy, mountain bicycling, and other nonmotorized opportunities and use levels would be the same as under Alternative A or could slightly decline over the long term due to a decrease of appropriate settings, other land use restrictions, and more overall human activity. Impacts would be negligible to minor.

From Special Designations on Recreation Management

Impacts to opportunities for beneficial outcomes, such as appreciation of cultural heritage resources, would be similar to those identified under of Alternative A because the Anza NHT would continue to be managed coincidentally with the Lower Gila Trails SRMA. Designation of a Back Country Byway would result in increased benefits such as viewing natural scenery and appreciating the natural environment.

On the remainder of the Decision Area, production of beneficial outcomes (such as appreciation of cultural heritage resources) would also be similar to Alternative A; however, beneficial outcomes such as appreciation of naturalness, solitude, and primitive, unconfined types of recreation would be greater as 91,750 acres of wilderness would be managed coincidentally with SRMAs to produce these outcomes.

From Travel Management on Recreation Management

Moderate production of beneficial opportunities and outcomes, such as enjoying exploration, risk-taking, and easy access to natural landscapes, would result from travel management actions under Alternative B. Fewer miles of routes would remain open for motorized use compared to Alternative A (1,241 miles, or 74 percent of available routes, versus 1670 miles, or 99 percent); however, beneficial outcomes would be directly produced through management of approximately 70 percent of the Decision Area as SRMAs.

Alternative B offers a substantial and dedicated variety of both structured and unstructured trail-based and motorized opportunities. Managing 100 percent of the Decision AreaDecision Area as limited to designated routes would maintain opportunities for motorized recreation as in Alternative A. On the other hand, Alternative B would reduce the public use route network by 429 miles for a total of 1,241 miles, of which 180 miles would be subject to seasonal closures due to Sonoran pronghorn and cactus ferruginous pygmy-owl related restrictions, which would reduced overall motorized recreation opportunities. Alternative B also emphasizes the opportunities and identifies potential locations for additional road development focused on increased motorized recreational access and opportunities. Accordingly, as compared to Alternative A, where less structured management is planned, the quality of the motorized opportunities could be improved and these uses and opportunities would more likely be sustained by effective management over the life of the Lower Sonoran RMP.

Over the long-term, active travel management practices and route designations have the opportunity to improve recreation resources and opportunities compared to Alternative A. This would be due to full implementation of route designations, complete route numbering, increased visitor information and signing, increased user education and outreach, the opportunity for new route development to increase the diversity and quality of the motorized recreation experience, application of Tread Lightly practices, and active restoration efforts. Designated and numbered routes could help maintain recreation settings, lessen impacts to other recreation uses, and reduce damage to natural resources.

In other aspects, short-term impacts on recreation settings and opportunities from travel management would be comparable to those described under Alternative A. While Alternative B would continue to allow for nonmotorized, non-mechanized cross-country travel, these activities could be restricted if repetitive use results in permanent route scars. In such localized places, natural landscape recreation settings could be maintained by restricting cross-country travel to designated access points, but doing so would constrain the opportunities to start from anywhere. Otherwise, cross-country nonmotorized travel impacts would be the same as identified under Alternative A in the Lower Sonoran Decision Area.

From Visual Resources on Recreation Management

Beneficial opportunities and outcomes, such as appreciation of natural landscapes, would be greater than under Alternative A because recreation and non-recreation facilities and developments would be designed and mitigated to a higher standard of visual quality, principally classes II and III (66 percent of the Lower Sonoran Decision Areaunder Alternative B versus 43 percent under Alternative A).

Some management actions that would be established under Alternative B could contribute to preserving and/or restoring the scenic landscape and naturalness of the recreation settings. For example, Alternative B would provide for restoring routes closed to motorized access or for converting them for nonmotorized trails, protecting historic landscapes in their natural condition, and mitigating developments visible from the Agua Caliente and Painted Rock Dam roads by exceeding or maintaining VRM objectives. Visual impacts minimized in the short term (5 years) and VRM objectives that are met in the long term could improve the scenic quality for recreation.

From Wilderness Characteristics on Recreation Management

Alternative B does not identify any lands to be allocated as lands managed to protect wilderness characteristics, so impacts would be the same as described under Alternative A. Lands managed to protect wilderness characteristics and primitive recreation opportunities could be maintained in back country RMZs, but their maintenance or continuation over the life of the RMP could not be assured.

4.17.4.2. Sonoran Desert National Monument

From Cultural and Heritage Resources on Recreation Management

Under Alternative B, the opportunities for beneficial outcomes would be moderately greater than identified under Alternative A. Selected sites would be allocated to public and scientific uses, and the SDNM would be managed as a SRMA to produce benefits such as appreciation of cultural heritage and natural resources. Facilitated visitation, interpretation, educational materials, and marketing would be targeted to national and regional visitors seeking destinations that emphasize such natural and cultural heritage resources.

From Livestock Grazing on Recreation Management

Livestock grazing would be perennial-ephemeral, with reduced availability of animal unit months. With fewer seasonal livestock numbers, fewer impacts to other resources such as recreation

would be anticipated but are not quantifiable. Under Alternative B, 8,500 acres on the SDNM is proposed to become unavailable for livestock use through fenced exclosures. These exclosures could impact recreation use and enjoyment. The strategic placement of gates and cattleguards would help mitigate these impacts. In comparison to Alternative A, negligible to minor impacts to beneficial outcomes, such as enjoyment of natural landscapes and appreciation of environmental benefits, would be expected.

From Recreation Management on Recreation Management

Facilitated camping, hiking, educational opportunities, and scenic driving would be designed and marketed to national and regional visitors through allocation of a "Destination" SRMA under Alternative B. Consequently, production of such recreation-related benefits such as appreciation of cultural heritage resources and natural landscapes would be higher from a moderate to a major degree, relative to Alternative A.

All target shooting would be consolidated at sites identified as naturally suitable for this activity. Damage to Monument objects in other areas would be reduced to a moderate degree; however, damage to natural resources at the sites identified as naturally suitable would increase in extent and severity. Impact at such sites would be major, although limited to the footprint of the shooting sites. The potential for conflicts between shooting groups would increase to a minor to moderate degree as opportunities for target shooting would be limited.

From Travel Management on Recreation Management

Under Alternative B, 157,700 acres (or 32 percent) of the SDNM would be closed to motor vehicles. The slight difference in area closed to motor vehicles in contrast to Alternative A poses negligible impacts to opportunities for recreation benefits.

Beneficial opportunities and outcomes derived from motorized activities, such as enjoying exploration, risk-taking, and easy access to natural landscapes, would be moderately greater than identified under Alternative A. Although fewer miles of routes would remain open for motorized use (531 miles, or 83 percent of available routes, versus 632 miles, or 100 percent under A), management of the SDNM as a SRMA would facilitate direct production of motorized beneficial outcomes and implementation of a system of designated routes would facilitate proper travel management. Motorized travel to trailheads, campsites, interpreted cultural sites, or general sightseeing would be designed and managed through a system of designated travel routes to emphasize enjoyment of natural landscapes and appreciation of cultural resources.

From Visual Resources on Recreation Management

Opportunities for beneficial outcomes, such as appreciation of natural landscapes, would be greater than identified under Alternative A as recreation and non-recreation facilities and developments would be designed and mitigated to a higher standard of visual quality, principally Class II (45 percent of SDNM Decision Areaunder Alternative B versus 19 percent under Alternative A).

4.17.5. ALTERNATIVE C

4.17.5.1. Lower Sonoran

From Cultural and Heritage Resources on Recreation Management

Under this alternative, moderate increases in opportunities for beneficial outcomes, such as opportunities for individual and community awareness and appreciation of cultural heritage resources, would result over the Lower Sonoran generally. Within allocated cultural resource management areas, greater opportunities for individual and community awareness and appreciation of cultural heritage resources would result. Allocation of the "Gila River Terraces and Southern Historic Trail Special Cultural Resource Management Area" (79,100 acres) and "Saddle Mountain Special Cultural Resource Management Area" (48,500 acres) would increase beneficial outcomes produced from public and scientific use of cultural resources on 14 percent of the Decision Area Lower Sonoran coinciding with the Lower Gila Historic Trails and Saddle Mountain SRMAs.

Moderate increases in opportunities for beneficial outcomes on the remaining 86 percent of the Lower Sonoran would be realized as some cultural sites would be allocated to public use, rather than only to scientific use; however, opportunities for individual and community awareness and appreciation of cultural heritage resources would be less compared to Alternative B as allocation to public use would not be emphasized.

From Livestock Grazing on Recreation Management

Potential impacts on recreation resources from grazing are comparable to those described under Alternative A, with minor exceptions. During ephemeral years, however large numbers of livestock would likely interfere with some recreational opportunities for short terms. Under Alternative C, allotments would be reclassified as perennial or ephemeral, with no supplemental ephemeral allocations for base herds (i.e. no perennial/ephemeral allotments would be designated). This would have negligible effects on recreation.

From Recreation Management on Recreation Management

Alternative C would allocate 637,300 acres (69 percent) of the Lower Sonoran to 5 SRMAs. The Gila Bend Mountains SRMA, targeted to "Undeveloped" recreation opportunities, would be the largest relative to all other alternatives and would represent nearly half (49 percent) of the acreage allocated to SRMAs in Alternative C.

In relation to Alternative B, recreation opportunities would shift from an emphasis on motorized recreation to a greater emphasis on nonmotorized recreation opportunities. The settings for facilitated motorized recreation opportunities would be less. The back country setting would be 28,100 acres (11 percent) greater than in Alternative B, and 289,900 acres (31 percent) of the Lower Sonoran would be allocated as an ERMA.

From Special Designations on Recreation Management

The Coffeepot Botanical ACEC would be enlarged from 8,900 acres to 63,300 acres, and the Agua Caliente Road would be designated a Back Country Byway. Both designations would provide for greater protection of natural areas and enhance opportunities for beneficial outcomes that are derived from natural landscapes. Opportunities for beneficial outcomes in the Ajo and Gila Bend Mountains SRMAs, such as greater sensitivity to/awareness of outdoor aesthetics, community awareness and appreciation of cultural and natural heritage, increased awareness and protection of natural resources, and increased desirability as a place to live would be greater under this alternative than Alternatives A and B.

From Travel Management on Recreation Management

Under Alternative C, 1,141 miles (68 percent) of available routes would be open to motorized use, in contrast to 1,241 miles (74 percent) in Alternative B and 1,670 miles (99 percent) in Alternative A. Opportunities for beneficial outcomes such as enjoying exploration, risk-taking, and easy access to natural landscapes, would be similar to Alternative B and moderately less than for Alternative A.

Alternative C continues to allow opportunities for nonmotorized, non-mechanized cross-country travel. Such travel, however, must be consistent with RMZ prescriptions and may be restricted if repetitive use leads to permanent routes. The application of designated access management in the Lower Sonoran Decision Area under Alternative C coupled with fewer access points could affect recreational use by reducing the level of cross-country travel opportunities that are available under Alternatives A and B. Limiting nonmotorized and non-mechanized access from private and State lands onto public lands to designated access points will affect recreational use.

From Visual Resources on Recreation Management

Opportunities for beneficial outcomes, such as appreciation of natural landscapes, would be much greater under Alternative C than Alternatives A and B as recreation and non-recreation facilities and developments would be designed and mitigated to a much higher standard of visual quality, principally Class II (42 percent of Lower Sonoran, versus 13 percent in A and 7 percent in B).

From Wilderness Characteristics on Recreation Management

Alternative C would result in the allocation of 128,100 acres, or 14 percent, of the Lower Sonoran as lands managed to protect wilderness characteristics managed coincidentally with recreation resources by SRMA's as back country settings. Impacts to opportunities for beneficial outcomes would be negligible.

4.17.5.2. Sonoran Desert National Monument

From Cultural and Heritage Resources on Recreation Management

Opportunities for beneficial outcomes (such as individual and community appreciation of cultural heritage resources) would be moderately greater in Alternative C than in Alternative A. Allocation of the "Sonoran Desert Historic Trails Special Cultural Resource Management Area" (16,200 acres) would increase, to a minor degree, the beneficial outcomes derived from

public and scientific uses of cultural resources on the 3 percent of the SDNM that is within this management area.

Opportunities for beneficial outcomes on the remaining 97 percent of the SDNM would be similar to Alternatives A and B as allocation of cultural sites to public and scientific uses would be similar.

From Livestock Grazing on Recreation Management

Livestock grazing would be perennial only, with no supplemental ephemeral permits authorized. However, available animal unit months would be the same as for the existing management situation. Consequently, opportunities for beneficial outcomes (such as viewing untrammeled natural landscapes) in the SDNM would be similar to Alternative A and impacts to the production of recreation benefits from livestock grazing would be minor.

Approximately 44,800 acres would be exclosed to prevent livestock use on portions of the Monument. Fences for this exclosure could impact recreational use and enjoyment. Strategic gates and cattleguards would help mitigate these impacts.

From Recreation Management on Recreation Management

Facilitated camping, hiking, educational opportunities, and scenic driving would be designed and marketed to national and regional visitors through allocation of a "Destination" SRMA. Consequently, the production of opportunities for such recreation-related benefits as appreciation of cultural heritage resources and natural landscapes would be moderately higher relative to Alternative A, and similar to Alternative B.

All target shooting would be restricted to specific sites that are actively managed for this activity. Impacts to Monument objects away from these sites would be decreased to a moderate degree as target shooting was restricted across the Monument; however, impacts to natural resources at the specific shooting sites would be greatest relative to the other alternatives as shooting activity is focused and management facilities such as roads, backstops, fencing, and/or other amenities would be constructed. Other impacts would include a less positive experience for those shooters who prefer a dispersed, unmanaged target shooting experience.

From Travel Management on Recreation Management

Under Alternative C, roads available for public use would be 185 miles less than Alternative A and 140 miles less than Alternative B. This represents a moderate reduction in opportunities for beneficial outcomes from motorized access, such as enjoying exploration, risk-taking, and easy access to natural landscapes. Overall impacts would be similar to Alternative B.

From Visual Resources on Recreation Management

Under Alternative C, opportunities for attainment of beneficial outcomes, such as appreciation of natural landscapes, would be greater than for implementation of Alternatives A and B because recreation and non-recreation facilities and developments would be designed and mitigated to a higher standard of visual quality, principally Class II (55 percent of SDNM, versus 19 percent in A and 45 percent in B).

4.17.6. ALTERNATIVE D

4.17.6.1. Lower Sonoran

From Cultural and Heritage Resources on Recreation Management

This alternative would produce negligible opportunities for beneficial outcomes derived from cultural resources as allocation of cultural sites to conservation for future use, not public use, would be emphasized. Also, approximately 59 percent of the Lower Sonoran would be managed as an ERMA and cultural sites allocated to public uses would be developed and interpreted to reduce impacts to cultural resources, which may lead to minor opportunities for recreation-related benefits.

From Livestock Grazing on Recreation Management

Under Alternative D, the naturalness component of all recreational settings would be enhanced compared to Alternatives A, B, and C because all livestock grazing allotments would be closed to such use. Fences would eventually be removed after permits expire, leaving miles of unfenced roads and trails open for recreational use. Opportunities for beneficial outcomes, such as appreciation of natural landscapes, would be enhanced to a minor degree.

From Recreation Management on Recreation Management

Alternative D would allocate the least acres to SRMAs (100,200 acres, or 11 percent of the Lower Sonoran). The Buckeye Hills and Lower Gila Historic Trails SRMAs would be allocated as a Community SRMA and Destination SRMA, respectively; however, recreation resources over the remainder of the Lower Sonoran would be managed custodially in an ERMA. Opportunities for beneficial outcomes, such as community awareness and appreciation of cultural and natural heritage, awareness and protection of natural resources and landscapes, ability for visitors to find areas providing wanted recreation experiences, and sense of community dependency on public lands, would be decreased to a moderate degree relative to Alternatives B and C. The difference in opportunities for these types of beneficial outcomes between Alternative D and Alternative A would be negligible.

From Special Designations on Recreation Management

Under Alternative D, 263,700 acres (28 percent) of the Lower Sonoran would be allocated as ACEC to protect unique vegetation, natural landscapes, endangered wildlife, and sensitive cultural sites. Opportunities for beneficial outcomes that are derived from appreciation of such resources would be enhanced to a moderate degree relative to Alternatives A, B, and C.

From Travel Management on Recreation Management

Under Alternative D, the least mileage of routes would be open for motorized use (799 miles, or 47 percent of available routes). Opportunities for beneficial outcomes that derive from motorized activities, such as enjoying exploration by vehicle and easy access to natural landscapes, would be moderately less than in Alternatives B and C, and less to a major degree in comparison to Alternative A. Opportunities for beneficial outcomes that derive from nonmotorized activities,

such as touring by hiking, bicycling, and / or horseback, would be enhanced to a minor degree in relation to Alternatives B and C, and to a moderate degree relative to Alternative A.

From Visual Resources on Recreation Management

Under Alternative D, the major portion of the Lower Sonoran would be managed to the objectives of VRM Class II (622,400 acres, or 67 percent). Opportunities for beneficial outcomes that derive from appreciation of landscape views and undisturbed nature would be moderately greater in comparison to Alternative C, and greater to a major degree in relation to Alternatives A and B.

4.17.6.2. Sonoran Desert National Monument

From Cultural and Heritage Resources on Recreation Management

Under Alternative D, the Sonoran Desert Historic Trails SCRMA would not be designated and allocation of cultural sites for public use would not be emphasized. Opportunities for beneficial outcomes (such as individual and community appreciation of cultural heritage resources) would be moderately less than Alternative C (where the Sonoran Desert Historic Trails SCRMA would be designated), less to a major degree relative to Alternative B (where allocation of cultural sites to public uses would be emphasized), and similar to Alternative A (where the Sonoran Desert Historic Trails SCRMA would not be allocated and allocation of cultural sites to public uses would not be emphasized).

From Livestock Grazing on Recreation Management

Under Alternative D, the naturalness component of all recreational settings would be enhanced compared to Alternatives A, B, and C because all livestock grazing allotments would be closed to such use. Opportunities for beneficial outcomes, such as appreciation of natural landscapes, would be enhanced to a minor degree.

From Recreation Management on Recreation Management

Under Alternative D, the recreation resources of the SDNM would be managed through an "Undeveloped" SRMA. Developed visitor facilities would not be provided as emphasis would be placed on undeveloped, dispersed recreation opportunities and activities. Opportunities for beneficial outcomes such as appreciation of natural landscapes, solitude, and primitive, unconfined recreation would be greatest relative to Alternatives A, B, and C. Opportunities for beneficial outcomes that are derived from developed and interpreted sites, such as appreciation of cultural heritage resources and easy access to natural areas through motorized travel, would be the least offered in comparison to Alternatives A, B, and C.

Resource damage and visitor conflicts on the SDNM would be minimized relative to Alternatives A, B, and C as target shooting would not be allowed on the SDNM. The impact to resources of the SDNM would be moderate as increased damage to Monument objects would not occur.

From Travel Management on Recreation Management

Under Alternative D, 310,700 acres (or 64 percent) of the SDNM would be closed to motor vehicles. The impact to opportunities for beneficial outcomes such as enjoying exploration by vehicle and easy access to natural landscapes would be moderately less than in Alternatives A, B, and C.

Under Alternative D, the least mileage of routes would be open for motorized use (261 miles, or 41 percent of available routes). Opportunities for beneficial outcomes that derive from motorized activities, such as enjoying exploration by vehicle and easy access to natural landscapes, would be moderately less than in Alternatives B and C, and less to a major degree in comparison to Alternative A. Opportunities for beneficial outcomes that derive from nonmotorized activities, such as touring by hiking, bicycling, or horseback, would be enhanced to a minor degree in relation to Alternatives B and C, and to a moderate degree relative to Alternative A.

From Visual Resources on Recreation Management

Under Alternative D, all of the SDNM would be managed to the objectives of VRM Classes I and II. The major portion of the SDNM would be managed to the objectives of VRM Class I (457,900 acres, or 94 percent). Opportunities for beneficial outcomes that derive from appreciation of landscape views and undisturbed nature would be highest in comparison to Alternatives A, B, and C.

4.17.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.17.7.1. Lower Sonoran

From Cultural and Heritage Resources on Recreation Management

Under Alternative E, impacts on production of opportunities for beneficial outcomes, such as individual and community appreciation of cultural heritage resources, would be enhanced to a minor degree relative to Alternatives A and D, as more cultural sites would be allocated to public use. Production of opportunities for beneficial outcomes, such as individual and community appreciation of cultural heritage resources, would be similar to Alternative B (as allocation of cultural sites to public use would be emphasized); and less than Alternative C (as the Sonoran Desert Historic Trails and Saddle Mountain SCRMAs would not be allocated).

From Livestock Grazing on Recreation Management

Potential impacts on recreation resources from grazing administration would be similar to Alternative A.

From Recreation Management on Recreation Management

Alternative E would allocate 646,500 acres (70 percent) of the Lower Sonoran to 6 SRMAs. Impacts to the production of beneficial outcomes would be similar to Alternatives B and C, and would be greater relative to Alternatives A and D.

From Special Designations on Recreation Management

Similar to Alternative D.

From Travel Management on Recreation Management

Similar to Alternative C.

From Visual Resources on Recreation Management

Similar to Alternative B.

4.17.7.2. Sonoran Desert National Monument

From Cultural and Heritage Resources on Recreation Management

Similar to Alternatives B and C.

From Livestock Grazing on Recreation Management

Similar to Alternative B.

From Recreation Management on Recreation Management

Similar to Alternative C. Impacts from target shooting would be similar to Alternative D.

From Travel Management on Recreation Management

Similar to Alternatives A, B, and C.

Impacts from SDNM Route Designations would be similar to Alternative C.

From Visual Resources on Recreation Management

Similar to Alternative C.

4.18. IMPACTS ON TRAVEL MANAGEMENT

Travel management focuses on the BLM's route system of roads; primitive roads and trails; and the associated signs, maps and management presence, including maintenance and law enforcement. Issues that affect management of the route system include: legal public access to BLM-managed publiclands, compliance with the route designations, effects of the route-area footprint, and direct and indirect effects of using routes, serving allowable uses in a sustainable manner, and managing traffic and resource conditions near routes. Routes will be specifically designated through this plan for SDNM, and effects on the resources and objects are discussed in this section. Lower Sonoran routes will be designated in subsequent planning, but the area designations will be established in this plan. Lower Sonoran routes have been reviewed by the BLM, and conceptual route models have been constructed to create estimates of how many miles are likely to remain open.The models also identify areas of special concern for analysis in this plan. The effects of Lower Sonoran resource allocations and decisions on the travel system is discussed in this section.

A systematic data-gathering process, referred to as a route evaluation process, was employed to create the initial route system alternatives for both SDNM and Lower Sonoran Decision Areas. Effective recreation management, including the use of vehicles, requires engineering, education, enforcement, and evaluation and monitoring. The four designation criteria outlined in 43 CFR 8342.1 was the basis for considering the designation of all routes at the time of evaluation and was carried forth through the evaluation tree questions asked for each route. Additional criteria, including the management philosophy for each alternative, was also applied to aid in developing route systems for each alternative.

The authorized officer shall designate public lands as either open, limited, or closed to off-road vehicles. All designations shall be based on the protection of the resources of the public lands, the promotion of the safety of all the users of public lands, and the minimization of conflicts among various uses of the public lands; and in accordance with the following criteria:

- Areas and trails shall be located to minimize damage to soil, watershed, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness suitability.
- Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.
- Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.
- Areas and trails shall not be located in officially designated wilderness areas or primitive areas. Areas and trails shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect their natural, esthetic, scenic, or other values for which such areas are established. (43 CFR 8342.1)

Each program has goals and objectives ranging from broad to very specific. The route designations are one tool to help achieve the goals. RMP action alternatives generally range from more use in Alternative B, to more restrictive and conservation oriented in Alternative D.

The associated route network derived for each alternative attempts to mirror the intent of these alternatives while addressing specific issues such as priority species and land health standards.

The BLM analyzed each route (road, primitive road and trail) individually on its own merit and within the context of a greater, regional context. Please refer to Appendix S, *Route Evaluation Methodology & Impact Analysis* (p. 1311) for a detailed discussion of the analytical procedure. An ID team comprised of awildlife biologist, archeologist, geologist, lands specialist, law enforcement officer, and recreation planner was convened to analyze the various proposed route networks. A representative of AGFD was also present at these meetings. Data was presented in the form of detailed printed maps comprised of accurate, up-to-date physical resource data. A computer-generated GIS map was available to display "live" electronic data, including the best available information and latest photogrammetry, to the ID team. Discussions were documented utilizing a software and database package. The software package uses an evaluation-tree process to gather information and guide the review team to create route system alternatives.

Table 4.29, "Equivalency of the Statutory Authority Related to Route Evaluation Questions" (p. 701) shows the statutory authority compared to the questions asked during the route evaluation process.

Table 4.29. Equivalency of the Statutory Authority Related to Route Evaluation Questions

Authority (Section/Criteria)	Question from Route Evaluation Tree	Question Letter in Tree
FLPMA (PL 94-579)		
Title V, Sec 501 (a) The Secretary, with respect to public lands … are authorized to grant, issue or renew rights-of-way over, upon, or through such lands.	Is the route an officially recognized right-of-way or an officially recognized county or state route?	A
Title VII, Sec 701 (a) Nothing in this Act or in any amendment made by this Act shall be construed as terminating any valid lease, permit, patent, right-of-way, or authorization existing on the date of approval of this Act.	Does the route provide commercial, private property, or administrative access?	C
43 CFR 8342.1		
(a) Areas and trails shall be located to minimize damage to soil, watershed, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness suitability.	Can the commercial, private-property and public uses of this route be adequately met by another route(s) that minimizes impacts to sensitive resources identified above or that minimizes cumulative effects on various other resources?	X, Y, Z, AA, BB, CC, DD, EE, FF, GG, HH, II, JJ, KK, LL
(b) Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.	Might the continued use of this route impact state or Federal special status species or their habitat or cultural or any other specially protected resources or objects identified by agency planning documents, plan amendments, or any other special area designations (e.g. National Monuments)	B, F, G
	Can the impacts to the above sensitive resources be avoided, minimized or mitigated?	D, E, H, I, J, K

Authority (Section/Criteria)	Question from Route Evaluation Tree	Question Letter in Tree
(c) Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.	Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public access opportunities enumerated in agency organic laws?	L, M, N, O, P, Q, R, S, T, U, V, W
(d) Areas and trails shall not be located in officially designated wilderness areas or primitive areas. Areas and trails shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect their natural, esthetic, scenic, or other values for which such areas are established.	Might the continued use of this route impact state or Federal special status species or their habitat or cultural or any other specially protected resources or objects identified by agency planning documents, plan amendments, or any other special area designations (e.g. National Monuments)	B, F, G
	Can the impacts to the above sensitive resources be avoided, minimized or mitigated?	D, E, H, I, J, K

Designation criteria (a), above, considers impacts to soil, watershed, vegetation, air, and "other resources." The BLM's analysis of each route/region carefully considers each of these factors and records them in a database.The process also involves creating a report for each numbered route detailing the factors, conditions, and methods for possible mitigation if necessary. The question in the evaluation tree process seeks to draw out answers from staff regarding not only information on designation criteria (a), but also cumulative effects. The staff is free to identify issues not specifically called out in criteria (a), as well.

One example of the type of analysis conducted during interdisciplinary reviews involves routes that are in areas where soil types do not support vehicle traffic. After identification of the route and the poor soils, which tend to be silty, these routes could be considered for seasonal closure or mitigation, possibly via soil treatment, to minimize impacts on soil and air resources as required in subpart (a). Routes in more stable soils would have less impact to vegetation or air quality and would not require engineering or specific limits. Analysis like this is considered on a route-by-route basis, as well as on a landscape or network basis. An example of the analysis for soils and air quality on an areawide basis would be the PM_{10} nonattainment area that affects approximately 3,500 acres at the north end of the SDNM. Not only were individual routes identified when they were inside the boundary, an area-wide approach to managing routes inside the area was considered and discussed in the area overview. This type of broad, yet specific analysis was intended to meet the statutory requirements placed on the BLM.

Designation criteria (b) above considers impacts to wildlife habitats, with emphasis to protection of T & E species. The BLM's analysis of each route/region details the type of species/habitat that a proposed or existing route may traverse. Mitigating factors for a road proposed as "open" may include, but not limited to, seasonal closure or re-route. Habitat fragmentation is an important analytical feature in the context of route/region analysis. One example of how this criteria was applied would include sand washes south of I-8. The range of alternatives includes two different seasonal closures in Alternatives C and E and complete closure in Alternative D. This would provide protection to important habitats during hot weather when wildlife is most vulnerable.

Designation Criteria (c) above considers conflicts between motorized users and other recreational pursuits. The BLM attempts to document and consider all of the known recreational uses of a given route/region. An interdisciplinary area overview discussion occurs prior to the

route-by-route evaluations in an attempt to identify the area's issues and potential for conflicts. The existing condition versus the proposed recreation experiences are also considered during this overview discussion. An example of how the BLM creates recreation zones to minimize conflict includes motorized use being designated for a certain region through the benefits based management approach, while equestrian use would be emphasized in a different area. This analysis would tie into the various recreational benefits for which the BLM manages.

Designation Criteria (d) above considers congressional/departmental designations. Officially designated wilderness areas, by law, are off limits to motorized and mechanized use. Furthermore, staff has analyzed the effects of allowing motorized use in lands managed to protect wilderness characteristics or ACECs. In these areas, motorized use is de-emphasized while pedestrian, equestrian, and nonmotorized pursuits are emphasized. Route evaluation criteria for natural areas, generally understood by the BLM to include allocated lands managed to protect wilderness characteristics, includes closing most or all of the vehicle routes within these areas. Alternatives considered might include a few open routes to allow passage through the area, but management prescriptions would prevent adversely affecting the area. One example is the sand wash routes on the north side of the Sand Tank Mountains. They would be closed when lands managed to protect wilderness characteristics are allocated in Alternative D.

A summary of the approach to creating the SDNM route designation proposals, including route modeling for Lower Sonoran, is as follows:

Alternative A (No Action): Leave the route system in its current state except where inventoried routes must be closed to comply with law. Emphasize education and enforcement to maintain resource conditions. Restore habitat and the human environment as necessary, expecting that this approach may be more expensive and difficult than other management regimes over the long term.

Alternative B: Leave most routes in their current state but emphasize loop trails where doing so would disperse recreationists while eliminating off-route travel, thereby minimizing effects to resources. No allocated lands managed to protect wilderness characteristics are present in this alternative. Close routes where no uses can be identified.

Alternative C: Attempt to find a balance between routes that are closed and open using resource allocations. Developing and hardening select high-use recreation sites would mitigate the loss of dispersed recreation opportunities and protect resources. Many undeveloped sites and primitive roads would remain open to support experiences historically found on public lands.

Alternative D: Emphasize engineering of recreation and public use sites to maximize resource protection. Reduce dispersed vehicle use and peripheral activities to reduce route density and protect resources. This management approach emphasizes engineering and education to manage the route system. Improvement and hardening of recreation sites where visitors would be concentrated would make sites more easily accessible by two-wheel drive vehicles. Management costs would be increased in developed areas and decreased in dispersed areas.

Alternative E (Preferred Alternative): This alternative takes the best of all the action alternatives to create a balanced route system that serves recreation, administrative and permitted uses. This alternative looks much like Alternative C in its attempt to balance visitation of the Monument with protection of the settings and objects. The main differences are a shorter seasonal closure on washes south of I-8, approximately 10 percent fewer primitive roads open than Alternative C, and the restriction of the area to licensed drivers only. This system of routes is guided by the resource allocations in the preferred alternative.

Only routes in the SDNM will be designated within this RMP. The route evaluation process, shown in Appendix S, *Route Evaluation Methodology & Impact Analysis* (p. 1311), identifies specific resources, objects, and concerns. By seeking out potential mitigations during this process, the four designation criteria are being addressed. Specifics of how the designation criteria are met are outlined in each resource area's impact analysis. A second analysis has been completed to assess the route system's effect on Monument objects. The methodology involved in identifying areas within the SDNM is based on unique assemblages of Monument objects, significant public use or interest, and areas with management challenges. A rationale was developed to assess the intensity and duration of impacts to Monument objects. Standard operating procedures were considered for their effect on managing the uses associated with designated routes. This additional step helped staff finalize route systems for each plan alternative that considers the various resource allocations in the alternatives.

4.18.1. METHODS OF ANALYSIS

4.18.1.1. Indicators

Indicators of impacts on travel management can be determined qualitatively or quantitatively. The indicators below explain the nature of the impacts and units of measure to compare among alternatives.

Air Quality: Possible closures due to opacity limits exceedance (opacity limit is 20 percent). The indicator is how many miles of routes are open inside PM_{10} boundaries that would be subject to closure when opacity limits are exceeded.

Caves Resources: Managing for safety around caves could require reducing the number of routes adjacent to caves to reduce the possibility of incidents and conserve resources. The indicator is the number of truncated routes within 0.1 miles of a cave site.

Cultural and Heritage Resources: Managing routes to prevent damage to cultural resources could necessitate rerouting, mitigation, or the treatment or closure of routes. Management could affect the creation of new routes. The indicator is the number of routes expected to be closed due to managing for cultural resources. A second indicator is the number of new routes (in miles) not constructed or that require mitigation.

Lands & Realty: Routes may be truncated, disconnected, or closed as a result of authorizing powerlines, pipelines, solar power plants, highways, or other actions. The indicator is the miles of open routes within utility corridors that could be closed or limited.

Livestock Grazing: New roads or primitive roads may be required to serve new grazing improvements. The RFD scenarios for grazing vary by alternative and indicate how many new improvements may be constructed. The indicator is how many miles of road or primitive road that could be constructed to serve new improvements.

Minerals Management: Routes to new mines and gravel pits may be truncated or disconnected as a result of developing new sites. The RFD scenarios for minerals development vary by alternative and indicate how many new mines/pits may be opened. The indicator of how this affect travel management is the number of miles of routes expected to be rerouted, mitigated, or closed.

Priority Wildlife Species and Habitat Management: Managing for wildlife habitat and movement corridors could cause routes to be closed, limited, or mitigated. New routes may be limited in their placement and the number of new routes restricted. Routes affecting the habitat of Sonoran pronghorn antelope, Sonoran desert tortoise, acuna Cactus, cactus ferruginous pygmy owl, lesser long-nosed bat could be closed, limited or mitigated. The indicator is the number of miles of routes closed, limited, or mitigated as a result of managing for special status species. An additional indicatoris the number of new routes limited in physical placement or prohibited as a result of corridors or habitat areas.

Hazardous Materials & Public Safety: Areas may be limited by permit or closed temporarily to remediate hazards. Effects on the travel system would be based on specific decisions that limit use. The indicator is the number of miles of routes in permit areas where use would be monitored or otherwise restricted.

Recreation Management: Decisions about recreation settings such as back country and front country will direct route designations. Routes may be opened, closed, limited, or proposed to meet the recreation setting decisions. The indicator is the number of new miles proposed in SRMAs. An additional indicator is the number of miles opened, closed, or limited by shifts in recreation setting allocations.

Special Designations: The stated purposes for designated wilderness areas, ACECs, national trails, and Back Country Byways will have an effect on the route designations. Changes are expected to the route system as special designation areas are allocated or change in size. Wilderness areas are closed to vehicles and mechanized travel by law. The indicator is the number of miles of routes open, closed, or limited as a result of decisions for special designation areas.

Travel Management: The management approach and assumptions for each alternative will guide the route designations in the SDNM and set the stage for future route designations in the Lower Sonoran Decision Area. Legal access points and enforceability would be altered by the management philosophy and resource allocations in each alternative. The indicator is the number of miles of routes open, closed, or limited in SDNM.

Vegetation Resources: Managing for vegetation, especially in washes, could require routes to be closed or limited by season or to administrative use. The indicator is the number of miles of routes closed, limited, or mitigated due to vegetation concerns.

Visual Resources: The creation of new roads, primitive roads, or trails may require mitigation to lessen their visibility. The indicator is the number of miles of new routes subject to increased costs as a result of decisions for VRM.

Soil Resources: Managing for soil retention and productivity could result in closure or limitation of some routes. Managing for watershed protection could result in closure or limitation by time of year, travel mode, or administrative use for some routes. The indicator is the number of miles of routes where erosion results in closure, limitation, mitigation, or closure. The indicator is the number of miles of routes closed, limited, or mitigated to protect watershed quality.

Wilderness Characteristics: Routes may be closed or limited to administrative use inside areas allocated as lands managed to protect wilderness characteristics. The indicator is the number of miles closed for protection of wilderness characteristics. This indicator also can be calculated as a percentage of total route miles.

4.18.1.2. Assumptions

The following assumptions regarding travel management are made:

- Use levels will not decrease. Use type may shift, but use will increase over time, likely keeping pace with population growth in the state.
- Developing higher standard roads will favor general recreation and deter OHV use because where passenger-car use increases off-highway vehicle users may feel out of place, causing them to seek other locations to ride.
- Improving the condition of access roads will concentrate uses, especially when combined with a reduction of primitive roads.
- Limiting access to the SDNM to licensed drivers would reduce resource impacts by barring less mature visitors from using vehicles there. The assumption is that irresponsible use, rather than specific vehicle types, is the major cause for impacts.
- Limiting SDNM access to licensed drivers and banning OHVs would create the highest level of protection for the SDNM while still allowing vehicular access to remote settings. This is because of the relatively low off-highway performance of most street-licensed vehicles and the maturity of the licensed drivers combined.
- Legal access from Interstate 8 can be secured.
- Limiting access to the SDNM to points where entry signs are present would improve compliance with rules.
- Barriers to wildlife movement develop when intensity of use reaches a threshold. Density of routes is less important than high use levels of routes and areas.
- Infrequent human visitation of wildlife waters does not deter wildlife from using them.
- Wilderness visitation is expected to increase at the same rate as population increase.
- Improvement of Vekol Valley Road south of I-8, which would include large culverts, could also improve wash conditions and wildlife movement by reducing mortality and making vehicle driving in washes more difficult.

4.18.1.3. Program Areas with No Impacts on Travel Management

There would be no impacts to travel management from actions proposed under the following program areas:

- Paleontological resources
- Water resources
- Wild horse and burro management
- Wildland fire management

4.18.1.4. Qualitative Intensity Scale

When referring to the intensity of an action, the terms negligible, minor, moderate, and major are used. There is a common definition of the way these terms are used in Chapter 4, *Environmental Consequences* (p. 371), yet some additional detail on these terms is given below:

Negligible: Actions that cause an insignificant change to accessing desired locations or experiencing Monument objects and sites would be considered negligible. Protection of Monument objects would affect only a few routes, and effects to access would be unnoticeable to most people.

Minor: Actions that affect the travel system in only one area, such as a specific route closure or affecting between 2 percent and 10 percent of total routes, would be considered minor. A specific travel mode or experience may be affected heavily in one area, but not in the entire Planning Area. Protection of Monument objects would affect a few routes in a specific location, and access would not be eliminated to an area of 1,000 to 2,999 acres.

Moderate: Actions that are widespread, affect routes for a specific geographic area of less than 33 percent of the Planning Area or specific issue, or affect 10 percent to 24 percent of the routes would be considered moderate. Protection of a specific Monument object would affect routes at only few locations but could affect access to a significantly larger area. Access may be eliminated to a geographic area of 3,000-10,000 acres or more.

Major: . Direct effects would affect 25 percent or more of the routes, experiences, or destinations over more than 33 percent of the Planning Area. Protection of a specific Monument object would affect an area of 10,000 acres or more or 200 miles of routes.

4.18.2. COMMON TO ALL ALTERNATIVES

No unique impacts are described for alternatives common to both Decision Areas.

4.18.3. ALTERNATIVE A (NO ACTION)

4.18.3.1. Both Decision Areas

No unique impacts are described for both Decision Areas under Alternative A.

4.18.3.2. Lower Sonoran

From Air Quality on Travel Management

While Alternative A does not provide specific air quality decisions, existing air quality rules and regulations apply. Under this alternative, 270 miles of the existing 1,688 miles of routes are inside the Buckeye Hills (East), Rainbow Valley, and Ajo PM_{10} nonattainment areas. The most heavily used area, known as the Buckeye Hills (East), contains primitive roads as well as motorized and nonmotorized trails within a short distance of residential areas. There are no immediate effects, yet future restrictions could be implemented to curb PM_{10} and fugitive dust emissions, possibly limiting or closing access on these routes. Such closures would be expected to have a

moderate effect on motorized travel. Nonmotorized access likely would be allowed inside PM_{10} nonattainment areas where the trail conditions or use levels allow passing the soil stability and visible emissions requirements of Maricopa County and would have a negligible to minor effect.

From Cave Resources on Travel Management

Impacts are anticipated to be negligible.

From Cultural and Heritage Resources on Travel Management

No decisions currently exist. Current rules and regulations that protect cultural resources include vehicle driving limitations where existing roads and trails are available for use. When designating routes in areas with known resources, routes could be rerouted or closed to minimize effects to resources. Specific management actions, including modifying, limiting, or closing routes to motor vehicles and mechanized vehicles would have a negligible to minor effect on travel because some limitations could occur. Nonmotorized travel modes would be allowed in a cross-country manner if deemed to not affect the resources for which the route was closed. Such management actions would have a negligible effect on travel by nonmotorized means.

From Lands & Realty on Travel Management

The continued issuance of LUAs could either reduce connectivity of existing routes or improve connectivity where new roads are established on non-exclusive use LUAs. Because the number and scale of new LUAs is not known until the time of application, no assessment of their impacts can be made.

From Livestock Grazing on Travel Management

The construction of new range facilities could add roads to the existing system. Such new developments are estimated to be up to 1 mile per year, a 0.05 percent increase of overall LSFO mileage yearly, as identified in the RFD scenarios for grazing. This would have a negligible effect on the route system overall, but impacts may increase to moderate on localized recreation route networks if new routes are prohibited near range improvements.

*From Minerals Management on Travel Managemen*t

The addition of new gravel pits or saleable minerals mine sites could reduce existing route connectivity or mileage, where placement of the mine cuts off access or eliminates existing public access points. However, because new development likely will not total more than one or two new pits per year, eliminating no more than 1 mile of existing primitive road and one access point to public land per mine, the impacts of new development are expected to be minor. Establishment of three to five new locatable mineral mines a year would have similar effects, as mine access needs and footprints would be similar.

From Priority Wildlife Species and Habitat Management on Travel Management

No decisions currently exist. Continuing the "No net loss" policy for desert tortoise habitat would have a moderate effect on future route development regardless of use type. A spring seasonal closure for Sonoran Pronghorn (from March15 to July 15) to all public entry would cause the route system inside the closure area to be unavailable during this time, producing a moderate effect on all travel within this area. Managing for Sonoran pronghorn would continue the seasonal closure for breeding in Ajo, which closes 181 miles out of 425 miles of routes in the Ajo area to all public use, would produce a moderate effect on travel. An estimated 40 percent of the routes would be off-limits during this time. Increasing visitation in adjacent areas would be likely, producing a moderate effect on the condition and experiences found on those routes due to an increase in visitor contacts and loss of vegetation along open routes.

Currently there are no decisions to reintroduce Sonoran pronghorn under Section 10J of the Endangered Species act on BLM-managed lands outside the Ajo area, thus there would be no impacts.

From Public Safety and Hazardous Materials on Travel Management

Lands conveyed from the BGR, including the Sentinel Plains SRMA, require a a free access permit to be obtained from BLM or Air Force locations in Gila Bend, Phoenix, or Yuma. This permit requirement has the effect of deterring some visitors from using this area. Managing the existing routes in the Sentinel Plains area as a permit area has a negligible effect on travel due to the low number of visitors using the area.

From Recreation Management on Travel Management

Designating routes within the existing Saddle Mountain, Gila Trails, Sentinel Plain Lava Flow, and Ajo SRMAs would affect approximately 700 miles of routes out of 1,675 miles of routes. Currently, no activity level plan has designated routes or recreation sites. Site-specific planning is required to determine the number and mileage of open and closed routes, therefore no assessment of the impact to various travel modes can be made at this time.

From Soil Resources on Travel Management

Travel on all Lower Sonoran lands would be limited to the existing 1,688 miles of existing roads and trails and to previously disturbed areas, which would have a negligible effect on travel. Where erodible soils exist, roads could be modified by adding earthen drainage structures, road base material, or instituting a total closure. No determination on the location of improvements or closures would be made until resource degradation becomes apparent. This could have a moderate effect on the route system, either upgrading or eliminating access to large areas in erodible soils.

From Special Designations on Travel Management

Maintaining the Coffeepot ACEC would continue to close 14 miles of routes to public use, producing a minor effect on travel in the Ajo area. A gas pipeline maintenance road would remain open to administrative use. No Back Country Byways are currently allocated. There would be no change in route status as a result of designated wilderness management because routes were closed by the previously implemented wilderness management plans.

From Travel Management on Travel Management

Continuing the current OHV area allocation of "existing roads and trails" on 808,100 acres would result in a moderate effect because an increase in new routes over the lifetime of the plan could be expected. This expectation is based on staff observations of route proliferation. Unauthorized route creation is not allowed, yet it occurs. Continuing the OHV area allocation of limited to designated routes (21,400 acres), would require routes to be designated within these areas, having a minor effect on travel by restricting use to only the designated open routes. There would be no time commitment on when the routes would be designated. Continuing the OHV closed allocation on 100,600 acres in designated wilderness and the camping closure area around Painted Rock campground would continue to ban motorized and mechanized vehicles from these areas, producing a moderate effect on the travel system and the reduced connectivity of routes and areas for motor and mechanized vehicle travel.

Law enforcement's ability to reduce travel off designated roads and trails would be hampered due to continued vagueness on the ground about what constitutes an existing route. Issuing a map that delineates existing roads and trails would have a negligible effect on the travel system. In areas with a denser route network, the establishment of new, unauthorized routes could confuse the public and result in the continued use of newly created routes, which could produce a moderate effect on travel due to the possibility of area closures for resource protection.

A lack of legal access points would continue the occasional loss of access across lands not in the BLM's jurisdiction, having a moderate to a major effect. As lands adjacent to public lands develop, longstanding access points could be eliminated or changed, excluding public access. Continued maintenance deferral on roads and trails also could cause minor changes in use patterns as routes conditions become impassable. This could cause route proliferation where visitors create new routes to access or re-establish previously accessible locations or areas.

From Vegetation Resources on Travel Management

Vehicle travel would be limited to existing roads and trails in the Fred J. Weiler Green Belt area, which would affect few routes. There is a low number of routes inside the green belt, therefore this limitation would have a minor effect on the travel system.

From Visual Resources on Travel Management

Currently, VRM Class III allocations cover most of the area where vehicle routes exist, and no ground disturbance, including route maintenance, is planned. Therefore there would no effect on the travel system from VRM. Indirect effects of managing under Class III is the ease of authorizing land uses that could interrupt the travel system, causing truncation or disconnection of routes.

From Wilderness Characteristics on Travel Management

No areas would be allocated as lands managed to protect wilderness characteristics under this alternative.

4.18.3.3. Sonoran Desert National Monument

From Air Quality on Travel Management

Five miles of existing primitive roads are inside the PM_{10} nonattainment area. While the current plan provides no decisions, existing air quality rules and regulations do apply. There are no immediate effects; future restrictions could be implemented to curb PM_{10} and fugitive dust. Closing all 5 miles of primitive roads would have a minor effect on the travel system due to the relatively short length of each primitive road segment.

From Cave Resources on Travel Management

Impacts are anticipated to be negligible.

From Cultural and Heritage Resources on Travel Management

The continued planning and development of the Anza NHT RMZ could restrict motor vehicle access on approximately 88 miles of roads and primitive roads inside the RMZ. Current rules and regulations direct the protection of cultural resources, including vehicle driving limitations where only "existing roads and trails" are available for use. These 88 miles of road constitute 14 percent of the total existing routes in the SDNM. Closure of routes would have a negligible to moderate effect to travel in the RMZ, depending upon each visitor's desired travel mode.

From Lands & Realty on Travel Management

Any lands and realty actions would have a minor effect due to the limited number of LUAs permitted in SDNM.

From Livestock Grazing on Travel Management

With the elimination of grazing south of I-8, some routes to range improvement projects could be closed. Most other routes south of I-8 remain open, so impacts from any of the road closures is negligible.

From Minerals Management on Travel Management

Continuing ADOT's permits to mine and store gravel at two sites south of I-8 requires maintaining access from I-8 at two unimproved exits from the eastbound lane between the Butterfield Trail exit and the Freeman Road exit. Gates providing access to the sites would need to remain in place. Continued public use of these gates might constitute a safety hazard because they could require evasive action for highway travelers to avoid vehicles entering or exiting from the breakdown lane. The loss of public access at these gates would have a moderate effect on access to SDNM south of I-8. Public access has been allowed historically, and the gates could be locked at any time.

From Priority Wildlife Species and Habitat Management on Travel Management

No decisions currently exist. Continuing a "No net loss" policy for desert tortoise habitat would have a moderate effect on future route development regardless of use type. At the time of route designation, management for cactus ferruginous pygmy owl could result in seasonal restrictions on primitive roads in 63 miles of sand washes in the SDNM. This is anticipated to have a minor to moderate effect on travel. Managing for bighorn sheep habitat and movement would have a

moderate effect on the development of new routes for any use due to the need to avoid creating movement barriers.

Currently there are no decisions to reintroduce Sonoran pronghorn under Section 10J of the Endangered Species Act, thus there would be no impacts.

From Hazardous Materials & Public Safety on Travel Management

The Area A permit requirement has a negligible effect on the route system because the permit is easy to obtain (it is available in multiple locations) and only affects a visitor's ability to use the area around Sand Tank Mountains and Javelina Mountain.

From Recreation Management on Travel Management

The designation of the SDNM, combined with the Gila Trails SRMA would have the effect of emphasizing the Anza NHT, which could result in designating a majority of the trail's length on BLM-managed lands as a nonmotorized route. Motorized use would be curtailed except for Butterfield Pass, which would continue to be available for both motor vehicle use and nonmotorized vehicle use. This would have a minor impact on travel management.

From Soil Resources on Travel Management

Continuing to allow travel on existing routes and in previously disturbed areas would result in the loss of soil on even lightly used routes. The continued loss of soil would require impromptu stabilization, reconstruction, or closure of routes and areas. Soil loss, a factor in not achieving land health standards, likely would result in a small number of route closures, having a minor effect on the travel system.

From Special Designations on Travel Management

Managing the Anza NHT would have a minor effect on the network by placing restrictions on motor vehicle use as the management plan for the trail is implemented. All sections of the Anza NHT east of Gap Well would remain available for vehicle use.

Continuing to manage the Vekol Valley Grassland ACEC would continue the closure of 5 miles of primitive roads, having a minor effect on travel since the area affected is relatively small in context of the Monument.

From Travel Management on Travel Management

Continuing the current OHV designation of "existing roads and trails" as required by the Monument proclamation could result in an increase in new routes being established over the lifetime of the plan, even though proliferation is prohibited. Currently, 632 miles of existing roads, primitive roads and trails exists. Continuing the temporary closure around the Anza NHT would eliminate impacts from driving off of existing roads in the immediate area, but over time, it is expected that use levels of would increase in other areas of the Monument. Additional use in other areas of the Monument could affect Monument objects, raising the intensity of use assuming use level does not decrease overall in SDNM. Continuation of this designation would have a negligible effect on travel since most people would continue to use the area with few restrictions.

Law enforcement success in reducing driving off of existing roads and trails would be hampered due to continued vagueness on the ground about what constitutes an existing route. Issuing a map showing the existing roads and trails would likely be sufficient to enforce the rule in areas where route densities are low and the navigation is simple enough to determine a location. Illegal activities, such as smuggling, that create new roads would further confuse the public and would lead to use on these unauthorized roads. In areas with more dense routes, the establishment of new routes could confuse the public attempting to find the existing roads and could result in the continued use of newly created routes. Some people would simply use any road not posted with a closed sign, regardless of a map, in turn raising the difficulty for the BLM to maintain sufficient signs. Currently, and average of four route markers per mile is required to sign a low-density route network. Each new road intersection would require at one to two new signs to direct visitors to stay on the existing route while a newly created route is reclaimed over a several year timeframe.

There are no requirements for vehicle drivers, including those of OHVs, to be licensed or otherwise trained, except in Area A where the BLM has carried forward a requirement from the USAF requiring licensed vehicles and drivers inside this relinquished area. This has had the effect of damaging an area adjacent to the Anza NHT through cross-country driving, which resulted in issuance of a temporary closure order for 88 miles of primitive roads in June of 2008.

A lack of acquired legal access points would continue the occasional loss of access across lands not in the BLM's jurisdiction. As lands adjacent to public lands develop, long standing access points could be eliminated, or changed to local resident access only by excluding public access. The continued deferral of roads and trails maintenance would cause changes in use patterns as route conditions change to the degree that routes are impassable. This could have the effect of unauthorized route proliferation where new routes are established for access to previously accessible locations or areas. The closure of unauthorized routes would have no effect on the legal existing travel network, but could moderately affect public perception of the available routes due to an increase in 'route closed' signs, thus having the indirect minor effect of diminished law enforcement success in maintaining compliance in high use areas.

Although routes would not be designated under the No-Action Alternative, 15 miles of primitive roads and roads would remain closed in the Vekol Valley Grasslands ACEC and in washes inside the Area A boundary, where driving vehicles in the washes is prohibited. 617 miles of road, primitive roads and trails would remain open, totaling 98 percent of the routes in SDNM.

From Vegetation Resources on Travel Management

The designation of upland routes would be emphasized while allowing necessary use of access routes in washes. Primitive roads in washes comprise 63 miles of the 971 miles of intermittent flow washes in SDNM. Allowing these routes to remain open at their current width would have no effect on the use of the route system since there would be no loss of access.

From Visual Resources on Travel Management

Impacts are anticipated to be negligible.

From Wilderness Characteristics on Travel Management

No areas would be allocated as lands managed to protect wilderness characteristics in Alternative A.

4.18.4. ALTERNATIVE B

4.18.4.1. Both Decision Areas

A decision to allow reintroduction of Sonoran pronghorn under Section 10J of the Endangered Species Act would have a negligible effect on the travel system since survey routes may need to use designated routes, adding a minor amount of traffic to some primitive roads.

4.18.4.2. Lower Sonoran

From Air Quality on Travel Management

Implementing a decision to comply with National Ambient Air Quality Standards (NAAQS), the state implementation plan (SIP) and state law on air quality will have the effect of raising the cost or need for management on Lower Sonoran areas inside the PM_{10} boundary (247,700 acres) and additionally in areas annexed by cities or towns, referred to as Area A, which would be affected by a state law requiring them to manage for dust (ARS Title 500). Areas in municipal jurisdictions within Area A such as Buckeye Hills East and Rainbow Valley, are required under state law to halt all vehicle driving off of paved or stabilized surfaces on high pollution advisory day. These closures would have a minor effect on travel since the closures occur mostly on weekdays. If entire areas were closed as a result of poor compliance with the temporary high pollution advisory days, then the impact would be moderate to major since entire areas would be off limits for vehicle driving and vehicle staging for all uses.

Route designations could reflect reduced open miles of routes in areas with higher silt content, or in areas where stabilization or hardening would be cost prohibitive under available funding. These closures could have a minor to moderate affect on travel in these areas since motorized travel would be eliminated or greatly reduced and restricted.

Nonmotorized travel would be largely unaffected unless staging areas develop causing a need to close and rehabilitate or develop unpaved parking lots. Unstabilized trails might be closed permanently, or at least temporarily, until soils naturally stabilize and to implement plan to address dust. If this occurs, nonmotorized travel requiring staging areas would be moderately affected in a similar manner as motorized travel.

From Cave Resources on Travel Management

A decision to close all caves to public entry unless specifically authorized would direct the route designation to end existing routes at least 0.1 miles before a cave to protect the cave and human safety from damage, thus increasing the distance that cave seekers would need to walk. Four caves are known which would lead to 0.4 miles of primitive roads being closed. This would have a negligible effect on the route system since the closed mileage could be about .03 percent of reasonable foreseeable route network.

From Cultural and Heritage Resources on Travel Management

A decision to allocate three historic sites, the Anza NHT, Painted Rock Petroglyph site and Sundad to public use would have a minor effect of leaving roads, primitive roads or trails open

to access areas which would be interpreted. Routes on the historic sites would be closed where doing so would protect the site's values. At least 1 site would have the route ended 0.1miles before the site to avoid parking on the site.

From Lands & Realty on Travel Management

The allocation of 10 multiuse corridors could have the minor effect of potentially reducing connectivity when designating routes. Adding linear authorizations such as transportation infrastructure and large area sites such as utility-scale renewable energy sites and paved access roads could have the cumulative effect of reducing the connectivity of the travel network regionally. Since the addition of sites would be incremental, connectivity would likely be reduced slowly, over decades. Such access would be difficult to reestablish and would likely be foregone.

From Livestock Grazing on Travel Management

The reduction of AUMs could have a net zero effect on the creation of new range facilities and their associated primitive roads. Since the development of new facilities is approved on a case by case basis with reduced AUMs, the effect would be expected to be minor, as described in Alternative A.

From Minerals Management on Travel Management

Effects would be the same as Alternative A except that additional acreage would be closed to mineral entry in Alternative B, which would reduce the number of places where mines could be located and have an effect of maintaining connectivity of the route system.

From Priority Wildlife Species and Habitat Management on Travel Management

Designating wildlife movement corridors (332,300 acres) would have a minor to moderate effect by limiting where new routes could be constructed. This alternative would have the least effect on transportation and access concerns within the LSFO compared to any of the other action alternatives.

Routes would not be constructed on ridge lines used by bighorn sheep, or in or along washes, especially where cactus ferruginous pygmy-owls are known to exist. Route path selection options would be reduced, requiring additional planning or increased expense to achieve satisfactory recreation outcomes. A seasonal closure (March 15-July 15), south of Ajo, would eliminate travel opportunities by any travel mode on 181 miles of roads and primitive roads during this period. Approximately 10 percent of the roads and primitive roads could be closed permanently to disperse and minimize the effects of concentration of camping to Pronghorn. Up to 5 miles of new primitive roads inside movement corridors are expected to be needed within the Arlington and Painted Rocks SRMAs.

Up to 30 percent of primitive roads could be closed to minimize effects to priority species such as Sonoran pronghorn, Sonoran desert tortoise and bighorn sheep. This level of closure would have a moderate effect on the route system since main connecting routes would be closed. Primitive roads in sand washes could be closed, reducing the overall impact of vegetation loss due to crushing or strata changes. Seasonally near Ajo, Sikort Chuapo Wash and Cuerda de Lena Wash could be

closed from February 1 to September 15 for cactus ferruginous pygmy-owl breeding, nesting and dispersal. The final decision to close routes will be made during follow-on route designations. Currently, no restrictions exist for driving in sand washes that are part of existing primitive roads.

From Hazardous Materials & Public Safety on Travel Management

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Recreation Management on Travel Management

Eight SRMAs would have the effect of designating the most miles as open for roads, primitive roads or trails of any of the action alternatives. Alternative B of Section 4.1.6, "Reasonably Foreseeable Development ScenarioS" (p. 376) for travel management, would leave the most miles of routes open (1,241 miles). Approximately 49 new miles of routes, or 2.9 percent of the Decision Area, could be created to improve vehicle circulation on loop routes in the Arlington, Painted Rocks Mountains, Ajo and Buckeye Hills SRMAs. Approximately 351 miles (21 percent of the Decision Area) of routes would be closed or limited to administrative use only. Alternative B would allow access by vehicle to most of the places that are currently available and would add new routes that allow loop trail riding by OHV recreationists. Direct effects on the travel system would come from improving circulation and connectivity in front country experience SRMAs and implementing small reductions in the number vehicle routes in SRMAs managed for back country experiences, which are primarily nonmotorized. This adjustment of vehicle access would be expected to have minor effects on both motorized and nonmotorized travelers by shifting where vehicles could be driven.

From Soil Resources on Travel Management

Managing for Land Health Standards on a designated route network would have a moderate effect of requiring all open routes to be reviewed and repaired, if necessary, to limit erosion and limit sedimentation of nearby washes. All open roads, primitive roads and trails, 1,688 miles total, would need to be reviewed. It is expected that 25 to 50 percent of the primitive roads would need water control features, such as drain dips, installed at a cost of up to $5,000 per mile and would need to be maintained at least every 10 years at a cost possibly less than $5,000 per mile. Currently, no maintenance is conducted on primitive roads under Alternative A.

From Special Designations on Travel Management

Coffeepot ACEC could close up to 14 miles of primitive roads to public use, while allowing administrative use on a gas pipeline maintenance road and an existing range improvement. Allocating 21 miles of Agua Caliente road as a Backcountry Byway, a county road, would receive increased signs and special management through mapping and information kiosks. Visitation might increase due to the allocation. The lowest estimate for usage increase would be that it would increase at the same rate that Maricopa county population increases since the market for the byway is expected to be Phoenix metro area and visitors to Phoenix. County maintenance would continue with no noticeable change in maintenance. This allocation would have a negligible effect on the travel system. This allocation does not exist under the No-Action Alternative.

The Anza NHT's continued designation would have the effect of designating access roads to interpretive sites along the trail. An estimated three sites would need up to 10 miles of existing primitive roads designated for access.

From Travel Management on Travel Management

A management decision to allocate OHV areas as limited to designated routes (828,400 acres) would have the effect of requiring route designations to be completed and limiting all vehicles and bicycles to the designated route system. Maintaining the existing designated wilderness areas and camping closure as OHV closed areas (101,800 acres) would continue the ban on driving motorized and mechanized vehicles in these areas. Allocating 40 acres in the Ajo area as an open area where cross-country travel would be permitted would allow an existing primitive road used for motocross experiences to remain and would reduce management needs in this area.

The management philosophy used in this alternative would provide for the most vehicle access to many popular locations along with access to very remote locations that receive little use. Allowing for dispersal of recreationists would help avoid overuse. This alternative's conceptual route network mileage seeks to respond to recreation settings defined Alternative B and all other resource allocations management actions. About 1316 miles of road, primitive roads and trails could be designated and be open to all vehicles which includes up to 141 miles of seasonally closed primitive roads, some of which would be in washes, but a majority would be in the Sonoran pronghorn seasonal closure area south of Ajo. Vehicle access would be designated on most existing routes and could add up to 49 miles of new primitive roads or trails in the Arlington, Ajo, Painted Rocks and Buckeye Hills SRMAs. Nonmotorized trails could total around 22 miles, four of which are existing in the Estrella Mountains wilderness. The balance would likely be converted from motorized trails in community interface areas in the Buckeye Hills RMZ. Motorized route connectivity would be emphasized in the Arlington, Painted Rocks and Buckeye Hills SRMAs. Under Alternative A management, Buckeye Hills East area is the highest use area for OHVs including off-highway motorcycles where approximately 20 miles of single-track trails currently exist.

Implementing OHV area allocations of "limited to designated routes" could result in an increase in new routes over the first 5 years of the plan even though route proliferation is not allowed (even with the caveat that until such time route designations are completed, travel is restricted to existing roads and trails). Over the long term, vehicle management would be tenable under the designated routes only OHV area allocation. Law enforcement success in reducing route use off of existing roads and trails should be increased. Issuing a map showing the existing roads and trails combined with route marking signs would be sufficient to enforce the designated routes in all areas. Congested route areas would be manageable where the BLM presence occurs regularly and new routes are rehabilitated quickly. Seeking legal access on designated routes across non-BLM jurisdictions would eliminate the loss of public access. Where non-BLM land is a chokepoint for access and access cannot be acquired, routes may be closed, resulting in the loss of public access. The actions of creating a travel system, map and signs and improved enforcement would have a minor effect on the route system by limiting visitors to the designated system while making vehicle travel more sustainable due to increased management leading to continued access for all visitors and the minimization of effects on natural and cultural resources.

From Vegetation Resources on Travel Management

Same as Alternative A except that fewer primitive roads in washes would likely be designated for use in Alternative B to increase protection. This would have a minor effect on travel since most upland primitive roads would remain available for use.

From Visual Resources on Travel Management

A decision to minimize visual impacts would have a minor effect of raising the construction cost of new roads, primitive roads or trails in Class VRM II areas. Cost increases could be 20 percent to move from VRM Class III to Class II based on current technologies such as restoration of natural colors of rock and soil. Up to 49 miles of new trails, primitive roads or roads could be constructed which would be subject to increased costs. Alternative A management sets VRM Class III over large portions of the field office, thus there would be a lower requirement for visual mitigation under Alternative A.

From Wilderness Characteristics on Travel Management

No areas would be allocated as lands managed to protect wilderness characteristics in this alternative.

4.18.4.3. Sonoran Desert National Monument

From Air Quality on Travel Management

Implementing a decision to comply with National Ambient Air Quality Standards (NAAQS), the state implementation plan (SIP) and State law on air quality will have the effect of raising engineering and management costs on five miles of routes and barren areas inside the PM_{10} boundary (3,452 acres) and in areas annexed by cities or towns, referred to as Area A, which would be affected by a State law requiring them to manage for dust (ARS Title 500). Stabilization costs of up to $10,000 per mile per year, totaling $50,000, would be required on any route within this area not meeting Maricopa county dust rules. The decision to comply with air quality rules would the effect of raising costs to manage dust and could lead to route closure if compliance cannot be achieved which would be a minor effect to the route system regionally. Locally, the effect would be moderate due to the loss of access near a residential area.

From Cave Resources on Travel Management

Impacts are anticipated to be negligible.

From Cultural and Heritage Resources on Travel Management

The Anza NHT would be designated for both motor vehicle and nonmotorized use within SDNM. Only a 2.75-mile segment west of Gap Well would be designated as nonmotorized use only. The eastern 13.5 miles would be combined motor/non-motor use. Big Horn Station, south of I-8, would be accessed by a maintenance intensity level 3 road (conceived to be up to eight miles long) . This would have a moderate effect on access to the area by making visitation of the site and areas south, slightly more difficult, yet safer, by requiring the use of the Freeman road exit and driving four miles west on a moderately improved dirt road. The highway gate currently in place would be locked and remain locked for administrative use only.

From Lands & Realty on Travel Management

The development of minor linear and non-linear LUAs on and along existing roads or primitive roads would have a minor to moderate effect, on a short-term basis by causing an interruption of public use during construction and site rehabilitation.

From Livestock Grazing on Travel Management

The elimination of grazing south of I-8 would cause all routes, with exception of one primitive road to a well site just south of I-8, to be unnecessary for grazing operations. The continuation of grazing north of I-8 would require the continued use of approximately 130 miles of designated roads and primitive roads to range improvements. All of these routes would be open to public use, thus there would be no effect to public travel as compared with the No-Action Alternative for the area north of I-8 where these same routes would also be available for use.

From Minerals Management on Travel Management

Impacts would be the same as those described under Alternative A for the Monument.

From Priority Wildlife Species and Habitat Management on Travel Management

Approximately 33 miles of primitive roads in sand washes south of I-8 would be open to vehicle driving. A decision to limit average route density to 3 miles per square mile in wildlife movement corridors would be attained through route designation. The average route density in this alternative would be 1.2 miles of roads, primitive roads or trails per square mile. The closures, in part caused by the management of priority species, represent 15 percent of the total existing routes, having a moderate effect on the travel system. A decision limiting driving speeds to 45 mph on new roads would require additional engineering, design and enforcement, having a minor effect on the use of the travel system.

From Hazardous Materials & Public Safety on Travel Management

Impacts would be the same as those described under Alternative A for the Monument.

From Recreation Management on Travel Management

The creation of camp areas north of SR 238 would require road improvements on the roads to the Butterfield and Estrella recreation areas, which skirt the North Maricopa Mountains, to protect desert soils, improve access by passenger car and improve air quality. High-visitation these areas will require road engineering and improvement to maintain the capacity of the road which will lead to increased funding needs and management attention.

Within the Sonoran Desert SRMA, 32.6 miles (5 percent of the Decision Area) of routes would be designated as roads, requiring additional improvement, construction and disturbance along the road. Approximately 569.9 miles (89 percent) of routes would be designated as primitive roads where maintenance would only be performed to protect soil and water resources from degradation and maintain the desired low level of access. Of this, 494.4 miles would be open to all vehicles

and 3.9 miles would be limited to vehicles 50 feet long and less. The 3.9 miles of primitive road would only be open to licensed vehicles and drivers possessing a BGR access permit. Approximately 69.5 miles of primitive roads would be closed to all uses and rehabilitated; 37 miles of trails would be designated for nonmotorized uses, of which 34.3 would be in designated wilderness and thus only available to horse and hiking use; 1 mile of trail would be closed and rehabilitated on the far eastern end of the Anza NHT, which could avoid private land trespass and uncontrolled access; and the remaining 2.7 miles would be outside of wilderness along the Anza trail corridor on the western side of the SDNM and managed as nonmotorized use only. All of these adjustments to the route system would have a minor effect as compared to the No-Action Alternative due to most routes being managed for the current uses and beginning management that would support the achievement of recreation objectives.

From Soil Resources on Travel Management

Approximately 57 miles of 147 total miles of routes in Gila Bend, Denure or Carrizo soil types would be closed, creating a moderate impact on travel. The proposed closed primitive roads are primarily located west of Mobile and near Vekol Wash. Impacts to visitors and the route system in this alternative would be minimized by allowing for dispersal users on more miles of routes than Alternative C or D, which would reduce the number of vehicle trips on erodible soils. SOPs, including the creation of earthen drainage structures on designated primitive roads with erodible soils, would be implemented. This would limit the effects of these primitive road closures and prevent the need for more closures, thus keeping the impacts to a moderate effect.

From Special Designations on Travel Management

Impacts are anticipated to be negligible.

From Travel Management on Travel Management

Allocating 328,700 acres as limited to designated routes OHV allocation would have the effect of requiring route designations and would lead to restriction of vehicles to the designated route system. Allocating 157,700 acres to OHV closed would ban motorized and mechanized vehicle driving in designated wilderness areas. Compared to the No-Action Alternative, OHV closed areas, approximately 161,200 acres in Alternative A, would be reduced by 3,500 acres by discontinuing the Vekol Valley ACEC and changing this area to limited to designated routes. The OHV allocations would have a moderate effect on the travel system and its use since current restrictions of limited to existing roads and trails can be vague and offers visitors the most latitude in choosing their route of travel and limited to designated routes would be very definitive and penalties would be higher for non-compliance.

The decision to designate routes in SDNM would have a major effect on how visitors access and use the Monument resources. Implementation of the route system including the use of maps and signs stating “use designated routes only” would raise awareness to the use of vehicles and bicycles and improve compliance. Reopening a temporary closure area north of SR 238 would make approximately 11 percent more area accessible to recreationists. Defining the routes in the current temporary closure area could make future closure of the area unnecessary leading to improved recreation opportunities, vegetation and soil conditions.

Manageability and legal uses of the route system would be improved over Alternative A. The average number of routes open per square mile would be reduced by 50 percent from Alternative A. Average route density, a general indicator of land health, would be reduced from 0.7 to 0.4 route miles per square mile, a 43 percent change from Alternative A. This would lead to reduced management costs and improved success in maintaining natural and cultural resource condition through better compliance and regular maintenance. Miles of routes open for vehicle use in route proliferation concern areas would be reduced from 231 miles in Alternative A to 125 miles under Alternative B, which would lead to more vegetative cover and stabilized soils and in turn minimize damage to soils, vegetation and wildlife. Alternative B's approach to managing recreation impacts by dispersing travelers and minimizing repetitive disturbance of wildlife allows the most route mileage for vehicle access.

In addition:

- A requirement for all drivers in the SDNM area to be licensed by the State of Arizona would have a moderate effect on the route system by potentially reducing cross-country driving in popular areas such as Gap Well, which are in creosote-bursage flats. This would improve the manageability of the proposed route system by reducing the need for enforcement and engineering.
- Safety would see minor improvements over Alternative A by the closure of two of five primitive roads identified with public safety concerns due to poor route condition.
- A decision to acquire legal access on all Monument access points would have a moderate effect on access. The number of access points would be reduced by the route designations for this alternative from 110 under Alternative A, the No-Action Alternative, to 89 in Alternative B, a 19.1 percent decrease.
- As compared with Alternative A, in which only 15 miles of primitive roads, or 1 percent of the routes in the SDNM, are closed, this alternative would have a minor effect on travel since 11 percent of the routes would be closed.

From Vegetation Resources on Travel Management

A decision to emphasize the designation of routes in upland areas rather than washes would affect 63 miles of roads, primitive roads and trails which were inventoried as being in washes. Approximately 0.6 miles of road, representing 100 percent of the roads in washes, would remain open, while 47 percent of the primitive roads and 0.8 miles (100 percent) of trails in washes would be closed under this alternative to minimize effects on vegetation occurring in washes. This would have a moderate effect on travel since the area where primitive roads occur most in washes is near the Sand Tank Mountains and few upland primitive roads exist to redirect traffic from the wash primitive roads. It should be noted that the reason for route closures in washes may not be solely based on one Monument object or resource, but rather several occurring in the same location.

A decision to rehabilitate impacts from disturbances within 5 years would raise the cost and complexity, and likely the success rate, of projects, having a minor effect on the route system since projects would likely not be foregone, just made more difficult. Specific projects like building the proposed road near Big Horn Station, rehabilitation of closed or unauthorized routes would require fencing and seeding with native seed and vegetation. Drip irrigation systems may need to be temporarily installed. Currently, there is no time requirement to rehabilitate areas resulting in long lasting visual impacts.

From Visual Resources on Travel Management

The decision to protect mountain vistas would have a minor effect on the newly proposed Big Horn Station access road by requiring the road be placed in an inconspicuous location as viewed from I-8. This would likely raise the cost of construction and reclamation. Furthermore, fugitive dust from driving the proposed level 3 road would need to be managed through dust suppressants or low dust surfacing to maintain unobstructed vistas. Cost to apply dust suppression could be $10,000 to $20,000 per year. Under the No-Action Alternative, no dust suppression is conducted and could result in the need to close routes.

Managing for Land Health Standards on a designated route network would have a moderate effect by requiring all open routes to be repaired to limit erosion and soil movement. All open roads, primitive roads and trails would need to be reviewed. It is expected that 25 to 50 percent of the primitive roads would need water control features, such as drain dips, installed at a cost of up to $5,000 per mile.

From Wilderness Characteristics on Travel Management

No areas would be allocated as lands managed to protect wilderness characteristics under Alternative B.

4.18.5. ALTERNATIVE C

4.18.5.1. Both Decision Areas

A decision to reintroduce Sonoran pronghorn under Section 10J of the Endangered Species Act would have the same effect as Alternative B.

4.18.5.2. Lower Sonoran

From Air Quality on Travel Management

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Cave Resources on Travel Management

Effects would be similar to Alternative B except fewer primitive roads in the Painted Rocks Mountains area would likely be designated as open for reasons other than access to caves. All roads would still end 0.1 miles before known caves.

From Cultural and Heritage Resources on Travel Management

Same as Alternative B, except primitive roads and trails would be designated as open to minimize effects on resources near routes. The allocation of the Gila River Terraces/Sonoran Desert Historic Trails and Saddle Mountain SCRMAs could have the effect of closing about 7 percent of the routes (119 miles) within the boundaries of these areas. Approximately 26 percent of the routes could be closed inside SCRMAs for a combination of reasons including efforts to minimize effects such as such as data loss as a result of driving through sites and damage to sites from

campsites in which casual collection may occur. A loop road around Saddle Mountain could be made partially nonmotorized to reduce the proximity of visitors using vehicles near cultural sites, an indirect impact where close proximity to a rock art site allows more visitors to degrade or vandalize the site. A primitive road to a campsite on the north face of Saddle Mountain would be converted to a nonmotorized trail to increase the distance from known cultural sites thus minimizing the indirect effects to cultural resources. Under the No-Action Alternative, no closures would be implemented unless a route was discovered to be affecting a cultural resource.

From Lands & Realty on Travel Management

The allocation of nine multi-use corridors could have a minor to moderate effect by potentially reducing route connectivity for recreational use. Under the No-Action Alternative, existing roads and trails are not considered an asset and can be closed during authorization of LUAs.

From Livestock Grazing on Travel Management

Impacts would be the same as those described for Alternative B for the Lower Sonoran.

From Minerals Management on Travel Management

Similar to Alternative A except fewer expected developments would cut connecting routes or eliminate access to fewer areas. This would result in less negative impact to the route system.

From Priority Wildlife Species and Habitat Management on Travel Management

Designating approximately 332,300 acres as wildlife movement corridors would have a moderate effect by limiting where new routes could be constructed and where doing so would have a negative effect on wildlife movement. Approximately 53 miles additional miles of primitive roads and trails could be closed compared to Alternative A, having the effect of reducing route connectivity in areas outside of SRMAs. Routes would not be constructed on ridges lines used by bighorn sheep or in well vegetated washes, especially where cactus ferruginous pygmy-owls are known to exist, specifically in the Ajo area. Limiting the location of new routes could raise construction costs and reduce trail location possibilities. New primitive roads and trails, totaling 2 miles, may not be constructed or result in fewer miles being constructed. Such routes would facilitate trail riding on primitive roads or trails. Fewer new primitive road or trail miles would be constructed field office-wide to minimize effects within movement corridors, leading to fewer loop route opportunities for vehicle-based recreation.

Within Sonoran pronghorn seasonal closure area, up to 39 percent (approximately 72 miles) of the routes could be closed. The approach of containing recreationists to few roads and areas would decrease the available mileage for driving, more than Alternatives A or B. Under the No-Action Alternative, the only restriction on the use of all the existing routes would be the seasonal entry closure (March-July).

From Hazardous Materials & Public Safety on Travel Management

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Recreation Management on Travel Management

The allocation of six SRMAs, compared to four under the No-Action Alternative, would have a minor effect on the travel system. Motorized-vehicle use would not be directed to the Arlington or Painted Rocks Mountain areas as in Alternative B. There would be no vehicular-recreation focus SRMAs to aid in managing for increasing OHV use. Recreation sites in ERMAs would be established by popularity of use, possibly including new unauthorized routes adjacent to popular camp areas in a similar manner as the No-Action Alternative. New routes to facilitate loop trails for both motorized and nonmotorized would still be considered in front county recreation settings, yet only half as many miles, 24, would likely be needed to facilitate improving traffic circulation away from main roads. A shift in urban interface and front country setting acres to back country and passage zone for a net increase in back country recreation setting acres of 37,500 would reduce the amount of area where new recreation road, primitive roads and motorized trails could be constructed. This zoning does not exist under the No-Action Alternative and all routes are available for use, regardless of desired visitor experiences identified under no action.

From Soil Resources on Travel Management

A small amount of mileage of primitive roads could be closed to minimize effects to loamy soils. Route closure, and thus reduction of impacts such as erosion and destabilization leading to vegetation loss, would occur mainly in the Buckeye Hills and Rainbow Valley areas north of the SDNM. Conversion of primitive roads to narrower and less dust producing trails for nonmotorized use would likely occur, especially near residential housing. Most single-track trails used by motorcycles today would be converted to hiking and equestrian use or closed in the East RMZ of the Buckeye Hills SRMA. This action would lead to moderate impacts to the travel system for motorcycle riders. Currently under the No-Action Alternative, no routes are closed and visitors are simply required to stay on existing roads and trails.

From Special Designations on Travel Management

The Coffeepot-Batamote ACEC could close 14 miles of primitive roads to public use while allowing public use on a gas-pipeline maintenance road. Under the No-Action Alternative, all 14 miles of routes would be closed. Agua Caliente road Back County Byway impacts would be the same as Alternative B.

From Travel Management on Travel

Management A management decision to allocate approximately 828,360 acres of OHV areas as limited to designated routes would have the effect of requiring route designations to be completed and limiting all vehicles and bicycles to the designated route system. Maintaining approximately 101,800 acres of existing designated wilderness areas and camping closures as OHV closed areas would continue the ban on driving motorized and mechanized vehicles in these areas. An 40-acre area north of Ajo where motocross experiences are currently obtained, would be managed as a designated route under Alternative C instead of an existing route, as it currently is under Alternative A. This change would be expected to have a minor effect on management of the route system due to the increased management responsibility associated with keeping the existing 2-mile track in the current alignment and reducing its effects on other resources. New layouts or simple realignments would require a travel management plan change. Under the No-Action Alternative, vehicle travel would be allowed on all existing roads and trail and there

would be no change to this motocross experience route. More route miles would be subject to the prescriptions of an enlarged Coffeepot-Batamote ACEC. It would be expected to have a minor effect on the route system due to a prohibition on creating new routes and the closure of some spur routes to campsites.

Alternative C's management approach seeks to balance use with protection and thus would avoid overuse by planning for more concentration of uses that Alternative A or B. The conceptual route network mileage (RFD scenario) follows recreation settings defined in Alternative C and all other resource allocations management actions where more area is allocated to back country than under Alternative B. Vehicle access would be designated as open on most existing routes in front country and could add up to 25 miles of new primitive roads or trails in SRMAs or areas where a new route would benefit public access or replace lost access as a result of private land blockage. The back country area increases by 75,900 acres over Alternative B. This would have a moderate effect on the route system since areas would more delineated for nonmotorized recreation and routes could be closed in areas to achieve desired recreation settings like back country.

On allocated lands managed to protect wilderness characteristics, most routes would be closed within the boundary, having a moderate impact on the travel system. Between Yellow Medicine Butte and Face Mountain, only a main through route would remain to connect Agua Caliente Road with areas south of the railroad near the Gila Bend Mountains. Approximately 33 to 50 percent of the routes within these areas field office-wide could be closed to vehicle use. The emphasis in closure would be on routes that are not needed for through access, such as vehicle camping spur or redundant or looping primitive roads and trails. Lands managed to protect wilderness character were not allocated under the No-Action Alternative, thus there would be no effects as described here under that alternative.

A decision to acquire legal access on the designated route system would curtail the loss of public access where designated routes cross land not under BLM management, assuming all access points could be successfully negotiated for access. Reduced mileage as compared to Alternative B, as shown in the RFD scenario for travel in the Lower Sonoran, would reduce the number of access agreements or easements needed to secure legal access. Reducing the number of access points would reduce cost and the BLM workload but increase the importance of acquiring the access on fewer routes. The decision to manage a route system would have a major effect on value of a travel system and lead to increased maintenance of roads and trails, which is expected to decrease OHV drivers' propensity to create unauthorized routes around areas with poor route conditions. Issuance of an approved travel management map would have the same effect as Alternative B and is expected to raise the effectiveness of on-the-ground navigation by the public and improve law enforcement success in reducing off-route use and the associated resource damage.

From Vegetation Resources on Travel Management

Impacts would be expected to be the same as under Alternative B except that fewer routes in washes would be designated for motor vehicle use. Primitive roads in washes in the Gila Bend and Painted Rock mountains, many coinciding with lands managed to protect wilderness characteristics allocated under Alternative C, would total approximately 50 miles and could be closed. An additional 26 miles throughout the Decision Area could be closed. jA total of 114 miles of primitive roads, or 7 percent of the total routes in Lower Sonoran, inventoried in washes. BLM regulations require vegetation to be maintained in washes, a total of approximately 76 miles of routes could be closed.

From Visual Resources on Travel Management

Effects would be the similar to Alternative B except that more acres would be allocated to VRM Class II. Up to 25 miles of new primitive roads or roads could be constructed within SRMAs, which would be subject to increased costs to comply with VRM Class II. Under the No-Action Alternative, in which most of the Decision Area is designated VRM Class III, the extra expenses would not be incurred, and visual impacts could be long lasting.

From Wilderness Characteristics on Travel Management

The allocation of lands managed to protect wilderness characteristics could have the effect of closing up to 28 miles, or 34 percent, of the routes inside the Decision Area to motorized vehicles, having a moderate effect due to a loss of connectivity of the route system. About 7 miles, or 15 percent, of existing trails currently open to only ATVs or motorcycles could be converted to nonmotorized trail as direct result of allocating lands managed to protect wilderness characteristics. Building new roads, primitive roads, and motorized trails would be avoided, which would have the effect of maintaining the area generally in its current state or slightly less roaded. Wilderness characteristic areas total 128,100 acres under Alternative C. In the No-Action Alternative, no lands managed to protect wilderness characteristics are allocated, thus the impacts discussed here would not be present.

4.18.5.3. Sonoran Desert National Monument

From Air Quality on Travel Management

Effects would be similar to Alternative B with exception that 2 miles of 4.9 miles of primitive roads would be open to access camping areas south of the gas pipeline road.

From Cave Resources on Travel Management

Impacts are anticipated to be negligible.

*From Cultural and Heritage Resources on Travel Managemen*t

A shift from motorized use to non-motorize use on the Anza NHT would limit the potential of cultural resources being trampled by vehicles along 17.1 miles of the trail. Butterfield Pass would be accessible by motor vehicle from the east to the existing information kiosk (3.9 miles) and from the west to a point near Happy Camp (1.1 miles). The middle portion, 1.6 miles in Area 2, would be accessible only by nonmotorized means or by motorized vehicle for administrative or permitted purposes.

Approximately 10.5 miles of the trail east and west of the mountain pass area would be limited to nonmotorized travel modes. This would be expected to have a minor effect on travel because most of the vehicle trips would occur on the Butterfield Pass area where similar the experiences are available in the No-Action Alternative.

From Lands & Realty on Travel Management

Impacts are anticipated to be negligible.

From Livestock Grazing on Travel Management

Impacts would be the same as those described under Alternative B for the Monument.

From Minerals Management on Travel Management

Impacts would be the same as those described under Alternative A for the Monument.

From Priority Wildlife Species and Habitat Management on Travel Management

Managing for priority species would have moderate effect on the travel system affecting 63.4 miles in washes, approximately 10 percent of the Monument's inventoried routes. Approximately 17 miles, or 27 percent, of primitive roads in sand washes south of I-8 would be limited to seasonal use where public driving would be disallowed from February 1 to September 15. This closure would protect cactus ferruginous pygmy-owl breeding areas, as well as thermal cover areas during hot weather. Approximately 34 miles of primitive roads in washes, or 55 percent of the total in the Decision Area, would be closed to all uses and would not be managed as an asset; 5 miles, or 8 percent, of the primitive roads in washes would be left open year round for vehicular traffic; and 11 percent would remain available for administrative uses. Between I-8 and the north side of the Sand Tank Mountains, when seasonal restrictions are in effect, access would be limited to hiking or equestrian modes because no other roads or primitive roads are present in the vicinity. This would be expected to have a major effect on the travel system and most people's ability to access this area. Administrative use by law enforcement or AGFD would be foregone on these same washes, having a major effect on the use of the system south of I-8 for these uses.

The allocation of 334,800 acres, or 69 percent of the Monument, to wildlife movement corridors would affect the ability to construct new roads or primitive roads in these areas by prohibiting or limiting the placement to minimize effects to movement. Because no new routes are planned under Alternative C, the effects would be negligible.

From Hazardous Materials & Public Safety on Travel Management

Impacts would be the same as those described under Alternative B for the Monument.

From Recreation Management on Travel Management

The creation of camp areas north of SR 238 would have the same impacts as Alternative B with the exception that fewer dispersed camping primitive roads would be available. This would require additional route and area monitoring and periodic maintenance or rehabilitation due to increased visitation to available camp areas.

Within the Sonoran Desert SRMA, 24.6 miles of routes would be designated as roads with similar effects as Alternative B, and 569.9 miles, or 89 percent, of routes would be designated as primitive roads where maintenance would be performed to protect soil and water resources from degradation and maintain the desired level of access. Of these 569.9 miles, 358.1 miles would be open to all vehicles; 3.9 miles of primitive roads would be open to vehicles 50 inches

wide or less, and the area south of Javelina Mountain would be closed to vehicles to provide for wildlife and primitive recreation. Though it represents a 100 percent closure of the primitive roads limited to ATV width, these closures under Alternative B would have a minor effect on the travel system as a whole.

Approximately 358.1 miles of primitive roads would be designated open for to all vehicles under Alternative C, which is a major (43 percent) reduction from Alternative A. Trail asset designation would be the same as Alternative B. Compared with the No-Action Alternative, route designations under Alternative Cwould represent a moderate change due to the marking of routes and a noticeable loss of vehicular access to remote areas.

From Soil Resources on Travel Management

Approximately 203 miles, or 42 percent, of roads and primitive roads in poor soils, out of the 350 miles total, would remain open, creating a moderate impact on travel since many popular areas would still be accessible by at least one route. Management of the route system would likely be more effective in poor soil areas, commonly associated with creosote-bursage vegetation community areas, by closing 53 percent of the routes. These areas were also identified by staff as "route proliferation concern areas," specifically north of SR 238 and along Vekol Valley Road. These routes would remain open under the No-Action Alternative. The management approach to restrict use to fewer routes than Alternatives A or B seeks to create a balance with human uses and natural resources leading to sustainability and Monument object protection. The percentage of the Decision Area affected by the route footprint in poor soil areas would be reduced from 0.16 percent under Alternative A to 0.11 percent under Alternative C. Impacts to route system sustainability would be further minimized by implementing mitigation measures such as creating earthen drainage structures on erodible soil sections of remaining open routes.

From Special Designations on Travel Management

Designation of the Anza NHT would have similar effects to Alternative B with the exception of shifting approximately 10 of 17 miles of the trail in the SDNM to nonmotorized use. The popular portion of the trail, including Desert Station, Happy Camp, and Butterfield Pass, would be designated as a primitive road where vehicles are only permitted by SRP. Most use would become nonmotorized, a moderate change in use from the No-Action Alternative where vehicles are allowed on all portions of the Butterfield/Anza trail.

From Transportation and Travel Management on Travel Management

Allocating 328,700 acres as OHV limited to designated routes and 157,700 acres to OHV closed would have the same effect as Alternative B.

Designating routes would have similar effects as Alternative B with respect to making travel management sustainable. Routes would not be designated under the No-Action Alternative. Designation of 24.6 miles of roads is the same as Alternatives B, and C and would have the same effects. Designation of trails is the same as Alternative B and would have the same effects. Designation of primitive roads would represent a major change from Alternative A, where 322.1 miles (57 percent) of the existing primitive roads would be closed. Additionally, 35.3 miles (6 percent) would be closed to public use with limited administrative access allowed. The closure of 60 percent of the primitive roads to the public would lead to concentration of visitors on fewer

roads and primitive roads. This would lead to a transfer of recreation opportunities from vehicles to dispersed nonmotorized opportunities. In this alternative, the fewest miles of primitive roads would be available for public use or BLM administration of authorized activities. Some activities may require cross country vehicle access which would need to be approved on a case-by-case basis and might require rehabilitation.

A driver's licensing requirement would have the same effect as described in Alternative B.

Law enforcement success in reducing driving off of existing roads and trails would be greatly improved and simplified by this alternative's reduced open mileage. Map and sign plan implementation would have the same effects as Alternative B. The implementation of 17.1 miles of administrative use only primitive roads, a large increase from Alternative B, where none exist, would increase the need for monitoring gates and inaccessible areas behind them. Expenses for managing the route system would be less than the other action alternatives over the long term due to fewer route miles to maintain and fewer signs to maintain. Expenses for implementation of the travel system would be increased over Alternatives A, B or C due to the need to effectively reclaim primitive roads and parking areas.

From Vegetation Resources on Travel Management

Effects would be similar to Alternative A except that fewer routes would remain open for vehicle use. Conserving vegetation in washes would have the effect of closing 34 miles of primitive roads in washes and limiting 16.5 miles of washes south of I-8 to seasonal vehicle use (February 1-September 15), which would have a moderate effect on travel.

From Visual Resources on Travel Management

Impacts would be the similar as Alternative B except that the new Big Horn Station access road would not be constructed and none of the issues surrounding the construction would be an issue south of I-8. This new route would not be constructed under the No-Action Alternative.

From Wilderness Characteristics on Travel Management

Approximately 35.3 miles, or 78 percent, of the primitive roads inside the boundary would be closed and rehabilitated in the Sand Tank Mountains area; 9.2 miles, or 21 percent, of primitive roads would remain open; and 0.7 miles of primitive road in a wash would be closed seasonally (February 1 to September 15). This route system minimizes conflict with the sights and sounds of vehicles and improves solitude and unconfined recreation. No lands managed to protect wilderness characteristics are allocated under the No-Action Alternative; thus none of the mileage reductions described would occur as compared to Alternative A or B.

4.18.6. ALTERNATIVE D

4.18.6.1. Both Decision Areas

A decision to reintroduce Sonoran pronghorn under Section 10J of the Endangered Species Act would have the same effect as Alternative B.

4.18.6.1.1. Lower Sonoran

From Air Quality on Travel Management

Effects would be the same as Alternative B with exception that approximately 137 of 270 miles, or 51 percent, of the routes inside PM_{10} areas could be closed due to PM_{10} dust issues or other management issues. This total of 137 miles represents 8 percent of the total routes in the Decision Area. Closing these routes would be expected to haveminor effects on access.

From Cave Resources on Travel Management

Effects would be the same as Alternative B except that fewer primitive roads would remain open in Sentinel Plain, partly to mitigate the hazard associated with this resource. Reducing vehicular access routes that go to cave resources would be expected to decrease visitation and consequently the opportunity to become trapped or injured.

From Cultural and Heritage Resources on Travel Management

Effects would be similar to Alternative C except that SCRMAs identified in Alternative C would be managed as ACECs in this alternative. Therefore, effects to the route system will be discussed in the special designations section.

From Lands & Realty on Travel Management

Impacts are anticipated to be negligible.

From Livestock Grazing on Travel Management

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Minerals Management on Travel Management

Same as Alternative A except that fewer open routes would increase the importance of preventing the loss of access to designated routes.

From Priority Wildlife Species and Habitat Management on Travel Management

WHAs identified in Alternative C would be managed as ACECs in this alternative. Eight movement corridors would remain and the effects would be the same as in Alternatives B and C.

Designating wildlife movement corridors would have the same effect as Alternatives B and C because they would be the same corridors. Compared to the No-Action Alternative, WHAs would place restrictions on new route creation and management that does not currently exist. Routes would not be constructed on ridges lines used by bighorn sheep or in well vegetated washes, especially where cactus ferruginous pygmy-owls are known to exist like in the Ajo area. Approximately 163 miles (89 percent) of the primitive roads in washes could be closed. Limiting the location of new routes could raise construction costs and reduce trail location possibilities. A total of 2 miles of new primitive roads and trails might not be constructed. Such routes would

facilitate trail riding on loop trails. Fewer new primitive road or trail miles would be constructed in the Decision Area, which would minimize effects within movement corridors.

Within Sonoran pronghorn seasonal closure area, up to 122 of 175 miles of the routes, or 70 percent of the total routes, could be closed. The approach of containing recreationists to few roads and areas would minimize effects to pronghorn by increasing unroaded habitat areas under this alternative.

From Hazardous Materials & Public Safety on Travel Management

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Recreation Management on Travel Management

The allocation of four SRMAs would have a moderate effect on the travel system due to a lack of direction to create loop trail systems and maintain the routes for specific identified uses. Motorized vehicle use would only be encouraged in the Buckeye Hills SRMA, West RMZ, and the bulk of recreation vehicle traffic would be directed to areas not developed to handle increasing use. The route system may become overused and require temporary or permanent closure as a result to stop route proliferation and minimize resource degradation. Recreation sites in ERMAs would continue as in the No-Action Alternatives, exhibiting denuded areas and, possibly, new unauthorized routes adjacent to popular camp areas, which would require additional rehabilitation on a yearly basis. New routes would be considered on a case by case basis, but generally would not be planned to improve recreation opportunities. A reduction of urban interface and front country acreage from Alternatives A, B, and C and in increase in back country and passage zone acres would reduce the amount of area where specific recreation management such as OHV and mountain bike loop trail systems would take place. The absence of the Ajo SRMA, replaced by an ACEC, would have the effect of avoiding recreation development thus the route system would be minimized under this management approach. This high level of back country allocation combined with other allocations would have a major effect since the route system would reduced in mileage by 40 to 50 percent across the field office area and new routes to connect loops would not be developed as in Alternatives B and C.

*From Soil Resources on Travel Managemen*t

Approximately 137 miles, or 51 percent, of primitive roads could be closed to minimize affects to soils mainly in the Buckeye Hills and Rainbow Valley areas north of the SDNM. Compared with the No-Action Alternative, in which no routes would be closed in these areas, the proposed closure under Alternative D would have a moderate impact to the travel system.

From Special Designations on Travel Management

Five ACECs totaling 263,700 acres could have the effect of closing 279 miles, or 61 percent, of the existing 454 miles of routes inside the ACECs. Approximately 37 miles, or 8 percent, could be designated for seasonal use. Effects on the route system would likely be major due to losses in connectivity of routes where breaking routes to deter traffic would benefit the resources of the ACEC. The Agua Caliente Road Back County Byway would not be present under this alternative; therefore the effects would be the same as the No-Action Alternative, where there is no backcountry byway.

From Travel Management on Travel Management

A management decision to allocate 551,900 acres of OHV areas as "limited to designated routes" would have the effect of requiring route designations to be completed and limiting all vehicles and bicycles to the designated route system. With the exception of 21,400 acres, the No-Action Alternative would not require route designation. Maintaining the existing designated wilderness areas and camping closure as OHV closed areas (378,300 acres) would continue the ban on driving motorized and mechanized vehicles in these areas. An existing primitive road used for motocross experiences in Ajo (2 miles) would be closed and rehabilitated having a negligible effect on the route system overall, yet represents a 100 percent closure to the mileage available for such experiences since it would be foregone. Recreation opportunity would be altered.

The effects of creating travel management areas would have the same effect as Alternatives B and C. No such areas exist under the No-Action Alternative.

This alternative's philosophy would direct a "concentration of use" of recreationists, thus reducing use in areas outside of hardened recreation sites and minimizing the effects to resources. This style of management is popular in city parks and other high use settings. This alternative's conceptual route network mileage seeks to respond to recreation settings defined in this alternative. Vehicle access would be designated on approximately 50 percent of the existing routes and would not add new miles of new primitive roads or trails. In SRMAs or areas where a new route would benefit public access or replace lost access, a no-net-gain route replacement would be considered. This 50 percent reduction over Alternative A route mileage would have a major effect on visitors' ability to disperse. Effects to visiting popular sites or areas are expected to be minor, even with large areas inaccessible by vehicle since redundant routes would be targeted for closure. This would have an additional effect of reducing route driving choices, which directly relates to recreation experiences, thus having a major effect on OHV users seeking less traveled routes.

Allocated lands managed to protect wilderness characteristics throughout the field office area would be only accessible on main through routes or by nonmotorized cross-country modes. Between Yellow Medicine Butte and Face Mountain, it is conceived that no routes would connect Agua Caliente Road with areas south of the railroad near the Gila Bend Mountains having a major effect on access to this large area due to not being able to drive off of main roads or higher use primitive roads. Under the No-Action Alternatives, all routes inside this area would be closed or limited to administrative use, mostly accessing wildlife waters. OHV closed designations coinciding with wilderness characteristic areas would have the effect of closing all routes inside these areas and also deterring the creation of new motor vehicle routes for public use.

Vegetation and rehabilitation requirements would remain the same as Alternative B, which would have a moderate effect on the route system since routes closed through route designation would need to be rehabilitated and the loss of route choices would be very noticeable to area users. Some primitive roads and trails in high rock content soils may take 10 years or more to recover even with active reclamation techniques. Achieving a timeframe of 5 years would require additional resources such as drip irrigation, specialized barriers, and hand cultivation.

A decision to acquire legal access on the designated route system would curtail the loss of public access where designated routes cross land not under BLM management. Reduced mileage as compared to Alternatives A, B and C, as shown in the RFD scenario for travel in Lower Sonoran, would reduce the number of access agreements or easements needed to secure legal access. Reducing the number of access points would reduce cost and the BLM workload, but also

increase the importance of acquiring the access on fewer routes. If the route system is reduced by 50 percent from Alternative A condition, the number of access points to acquire access on could be approximately half that of the current condition, thus having the effect of increasing the importance of acquiring the remaining access points. Reducing the number of access points to the BLM route system by up to 50 percent would have a major effect on the network by making access points further apart and disallowed in some areas altogether. Furthermore, construction of only 1 mile of new route would be allowed, probably to service new range improvements would reduce the possibility of creating bypass routes around private or other jurisdiction lands for access.

Issuance of an approved travel management map would have the same effect as Alternative B, and is expected to raise the effectiveness of on-the-ground navigation by the public and improve law enforcement success in reducing off-route use and the associated resource damage. No comparable map exists under the No-Action Alternative management.

From Vegetation Resources on Travel Management

Impacts are anticipated to be the same as described for Alternative B except that fewer routes in washes would be designated for motor vehicle use. A decision to emphasize the designation of routes in upland areas rather than washes would affect 183 miles of primitive roads, which were inventoried as being in washes. Approximately 163 miles of primitive roads could be closed under this alternative. Approximately 4 miles of primitive road in washes could be designated as limited to administrative use in the northern part of the Gila Bend Mountains, which would reduce public travel through washes to wildlife waters and range improvements, thus reducing the frequency of disturbance to wildlife.

From Visual Resources on Travel Management

Effects would be the same as Alternative B except that more acres would be allocated to VRM Class II, which raises the requirement for mitigation of ground disturbance. No new roads or primitive roads would be constructed, leading to less connectivity of the route system.

From Wilderness Characteristics on Travel Management

Approximately 270 miles of existing routes traverse areas that would be allocated as lands managed to protect wilderness characteristics, a allocation that could close up to 40 percent, or 51 miles, of the routes inside these areas to motorized vehicles. About 12 percent of the routes inside these areas, or 33 miles of primitive roads, could be limited to seasonal use (April 1 – September 15), thus having a minor effect regionally, but a moderate effect locally. Approximately 56 percent (151 miles) of the primitive roads could remain open as cherry stemmed routes and would consist of through routes mainly with no campsite spur roads. Public access by vehicle to wildlife waters would be maintained except near Face Mountain where access would be administrative. The building of new roads and primitive roads and motorized trails would be prohibited by the decision to allocate the OHV area designation as closed coincident with lands managed to protect wilderness characteristics.

4.18.6.1.2. Sonoran Desert National Monument

From Air Quality on Travel Management

Impacts are anticipated to be minor, with 3.4 miles of primitive road being closed to all uses inside the PM_{10} area.

From Cave Resources on Travel Management

Impacts are anticipated to be negligible.

From Cultural and Heritage Resources on Travel Management

A shift from motorized use to non-motorize use on the Anza NHT would reduce affect 17.1 miles of the trail. The 17.1 miles would be designated as a primitive road limited to nonmotorized use. Butterfield Pass would be inaccessible to the public by motor vehicle. Administrative motor vehicle use from Gap Well to approximately Desert Station would be permitted. Areas to the east and west of Butterfield Pass totaling 10.5 miles would be managed for nonmotorized use. Driving vehicles on the Anza NHT would prohibited. Compared to the No-Action Alternative, the decision to restrict the trail to nonmotorized use represents a 100 percent closure to motor vehicles on the Butterfield/Anza trail and would have a moderate impact on visitors wishing to drive on the historic trail with vehicles, specifically at Butterfield Pass. For visitors seeking nonmotorized opportunities, this represents a moderate effect due to achieving desired recreation experiences. Overall, the loss of vehicle access to this trail corridor represents a closure of 3 percent of the total vehicle accessible routes in SDNM which would be a minor effect to the travel system overall.

From Lands & Realty on Travel Management

Impacts are anticipated to be negligible.

From Livestock Grazing on Travel Management

Impacts would be the same as those described under Alternative C for the Monument.

From Minerals Management on Travel Management

Impacts would be the same as those described under Alternative A for the Monument.

From Priority Wildlife Species and Habitat Management on Travel Management

Managing for priority species would have moderate effect on the travel system by affecting 64 miles, or 10 percent, of the Monument's inventoried routes. Approximately 59 miles, representing 92 percent of the primitive roads in washes, would be closed to all uses and would not be managed as an asset. Approximately 1 mile, or 1 percent, of the primitive roads in washes would be left open year round for vehicular traffic. Between I-8 and the south border of the SDNM near the Sand Tank Mountains and White Hills, decisions to maximize habitat in washes would limit access to hiking or horseback because no other open roads or primitive roads would be present in the area. Closing these primitive roads in washes would be expected to have a moderate effect on travel in the SDNM.

The allocation of large areas, 334,800 acres consisting 69 percent of the Monument, for wildlife movement corridors would affect the ability to construct new roads or primitive roads in these areas, although no new routes are currently proposed in this alternative.

From Hazardous Materials & Public Safety on Travel Management

Impacts would be the same as those described under Alternative B for the Monument.

From Recreation Management on Travel Management

The allocation of large back country RMZs would have a major effect on the route system. Combined with allocations for natural resources, the greatest total of routes would be closed under this alternative. As compared to the No-Action Alternative, where none of these allocations occur and few routes are closed, route closures would increase by about 56 percent in the back country areas, which total 82 percent of the Monument. Passage zones totaling 2 percent of the Monument would provide some relief by allowing selected routes to remain open.

The allocation of front country zones and the potential creation of camp areas north of SR 238 would have the same impacts as Alternative B, with the fewest dispersed camping primitive roads available. This would require the highest route and area monitoring and periodic maintenance or rehabilitation due to high visitation to available camp areas.

Within the Sonoran Desert SRMA, 25 miles of routes would be designated as roads with similar effects as Alternative B. Approximately 219 miles, or 39 percent, of routes would be designated as primitive roads where maintenance would only be performed to protect soil and water resources from degradation and maintain the desired level of access, and 35 miles of primitive roads would be limited to administrative use only. Trail asset designation would be the same as under Alternative B.

From Soil Resources on Travel Management

Approximately 149 miles (43 percent) of routes of the 350 miles located in poor soils would remain open, creating a moderate impact on vehicular travel. Most popular areas would still be accessible by at least one route. Route choices to most locations would be limited to a single route and would likely increase the maintenance needs on the remaining open routes. Hardening of the road base would likely be required for roads and primitive roads receiving 50 to 100 average daily traffic counts or more. None of these routes would be closed under the No-Action Alternative, yet the requirement to stabilize them would remain.

Effects to travel would be major as compared to the No-Action Alternative by closing 60 percent of the routes, or 144 of 231 miles, in areas identified by staff as “route proliferation concern areas,” specifically north of SR 238 and along Vekol Valley Road. The management approach to greatly restrict use to the fewest routes feasible seeks to minimize the human footprint to hardened, managed areas. This approach requires balancing the development of anticipated high-use recreation sites with the possibility for creating new wildlife avoidance zones and movement barriers. Having the fewest available routes in poor soils could improve Monument objects and resources that rely on soil condition, thereby allowing the soil to become productive where vehicle routes were previously. The amount of area affected by the route footprint in poor soil areas would be reduced from 0.16 percent in Alternative A to 0.10 percent in this alternative. Impacts would further be minimized by implementing standard mitigation measures such as creating earthen drainage structures on erodible sections of open routes.

From Special Designations on Travel Management

Designation of the Anza NHT would have similar effects to Alternative B, with the exception of shifting the entire 17 miles the trail in SDNM to nonmotorized use. The popular portion of the trail including Desert Station, Happy Camp and Butterfield Pass would be designated as a primitive road where vehicles would be allowed. Mitigations would need to be applied to prevent the impacts from OHV use that caused a temporary closure in this area. As compared to the No-Action Alternative, where vehicle use would be allowed on all portions of the trail, this alternative has a major effect on travel by motor vehicle by eliminating it on the trail and only allowing nonmotorized traffic on the trail. Access to popular areas along the trail by motor vehicle would remain available.

From Travel Management on Travel Management

Allocating 175,700 acres as limited to designated routes and allocating 310,700 acres to OHV closed area would have a major effect on the travel system, by closing areas greater than 10,000 acres to vehicular use. Conversely, large areas for nonmotorized access are dramatically increased in size, having a major effect on this travel mode as well. As compared to the No-Action Alternative, where 161,200 acres are closed, this alternative closes much more area to vehicular access.

Designating routes would have similar effects as Alternative B, with respect to making travel management sustainable and reducing vehicle and bicycle driving opportunity. Designation of 24.7 miles of roads would be the same as under Alternatives B and C and would have the same effects. Designation of trails is the same as Alternative B and would have the same effects. Designation of primitive roads would represent a major change from Alternative A, in which 303 miles (54 percent) of the existing primitive roads would be closed. Additionally, 35 miles (6 percent) would be closed to public use with limited administrative access allowed. The closure of 60 percent of the primitive roads to the public would lead to concentration of visitors on fewer roads and primitive roads. In turn, this would lead to a transfer of recreation opportunities between visitors relying of vehicles and those seeking dispersed nonmotorized opportunities. In this alternative, the fewest miles of primitive roads would be available for public use and administration of authorized activities. Some activities may require cross country vehicle access which would need to be approved on a case-by-case basis and might require rehabilitation.

A licensing requirement for all drivers on SDNM coupled with a ban on OHVs under 1,800 lbs. would have a moderate effect on the travel system. One cause of the moderate effect would come as a result of fewer vehicles with knobby tread tires adding wear and tear on roads and primitive roads causing the need for additional maintenance. Access to remote areas would remain available, but only with full-size, licensed vehicles. Conversely, more mature drivers, demonstrated by a minimum age of 16 years and able to pass the State vehicle licensing test, combined with smooth tire vehicles used in a relatively low speed manner, would reduce maintenance needs on many roads and primitive roads and areas adjacent to them. Off-highway vehicle users riding dual sport motorcycles with the State OHV decal would be particularly affected since they legally use paved highways, similar to full size vehicles, prior to accessing primitive roads, but would be barred from using any road or primitive road on the SDNM. However, the effects of cross country use by full size vehicles would remain unchanged wherever it occurs. There is no data available to suggest if full size vehicle traffic would increase to replace lost access formerly gained by using OHVs.

Law enforcement success in reducing driving off of existing roads and trails would be greatly improved and simplified by this alternative's reduced open mileage. Map and sign plan

implementation would have the same effects as Alternatives B and C. The implementation of 35 miles of administrative use only primitive roads, a 100 percent increase from Alternative C, would increase the need for monitoring gates and the inaccessible areas behind them. Expenses for managing the route system would be less than the other action alternatives over the long term due to fewer route miles to maintain and fewer signs to maintain. Expenses for implementation of the travel system would be increased over Alternatives A, B or C, due to the need to effectively reclaim primitive roads and parking areas.

Access points to SDNM would number 44, a 60 percent reduction from Alternative A. Acquiring legal access to a greatly reduced mileage system could reduce acquisition costs and staff work load. Similar to Alternatives B and C, with limited access points, each point becomes much more critical to secure.

From Vegetation Resources on Travel Management

Same as Alternative A, except the fewest routes would remain open for vehicle use. Conserving vegetation in washes would have the effect of closing 59 miles, of 63 miles total, of primitive roads in washes. No seasonal limits would be enacted. This would have a moderate effect on the travel system, mostly south of I-8.

From Visual Resources on Travel Management

Impacts would be the same as those described under Alternative C for the Monument.

From Wilderness Characteristics on Travel Management

Approximately 125 miles (91 percent) of the primitive roads inside the boundary would be closed and rehabilitated in the Sand Tank Mountains area. Approximately 2 miles, representing 100 percent of the trails outside wilderness, would be closed, 2 miles (2 percent) of primitive roads would remain open, and 7 miles of primitive road would be available only for administrative use. Allocation of lands managed to protect wilderness characteristics creates the maximum amount of solitude and unconfined recreation of all the alternatives through the closure of existing primitive roads and trails, having a major effect by greatly restricting vehicular access to areas around the Sand Tank Mountains, Javelina Mountain, and Margie's Peak.

4.18.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.18.7.1. Both Decision Areas

A decision to reintroduce Sonoran pronghorn under Section 10J of the Endangered Species Act would have the same effect as Alternative B.

4.18.7.2. Lower Sonoran

From Air Quality on Travel Management

Effects would be the same as Alternative C except that 1 percent more routes would be expected to remain open for motor vehicle use as a result of implementing a combination of decisions from other resource areas intended to mitigate for environmental effects.

From Cave Resources on Travel Management

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Cultural and Heritage Resources on Travel Management

Effects would be the same as Alternative D, in which Gila River Terraces and Saddle Mountain would be managed as ACECs.

From Lands & Realty on Travel Management

Impacts are anticipated to be negligible.

From Livestock Grazing on Travel Management

Impacts would be the same as those described under Alternative A for the Lower Sonoran. Effects would be from the creation of new range improvements and associated routes needed to serve the activity.

From Minerals Management on Travel Management

Same as Alternative B. Effects would be from the creation of new mines and the conversion of existing roads or primitive roads into haul roads not suitable for recreation or the truncation of recreation routes without rerouting.

From Priority Wildlife Species and Habitat Management on Travel Management

Effects would be similar to Alternative D with a notable exception due to the addition of SRMAs adjacent to WHAs. The combination of wildlife movement areas, wildlife habitat areas and SRMAs would affect the creation of new routes in the Arlington and Ajo SRMAs such that the locations would be limited to areas outside WHAs and would need to consider the indirect effects to the WHA for habitat fragmentation and movement of wildlife. Such restrictions would likely limit new routes to only one or two per area and also in a way that the route would not run the length of the movement corridor, which would reduce the value to a recreational trail system such that it would likely be a moderate to major impact to achieving the potential of the recreation objectives. Neither movement areas nor wildlife habitat areas exist under the No-Action Alternative.

Similar to Alternative B, the OHV designation of 40 acres near Ajo, AZ as “open” would likely not effect desert tortoise habitat, since high motorized use occurs in this area.

From Hazardous Materials & Public Safety on Travel Management

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Recreation Management on Travel Management

Allocation of six SRMAs would have effects similar to Alternative C with the exception that the addition of the Arlington SRMA. New primitive roads or trails could be constructed in the Arlington, Buckeye Hills, and Ajo SRMAs totaling up to 35 miles. Within SRMAs, approximately 72 percent of the existing routes would remain open as roads or primitive roads, 19 percent could be closed and rehabilitated, 4 percent could be designated as motorized trails, and 19 miles (2 percent) could be converted from primitive roads to nonmotorized trails, specifically in the Saddle Mountain area where the "loop road" around the prominent Saddle Mountain could become nonmotorized to implement back country setting on around the mountain. North of Ajo, up to 2 miles of primitive roads could be constructed to improve primitive road connectivity.

From Soil Resources on Travel Management

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Special Designations on Travel Management

Effects would be similar to B for routes inside Coffeepot and Cuerda de Lena ACECs and similar to Alternative C in Gila River and Saddle Mountain. The creation of new motorized routes would be disallowed in all the ACECs unless a route is needed to minimize damage or stop degradation of the purposes for the ACEC.

From Travel Management on Travel Management

A management decision to allocate 788,160 acres of OHV areas as limited to designated routes would have the similar effects as Alternatives B, C, and D by limiting all vehicles and bicycles to the designated route system. Maintaining 142,000 acres of designated wilderness and allocated lands managed to protect wilderness characteristics as OHV closed would continue the ban on driving motorized and mechanized vehicles in these areas. Allocating 40 acres in the Ajo area as an open area where cross-country travel would have the same effects as Alternative B. This open travel designation of 40 acres in Ajo would minimize the BLM's involvement on a daily basis and change the management approach from policing to that of maintenance and rehabilitation to recover areas impacted by heavy OHV use. The area is small, so effects to the travel system are expected to be minor. The importance of effectively managing the intense vehicle use in the Ajo area is addressed by implementing this open area. Managing this use in this existing location has the potential to prevent natural and cultural resource damage in the surrounding areas.

The effects of creating travel management areas would have the same effect as Alternatives B, C and D.

Implementing SRMAs, thus allowing for a "dispersal of use" of recreationists on a variety of route types would have the similar effects as Alternatives C and D. This alternative's conceptual route network mileage seeks to respond to recreation settings which are a combination of Alternatives C and D recreation allocations. Vehicle access would be generally allowed on about 78 percent of existing and new routes, similar to Alternative C. SRMA allocations would direct the construction of up to 35 miles of new primitive roads or trails. Such routes would benefit

public access or replace lost access as a result of private land blockage. This would have a minor effect on visitors' ability to disperse in back country areas where access would be reduced. Effects to visiting popular sites or areas are expected to be minor. Effects to motorized use in the Buckeye Hills East RMZ would be major where approximately 56 percent of the primitive roads and trails could be closed to use or converted to nonmotorized use.

Issuance of an approved travel management map would have the same effect as Alternative B.

The creation of seven travel management areas would have no effect on the outcome of route designations, yet creates a Planning Area for route designation and way to group regional issues.

Effects of securing public access would be similar to all alternatives, but most similar to Alternative C, where comparable route mileages and comparable number of accesses to seek access for are expected. Effects to the travel system would be long term, making the trail system robust and sustainable.

From Vegetation Resources on Travel Management

Effects would be the similar to Alternative C except that no washes would be seasonally closed. Primitive roads in washes would be designated either as open or closed to simplify management and make the route system more understandable.

From Visual Resources on Travel Management

Effects would be the same as Alternative B except that fewer primitive roads are likely to be constructed (due to factors other than VRM). Up to 35 miles of new primitive roads likely would be needed to complete loop routes inside mostly VRM Class III areas where mitigations to visual resources would likely not be required, having no effect or negligible effects on the travel system.

From Wilderness Characteristics on Travel Management

Wilderness characteristics in the Batamote Mountains and Saddle Mountain would have a minor effect on the travel system. There are no routes inside the Saddle Mountain area. The Batamote Mountains have one route connecting the gas pipeline road to BGR Area B, plus some primitive short-spur roads of 1/8 mile leading to campsites. About half of these would remain open. This is anticipated to have a negligible effect on the travel system. Only 16 miles of primitive roads would be located within these two areas, of which 8 miles would remain open. As compared with the No-Action Alternative, in which no areas would be allocated lands managed to protect wilderness characteristics, Alternative E would have negligible effect on accessing areas on existing routes by vehicle. Closure of new routes to OHV travel would prevent new primitive roads or vehicle trails from being created, having the effect of limiting the route system to what would be designated from the available existing routes. Effects are expected to be negligible because most people would not notice a loss of access near lands managed to protect wilderness characteristics.

4.18.7.3. Sonoran Desert National Monument

From Air Resources on Travel Management

Management of air quality would have the effect of closing 3/5 of the 5 miles of routes inside the PM_{10} nonattainment boundary. The primitive roads that would be affected are typically used for target shooting, camping, and parking for hunting,. Other primitive roads in the area would remain available for use, and this management prescription would have a minor effect on access and the travel system.

From Cave Resources on Travel Management

Impacts are anticipated to be negligible.

From Cultural and Heritage Resources on Travel Management

Impacts would be the same as those described under Alternative C for the Monument. Butterfield Pass would be accessible to motor vehicles.

From Lands & Realty on Travel Management

Impacts would be the same as those described under Alternative A for the Monument.

From Livestock Grazing on Travel Management

Impacts would be the same as those described under Alternative B for the Monument.

From Minerals Management on Travel Management

Impacts are anticipated to be negligible.

From Priority Wildlife Species and Habitat Management on Travel Management

Effects would be the same as Alternative C with the exception of a seasonal closure of primitive roads in washes enacted from April 1 to September 15. Effects on managing the priority species would be minor and short term due to the availability of motorized access by at least one route to most popular places in SDNM. Seasonal closure periods in washes would also be during the lower visitation times of the year making the effects to visitors including hunters, having a minor effect.

From Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative B for the Monument.

From Recreation Management on Travel Management

Effects would be similar to Alternative C. Primitive roads would be available to serve designated campsites and the number would remain fixed. This would minimize the maintenance and rehabilitation needs along the designated routes and thus minimize effects to resources. This management approach would require additional route and area monitoring and periodic maintenance or rehabilitation due to increased visitation to available camp areas.

Within the Sonoran Desert SRMA, 28.9 miles of routes would be designated as roads with similar effects as Alternative B. A new road would be constructed to connect the Freeman Road exit with Big Horn Station to the west. Approximately 330 miles of routes would be designated as primitive roads where minimal maintenance would be performed primarily be done to protect soil and water resources from degradation and secondarily to maintain the desired level of access. Approximately 32 miles of primitive roads in washes would be closed seasonally from April 1 to September 15. Trail asset designation would be the same as Alternative B.

From Special Designations on Travel Management

Impacts would be the same as those described under Alternative C for the Monument.

From Travel Management on Travel Management

Impacts would be the same as those described under Alternative C for the Monument.

Effects of the proposed route designations would be the similar to Alternative C. The management philosophy would be the same as Alternative C: seeking to find a balance between protection and enjoyment of the Monument and has the same implications for management.

Primitive road closures comprise the main difference in route designations between Alternatives C and E. Alternative E proposes to close 43.4 miles more, mostly to places that would be difficult to manage or where mitigating the impacts would be difficult.

The decision to construct a new road in Alternative B from the Freeman Road exit to Big Horn Station south of I-8 would have the same impacts as described under Alternative B. This would have a major effect on travel by eliminating the need to exit I-8 at fence gates and further reduce the need to create deceleration lanes on the south side of I-8 for safe entry/exit. Such lanes may be required on the north side of I-8 to access the South Maricopa Wilderness. Alternative E opens the southernmost segment of Vekol Valley Road, which is closed in the No-Action Alternative and would be limited to administrative use in Alternative C. Access south of I-8 near the SR-84 interchange near an old gravel pit and accessing the north end of Table Top Wilderness is closed, eliminating the need to regularly monitor this area and reducing the number of access agreements necessary to cross private land. A primitive road is closed for the same reason north of Vekol Ranch on the eastern edge of the South Maricopa Mountains Wilderness. One primitive road west of Mobile and north of the South Maricopa Mountains Wilderness has been closed for redundancy and to reduce maintenance needs in this area.

The effects of a licensing requirement for using vehicles on SDNM would be the same as Alternative B.

The number of access points would be 76, a 34 percent reduction from Alternative A. This would have the effect of reducing the number of areas for affecting Monument objects and reduce the need for entry signs, maintenance, and enforcement over the No-Action Alternative.

From Vegetation Resources on Travel Management

Impacts would be the same as under Alternative A except fewer routes would remain open for vehicle use. Effects would be between Alternatives C and D. Conserving vegetation in washes would have the effect of closing 46 miles of primitive roads in washes and limiting 13.4 miles

of washes south of I-8 to seasonal vehicle use (April 1-September 15), which would have a moderate effect on travel.

From Visual Resources Management on Travel Management

Effects would be the same as Alternative B, including a 4.2 mile access road south of I-8 from Freeman Road exit to Big Horn Station, which would be constructed.

From Soil Resources on Travel Management

Approximately 221 miles (64 percent) of 350 miles located in poor soils areas would remain open, creating a moderate impact on travel. Effects are similar to Alternative C. Many popular areas would still be accessible by at least one route and more contact with other visitors may occur. This would have a minor effect on the travel system since some visitors may choose to congregate in areas of their preference increasing traffic and thus the maintenance needs on associated routes.

Impacts to soils would be minimized from the current condition (Alternative A) by closing 44 percent of the routes, or 100 of 231 miles, in areas identified by staff as "route proliferation concern areas," specifically north of SR-238 and along Vekol Valley Road. The management approach would be as described in Alternative C, which attempts to find a balance between dispersal and concentration of visitors. The amount of area affected by the route system footprint in poor soil areas would be reduced from 0.16 percent in Alternative A to 0.13 percent of the total poor soils area in Alternative E. Impacts to resources would further be minimized by implementing standard mitigation measures such as creating earthen drainage structures on erodible sections of open routes, all of which would have a minor effect on the management of the route system.

From Wilderness Characteristics on Travel Management

Realigning the boundaries using primitive roads to define the areas would have minor effects to the route system, especially when compared with Alternatives C or D. With boundaries of the lands managed to protect wilderness characteristics available for travel and open at least seasonally in washes, effects to the travel system would be minor. Seasonal restrictions would increase the effects to the travel system, but they are not a result of wilderness characteristics. Rather, they are a result of managing for diverse wildlife populations

4.19. IMPACTS ON SPECIAL DESIGNATIONS

Existing special designations in the Lower Sonoran reviewed in this section include wilderness areas, the Juan Bautista de Anza NHT, and the Coffeepot Botanical ACEC. Existing special designations reviewed within the SDNM include wilderness areas, the portion of the Juan Bautista de Anza NHT within the Monument, and the Vekol Valley Grassland ACEC. Proposed alternatives introduce several new special designations, including three new ACECs and two National Scenic Byways and a Backcountry Byway throughout the various action alternatives.

Current management of the Juan Bautista de Anza NHT is consistent with a management plan developed by the NPS and completed in cooperation with the BLM and other agencies and organizations. The National Scenic and Historic Trail Policy Act and the BLM National Scenic and Historic Trails Strategy (2006) provide additional guidance.

The focus of the analysis that follows is on the resource values for which special designations were established. These values include biological, water and soil, cultural, and visual resources and wilderness characteristics. Resource management disciplines that would potentially impact these values include those pertaining to the specific values themselves (i.e. biological, water and soil, cultural, and visual resources and wilderness characteristics) and grazing, recreation, travel management, lands and realty, and mineral resources.

4.19.1. METHODS OF ANALYSIS

4.19.1.1. Indicators

Areas of Critical Environmental Concern

Opportunities for the maintenance, enhancement or diminishment of resources of relevance and importance identified for management in the ACEC.

National Byways

For National Scenic Byways, the prime indicators are the vividness, intactness and unity of the landscape elements. For Back Country Byways, the recreation niche is an "off-the-beaten-path" motorized adventure on a Type III dirt road through remote landscape settings, providing solitude and scenery in natural saguaro cactus desert landscapes, and the quality of the routes' ghost town, wildlife, and interpretive/educational opportunities.

National Historic Trails

- Damage to the arrangement or structure of features
- Artifacts missing or rearranged
- Site or historic trail elements re-arranged
- Ground surface disturbed
- Subsurface cultural and historic deposits disturbed and/ or re-arranged
- Damage to physical environment of historic trail and/or associated cultural site
- Damage to historic sense of a particular period of time or feeling of historic trail or associated site's context
- Changes to the historic setting, to the level that historic trail and associated site values are diminished.

Wilderness Areas

- The extent, location, distribution, and quality of naturalness and natural conditions in the wilderness. Naturalness is affected by surface disturbing activities and associated human uses and developments.

- The extent, location, distribution, and quality of opportunities for solitude and primitive, unconfined recreation within wilderness areas. Opportunities for primitive, unconfined recreation are affected by the presence of motorized activities and the availability, or non-availability, of landscapes free of surface disturbing activities and the sights and sounds of human uses and their developments.

4.19.1.2. Assumptions

The following assumptions regarding the future management of special designations are made:

Areas of Critical Environmental Concern

- Uses and activities occurring outside special designation allocations could influence ACECs, though such influences would generally be indirect.
- Uses and activities occurring outside ACEC's allocations could influence ACECs, though such influences would generally be indirect.
- All guidelines for the maintenance of the ACEC characteristics, as identified in this document would be followed, to the extent allowed by existing budget and available personnel.

National Byways

- Uses and activities occurring outside special designation allocations could influence Byway's, though such influences would generally be indirect.
- All guidelines for the maintenance of the Byway's characteristics, as identified in this document would be followed, to the extent allowed by existing budget and available personnel.

National Historic Trails

- Historic trails and associated sites are considered cultural resources also.
- On the SDNM, the official Juan Bautista de Anza NHT corridor, the Butterfield Overland Stage Route, and the Mormon Battalion Trail are all named Objects of the Monument and all overlay one another physically.
- The historic setting of the Anza NHT on all Federal Protection Components will have management prescriptions applied to a minimum of three miles from the NHT to the visual horizon, whichever is less.
- The recreational setting of the Anza NHT on all Federal Protection Components will have management prescriptions applied to a minimum of five miles from National Register eligible properties to the visual horizon, whichever is less, when management concerns warrant.
- Before the BLM may authorize any project with potential to affect cultural resources, law and regulation require that the agency conduct site-specific inventory, evaluate potentially impacted sites for National Register of Historic Places eligibility, and stipulate measures to reduce effects, as necessary. Impacts may be reduced by avoidance or mitigation measures, such as data collection or project redesign.

- Ground/surface disturbing activities can vary in nature and include mechanical/vehicular, livestock/wildlife, and human -caused. Ground disturbing activities from mechanical/vehicular means are assumed to have the potential to impact cultural resources by damaging features, crushing/compacting subterranean features, rearranging features, pushing soils to remove or excavate original surface, and disturbing the contextual arrangement of features and artifacts. Ground disturbing activities from wildlife/livestock can occur when an animal burrows or wallows in soft soils and damages features. Other animal activities can disturb original subsurface cultural soil horizons, crush/compact surface artifacts, and rearrange the context of artifacts and features. Human ground disturbance can occur from fire contamination, trampling, digging, vandalism, and unauthorized collection.

- Most of the Planning Area has not been inventoried for cultural resources, and there is no predictive modeling or sensitivity mapping available to estimate or quantify resource density. There is potential for cultural resources on most of the Planning Area, but the presence and significance of resources and impacts cannot be quantified. Most of the length of the Anza NHT has not been inventoried for associated cultural resources.

- There is qualitative information that indicates areas where there is a higher probability that cultural resources would be present, relative to the whole Planning Area. These include river corridors, spring locations, historic trails, and high quality arable land in proximity to rivers. Highly disturbed or recently developed areas would be less likely to include intact cultural resources.

- Measures that withdraw land or restrict surface development to protect resources can provide direct and indirect protection of historic trail and associated cultural resources from disturbance and from incompatible and unauthorized activities.

- Natural processes, such as erosion or weathering, will degrade the integrity of many types of historic trail and cultural resources over time. Human visitation, recreation, OHV use, livestock grazing, fire and non-fire vegetation treatments, and other activities can increase the rate of deterioration through natural processes. While the effect of a few incidents may be negligible, the effect of repeated actions or visits over time could intensify impacts.

- Vandalism or unauthorized collecting can destroy historic trails and associated cultural resources in a single incident. Exposure or access to areas where these resources are present can increase the risk of vandalism or unauthorized collection of artifacts.

- Site monitoring, non-project-related inventories, interpretive development, site stabilization and other proactive management activities would continue.

- Uses and activities occurring outside NHT allocations could influence NHT, though such influences would generally be indirect.

- All guidelines for the maintenance of the NHT's characteristics, as identified in this document would be followed, to the extent allowed by existing budget and available personnel.

Wilderness Areas:

- Development of a proactive management framework, including goals, objectives and actions for ecological and biological, water and soil, cultural, and visual resources would generally benefit wilderness areas by maintaining or improving naturalness. Otherwise, all management

of these resources would be compatible with the existing wilderness plans under all the alternatives.

- Uses and activities occurring outside wilderness areas could influence wilderness areas, though such influences would generally be indirect.
- All guidelines for the maintenance of the wilderness area's characteristics, as identified in this document would be followed, to the extent allowed by existing budget and available personnel.

4.19.1.3. Qualitative Intensity Scale

The intensities of impacts are the same as those described in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375) for the Intensity of Impacts.

4.19.1.4. Program Areas with no Impacts on Special Designations

There would be no impacts to special designations from actions proposed under the following program areas:

Areas of Critical Environmental Concern

- Air Quality Resources
- Cave Resources
- Paleontological Resources
- Hazardous Materials & Public Safety
- Wild Horse & Burro Management
- Wildland Fire Management

National Byways

- Air Quality Resources
- Cave Resources
- Cultural and Heritage Resources
- Minerals Management
- Paleontological Resources
- Priority Wildlife Species and Habitat Management
- Public Safety and Hazardous Materials
- Soils Management
- Vegetation Resources

- Water Resources
- Wild Horse & Burro Management

National Historic Trails

- Cave Resources
- Paleontological Resources
- Wild Horse & Burro Management

Wilderness Areas:

- Air Quality Resources
- Cave Resources
- Minerals Management
- Paleontological Resources
- Wild Horse & Burro Management

4.19.2. COMMON TO ALL ALTERNATIVES

4.19.2.1. Both Decision Areas

4.19.2.1.1. Areas of Critical Environmental Concern

There are no unique impacts on ACECs in both decision areas.

4.19.2.1.2. National Byways

From Wildland Fire Management on National Byways

Recognized visual values would be potentially diminished, degraded or lost all together over the long term by certain actions and outcomes associated with fire and fuels management. Such impacts, however, do not vary substantially by alternative. Fires remove the vegetation, which impacts the scenery, naturalness and ecosystem integrity of an area. Overall impacts range from minor to major.

4.19.2.1.3. National Historic Trails

***From Public Safety and Hazardous Materials Management on National Historic Trail*s**

Hazardous material clean-ups may directly affect NHT resources at a minor to moderate level due to ground disturbing activities for the short term. Impacts are expected to range from minor to moderate.

From Soil Resources on National Historic Trails

Minimizing surface disturbance may protect the integrity of the NHT and associated landscapes and resources directly and indirectly over the long term at a minor level.

Measures taken to control soil erosion may affect the NHT and associated landscapes directly and indirectly over the long term at a minor level in localized areas.

From Vegetation Resources on National Historic Trails

Vegetation restoration and manipulation may directly or indirectly benefit the NHT and its associated resources at a minor level in localized areas for the long term.

Active vegetation management strategies may directly or indirectly affect the NHT at a minor level in localized areas for the short term due to the use of heavy equipment which disturbs or damages surface and subsurface features on sites.

Passive vegetation restoration projects may have a direct or indirect protective effect on cultural resources for the long term by helping to arrest erosion processes through the establishment of the natural stabilizing effects of plant roots. Impacts would be minor.

Anza NHT resources located on the lands on which the Fred J. Weiler Green Belt had been designated enjoy additional protections due to the closure to mineral entry and other restrictions of this designation directly or indirectly at a minor level for the long term by either reducing or eliminating the ground disturbance from minerals prospecting, extraction, and associated vehicle damage.

From Water Resources on National Historic Trails

Minimizing groundwater development and exploration in sensitive areas could protect the trail indirectly at a minor level over the long term.

From Wildland Fire Management on National Historic Trails

Wildland fires and fire suppression activities may directly impact NHT sites and segments directly at minor, moderate, or major levels for short term and intensive duration.

Use of minimum impact suppression tactics in wilderness and along National Trails may have the effect of reducing impacts to NHT sites and segments from heavy equipment use. Since NHT sites and segments can be avoided during fuels reduction activities, a minor level of indirect impact may be anticipated from the use of equipment and possible chemical application, in localized areas.

4.19.2.1.4. Wilderness Areas

From Lands and Realty Management on Wilderness Areas

Acquiring nonFederal mineral estate within wilderness areas would increase the potential for protecting naturalness, opportunities for solitude, and opportunities for primitive unconfined recreation in those areas. Impacts would be minor to major.

From Soil Resources on Wilderness Areas

Generally, development of a proactive management framework, including goals, objectives and actions for water would moderately benefit special designations by maintaining or improving natural and ecological conditions. Thus, management of these resources would be compatible with all wilderness areas. Maintaining and improving soil cover and productivity could promote to minor degree retention of natural conditions and plants by preventing erosion of soils. Scenic resources would be retained to the extent that native plant communities are protected from direct mortality or indirectly harmed by establishment of invasive plants within the greater plant community. Associated watershed and soil actions would also promote retention of natural conditions due to decreased erosion, maintenance of plant cover, a decrease in invasive species, and localized gain in plant and ecological community diversity.

From Public Safety and Hazardous Materials Management on Wilderness Areas

Hazardous materials and solid waste issues occur on occasion within the Decision Areas. Containment and cleanup of these materials often involves the use of vehicles and equipment in surface disturbing activities. Wilderness areas could be impacted by the damage from vehicle movements and removal of contaminated soils. With appropriate restoration and mitigation, these impacts would typically be temporary and natural, scenic and ecological resource conditions could be restored; however, some impacts could cause long-term degradation of naturalness. Overall, these impacts would be considered negligible overall as hazardous materials and solid waste issues are usually uncommon in remote and unroaded areas.

Dispersed, indiscriminant, extremely intense, or continual recreational target shooting generates public safety and hazardous materials impacts wherever such activities crop up. Often, shooting is done without an effective backdrop or safety fan, endangering other users, damaging or killing vegetation, destroying or pock-marking rocks and denuding hillsides. Sharp metals, glass, and debris left behind can injure or trip visitors. Brass, targets, spent shells, Freon, paint and gas cans, glass, mirrors, windows, construction debris, clay targets, appliances, batteries, computers, target holders, scrap metal and the like are habitually left in the wake of target shooting activity. Hazardous materials spill from paint, Freon, or gas cans. Shot up vehicles leak all manner of hazardous fluids and proliferate hazardous materials residue. Appliances leak Freon and other refrigerants. Computers, screens, and televisions, all popular targets, result in a considerable residue of lead, toxic metals and other materials.

From Water Resources on Wilderness Areas

Development of a proactive management framework, including goals, objectives and actions for water would generally and moderately generally benefit special designations by maintaining or improving current resource conditions. As a consequence, management of these resources would be compatible with wilderness areas under all the alternatives.

From Wildland Fire Management on Wilderness Areas

Recognized resource values would be potentially diminished, degraded or lost all together over the long term by certain actions and outcomes associated with fire and fuels management. Such impacts, however, do not vary substantially by alternative. Fires remove the vegetation, which impacts the scenery, naturalness and ecosystem integrity of an area. Associated soil

erosion following a fire may damage or destroy surface resources, harm artifacts, or alter natural appearing historical or scenic landscapes. Fire suppression activities impact wilderness areas due to the evidence of heavy earth-moving equipment and vehicles used to cut fire lines. Fire line scars can last for decades, even with reclamation. Use of fire retardants can stain rocks and soils for years, up to a decade. Additionally, fire suppression activities could result in diminished naturalness and opportunities for solitude over the short term in localized areas. Fires kill and remove native vegetation, allowing disturbed landscapes to be easily invaded by opportunistic non-native invasive plants and fire-tolerant weeds like buffelgrass. This is a potentially severe and permanent impact if Sonoran Desert fires convert fire-intolerant native desert habitats currently represented by saguaros, creosote, paloverde, cactus, scrubs and native grasses non-native fire tolerant grasslands. In summary, all the actions described can degrade or diminish naturalness, vegetation, habitat, scenery, ecological integrity and cultural resources over the long term and are considered major both in scope, scale and severity. On the other hand, effective fire suppression quickly employed by ground and air based fire fighting organizations can suppress fires in special designation areas, limiting potential disturbances. Quick suppression actions will minimize or eliminate the potential adverse and major long-term effects of fire, including consequences on naturalness, scenery and ecosystems associated with large scale mechanized fire suppression, and the severe long-term potential for minor to major non-native ecosystem conversion. Overall impacts would range from minor to major.

4.19.2.2. Lower Sonoran

No unique impacts are identified under for the Lower Sonoran.

4.19.2.3. Sonoran Desert National Monument

4.19.2.3.1. Areas of Critical Environmental Concern

No unique impacts.

4.19.2.3.2. National Byways

No allocations.

4.19.2.3.3. National Historic Trails

No unique impacts.

4.19.2.3.4. Wilderness Areas

From Special Designations on Wilderness Areas

A small portion of the Juan Bautista de Anza NHT would overlap four miles along the southern boundary of the North Maricopa Mountains Wilderness Area. The sights and sounds of visitor use through the corridor, and associated infrastructure installed for visitor safety, interpretation, resource protection and visitor enjoyment could have minor impacts on naturalness, solitude and primitive recreation. These impacts would be transitory, but long term, and occasionally influence

the outermost southeastern part (2,560 acres or 4 percent of wilderness acreage) of the wilderness area. Impacts are expected to be minor.

4.19.3. ALTERNATIVE A (NO ACTION)

Under Alternative A, special designations in the Decision Area would include six wilderness areas: the Juan Bautista de Anza NHT, the Coffeepot ACEC, and the Vekol Valley Grassland ACEC. Whereas the Action Alternatives respond to issues and concerns that arose during the planning process, the No-Action Alternative is based on existing RMPs (see Map 2-16a).

4.19.3.1. Both Decision Areas

4.19.3.1.1. Areas of Critical Environmental Concern

No unique impacts.

4.19.3.1.2. National Byways

No national byways are designated under alternative A.

4.19.3.1.3. National Historic Trails

From Air Quality on National Historic Trails

Improvements to air quality may directly impact the settings of the Anza Trail and its associated historic landscapes with a potential for development for public interpretation at minor level, long term. Slowed speeds of vehicle traffic on dirt roads would reduce dust in the air, which could also reduce dust resettling on features, artifacts, and interpretive panels. Impacts are expected to be minor.

From Cultural and Heritage Resources on National Historic Trails

Research that is proposed under Alternative A (which may include excavation activities on cultural sites) may impact National Trails directly or indirectly, at a moderate level, for short term duration by the application of ground disturbing activities such as excavation.

From Lands & Realty on National Historic Trails

Construction, installation, operation, and maintenance of major utilities in corridors may impact Anza NHT resources directly by affecting the trail attributes through ground disturbance and indirectly by affecting the settings and changing vehicle access patterns at a minor to major level of intensity for the short and / or long term.

The authorization of LUAs to construct, operate, and maintain roads, utilities, and other types of uses including but not limited to utility-scale renewable energy facilities may directly impact Anza NHT resources through associated ground disturbance and / or indirectly by changing vehicle access patterns at a minor to major level of intensity for the short or long term.

Land tenure adjustments including disposal or acquisition may affect directly Anza NHT resources either by removing historic sites and trail segments from the protections of Federal ownership or by bringing them into the protection of Federal ownership. Other types of land decisions or authorizations or allocations may affect Anza NHT resources indirectly by affecting the settings and integrity due mostly to changes in vehicle and public uses.

From Livestock Grazing on National Historic Trails

Livestock grazing as well as development, operation, and maintenance of range improvements may impact NHT resources directly and indirectly at a minor to moderate level of intensity both in the short term and long term. Livestock may tend to gather in certain areas where water, soft soil, or shade is available. Anza NHT resources may be affected directly by intense trampling of the surface soils at a minor to moderate level of intensity in localized areas for the short or long term; or indirectly by denuding the vegetation and allowing erosion to accelerate along trail segments.

4.19.3.1.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

Implementation of Alternative A would not allocate any cultural resources to scientific, public, traditional, future, or discharged uses in wilderness areas. Management of cultural and heritage resources in wilderness areas would continue on a case-by-case basis as directed by policy. Future site development for public interpretive and educational purposes, excavation for scientific study, or other similar activities would have none to negligible short- and long-term effects on the naturalness of designated wilderness; however, these effects are not measurable in the absence of such allocations.

From Lands & Realty on Wilderness Areas

Implementation of Alternative A would leave the existing lands and realty programs in place but no impacts are anticipated. Moreover, no effects are expected from land disposals because parcels identified for disposal are not adjacent to wilderness areas. Impacts from lands and realty management are further and fully detailed in the Maricopa Wilderness Management Plan, Environmental Assessment and Decision Record (BLM, 1995) and Woolsey Peak Wilderness and Signal Mountain Wilderness Management Plan, Environmental Assessment, Finding of Not Significant Impact, and Decision Record (BLM, 2003).

From Priority Wildlife Species and Habitat Management on Wilderness Areas

No WHAs would be allocated to protect core areas of wildlife habitat. The management of public uses, including recreation, specifically to protect wildlife and wildlife habitat, would continue to be managed on a case-by-case basis. Construction of facilities in wildlife movement corridors and sensitive habitats, not improving habitat connectivity, and not minimizing physical barriers to movement on public lands adjacent to designated wilderness areas would impact wilderness areas by detracting from naturalness and opportunities to observe healthy wildlife populations.

Wildlife waters would continue to be developed and maintained on a case-by-case basis. Construction activities would detract from naturalness, causing short-term impacts to wilderness values. The presence of new permanent structures located in areas of wilderness would pose

long-term detractions to naturalness; however, to the extent natural populations of native wildlife are maintained, naturalness would be enhanced. Impacts would therefore be negligible.

The use of native plants in restoration projects would not be required, and no area-wide program of surface disturbance restoration and protective measures to minimize the spread of noxious and other weed species would be implemented, which would result in long-term detractions from naturalness and ecosystem integrity. Reintroductions, transplants, and supplemental stockings of native wildlife would be conducted in collaboration with AGFD and/or the U.S.FWS. Long-term contributions to naturalness in areas of wilderness would result if populations of native wildlife were maintained at natural levels.

Competitive and speed events authorized by SRPs on public lands adjacent to wilderness areas would be prohibited in Category I desert tortoise habitat and discouraged in Category II habitat. Long-term contributions to naturalness would result from maintenance of tortoise habitat. Management of water and soil resources aimed to maintain vegetative cover and soil stability would benefit naturalness in all alternatives.

From Recreation Management on Wilderness Areas

Implementation of Alternative A would leave existing recreation management programs in place. Future recreation standards and management prescriptions established for visitation, facility development, and other recreation-related considerations would be instructed to protect wilderness values. Per se, long-term loss, impairment or diminishment of wilderness values due to recreation management would be negligible and impact only localized areas.

Existing Recreation Opportunity Spectrum (ROS) management classes implemented under Alternative A would protect wilderness values. Almost all wilderness area acreage is to be found within semi-primitive nonmotorized and primitive ROS classes. Semi-primitive nonmotorized and primitive areas do not have motorized access and tend to support protection and maintenance of wilderness values. SRPs would continue to be authorized; however wilderness management prescriptions mandated by the in the Maricopa Wilderness Management Plan, Environmental Assessment and Decision Record (BLM, 1995) and Woolsey Peak Wilderness and Signal Mountain Wilderness Management Plan, Environmental Assessment, and Decision Record (BLM, 2003) would be satisfied. Accordingly, no impacts were identified and therefore, impacts would be negligible.

From Soil Resources on Wilderness Areas

Under Alternative A, there would be no development of a comprehensive and proactive watershed and soils management framework, including goals, objectives and actions for watersheds and soils that would benefit wilderness areas by protecting or improving natural and ecological conditions. Failure to maintain and improve soil cover and productivity could promote up to a moderate degree of loss or impairment of natural conditions and plants by tolerating or increasing soil erosion. Plant communities and ecological integrity could be absent to the extent that native plant communities would be subject to direct mortality or indirectly harmed by establishment of fire-tolerant invasive plants. Failure to implement watershed and soil actions required to promote retention of natural conditions would contribute to increased erosion, decline in plant cover, an increase in invasive species, and localized to landscape-level losses in the wilderness area's plant and ecological communities and related diversity.

From Special Designations on Wilderness Areas

Impacts from special designations under Alternative A would be negligible.

From Travel Management on Wilderness Areas

All motorized travel routes would remain available for use without consideration of potential impacts on wilderness areas and their associated indicators. Motorized routes with a predilection to contribute to or facilitate vehicle trespass or resource-based impacts (plant theft, wood cutting, fires, campsite clearing, target shooting, OHV staging, or parking) on the periphery of wilderness areas would remain open. In some cases these roads and primitive roads and their adjoining travel corridors may contribute to localized travel-based recreation impacts. Impacts could reach the minor to moderate intensity level on the wilderness values of naturalness, solitude and primitive recreation. The BLM would address these impacts on a case by case basis using wilderness management plans and current regulations. Potential impacts would be moderate in the Lower Sonoran. The three wilderness areas within the SDNM would have supplementary management oversight offered by the Monument's protective prescriptions, thus impacts overall would be minor.

From Vegetation Resources on Wilderness Areas

Major resource impacts could accumulate from the No Action alternative on both Decision Areas due to a lack of emphasis on vegetation resources. The use of native plants in restoration projects would not be required, and no area-wide program of surface disturbance restoration and protective measures to minimize the spread of noxious and other weed species would be implemented. This could result in long-term injury from the wilderness value of naturalness, including the potential of ecosystem conversion from the Sonoran Desert to a non-native fire-adopted grasslands. Woodcutting, wood collection, could continue within and next to wilderness areas. Impacts would range from minor to moderate.

4.19.3.2. Lower Sonoran

4.19.3.2.1. Areas of Critical Environmental Concern

From Cultural and Heritage Resources on Areas of Critical Environmental Concern

Currently under Alternative A the Coffeepot ACEC encompasses approximately 8,900 acres of public lands. This ACEC was designated for the protection of the endangered Acuna cactus. Currently there are scatted populations of this cactus within the boundaries of the ACEC and management is focused on this single species. The area does contain an active gas pipeline and numerous routes that could affect the existence of the species. The ACEC is also within close proximity to the town of Ajo and recreation and mining uses do occur within the ACEC which could lead to further habitat fragmentation for the cactus. Impacts would be expected to be moderate under current conditions.

From Lands & Realty on Areas of Critical Environmental Concern

Maintenance of the existing 1-mile wide utility corridor through the Coffeepot Botanical ACEC for the existing El Paso Natural gas pipeline would continue to affect the botanical resource values of the ACEC under Alternative A While the current pipeline occurs underground in valley areas of the ACEC and would minimally affect botanical resource values under Alternative A, additional development of the 1-mile wide utility corridor (above ground or underground) could locally affect botanical resource values where the utility corridor bisects the ACEC. The lack of an RMP decision to avoid placing new LUAs in special designations could result in localized impacts to botanical resource values of the ACEC, including the Acuña cactus.

Under Alternative A, the Coffeepot Botanical ACEC could be impacted by lack of RMP-level decisions regarding utility-scale renewable energy development. Impacts would be expected to range from minor to major.

From Livestock Grazing on Areas of Critical Environmental Concern

Under Alternative A, perennial/ephemeral grazing in the Coffeepot Botanical ACEC could have localized impacts on botanical resources, but these would be minimized through grazing management prescriptions. Impacts would be expected to range from negligible to moderate.

From Minerals Management on Areas of Critical Environmental Concern

Under Alternative A, the Coffeepot Botanical ACEC could be impacted by lack of RMP-level decisions regarding mineral material disposal, and development of saleable minerals. Mining activities would be required to be mitigated as to not disturb individual plants and avoid known populations for the cactus reducing habitat fragmentation and allowing persistence of the species on a small scale. Impacts would be expected to range from negligible to minor.

From Priority Wildlife Species and Habitat Management on Areas of Critical Environmental Concern

Continuing to manage the Category I desert tortoise habitat within the ACEC would enhance botanical resource values. Continued implementation of conservation measures for cactus-ferruginous pygmy-owl would provide protection for the endangered lesser long-nosed bat and botanical resources within the ACEC.

Some protection would be afforded by preventing OHV use in certain closure areas and prohibiting new land uses in desert tortoise habitat. Impacts from cultural would be moderate under current conditions.

From Recreation Management on Areas of Critical Environmental Concern

Under Alternative A, dispersed vehicle-based camping and the use of dead and down wood for campfires could cause localized impacts to vegetation in the Coffeepot Botanical ACEC. Unauthorized motorized vehicle use, recreation target shooting, unrestricted nonmotorized and mechanized cross-country travel, and a lack of decisions regarding emerging recreation uses may affect botanical resource, wildlife, and special status species in localized areas within the ACEC. The majority of the ACEC would be allocated as part of the Ajo SRMA, with 8,500 acres in a semi-primitive motorized setting and 400 acres in a roaded-natural setting. These recreation

opportunity settings may allow for recreational development and activities that can impact the resource values of the ACEC.

From Soil Resources on Areas of Critical Environmental Concern

Maintain or restore upland, channel, and riparian components of watersheds that help stabilize or improve watershed conditions. Major indicators of watershed health include maintaining total cover levels (vegetation and litter) consistent with desired future conditions, riparian areas in properly function condition, and erosion and sedimentation rates appropriate to the ecological site. Impacts would be expected to range from negligible to minor.

From Special Designations on Areas of Critical Environmental Concern

Under Alternative A, the Coffeepot Botanical ACEC would continue to encompass approximately 8,900 for the protection of botanical resources with importance tied to the occurrence of the diverse plant community, particularly the Acuña cactus. Management prescriptions would include the implementation of grazing management practices that would ensure perpetuation of botanical diversity within the area, mitigation of mining practices that impact unique botanical habitat, and closure of routes for motorized vehicle access. Impacts would b expected to be negligible.

From Travel Management on Areas of Critical Environmental Concern

Although the Coffeepot Botanical ACEC is closed to OHV use, the routes have not been designated as closed and motorized use would be allowed on existing routes within the ACEC. Under Alternative A, decisions on motorized-vehicle use generally would leave the current OHV class designations and route system in place and route designations would be deferred to a later implementation-planning and decision-making process. The route network under Alternative A would predominantly be located in the valley areas of the ACEC. Negligible impacts would be expected.

From Vegetation Resources on Areas of Critical Environmental Concern

The harvesting of vegetation (including wood harvesting) would potentially affect resource values in the ACEC. Continuing to emphasize passive restoration by natural processes would potentially benefit the resource values of the ACEC in localized areas.

From Visual Resources on Areas of Critical Environmental Concern

Although the visual resource inventory completed as part of this RMP process characterized the Coffeepot Botanical ACEC and surrounding Sauceda Mountains area as Class II, the ACEC would continue to be managed under VRM Class III standards under Alternative A. This would allow for uses that cause evident changes to scenic quality, which could impact the botanical resource values of the ACEC, particularly if they were to occur in areas of unique vegetation. Impacts would be expected to range from negligible to major.

From Water Resources on Areas of Critical Environmental Concern

Water management policy under Alternative A would continue to protect the botanical resources of the Coffeepot Botanical ACEC by limiting groundwater development within the ACEC. A

lack of other decisions regarding water prospecting under Alternative A could lead to localized impacts such as increased erosion, over-utilization of water resources, and degradation of ecological functions that could lead to modifications and degradation of botanical resources. Impacts would be expected to range from negligible to major.

From Wilderness Characteristics on Areas of Critical Environmental Concern

No areas would be allocated as lands manged to protect wilderness characteristics. Impacts are expected to negligible.

4.19.3.2.2. National Byways

No allocations.

4.19.3.2.3. National Historic Trails

From Minerals Management on National Historic Trails

Mineral exploration and development may directly affect Anza NHT resources at a minor to major level with short term to long term duration through the application of ground disturbing activities. Indirect impacts may also affect NHT resources at a minor to major level by changes in the vehicle route system and changes in drainage, leading to additional erosion in and around the mineral exploration and development.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts proposed under Alternative A for the Lower Sonoran from Priority Wildlife Species and Habitat Resources would have a negligible impact on NHTs.

From Recreation Management on National Historic Trails

Increased vehicle-based recreation may lead to an increase of off-road vehicle use which may affect NHT resources directly at a minor to major level by driving over trail and associated historic site features and mashing associated artifacts in localized areas.

Camping in a dispersed manner may affect the integrity and historic settings of NHT resources directly by vehicle incursions, trampling, vegetation damage, and possible exposure to the threat of unauthorized collection of artifacts. Impacts could be minor to moderate.

NHT resources allocated to public use (high potential historic route segments and sites) may be affected at a minor to moderate level in localized areas due to increased agency presence, interpretive media, and educational values available on site. The construction, operation, and maintenance of new recreational developments may have an indirect effect on NHT resources for the long term in localized areas at a level of minor to moderate intensity due to the use of heavy, surface disturbing equipment used to install and maintain these facilities. Increased visitation brought about by recreational developments with amenities may affect NHT resources directly and indirectly at a minor level in localized areas due to increased trampling.

SRP vehicle events and large group events may impact NHT resources indirectly by creating new access route patterns, excess dust, creating ruts and berms that lead to erosion, and attracting large numbers of vehicles and visitors which may lead to increased vandalism and unauthorized collection. All of the impacts from SRP's are minor to moderate in level and vary from short term to long term in localized areas.

From Special Designations on National Historic Trails

The existing Juan Bautista de Anza NHT designation with its Comprehensive Management Plan (NPS) in the implementation phase may affect directly the NHT segments and sites associated with it for the long term due to its status as a nationally important resource. As visitation increases, trail resources may be impacted directly and indirectly by disturbance due to vehicle use, trampling by visitors, and unauthorized collection of artifacts. As interpretive media is developed for the high potential sites and segments of the trail, visitation will increase which may impact the trail resources directly by vehicle damage to NHT features. Impacts are expected to continue at minor to moderate levels.

From Travel Management on National Historic Trails

The use, operation, and maintenance of existing routes may directly impact NHT resources in a minor to major level for the long term by cutting, filling, and other ground disturbing activities associated with the use and care of routes. The use, operation, and maintenance of existing routes may indirectly impact cultural resources in a minor to moderate level for the long term by allowing access into sensitive NHT and site areas or altering drainage patterns leading to inundation or erosion.

The development of new routes may directly impact NHT resources in a minor to major level for the long term by the use of ground disturbing activities. The development of new routes may directly or indirectly affect NHT resources by removing vehicle use from sensitive areas for the long term at a minor to moderate level of intensity.

Designation of a few routes to a nonmotorized level of use may have a direct and indirect protective effect on NHT resources for the long term by prohibiting motor vehicle use, thereby reducing or eliminating the number of visitors in a localized area.

From Visual Resources on National Historic Trails

Decisions regarding management of visual resources may indirectly affect the settings of the Anza and its associated sites in localized areas for the long term at a minor to major level. Under this alternative, a mixture of management allocations is employed for different areas of the Lower Sonoran. The allocation of VRM Class IV (71 percent of the trail area) would allow visual intrusions and associated ground disturbing activities associated with a variety of uses to dominate the landscape at a level which would damage or destroy National Trail resources as well as historic landscape integrity at a moderate to major level of intensity in localized areas for the long and short term.

The allocation of VRM Class III (25 percent of the trail area) would impact the integrity of NHT resources and historic landscape settings by allowing visual intrusions on the landscape and associated ground disturbing activities associated with a variety of land uses at a level which would deteriorate the integrity of trail segments and settings.

From Wilderness Characteristics on National Historic Trails

No lands manged to protect wilderness characteristics would be allocated in Alterative A for the Lower Sonoran Decision Area.

4.19.3.2.4. Wilderness Areas

From Livestock Grazing on Wilderness Areas

Implementation of Alternative A would leave existing livestock grazing regimes in place, and could have minor and localized impacts on naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. Taken as a whole however, current-grazing regimes would not detract from nor greatly alter current wilderness conditions in the Lower Sonoran over the life of the plan.

Localized impacts could occur with potential minor effects. The basis for this: (1) livestock use adjustments with increased or fewer animals; (2) changes to grazing management systems; (3) potentially large ephemeral turnouts causing short-term impacts on naturalness and loss of solitude and primitive recreation opportunities; and (4) construction or abandonment of rangeland developments. Such actions would degrade or enhance naturalness and opportunities for solitude and primitive, unconfined recreation. Impacts from grazing are further detailed in the Woolsey Peak Wilderness and Signal Mountain Wilderness Management Plan, Environmental Assessment, Finding of Not Significant Impact, and Decision Record (BLM, 2003).

From Visual Resources on Wilderness Areas

Under Alternative A, public lands adjacent to the Signal Mountain, Woolsey Peak and Sierra Estrella Wilderness Areas would retain existing VRM classes, which include VRM Class IV in the Lower Sonoran. Such VRM class allocations would allow for landscape altering activities that could be visible from adjacent wilderness areas, resulting in potentially minor to moderate long term visual detractions from naturalness and opportunities for solitude. Wilderness areas themselves are classified as VRM Class I, with the objective of preserving the existing character of the landscape. While this would not preclude many forms of management activity, the level of change to the characteristic landscape should remain low and must not attract attention. Impacts to naturalness and opportunities for solitude would thus be negligible to minor.

From Wilderness Characteristics on Wilderness Areas

No areas would be allocated as lands manged to protect wilderness characteristics under Alternative A. Two areas with wilderness characteristics are adjacent to the Woolsey Peak and Signal Mountain wildernesses. Not allocating these areas as lands manged to protect wilderness characteristics would result in minor harm to naturalness and opportunities for solitude and primitive, unconfined recreation within adjacent wilderness areas. In the Lower Sonoran Decision Area, impairment occur from land use authorizations, construction of facilities, recreation uses, mining and other uses on lands manged to protect wilderness characteristics.

Future site development for public interpretive and educational purposes, excavation for scientific study, or other similar activities would have negligible to no short or long-term effects on the naturalness of designated wilderness areas. Management of cultural and heritage resources in

wilderness areas would continue on a case-by-case basis as directed and guided by approved wilderness management plans and policy.

4.19.3.3. Sonoran Desert National Monument

4.19.3.3.1. Areas of Critical Environmental Concern

From Cultural and Heritage Resources on Areas of Critical Environmental Concern

Currently there are 3,500-acres of public lands within the Vekol Valley Grasslands ACEC. This ACEC was designated to protect a grassland system. Currently the Vekol Valley ACEC lies within the SDNM; however, it was designated before the conception of the SDNM. The ACEC has an existing decision of the previous RMP, to "close the Vekol Valley Grassland ACEC to OHV use," and remains in effect. Impacts would be expected to be minor under current conditions.

From Lands & Realty on Areas of Critical Environmental Concern

Under Alternative A, the Vekol valley ACEC could be impacted by lack of RMP-level decisions regarding LUA developments. Impacts would be expected to range from minor to major.

From Livestock Grazing on Areas of Critical Environmental Concern

In accordance with the Monument proclamation, livestock grazing in the Vekol Valley ACEC would continue until existing permits expire, at which time the allotments would be permanently closed to grazing. This would eliminate any long-term impacts from grazing. In the short term, grassland conditions in the ACEC would continue to be impacted by grazing until the allotments are closed; however, intensive management of grazing in the form of adequate rest periods would ensure that the health and vigor of the tobosa grassland would be maintained and the amphibian habitat protected. Livestock grazing would also be controlled via the existing pasture fence.

From Minerals Management on Areas of Critical Environmental Concern

The withdrawal of the SDNM from all mineral entry in the Monument has a protective effect on the ACEC at a negligible to minor level due to the elimination of surface disturbing activities associated with mineral exploration, development, and extraction.

From Priority Wildlife Species and Habitat Management on Areas of Critical Environmental Concern

The continued implementation of existing Priority Wildlife Species and Habitat management decisions under Alternative A would generally be protective of the resource values of the ACEC. It would be unlikely that developing wildlife waters on a case-by-case basis under Alternative A would affect the resource values for which the ACEC was designated.

Other existing wildlife management decisions related to desert bighorn sheep, desert tortoise, and cactus-ferruginous pygmy-owl habitat would not apply to the resource values of the ACEC as habitat for these species does not occur within the ACEC. Impacts would be expected to range from negligible to moderate under current conditions.

From Recreation Management on Areas of Critical Environmental Concern

The Vekol Valley ACEC area would not be located within a SRMA as the ACEC is not recognized for its recreation value and recreation use of this area is discouraged due to problems with illegal immigration activities in this area.

From Soil Resources on Areas of Critical Environmental Concern

The management of watersheds, soils under Alternative A would protect localized areas of the Vekol Valley ACEC from potential impacts related to OHV use in the area. Impacts would be expected to range from negligible to minor.

Repairing and maintaining the existing watershed dike system and associated watershed fence in upper Vekol Valley would potentially improve habitat resource values of the ACEC as well as the unique amphibian populations associated with the watershed dike system. Impacts would be expected to range from negligible to minor.

From Special Designations on Areas of Critical Environmental Concern

Alternative A would involve management practices to maintain and enhance the resource values for which the Vekol Valley ACEC was designated. Alternative A would also require the integration of management prescriptions outlined the proclamation, including the protection of Monument values. Since Monument values coincide with the ACEC resource values, specific protection provided by Monument designation duplicates the protective measures of the ACEC. Impacts would be expected to be negligible.

From Travel Management on Areas of Critical Environmental Concern

The area is closed to OHV use. Continuation of these policies under Alternative A would be protective of the resource values of the ACEC.

From Vegetation Resources on Areas of Critical Environmental Concern

The continued implementation of existing vegetation management decisions under Alternative A would generally be protective of the resource values of the ACEC. Invasive species management would continue to be limited to targeting populations of noxious weeds that can be controlled or eliminated by approved methods. This would limit the BLM's ability to minimize or reduce potential impacts of noxious weeds on grassland communities in the ACEC.

The harvesting of vegetation (including wood harvesting) would potentially affect resource values in the ACEC. Continuing to emphasize passive restoration by natural processes would potentially benefit the resource values of the ACEC in localized areas.

From Visual Resources on Areas of Critical Environmental Concern

Under Alternative A, the Vekol Valley ACEC would be managed under Class III VRM standards, which would provide appropriate protection of the area's scenic resources but would not restrict activities that could affect the resource values for which the ACEC was designated.

From Water Resources on Areas of Critical Environmental Concern

Impacts would be negligible.

From Wilderness Characteristics on Areas of Critical Environmental Concern

No known impacts would occur.

4.19.3.3.2. National Byways

No allocations.

4.19.3.3.3. National Historic Trails

From Minerals Management on National Historic Trails

The withdrawal of the SDNM from all mineral entry in the Monument has a protective effect on the Anza NHT at a minor to major level due to the elimination of surface disturbing activities associated with mineral exploration, development, and extraction.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Recreation Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Special Designations on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Travel Management on National Historic Trails

The use, operation, and maintenance of existing routes may directly impact the Anza NHT resources and Monument objects in a minor to major level for the long term by cutting, filling, and other ground disturbing activities associated with the use and care of routes. The use, operation, and maintenance of existing routes may indirectly impact NHT resources in a minor to moderate level for the long term by allowing access into sensitive trail segments and site areas or altering drainage patterns leading to inundation or erosion.

The development of new routes may directly impact the Anza NHT resources and Monument objects in a minor to major level for the long term by the use of ground disturbing activities. The development of new routes may directly or indirectly affect NHT resources by removing vehicle use from sensitive areas for the long term at a minor to moderate level of intensity.

Designation of a few routes to a nonmotorized level of use may have a direct and indirect protective effect on the Anza NHT resources and Monument objects for the long term by prohibiting motor vehicle use, thereby reducing or eliminating the number of visitors in a localized area.

From Visual Resources on National Historic Trails

The Anza NHT corridor, as an object of the SDNM, runs through a mixture of management strategies from VRM Class II, Class III, and Class IV. Management of the NHT under Class IV (approximately 41 percent of the trail area in the Monument) would allow visual intrusions and associated ground disturbing activities to dominate the landscape at a level which would damage or destroy trail and historic landscape integrity through loss of the very elements that the Anza NHT was designated to do. These activities and ground disturbing projects would be completely incompatible with National Trail as well as Monument object protection related goals. The impacts would occur at a major level of intensity within this area.

Allocation of the Anza NHT corridor within the SDNM in a VRM Class III (approximately 21 percent of the trail area in the Monument) would impact the trail and its historic settings by allowing visual intrusions on the landscape and associated ground disturbing activities at a level which would quickly deteriorate its integrity. Management at this level would allow activities and developments that are completely incompatible with a NHT, at a moderate to major level of intensity in localized areas for the long term.

The areas of the trail within the center areas of the SDNM would be managed at a VRM Class II (approximately 31 percent of the trail area in the Monument), which would have a far more beneficial effect on the essential characteristics and attributes of a NHT and the associated Monument objects. Management of activities and developments would be more restrictive in terms of visual intrusions and ground disturbing activities on the historic landscape, leading to a more protection of the trail resources and Monument objects, at a minor to moderate level of intensity throughout the SDNM.

From Wilderness Characteristics on National Historic Trails

No lands manged to protect wilderness characteristics would be allocated on the Monument under Alterative A.

4.19.3.3.4. Wilderness Areas

From Livestock Grazing on Wilderness Areas

Implementation of Alternative A would leave the existing livestock grazing regime in place. This could have moderate landscape level impacts on naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. This is a moderate impact because the livestock grazing forage utilization prescriptions for the North and South Maricopa Mountain Wilderness Areas, as set by the Maricopa Complex Wilderness Management Plan, Environmental Assessment and Decision Record (BLM, 1995) are not fully being met. Taken as a whole however, current-grazing regimes would not detract from nor greatly alter current wilderness conditions in the SDNM over the life of the plan; these regimes would just maintain the current state of affairs.

On the other hand, Monument management prescriptions could add an additional level of protection to protecting wilderness values. Livestock grazing impacts are more fully detailed in the Maricopa Complex Wilderness Management Plan, Environmental Assessment and Decision Record (BLM, 1995).

Localized impacts could also occur with potential moderate effects. The basis for this: (1) livestock use adjustments with increased or fewer animals; (2) changes to grazing management systems; (3) potentially large ephemeral turnouts causing short-term impacts on naturalness, vegetation, and loss or impairment of solitude and primitive recreation opportunities; (4) failure to currently satisfy all rangeland health standards; and (5) construction or abandonment of rangeland developments. Such actions could degrade or enhance naturalness and opportunities for solitude and primitive, unconfined recreation.

From Recreation Management on Wilderness Areas

A small portion of the Gila Trails SRMA would overlap four miles along the southern boundary of the North Maricopa Mountains Wilderness Area. Impacts would negligible.

From Visual Resources on Wilderness Areas

Under Alternative A, public lands adjacent to the North Maricopa Mountains, South Maricopa Mountains, and Table Top Wilderness Areas would retain existing VRM classes, which include VRM Class III in the SDNM. Such VRM class allocations might allow for minor to negligible landscape altering activities that could be visible from adjacent wilderness areas, resulting in potentially minor long term visual detractions from naturalness and opportunities for solitude. However, it must be noted that Monument status offers considerable resource and landscape protection. wilderness areas themselves are classified as VRM Class I, with the objective of preserving the existing character of the landscape. Impacts to naturalness and opportunities for solitude would thus be negligible.

From Wilderness Characteristics on Wilderness Areas

No areas would be allocated as lands managed to protect wilderness characteristics under Alternative A. Two areas with wilderness characteristics are adjacent to the North and South Maricopa wildernesses in the SDNM. Not allocating these areas as lands manged to protect wilderness characteristics would have negligible to no impact on naturalness and opportunities for solitude and primitive, unconfined recreation in designated wilderness.

4.19.4. ALTERNATIVE B

Under Alternative B, special designations would include the six wilderness areas, the Juan Bautista de Anza NHT, Agua Caliente Scenic Byways in the Lower Sonoran, and the existing Coffeepot Botanical ACEC. In the SDNM, the Vekol Valley Grasslands ACEC designations would be removed and the area would be managed in accordance with the terms of the SDNM proclamation. The Juan Bautista de Anza NHT would be managed in concert with the Lower Gila Historic Trail SRMA in the Lower Sonoran and would be consistent with the NPS management plan. Agua Caliente road in the Lower Sonoran would be designated as scenic byway and would be managed to protect the visual resource and natural character of the view shed. Actions that would affect the qualities for which these areas were designated or are proposed for designation are considered impacts (see Map 2-16b).

4.19.4.1. Both Decision Areas

4.19.4.1.1. Areas of Critical Environmental Concern

No unique impacts.

4.19.4.1.2. National Byways

No unique impacts.

4.19.4.1.3. National Historic Trails

From Air Quality on National Historic Trails

Impacts would be the same as those described under Alternative A for both Decision Areas.

From Cultural and Heritage Resources on National Historic Trails

Impacts would be the same as those described under Alternative A, except, a greater number of sites would be allocated to public use. These allocations would lead to interpretive developments that may directly impact the NHT trails at a moderate level for the long term by altering access points, installation of facilities along the trail and onto areas adjacent to the site, and attracting additional visitation and possibly vehicle-based activities.

From Lands & Realty on National Historic Trails

Under Alternative B, the NHT would be allocated as LUA Exclusion Area and excluded from any potential utility-scale renewable energy development. Impacts from these allocations would have a moderate affect on the NHT, as there would be no surface disturbances from LUAs within the NHT's boundaries, thus assisting the execution of NHT goals and objectives.

Lands within the NHT boundaries would also be retained. Impacts would be minor.

From Livestock Grazing on National Historic Trails

Impacts would be the same as those described under Alternative A for both Decision Areas, just slightly decrease, as there would be half as many AUMs throughout the Decision Area, thus decrease potential surface disturbing activities from livestock movement that might harm the integrity of the NHT. Impacts would be minor.

4.19.4.1.4. Wilderness Areas

From Special Designations on Wilderness Areas

Impacts from special designations under Alternative B would be negligible.

From Wilderness Characteristics on Wilderness Areas

As under Alternative A, no lands manged to protect wilderness characteristics would be allocated. Impacts would thus be the same as those described under Alternative A.

4.19.4.2. Lower Sonoran

4.19.4.2.1. Areas of Critical Environmental Concern

From Cultural and Heritage Resources on Areas of Critical Environmental Concern

Developing facilities to preserve the integrity of cultural landscapes and management of heavily visited culturally significant resources would provide protection of cultural resources within the Coffeepot Botanical ACEC and would be an improvement as compared to Alternative A. For wildlife impacts associated with developing facilities would be expected to range from negligible to minor, depending on the location of facilities and duration of use at the facilities.

From Lands & Realty on Areas of Critical Environmental Concern

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Livestock Grazing on Areas of Critical Environmental Concern

Livestock use would be managed to perpetuate botanical diversity and range developments would not be located in areas that would increase livestock use where local populations of the cacti could be found. Reduce perennial grazing would be used. Overall impacts would be expected to range from negligible to moderate.

From Minerals Management on Areas of Critical Environmental Concern

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on Areas of Critical Environmental Concern

Under Alternative B impacts would be similar to Alternative A except the ACECwould be closed to OHV use reducing fragmentation and the possible crushing of individual plants. Mining activities would be required to be mitigated as to not disturb individual plants and avoid known populations for the cactus reducing habitat fragmentation and allowing persistence of the species on a small scale. Livestock use would be managed to perpetuate botanical diversity and range developments would not be located in areas that would increase livestock use where local populations of the cacti could be found. Overall impacts would be expected to range from negligible to moderate.

From Recreation Management on Areas of Critical Environmental Concern

Impacts would be expected to be similar to Alternative A.

From Soil Resources on Areas of Critical Environmental Concern

Ensure watersheds are in properly functioning condition consistent with Land Health Standards. Characteristics of a properly functioning watershed include channels that are stable and in balance with the landscape; erosion and sediment deposition appropriate for the ecological site; infiltration of surface water in soils sufficient to support desired future conditions (DFCs) and minimize erosion from runoff; and flood frequencies, durations, and magnitudes appropriate for the landscape. Impacts would be expected to range from negligible to minor.

Disturbance of sensitive soil surfaces, including those classified as highly susceptible to wind and water erosion and those with protective desert pavement or well-developed cryptogamic crust will be avoided. If disturbance occurs, damage will be mitigated. Impacts would be expected to range from negligible to minor.

From Special Designations on Areas of Critical Environmental Concern

Under Alternative B, the 8,900-acre Coffeepot Botanical ACEC designation would be removed, reducing protections to special status species such as the Acuña cactus, cactus ferruginous pygmy-owl, lesser long-nosed bat, and desert tortoise. Impacts from removing the designation under this alternative and not carrying forward in other alternatives could be expected to range from minor to major.

From Travel Management on Areas of Critical Environmental Concern

Under Alternative B impacts would be similar to Alternative A except the ACEC would be closed to OHV use reducing fragmentation and the possible crushing of individual plants. Impacts would be expected to be negligible.

From Vegetation Resources on Areas of Critical Environmental Concern

Under Alternative B impacts would be similar to Alternative A except the ACEC would be closed to OHV use reducing fragmentation and the possible crushing of individual plants. Mining activities would be required to be mitigated as to not disturb individual plants and avoid known populations for the cactus reducing habitat fragmentation and allowing persistence of the species on a small scale. Livestock use would be managed to perpetuate botanical diversity and range developments would not be located in areas that would increase livestock use where local populations of the cacti could be found. Overall impacts would be expected to range from negligible to moderate.

From Visual Resources on Areas of Critical Environmental Concern

The majority of the Coffeepot Botanical ACEC would be assigned to VRM Class II. The El Paso Natural Gas ROW/Gas Pipeline Road would be Class III. This, along with the management decision to manage the viewshed of the Batamote-Coffeepot Mountains to protect scenic values of the viewsheds, would be a more protective designation than under Alternative A. Associated restrictions on development/use would protect the scenic and natural landscape values of the ACEC, as well as protect the other resource values of the ACEC.

Impacts would be expected to range from negligible to major.

From Water Resources on Areas of Critical Environmental Concern

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Wilderness Characteristics on Areas of Critical Environmental Concern

There are no lands manged to protect wilderness characteristics. Impacts are expected to be negligible.

4.19.4.2.2. National Byways

From Lands & Realty on National Byways

Designation of the Aqua Caliente Road as a Back Country Byway could limit or hinder land use authorizations if they detracted from or impaired the scenic, natural, recreational, visual, and cultural opportunities represented by this proposed 30-mile byway.

The management goals presented by this byway could be in major and direct opposition to the long-term considerations of Maricopa County. The county, in various master regional transportation system documents, has plans that over the long term, would upgrade this road from maintained dirt to pavement. This action, in turn, would achieve safe higher speed travel, but eliminate the recreational Back Country Byway exploratory opportunity aspects of the current road.

From Recreation Management on National Byways

Recreation opportunities, benefits, and experiences would be moderately enhanced by the designation of the 30-mile Agua Fria back Country Byway. In turn, this would enhance the motoring experience of the byway's users. Impacts would be minor.

From Special Designations on National Byways

Special designations would have negligible impacts on the proposed Aqua Caliente Back Country Byway.

From Travel Management on National Byways

The comprehensive travel and route management system implemented under Alternative B would be compatible and offer moderate protection to sustain the natural, scenic, visual, recreational and cultural sites and associated opportunities afforded by this proposed byway. Impacts would be negligible to minor.

From Visual Resources on National Byways

Minor to moderate impacts are anticipated on the proposed Agua Caliente Byway from Class III VRM prescriptions bestowed under this alternative. The protection offered by this VRM is less than optimal for the preservation of the route's scenic, natural, and recreational benefits and outcomes. Over the long-term, some of these byway attributes could be moderately impaired.

4.19.4.2.3. National Historic Trails

From Minerals Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Recreation Management on National Historic Trails

Under Alternative B, the majority of the NHT would be managed under the Lower Gila Historic Trails SRMA-Gila River RMZ. For the areas outside of this planned management area, the impacts would be the same as Alternative A for the Lower Sonoran.

In the Lower Gila Historic Trails SRMA, vehicle-based, front country route exploration is anticipated to be complementary and more protective to the historic trail segments that cross the unit than under Alternative A. It is anticipated that this activity would impact NHT resources on a minor level for a short duration, in localized areas due to vehicle incursions. Camping in a dispersed manner may affect the integrity of NHT resources directly by vehicle incursions, trampling, and indirectly by possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity over the long term, in localized areas.

From Special Designations on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran, in addition, development of interpretive media and facilities would have a minor to moderate effect on NHT resources in localized areas.

Public use and management under a SRMA forms the framework of this alternative. As visitation increases, NHT resources may be impacted directly and indirectly by disturbance due to vehicle use and trampling by visitors. As additional interpretive media is developed for the trail, increasing visitation may impact the trail resources directly by vehicle damage to associated site features and trampling. As vehicle-based visitation is highly promoted under this alternative, effects to NHT resources are expected to be far greater in level than that expected under Alternative A.

From Travel Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except, a considerable increase in the length of the road network may affect many more NHT resource sites, segments, and landscapes (historic settings) directly by cutting through and near sites. Impacts would still range from minor to moderate.

From Visual Resources on National Historic Trails

The allocation of at least 87 percent of the trail area to VRM Class III would impact the integrity of Anza National Trail resources and historic landscape settings only slightly less than under

Alternative A by allowing visual intrusions on the landscape and associated ground disturbing activities associated with a variety of land uses at a level which would deteriorate the integrity of trail segments and settings.

The remainder of the NHT corridor lies on lands allocated to the Class IV VRM level which would allow visual intrusions and associated ground disturbing activities associated with a variety of uses to dominate the landscape at a level which would damage or destroy National Trail resources as well as historic landscape integrity at a moderate to major level of intensity in localized areas for the long and short term. Impacts from VRM would range from minor to moderate.

From Wilderness Characteristics on National Historic Trails

No lands manged to protect wilderness characteristics would be allocated under Alterative B for the Lower Sonoran.

4.19.4.2.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Lands & Realty on Wilderness Areas

The number, width, and capacity of utility corridors adjacent to the Woolsey Peak and Signal Mountain Wildernesses would remain essentially unchanged from existing alignments, with impacts similar to Alternative A. A fully utilized and built-out utility corridor adjacent to the Sierra Estrella Wilderness would indirectly reduce naturalness and opportunities for solitude within the north ½ of the Sierra Estrella Wilderness to a moderate degree over the long term. Additional powerlines, pipelines and associated support infrastructure sited in this corridor would be noticeable from half of this area, essentially for two reasons: (1) the wilderness has an open unscreened aspect to the southwest; and, (2) the utility corridor forms about five miles of the wilderness area boundary. Impacts would be minor.

From Livestock Grazing on Wilderness Areas

The prospective for improved forage or vegetation conditions from modified grazing practices and a 51 percent reduction in AUMs could result in long-term vegetative and visual impacts on the landscape that would maintain or improve naturalness. Forage allocated to livestock would instead be available to native wildlife. The sights of cattle trailing, cow waste, and trampled vegetation would be moderately reduced, enhancing wilderness values. Impacts from livestock infrastructure management would be similar as described under Alternative A. There will be no impact from water development installation over the long term as the current wilderness management plan prohibits new livestock developments in the Signal Mountain and Woolsey Peak Wilderness Areas.

From Priority Wildlife Species and Habitat Management on Wilderness Areas

Overall, implementation of the wildlife-related ecological and biological resources measures of Alternative B would offer minor contributions to naturalness to a greater degree than would

implementation of Alternative A by emphasizing connectivity of wildlife habitat, use of native vegetation in restoration efforts, and measures to maintain populations of native wildlife. In contrast, implementation of Alternative B would cause a minor and more substantial detraction from naturalness than would Alternative A due to the potential increased density of new wildlife water developments.

Under Alternative B, new wildlife waters would potentially be built in wilderness areas. Construction activities would detract from naturalness and opportunities for solitude, causing short-term impacts to wilderness values. In the long term, the presence of new permanent structures in wilderness areas would detract from naturalness. Moreover, long-term, impacts to naturalness could also result if abnormally abundant watering sources lead to unnatural wildlife population levels or behaviors. Impacts from wildlife waters would be minor.

Reintroductions, transplants, and supplemental stockings of native wildlife would be conducted in collaboration with AGFD; existing earthen livestock waters could be used as refugia for native wildlife where livestock grazing is not longer permitted; and the placement of fences would be restricted or mitigated to avoid adverse impacts to wildlife. Long-term contributions to naturalness in wilderness areas would result if such actions would maintain native wildlife populations at natural levels. Impacts would be negligible to minor.

From Recreation Management on Wilderness Areas

Implementation of Alternative B would contribute to naturalness and opportunities for solitude and primitive recreation to a greater degree than would Alternative A. Alternative B would allocate the Gila Bend Mountains SRMA, which includes all lands within the Signal Mountain and Woolsey Peak Wildernesses. Existing ROS management classes would be replaced by RMZ settings, with all designated wilderness managed as back country RMZ. This setting would sustain setting characteristics that produce opportunities for remote primitive recreation experiences.

Under Alternative B, long-term, contributions to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would result where restrictions to motorized travel occur adjacent to wilderness areas. Such impacts would occur to a greater degree than under Alternative A.

Contributions to naturalness and opportunities for solitude and primitive recreation would be further enhanced under Alternative B where public lands adjacent to wilderness areas would be managed as part of the back country RMZ. Impacts would be minor.

From Travel Management on Wilderness Areas

Implementation of Alternative B would contribute to naturalness and opportunities for solitude and primitive recreation to a moderate degree more than would Alternative A. Most existing motorized roads providing access or forming a wilderness boundary would remain available for use next to wilderness areas. However; unlike Alternative A, there would be careful consideration of potential impacts from motorized use of such roads on adjacent wilderness areas and their associated indicators. Motorized routes with a predilection to contribute to moderate levels of vehicle trespass or resource-based impacts (plant theft, wood cutting, fires, campsite clearing, target shooting, OHV staging, parking) on the periphery of wilderness areas would remain open, but adverse uses would be mitigated through various management options available to the BLM for corrective action.

Contributions to naturalness and opportunities for solitude and primitive recreation would be augmented under Alternative B because roads and primitive roads adjacent to wilderness areas would eventually be managed as part of a designated comprehensive travel management network. Potentially moderate, but adverse effects, from motorized intrusions and associated recreation uses would be reduced or eliminated in some areas. Moreover, boundary roads and cherry stem roads would be managed as part of a designated and comprehensive travel management network. Consequently, adverse effects from motorized intrusions and associated recreation activities would be lessened or eliminated in many areas.

Over-the-long-term associated management actions would reduce travel and access based impacts on wilderness to minor or negligible levels.

From Vegetation Resources on Wilderness Areas

Under Alternative B, active restoration of surface disturbances would be emphasized, use of native species in all restoration projects would be required, and an integrated weed management program to control invasive species would be put into place. The use of native species and control of invasive species would limit the spread of non-native vegetation and reduce the size and intensity of wildfires, which would otherwise destroy native vegetation of non-fire adapted areas of the Sonoran Desert, resulting in moderate and long-term contributions to the wilderness value of naturalness. A reduction in grazing activities and AUMs would generally mean smaller herds and could result in an increase in forage production.

From Visual Resources on Wilderness Areas

Impacts would be the same as those described under Alternative A, except that under Alternative B, public lands adjacent to the Woolsey Peak and Signal Mountain Wildernesses would be classified as VRM Class II, with the objective of retaining the existing character of the landscape. Such actions would play a minor part and indirectly contribute to naturalness of the two wilderness areas to a greater degree than would Alternative A. Public lands adjacent to the Sierra Estrella Wilderness would retain existing VRM classifications of Class III and Class IV, which would result in the same impacts as described under Alternative A.

4.19.4.3. Sonoran Desert National Monument

4.19.4.3.1. Areas of Critical Environmental Concern

No ACECs are allocated in this Alternative for the SDNM. The Monument's proclamation provides the necessary protection that an ACEC would provide.

4.19.4.3.2. National Byways

No national byways are designated under Alternative A in the Monument.

4.19.4.3.3. National Historic Trails

From Minerals Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Improvements to existing wildlife water developments may affect the Anza NHT and associated resources as Monument objects directly at a minor to moderate level in localized areas in the short term as old developments are remodeled. These impacts would be direct due to the use of heavy equipment to excavate and replace old facilities and indirect due to changes in adjacent drainage patterns leading to erosion of cultural sites. Impacts would be minor to moderate.

From Recreation Management on National Historic Trails

Under Alternative B, the NHT would be managed under the SDNM SRMA – Anza NHT RMZ. It is anticipated that the actions under this allocation would offer the same level of protection to the Anza NHT resources and Monument objects as Alternative A because the increased management would not be enough to counteract the sharp increase in public visitation.

In the SDNM SRMA – Anza NHT RMZ, the majority of the lands would be allocated to this level of management, as back country. In the back country, it is expected that camping in a dispersed manner and increased vehicular recreation may affect the integrity of Anza NHT resources and Monument objects directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts at a minor level of intensity over the long term, in localized areas. Impacts are anticipated to be minor to moderate.

From Special Designations on National Historic Trails

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Travel Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument, except for a considerable increase in the length of the road network may affect many more of the Anza NHT resource sites, segments, landscapes (historic settings), and Monument objects directly by cutting through and near sites. Impacts would range from minor to moderate.

From Visual Resources on National Historic Trails

Allocation of the Anza NHT corridor within the SDNM in a VRM Class III (approximately 93 percent of the trail area in the Monument) locale would impact the trail and its historic settings far more than under Alternative A by allowing visual intrusions on the landscape and associated ground disturbing activities at a level which would quickly deteriorate its integrity. Management at this level would allow surface disturbing activities and intrusive developments that are completely incompatible visually with a NHT and may threaten the Monument objects, at a moderate to major level of intensity throughout the SDNM.

From Wilderness Characteristics on National Historic Trails

No lands manged to protect wilderness characteristics would be allocated under Alterative B for the Monument.

4.19.4.3.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

Impacts would be the same as those described in the Lower Sonoran for Alternative B.

From Lands & Realty on Wilderness Areas

The three one-mile wide corridors in the SDNM would not directly impact the naturalness or wilderness opportunities of the wilderness areas within the Monument.

Installation of new facilities in the I-8 utility corridor south of the highway would have minor and indirect impacts on the South Maricopa Mountains Wilderness. Currently this corridor is occupied only by the highway with no underground or overhead facilities. The sight of new overhead facilities would extend northward one to two miles into the wilderness. However, this effect would have no greater influence than the sights and sounds of highway traffic currently experienced by wilderness visitors in areas along the highway.

Installation of new facilities in the Santa Rosa to Gila Bend utility corridor would have no visual effect on the South Maricopa Mountains Wilderness located to the south. The utility corridor is currently occupied by a highway, sets of railroad tracks, pipelines, optic lines and overhead transmission facilities. New installations would compliant with VRM prescriptions, nor add greatly to the level of visual commotion currently present in the landscape. Impacts would be negligible from this corridor.

From Livestock Grazing on Wilderness Areas

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on Wilderness Areas

Overall, implementation of the wildlife-related ecological and biological resources measures of Alternative B would offer minor contributions to naturalness to a greater degree than would implementation of Alternative A by emphasizing connectivity of wildlife habitat, use of native vegetation in restoration efforts, and measures to maintain populations of native wildlife. In contrast, implementation of Alternative B could cause a more minor detraction from naturalness than would Alternative A through a potentially increased density of new wildlife water developments.

Under Alternative B, potentially new wildlife waters would be built in SDNM wilderness areas, and considered on a case-by-case basis. Construction activities would detract from naturalness and opportunities for solitude, causing short-term impacts to wilderness values. In the long term, the presence of new permanent structures in wilderness areas would detract from naturalness. Long-term, impacts to naturalness could also result if artificially abundant watering sources lead to unnatural wildlife population levels and behaviors. Impacts from wildlife waters would be minor.

Reintroductions, transplants, and supplemental stockings of native wildlife would be conducted in collaboration with AGFD and/or FWS; existing earthen livestock waters would be used as refugia for native wildlife where livestock grazing is not longer permitted; and the placement of LUAs, and fences would be restricted or mitigated to avoid adverse impacts to wildlife. Long-term

contributions to naturalness in wilderness areas would result if such actions would maintain native wildlife populations at natural levels.

From Recreation Management on Wilderness Areas

The SDNM's wilderness areas would be included in the SDNM SRMA and part of the. Recreation allocations and prescriptions established by those SRMAs are fully compatible with wilderness management and current wilderness management plans. Accordingly, negligible impacts on wilderness values are anticipated. As described under Alternative A, about 4 percent of the North Maricopa Mountains Wilderness would be subject to minor impacts from the sights and sounds of visitor management and resource protection infrastructure along the Lower Gila Historic Trails SRMA (Anza NHT and the Butterfield Overland Stage Trail). Elsewhere, few to no noticeable impacts from recreation use management on wilderness values would be anticipated.

From Travel Management on Wilderness Areas

Under Alternative B, minor, but long-term, contributions to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would result, mainly where motorized travel restrictions occur adjacent to wilderness areas. The first contribution would accrue from minor route closures. The second benefit would accrue from improved stewardship of travel management networks.

Beneficial impacts would emerge to a greater degree than under Alternative A. A few routes around the north part of the North Maricopa Mountains Wilderness and one spur route along the northern end of Table Top Wilderness would be closed under Alternative B. Such specific route closures would precipitate a localized reduction or elimination in the motorized trespass and recreation-related impacts on wilderness values as described under Alternative A.

Most existing motorized roads providing access or forming a wilderness boundary would remain available for use next to wilderness areas. However; unlike Alternative A, there would be careful consideration of potential impacts from motorized use of such roads on Monument objects and adjacent wilderness areas and their associated indicators. Motorized routes with a predilection to contribute to moderate levels of vehicle trespass or resource-based impacts (plant theft, wood cutting, fires, campsite clearing, target shooting, OHV staging, parking) on the periphery of wilderness areas could remain open, but adverse uses would be thoroughly mitigated through various management options available to the BLM for corrective action.

Contributions to naturalness and opportunities for solitude and primitive recreation would be augmented under Alternative B because roads and primitive roads adjacent to wilderness areas would eventually be managed as part of a designated comprehensive travel management network. Potentially minor, but adverse effects, from motorized intrusions and associated recreation uses would be reduced or eliminated in some areas. Over-the-long-term associated management actions would reduce travel and access based impacts on wilderness to negligible levels.

From Vegetation Resources on Wilderness Areas

Under Alternative B, current vegetation communities would be maintained or enhanced over the long term. Active restoration of surface disturbances would be emphasized, use of native species in all restoration projects would be required, an integrated weed management program to control invasive species would be put into place, and grazing AUMs would be reduced 31 percent.

The use of native species and control of invasive species would limit the spread of non-native vegetation and reduce the size and intensity of wildfires, which would otherwise destroy native vegetation of non-fire adapted areas of the Sonoran Desert, resulting in long-term contributions to naturalness. The health and vigor of vegetative communities would be sustained. As compared to Alternative A, this alternative would have a moderate influence on the health and vigor of plants and vegetative communities in the two wilderness areas north of I-8, and a major influence on the Table Top Wilderness vegetation south of the highway. A reduction in grazing activities and AUMs would generally mean smaller herds and could result in an increase in forage production.

From Visual Resources on Wilderness Areas

In the SDNM, much of the lands surrounding wilderness areas would be allocated to VRM Class II, which would have minor and indirect contribute to naturalness in the adjoining wilderness areas.

From Wilderness Characteristics on Wilderness Areas

As under Alternative A, no lands manged to protect wilderness characteristics would be allocated. Impacts would thus be the same as those described under Alternative A.

4.19.5. ALTERNATIVE C

Under Alternative C, the Coffeepot Botanical ACEC would be expanded from 8,900 acres under Alternative A and B to 63,300 acres under Alternative C. The Aqua Caliente Back Country Byway would be carried forward from Alternative B. Arizona State Route 238 would be established as a National Scenic Byway of 18 miles crossing east to west through the SDNM. The Vekol Valley ACEC of 3,500-acres within the SDNM would not be carried forward.

4.19.5.1. Both Decision Areas

4.19.5.1.1. Areas of Critical Environmental Concern

No unique impacts.

4.19.5.1.2. National Byways

No unique impacts.

4.19.5.1.3. National Historic Trails

From Air Quality on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except, any reductions in vehicle use on dirt roads may have an indirect, yet protective effect on Anza Trail resources at a minor level for the long term by reducing the amount of ambient dust in the area where interpretive facilities are planned or are located.

From Cultural and Heritage Resources on National Historic Trails

Under Alternative C, a SCRMA would be allocated in a way that incorporates the Anza Trail (Map 2–1c). The purpose of this SCRMA will be to focus management of cultural and National Trail resources for public use and scientific use. This allocation would have a protective effect on the Anza Trail due to the higher priority that would be placed on the area for inventorying and monitoring. This would be expected to be at a minor to moderate intensity for the long term.

From Lands & Realty on National Historic Trails

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Livestock Grazing on National Historic Trails

Impacts would be the same as those described under Alternative A for both Decision Areas, just slightly decrease, as there would be no ephemeral grazing, thus decreasing the potential surface disturbing activities from livestock movement year-round that might harm the integrity of the NHT. Impacts still remain minor to moderate, as livestock grazing would still be allowed during certain portions of the year.

4.19.5.1.4. National Historic Trails

From Air Quality on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except, any reductions in vehicle use on dirt roads may have an indirect, yet protective effect on Anza Trail resources at a minor level for the long term by reducing the amount of ambient dust in the area where interpretive facilities are planned or are located.

From Cultural and Heritage Resources on National Historic Trails

Under Alternative C, a SCRMA would be allocated in a way that incorporates the Anza Trail (Map 2–1c). The purpose of this SCRMA will be to focus management of cultural and National Trail resources for public use and scientific use. This allocation would have a protective effect on the Anza Trail due to the higher priority that would be placed on the area for inventorying and monitoring. This would be expected to be at a minor to moderate intensity for the long term.

From Lands & Realty on National Historic Trails

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Livestock Grazing on National Historic Trails

Impacts would be the same as those described under Alternative A for both Decision Areas, just slightly decrease, as there would be no ephemeral grazing, thus decreasing the potential surface disturbing activities from livestock movement year-round that might harm the integrity of the NHT. Impacts still remain minor to moderate, as livestock grazing would still be allowed during certain portions of the year.

4.19.5.2. Lower Sonoran

4.19.5.2.1. Areas of Critical Environmental Concern

From Cultural and Heritage Resources on Areas of Critical Environmental Concern

The proposed Coffeepot-Batamote ACEC encompasses 63,300 acres of public lands under Alternative C. This ACEC is being proposed to protect lesser long-nosed bat and cactus ferruginous pygmy-owl habitats, outstanding botanical diversity of the native plant communities, botanical resources unique to the area such as the Acuña cactus, desert bighorn sheep other diverse wildlife populations, and outstanding landscape and scenic and cultural resources. The ACECcontains 100 percent public lands and it is recommended to retain those lands within the ACEC as public ownership. Overall impacts to wildlife would be expected to range from negligible to minor.

From Lands & Realty on Areas of Critical Environmental Concern

The ACEC contains 100 percent public lands and it is recommended to retain those lands within the ACEC as public ownership.

New utility, communication, transportation, and utility-scale renewable energy facilities would be avoided with the ACEC. If these actions are avoided within the ACEC negligible to minor impacts wildlife are expected to occur.

Impacts to the Coffeepot Botanical ACEC under Alternative C from the El Paso Natural Gas Multiuse Utility corridor would be negligible, as this portion of the corridor would be removed under Alternative C.

From Livestock Grazing on Areas of Critical Environmental Concern

Livestock grazing would be closed in the ACEC and related infrastructure associated with grazing would be removed. Upon removing grazing minor impacts to wildlife would be expected, however removing associated infrastructure could cause major impacts to wildlife especially if water sources are removed. Water is a scarce resource in the Sonoran desert and removing any water source could be detrimental to wildlife species that have become accustomed to a particular water source. Local populations of wildlife in the area would have to relocate and possibly face mortality without free water. Impacts to wildlife and threatened and endangered species are expected to range from negligible to major.

From Minerals Management on Areas of Critical Environmental Concern

Impacts to resource values in the Coffeepot Botanical ACEC from mineral resource development would be the same as described for Alternative A, except that Alternative C would provide additional standard stipulations that could potentially provide a higher level of protection for resource values within the ACEC. Impacts would be expected to range from negligible to minor.

From Priority Wildlife Species and Habitat Management on Areas of Critical Environmental Concern

The proposed Coffeepot-Batamote ACEC encompasses 63,300 acres of public lands under Alternative C. This ACEC is being proposed to protect lesser long-nosed bat and cactus ferruginous pygmy-owl habitats, outstanding botanical diversity of the native plant communities, botanical resources unique to the area such as the Acuña cactus, desert bighorn sheep other diverse wildlife populations, and outstanding landscape and scenic features. The Coffeepot-Batamote ACEC does contain an endangered plant species the Acuna cacti and foraging habitat for the endangered lesser long-nosed bat. The cactus ferruginous pygmy-owl has been petitioned as a candidate and habitat is available for this species within the ACEC. The ACEC contains 100 percent public lands and it is recommended to retain those lands within the ACEC as public ownership. New routes within the ACEC would be prohibited within washes, unless during route designations conflicts with wildlife are mitigated and minimization criteria would be established. At the time of route designations, mitigation, adaptive management, and BMPs would be utilized to avoid harassment and long term displacement of wildlife. Overall impacts to wildlife would be expected to range from negligible to minor.

From Recreation Management on Areas of Critical Environmental Concern

The expanded Coffeepot Botanical ACEC would also be allocated as the Ajo Trails SRMA. The entire ACEC would be allocated as back country RMZ, with passage RMZ corridors that would entail 100 feet on each side of the centerline of open motorized vehicle routes. Decisions to develop campgrounds/sites as needed to reduce impacts; limit developed staging areas to community interface, front country, and passage RMZs; and encourage the use of existing sites for parking, staging, and camping areas would help reduce or avoid impacts to the ACEC-resources due to dispersed recreational use. Additional restrictions on camping limits; prescriptions for wood collection, campfires, and camp stoves; and managing recreational target shooting, nonmotorized uses, equestrian and stock-animal use, and emerging forms of recreation would also assist in reducing impacts from dispersed use. Impacts would be expected to range from negligible to moderate.

From Soil Resources on Areas of Critical Environmental Concern

Impacts will be the same as those described under Alternative B for the Lower Sonoran.

From Special Designations on Areas of Critical Environmental Concern

Under Alternative C the proposed Coffeepot-Batamote ACEC would encompass 63,300 acres of public lands. This ACEC is being proposed to protect lesser long-nosed bat and cactus ferruginous pygmy-owl habitats, outstanding botanical diversity of the native plant communities, botanical resources unique to the area such as the Acuña cactus, desert bighorn sheep other diverse wildlife populations, and outstanding landscape and scenic features. The Coffeepot-Batamote ACEC does contain an endangered plant species – the Acuna cacti –, foraging habitat for the endangered lesser long-nosed bat and habitat for bighorn sheep and the cactus ferruginous pygmy-owl. The cactus ferruginous pygmy-owl has been petitioned as a candidate and habitat is available for this species within the ACEC. The ACEC contains 100 percent public lands and it is recommended to retain those lands within the ACEC as public ownership. Impacts from retaining the public lands within the ACEC would be negligible. Overall impacts from the special designation would be expected to range from negligible to minor.

From Travel Management on Areas of Critical Environmental Concern

Motorized travel in the Coffeepot Botanical ACEC under Alternative C would be limited to designated routes, with some existing routes being closed to motorized travel, including portions of the route to Coffeepot Well and a less than 1-mile duplicative route the Gas Pipeline Road. An additional less than 1-mile route segment extending northwest from Coffeepot Well would be designated as limited. Designation of routes would reduce the potential impacts to resource values from the illegal proliferation of roads and off-road use. Negligible to minor impacts to wildlife would be expected.

New routes within the ACEC would be prohibited within washes, unless during route designations conflicts with wildlife are mitigated and minimization criteria would be established. At the time of route designations, mitigation, adaptive management, and BMPs would be utilized to avoid harassment and long term displacement of wildlife. By utilizing these techniques, negligible to minor impacts to wildlife would be expected.

From Vegetation Resources on Areas of Critical Environmental Concern

Prohibiting the collection of trees, shrubs, and cacti and prohibiting wood harvesting would protect the botanical resource values of the ACEC. Restoration and rehabilitation using both active and passive methods based on site conditions, using native plants as the first priority, and pursuing an integrated weed management approach to control invasive species would be protective of the botanical resource values of the ACEC.

From Visual Resources on Areas of Critical Environmental Concern

The majority of the expanded Coffeepot Botanical ACEC would be assigned to VRM Class II. The southernmost portion of the ACEC would be assigned to Class III This, along with the management decision to manage the viewshed of the Batamote-Coffeepot Mountains to protect scenic values of the viewsheds, would be a more protective designation than under Alternative A. Associated restrictions on development/use would protect the scenic and natural landscape values of the ACEC, as well as protect the other resource values of the ACEC. Impacts would be expected to range from negligible to minor.

From Water Resources on Areas of Critical Environmental Concern

Under Alternative C, the protection of water flow and water use in localized areas would provide protection of the watershed function in and near the expanded Coffeepot Botanical ACEC, thereby protecting the botanical resource values of the ACEC. Impacts would be expected to range from negligible to minor.

From Wilderness Characteristics on Areas of Critical Environmental Concern

The majority of the Coffeepot ACEC would be allocated as lands manged to protect wilderness characteristics. No impacts are expected.

4.19.5.2.2. National Byways

From Lands & Realty on National Byways

Impacts are similar to those described under Alternative B for the Lower Sonoran.

From Recreation Management on National Byways

Impacts are similar to those described under Alternative B for the Lower Sonoran.

From Special Designations on National Byways

Impacts are similar to those described under Alternative B for the Lower Sonoran.

From Travel Management on National Byways

Impacts are similar to those described under Alternative B for the Lower Sonoran.

From Visual Resources on National Byways

Impacts are similar to those described under Alternative B for the Lower Sonoran.

4.19.5.2.3. National Historic Trails

From Minerals Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Recreation Management on National Historic Trails

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Special Designations on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except, management of the NHT and its resources under a SCRMA allocation would institute an emphasis of increased scientific research and a focused approach that would have a protective effect on trail resources for the long term in a minor intensity and on a landscape level than Alternative A.

From Travel Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except a slight reduction of the number of routes would occur. Fewer routes may have a beneficial effect on NHT resources as there may be fewer places where impacts would occur. Impacts would range from minor to moderate.

From Visual Resources on National Historic Trails

Under this alternative, about 85 percent of the National Trail area is managed at a VRM Class II, which would have a far more beneficial effect than Alternative A on the essential characteristics

and attributes of historic landscapes and Anza NHT resources. Management of activities and developments would be more restrictive in terms of visual intrusions and ground disturbing activities on the historic landscape, leading to more protection of the NHT resources, at a minor to moderate level of intensity throughout the Lower Sonoran. The remaining NHT area would be managed at a Class III VRM level which would impact the integrity of Anza National Trail resources and historic landscape settings by allowing visual intrusions on the landscape and associated ground disturbing activities associated with a variety of land uses at a level which would deteriorate the integrity of trail segments and settings. Impacts under Alternative C would present negligible to minor impacts.

From Wilderness Characteristics on National Historic Trails

Impacts would be negligible, as no lands manged to protect wilderness characteristics would be allocated within or near the NHT boundaries.

4.19.5.2.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

Under Alternative C, future site development for public interpretive and educational purposes, excavation for scientific study, or other similar activities would have no short long-term effects on the naturalness of the Lower Sonoran's three wilderness areas. Cultural and heritage management activities would be guided by approved wilderness management plans. Implementation of Alternative C measures for cultural and heritage resources would likely contribute to naturalness to a greater degree in the three wilderness areas than would Alternatives A and B due to increased emphasis on resource protection and less emphasis on development for public visitation.

The Gila River Terraces and Southern Historic Trail SCRMA would be allocated adjacent to the southern boundary of Woolsey Peak Wilderness, increasing protection of cultural and natural resources and providing opportunities for recreation and interpretation. Impacts would be negligible.

From Livestock Grazing on Wilderness Areas

Impacts would be the same as described under Alternative A, except no ephemeral grazing would occur. This re-classification would enhance naturalness in the long term as ephemeral forage would not be removed and would become available to wildlife. The sight, sound, smells and other impacts from large ephemeral turnouts on the SDNM would not occur, enhancing naturalness and maintaining opportunities for primitive recreation in a more natural appearing and untrampled environment. Compared to Alternatives A and B, Alternative C would have both amplified and proactive contributions to naturalness, solitude and primitive recreation values. Impacts would be negligible to minor.

From Lands & Realty on Wilderness Areas

Impacts from Lands & Realty Management would result in similar impacts to Alternative A.

From Priority Wildlife Species and Habitat Management on Wilderness Areas

Overall, implementation of the ecological and biological resources measures under Alternative C would provide a minor contribution to naturalness to a greater degree than would Alternatives A and B by protecting core areas of wildlife habitat, emphasizing connectivity of wildlife habitat, removing ineffective wildlife water developments, requiring use of native vegetation in restoration efforts, and implementing measures to maintain populations of native wildlife, especially sensitive species.

Under Alternative C, the Gila Bend WHA totaling 255,700 acres, which would be inclusive of the Woolsey Peak and Signal Mountain Wildernesses, would be allocated to protect native vegetation, expansive, and unfragmented wildlife habitat and movement corridors. Facilities that would concentrate recreation use, including motorized routes, nonmotorized trails, and trailheads, would not be constructed while dispersed, undeveloped recreation opportunities would be emphasized.

Route systems that decrease wildlife habitat fragmentation, wildlife disturbance, and vegetation damage would be designated. Land use authorizations, mining sites, developments, facilities, and activities would be avoided or mitigated with particular attention to maintaining wildlife habitat and movement corridors.

Such measures implemented on public lands adjacent to the Woolsey Peak and Signal Mountain Wildernesses would contribute to naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. Such impacts would not be realized under Alternative A or B as no WHAs would be allocated.

Under Alternative C, no new artificial wildlife waters would be constructed, and existing wildlife waters that are ineffective in achieving targeted wildlife management objectives would be removed. The removal of ineffective wildlife developments would enhance naturalness. Conversely, impacts to naturalness would result if encroaching human activities restrict wildlife movements to and from existing water sources and populations decline in response. Overall, implementation of Alternative C poses greater contributions to the naturalness of wilderness areas than does Alternative B, while there would be few discernible difference in impacts compared to Alternative A. Overall impacts would be negligible.

From Recreation Management on Wilderness Areas

Contributions to naturalness and opportunities for solitude due to the SRMA and back country RMZ allocations within and adjacent to the Signal Mountain and Woolsey Peak Wildernesses would be similar to those described under Alternative B. Impacts on the Sierra Estrella Wilderness would be indistinguishable from Alternative A and B.

From Special Designations on Wilderness Areas

No special designations proposed under Alternative C would impact wilderness areas.

From Travel Management on Wilderness Areas

Impacts on wilderness areas are from Travel Management are similar to those described under Alternatives B, except that Alternative C could restrict motorized use on up to 30 percent of roads and primitive roads that would be otherwise open to motorized use under Alternative A, and up to 6 percent more route closures and restrictions than proposed under Alternative B. Thus, implementation of Alternative C could slightly contribute more to naturalness and

opportunities for solitude and primitive recreation than would Alternative B. Like Alternative B, Alternative C would also employ a designated comprehensive travel management network and apply consideration of potential impacts from motorized use on adjacent wilderness areas and associated indicators.

Motorized routes with a predilection to contribute to moderate levels of vehicle trespass or resource-based impacts (plant theft, wood cutting, fires, campsite clearing, target shooting, OHV staging, parking) on the periphery of wilderness areas might be closed or use limited. Adverse uses would be mitigated through various management options available for corrective action. Impacts would be negligible to minor.

From Vegetation Resources on Wilderness Areas

Under Alternative C, the range of vegetation management actions would result in long-term contributions to naturalness, more so than under Alternatives A and B. Both active and passive restoration of surface disturbances would be emphasized, use of native species in all restoration projects would be required, and an integrated weed management program to control invasive species would be put into place. The lack of ephemeral grazing would enhance forage for wildlife. Impacts would be negligible.

From Visual Resources on Wilderness Areas

Under Alternative C, lands adjacent to the Woolsey Peak and Signal Mountain Wildernesses would be classified as VRM Class II, with the objective of retaining the existing character of the landscape. Public lands adjacent to the Sierra Estrella Wilderness would also primarily be classified as VRM Class II, although a portion of adjacent public lands would be classified as VRM Class III. To the extent that landscape-altering activities would be visible from areas of designated wilderness, long-term detractions from naturalness and opportunities for solitude could occur. Overall, however, more protective visual resource prescription allocations under Alternative C would contribute to naturalness of designated wilderness to a greater degree than would Alternatives A and B, primarily in the vicinity of the Sierra Estrella Wilderness. Impacts would be negligible.

From Wilderness Characteristics on Wilderness Areas

Alternative C would allocate 128,100 acres of the Lower Sonoran to protect wilderness characteristics; however, these areas would not be in close proximity to existing designated wilderness areas, resulting in no impacts.

4.19.5.3. Sonoran Desert National Monument

4.19.5.3.1. Areas of Critical Environmental Concern

No ACECs are allocated in this Alternative for the SDNM. The Monument's proclamation provides the necessary protection that an ACEC would provide.

4.19.5.3.2. National Byways

From Lands & Realty on National Byways

Only minor impacts are anticipated on the Arizona State Route 238 National Scenic byway from the installation of additional underground utilities within the Santa Rosa - Gila Bend utility corridor. The corridor is already impacted by roads, railroad tracks, powerlines and underground cables. Additional installations would not be greatly noticeable except by the most perceptive visitor. Impacts would be negligible to minor.

From Recreation Management on National Byways

Impacts are anticipated to be negligible.

From Special Designations on National Byways

There would no impacts on Areas of Critical Environmental Concern, wilderness areas or the Anza NHT from Arizona State Route 238 being designated as a National Scenic Byway under Alternative C.

From Travel Management on National Byways

Impacts are anticipated to be negligible.

From Visual Resources on National Byways

Lands north of State Route 238 would be managed to a VRM Class II standard, thus ensuring additional protection to scenic, natural and recreational benefits and outcomes. Impacts would be negligible.

4.19.5.3.3. National Historic Trails

From Minerals Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument.

From Recreation Management on National Historic Trails

Impacts would be the same as those described under Alternative B for the Monument.

From Special Designations on National Historic Trails

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Travel Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument, except for a slight reduction of the number of routes. The reduction of motorized routes may have a beneficial

effect on the Anza NHT resources and Monument objects as there may be fewer places where impacts would occur. Impacts would range from minor to moderate.

From Visual Resources on National Historic Trails

The Anza NHT corridor is a Monument object running through both VRM Class III and Class II areas. Management of this high potential segment of the Anza NHT corridor in VRM Class III (approximately 52 percent of the trail area in the Monument) would impact NHT resources by allowing visual intrusions on the landscape and associated ground disturbing activities at a level which would quickly deteriorate its integrity. Management at this level would allow activities and developments that are incompatible with a NHT, at a moderate to major level of intensity, over the long term.

The areas of the Anza NHT within the center areas of the SDNM, roughly 41 percent of the trail area in the Monument, would be managed at a VRM Class II, which would have a far more beneficial effect on the essential characteristics and attributes of a NHT. Management of activities and developments would be more restrictive in terms of visual intrusions and ground disturbing activities on the historic landscape, leading to a more protection of the NHT resources and associated Monument objects, at a minor to moderate level of intensity. This management regime would be far more protective of the Anza NHT and its associated Monument objects than under Alternative A.

From Wilderness Characteristics on National Historic Trails

Impacts would be negligible, as no lands managed to protect wilderness characteristics would be allocated within or near the NHT boundaries.

4.19.5.3.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

In the SDNM, a cultural SCRMA would be located along the Anza NHT bordering the North Maricopa Wilderness. Future site development for public interpretive and educational purposes, excavation for scientific study, or other similar activities could have minor indirect impacts on naturalness when or if such developments or excavations are observable from the adjoining wilderness.

Implementation of Alternative C measures for cultural and heritage resources across the SDNM's three wilderness areas would likely contribute to naturalness to a greater degree than would Alternatives A and B due to increased emphasis on resource protection and less emphasis on development or management for public visitation. Impacts would be negligible.

Lands & Realty on Wilderness Areas

Additional underground utility installations within the ½ -mile wide corridors would not impact the naturalness or solitude of the Monument's wilderness areas. All potential utility installations would be underground, therefore, impacts would be negligible to minor.

From Livestock Grazing on Wilderness Areas

Impacts would be the same as described under Alternative A, except no ephemeral grazing would occur. This re-classification would enhance naturalness in the long term as ephemeral forage would not be removed and would become available to wildlife. The sight, sound, smells and other impacts from large ephemeral turnouts on the SDNM would not occur, enhancing naturalness and maintaining opportunities for primitive recreation in a more natural appearing and untrammeled environment. Compared to Alternatives A and B, Alternative C would have proactive contributions to naturalness, solitude and primitive recreation values. Impacts would be negligible to minor.

From Priority Wildlife Species and Habitat Management on Wilderness Areas

Impacts would be the same as those described under Alternative C for the Lower Sonoran, except that no WHAs would be designated within the SDNM. The Monument proclamation protects many of the natural resources proposed for protection in the WHAs, thus the impacts are similar. Impacts would be negligible.

From Recreation Management on Wilderness Areas

Impacts are similar to Alternative B from management of the SDNM SRMA. Pedestrian and equestrian recreational access to the SDNM from public, State and private lands would be more restricted than under Alternative A and B, limited to established access points. Equestrian users would be required to remain on designated routes within 0.5 mile of these designated access points increasing the travel time and ease of access to the Monument's wilderness areas. Conversely, the proposed access actions would potentially reduce impacts to wilderness areas adjacent to Federal, State and private lands. Impacts would be minor.

From Special Designations on Wilderness Areas

There would be no impacts on wilderness areas from Arizona State Route 238 being designated as a National Scenic Byway under Alternative C. Any potential impacts would be negligible.

Travel Management on Wilderness Areas

Implementation of Travel Management actions under Alternative C would have a moderate, but indirect, contributions to naturalness and opportunities for solitude and primitive, unconfined recreation of designated wilderness to a greater degree than would implementation of Alternatives A and B. Overall, impacts would be localized. Alternative C would restrict motorized use on about 211 miles of roads/primitive roads otherwise open to motorized use under Alternative A, and about 75 miles that would be open under Alternative B. Where these route restrictions to motorized travel correspond to the boundaries of designated wilderness, long-term retention or augmentation the wilderness values of naturalness and outstanding opportunities for solitude and primitive, unconfined recreation would result. Instances of motorized trespass and recreation-related camping and staging impacts would be reduced.

From Visual Resources on Wilderness Areas

Alternative C would offer major positive, but indirect, impacts on wilderness areas. All lands adjacent to existing wilderness in the SDNM would be allocated as VRM Class I or Class II.

Management to preserve or retain the existing character of these adjacent landscapes would, to the greatest extent, offer supplemental protection for wilderness area's scenic and natural values.

From Wilderness Characteristics on Wilderness Areas

Areas adjacent to South Maricopa Mountains Wilderness Area (west of the Wilderness and north of I-8) would be allocated as lands manged to protect wilderness characteristics. This would result in restrictions to certain types of land use and development activities, which would indirectly contribute to the resource values of the adjacent wilderness area. Opportunities for solitude would be enhanced, areas open to hiking and hunting in a wild setting would be increased, and natural conditions would be retained over a larger area of Sonoran Desert outwash landscapes. Major indirect positive impacts are expected.

4.19.6. ALTERNATIVE D

Under Alternative D, special designations in the two Decision Areas would include six wilderness areas and portions of the Juan Bautista de Anza NHT.

In the Lower Sonoran, an area of approximately 48,500 acres would be designated as the Saddle Mountain ACEC (to include the Palo Verde Hills) to protect geology, native vegetation and wildlife, including desert bighorn sheep, desert tortoise, and raptor species, cultural resources, and outstanding landscape and scenic features. Instead of the Coffeepot Botanical ACEC, an approximately 77,600-acre area would be designated as the Coffeepot-Batamote ACEC to protect habitat for lesser long-nosed bat and Acuña cactus, the outstanding biological diversity of the native plant communities, desert bighorn sheep, and other diverse wildlife populations. An approximately 58,500-acre area would be designated as the Cuerda de Lena ACEC to protect the endangered Sonoran pronghorn antelope as well as to protect habitat for other wildlife species including cactus ferruginous pygmy-owl and to protect cultural resources.

An approximately 79,100-acre area would be designated as the Lower Gila Terraces and Historic Trails ACEC to manage the Gila River and terraces, Butterfield Overland Stage Routel, Mormon Battalion Trail, Painted Rock Petroglyph Site, and associated areas to protect cultural resources. Management prescriptions for resource management and resource use would be established for these ACECsas detailed in Table 2.20, "Proposed Route Designation Table by Alternative" (p. 184).

The Juan Bautista de Anza NHT would be managed in concert with the Lower Gila River Terraces and Historic Trails ACEC and the management emphasis will be on protecting cultural resources while providing limited scientific research interpretive opportunities. Agua Caliente Road in the Lower Sonoran and SR-238 and I-8 in the SDNM would be allocated as national scenic or Back Country Byways under Alternative D.

4.19.6.1. Both Decision Areas

4.19.6.1.1. Areas of Critical Environmental Concern

No unique impacts.

4.19.6.1.2. National Byways

No unique impacts.

4.19.6.1.3. National Historic Trails

From Air Quality on National Historic Trails

Impacts would be the same as those described under Alternative C for both Decision Areas.

From Cultural and Heritage Resources on National Historic Trails

Activities proposed under Alternative D for the Lower Sonoran from cultural and heritage resources are limited in scope and nature, therefore, would have a negligible impact on NHTs.

From Lands & Realty on National Historic Trails

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Livestock Grazing on National Historic Trails

Livestock grazing would be closed throughout the Decision Area, resulting in negligible affects on the NHT, as there would be no surface disturbances from grazing within the NHT's boundaries, thus assisting the execution of NHT goals and objectives.

4.19.6.1.4. Wilderness Areas

No unique impacts.

4.19.6.2. Lower Sonoran

4.19.6.2.1. Areas of Critical Environmental Concern

From Cultural and Heritage Resources on Areas of Critical Environmental Concern

Under Alternative D an area of approximately 79,100 acres of public lands (14,300 more acres than Alternative C and 68,700 more acres than Alternative A) would be designated as the Coffeepot-Batamote ACEC to protect habitat and populations of the endangered Acuna Cactus. All public lands within the ACEC would be retained. New routes would be prohibited within washes unless conflicts with wildlife and cultural resources are mitigated during route designation to minimize habitat fragmentation. Impacts to wildlife and threatened and endangered species are expected to range from negligible to minor.

The proposed Cuerda de Lena ACEC encompasses 58,500 acres of public lands. This ACEC is proposed to protect habitat for the endangered Sonoran pronghorn as well as protect habitat for other wildlife species, including the cactus ferruginous pygmy-owl. A vast majority of the ACEC is public land with approximately 70 acres of private land and approximately 640 acres of State land. It is recommended that lands not in public ownership be acquired to further protect

habitat for the Sonoran pronghorn as funding and opportunities arise. Overall impacts to wildlife and threatened and endangered species from cultural, within the ACEC, would be expected to range from negligible to minor.

Under Alternative D the proposed Lower Gila River Terraces and Historic Trails ACEC would encompass approximately 76,200 acres of public lands. The intent of the ACEC is to protect the cultural resources, historic trail resources, and sensitive habitats in which they reside. Limitations placed on surface disturbing activities within the boundaries and restoration in selected areas will have a beneficial effect upon wildlife and cultural resources in the ACEC.

The BLM would propose to develop cultural resources for interpretation and environmental education purposes for the Saddle Mountain ACEC. This would have negligible to minor impacts on wildlife through avoidance for the short term depending on the location and frequency of use within the ACEC and proximity to areas traditionally used by wildlife.

From Lands & Realty on Areas of Critical Environmental Concern

The El Paso Natural Gas (Ajo) utility corridor would be removed from this alternative and all LUAs would be excluded, including utility-scale renewable energy development, which would reduce habitat fragmentation within the ACEC. All public lands within the ACEC would be retained. Negligible impacts would be expected.

Within the Cuerda de Lenda ACEC all LUAs would be prohibited, as the ACEC is allocated as a LUA Exclusion Area, therefore, impacts would be negligible.

Within the Lower Gila River Terraces and Historic Trails ACEC all LUAs (including utility-scale renewable energy development) would be prohibited, as the ACEC is allocated as a LUA Exclusion. All Federal lands would also be retained, thus assisting the management objectives for allocating this ACEC. Impacts would be negligible to wildlife, cultural, and historic trail resources.

Lands that are not currently under public ownership would be acquired and public lands would be retained within the Saddle Mountain ACEC. This would have minor impacts on wildlife due to the fact that there is very small amount of State and private lands within the ACEC. LUAs would be avoided in the ACEC, utility-scale renewable energy development would be prohibited, and the Palo Verde to Devers multiuse utility corridor would be removed. These actions would present positive impacts on the management of this ACEC. However, impacts would remain at minor, as the major linear LUAs can still be authorized in the El Paso Natural Gas corridor, which is retained in this alternative.

From Livestock Grazing on Areas of Critical Environmental Concern

The Coffeepot ACEC would be closed to livestock grazing to protect the outstanding botanical resources. Closing the ACEC to grazing would allow vegetation to reach desired plant communities and reduce competition between wildlife and cattle for food, water and space resources. Fencing and facilities (i.e. corrals, etc) related to the grazing operation would be removed. By removing these facilities wildlife could move unencumbered with the ACEC; however, if water sources are removed wildlife may vacate areas that have traditionally held water for livestock in which wildlife have become dependent upon. This action could be

detrimental to wildlife in the local area of water removals. Impacts would be expected to range from negligible to major.

The Cuerda de Lena ACEC would be closed to livestock grazing to protect the outstanding botanical resources. Closing the ACEC to grazing would allow vegetation to reach desired plant communities and reduce competition between wildlife and cattle for food, water and space resources. Fencing and facilities (i.e. corrals, etc) related to the grazing operation would be removed. By removing these facilities wildlife could move unencumbered with the ACEC; however, if water sources are removed wildlife may vacate areas that have traditionally held water for livestock in which wildlife have become dependent upon. This action could be detrimental to wildlife in the local area of water removals. Impacts would be expected to range from negligible to major.

The Lower Gila River Terraces and Historic Trails ACEC would be closed to livestock grazing to protect the outstanding botanical resources. Closing the ACEC to grazing would allow vegetation to reach desired plant communities and reduce competition between wildlife and cattle for food, water and space resources. Fencing and facilities (i.e. corrals, etc) related to the grazing operation would be removed. By removing these facilities wildlife could move unencumbered with the ACEC; however, if water sources are removed wildlife may vacate areas that have traditionally held water for livestock in which wildlife have become dependent upon. This action could be detrimental to wildlife in the local area of water removals. Impacts would be expected to range from negligible to major. These activities would have a protective effect on cultural resources within this ACEC.

The Saddle Mountain ACEC would be closed to livestock grazing to protect the outstanding botanical resources. Closing the ACEC to grazing would allow vegetation to reach desired plant communities and reduce competition between wildlife and cattle for food, water and space resources. Fencing and facilities (i.e. corrals, etc) related to the grazing operation would be removed. By removing these facilities wildlife could move unencumbered with the ACEC; however, if water sources are removed wildlife may vacate areas that have traditionally held water for livestock in which wildlife have become dependent upon. This action could be detrimental to wildlife in the local area of water removals. Impacts would be expected to range from negligible to major.

From Minerals Management on Areas of Critical Environmental Concern

The Coffeepot ACEC would be withdrawn to locatable mineral extraction; however, valid existing rights would be allowed to continue. Withdrawing the ACEC to all forms of mineral extraction could retain or improve habitat availability for wildlife. Impacts to wildlife and threatened and endangered species are expected to range from negligible to minor.For leasable minerals the ACEC would be closed to entry. Negligible impacts are expected to occur. Mineral material disposals (Saleable materials) the ACEC would be an avoidance area. Negligible impacts are expected to occur.

The Cuerda de Lena ACEC would be closed to mineral material disposals. By closing the area to mineral material disposals habitat would remain connected and available for wildlife use. Valid existing rights will be respected; however surface disturbance would be minimized through plans of operation where appropriate. The ACEC would also be proposed as withdrawn from locatable minerals. Using plans of operations on existing rights foot prints of operations could be decreased in the ACECto allow for habitat availability for all wildlife species. Impacts from

Alternative E would be greater than D; however, overall impacts would be expected to range from negligible to minor.

The Lower Gila River Terraces and Historic Trails ACEC would be withdrawn to locatable mineral extraction; however, valid existing rights would be allowed to continue. Withdrawing the ACEC to all forms of mineral extraction could retain or improve habitat availability for wildlife. Similarly, this would have a protective effect on the cultural and historic trail resources in the ACEC. Impacts are expected to range from negligible to minor. For leasable minerals the ACEC would be closed to entry. Negligible impacts are expected to occur. Mineral material disposals (Saleable materials) the ACEC would be an avoidance area. Negligible impacts are expected to occur.

The Saddle Mountain ACEC would be closed to new mineral material sales and valid existing rights would be recognized. Mineral material sales would be managed through plans of operations and would contain appropriate mitigation as not to harm, harass, or cause mortality to wildlife in the area. This would be a minor impact. New mining activities would be avoided in bighorn sheep lambing areas, high quality mule deer habitats, and in Category I and II tortoise habitats. By reducing the amount of disturbance from new mining activities minor impacts to wildlife are expected to occur. Valid existing rights as related to mining would be respected, however; surface disturbing activities from operation would be minimized through plans of operations, adaptive management and BMPs. By utilizing to above mentioned techniques impacts would be expected to range from negligible to minor.

From Priority Wildlife Species and Habitat Management on Areas of Critical Environmental Concern

While the ecological and Priority Wildlife Species and Habitat decisions would improve habitat and wildlife resources in the Coffeepot ACEC, the decision not to construct new wildlife waters under Alternative C could inhibit the maintenance or enhancement of the ACEC's wildlife resources, particularly the big game species cited in the importance and relevance statements. Overall impacts would be expected to range from negligible to major.

It is proposed that the Cuerda de Lena ACEC be closed to public entry from March 15th through June 15th in accordance to the Sonoran pronghorn recovery teams' recommendations. By closing the area to public entry during this time frame negligible impacts to the Sonoran pronghorn are expected. This closure to entry to the public allows the pronghorn females to birth uninterrupted, allows new born antelope the opportunity to wean without distractions and allows male pronghorn the ability to seek females for procreation undisturbed. This closure would also assist the lesser long-nosed bat in foraging without human disturbance from the general public and allow the cactus ferruginous pygmy-owl to breed, hunt and brood uninterrupted. Overall impacts would be expected to range from negligible to minor.

Impacts from priority wildlife would be negligible on the Gila River Terraces ACEC and the Saddle Mountain ACEC.

From Recreation Management on Areas of Critical Environmental Concern

The northern portion of the Coffeepot-Batamote ACEC would be allocated as an ERMA (57,900 acres), while the southern portion of the ACEC would be allocated as the Ajo Trails SRMA with back country RMZ in the southeast (30,100 acres), Frontcountry RMZ in the western

portion of the ACEC (6,700 acres), and a small portion of the ACEC in the community interface RMZ (1,900 acres). The SRMA would be managed for remote self directed and unstructured opportunities to discover the areas resources and scenic landscapes, thereby, protecting the natural resource values of the ACEC as well. Management of recreation use in the ERMA generally would not provide structured recreation opportunities except where needed to compliment other management objectives. Impacts would be expected to range from negligible to minor.

Camping within the Cuerda de Lena ACEC would be limited to dispersed and undeveloped sites. By limiting camping in this manner negligible to minor impacts to wildlife are expected to occur. Limiting other forms of recreation would be expected to have the same impact as camping. Overall impacts to wildlife and threatened and endangered species within the ACEC would be expected to range from negligible to minor.

Within the Lower Gila River Terraces and Historic Trails ACEC recreation would be encouraged and managed to levels appropriate to protect the ACEC's cultural resources and habitat for wildlife. SRMAs and RMZs would be established to enhance visitor settings and at the same time protect the integrity of the ACEC's resources and habitats there within. Impacts would be expected to range from negligible to minor.

Recreational routes would be prohibited in washes within the Saddle Mountain ACEC where conflicts with wildlife would likely occur. Mitigation, adaptive management and BMPs would be utilized to avoid harassment and long term displacement of wildlife associated with recreational routes. This would have minor impacts to wildlife in the area. Areas within the ACEC could be closed or access limited to motorized vehicles where conflicts with wildlife could not be mitigated adaptive management and BMPs would be utilized to avoid harassment and long term displacement of wildlife. Minor impacts to wildlife are expected. Nonmotorized trails could be constructed within the ACEC as long as mitigation adaptive management and BMPs are utilized to avoid harassment and long term displacement of wildlife. There would be minor impacts to wildlife from the construction on nonmotorized trails with mitigation. Recreational speed events, such as endurance motocross racing would be prohibited within the ACEC. Speed events have the potential harm, harass, or cause mortality to wildlife in the area. By prohibiting these types of recreational activities negligible to minor impacts to wildlife are expected to occur.

From Soil Resources on Areas of Critical Environmental Concern

Impacts will be the same as those described under Alternative B for the Lower Sonoran for the Coffeepot and Cuerda de Lena ACEC.

Impacts are expected to negligible on the Gila River Terraces ACEC and the Saddle Mountain ACEC.

From Special Designations on Areas of Critical Environmental Concern

Under Alternative D, an area of approximately 79,100 acres of public lands would be designated as the Coffeepot-Batamote ACEC to protect habitat and populations of the endangered Acuna Cactus. All public lands within the ACEC would be retained. New LUAs, including utility-scale renewable energy development, would be excluded from the ACEC to reduce habitat fragmentation within the ACEC. Utilities would be required to be installed underground within the existing multi-use utility corridor to retain the unencumbered viewshed and reduce the amount of further fragmentation exterior the existing utility corridors. LUAs would be excluded from

the remaining area to retain habitat connectivity and natural settings associated with the ACEC. Overall impacts to wildlife and threatened and endangered species are expected to range from negligible to minor which would be an improvement as compared to Alternative A.

All public lands within the ACEC would be retained. New LUAs, including utility-scale renewable energy development, would be excluded from the ACEC to reduce habitat fragmentation within the ACEC. Utilities would be required to be installed underground within the existing multi-use utility corridor to retain the unencumbered viewshed and reduce the amount of further fragmentation exterior the existing utility corridors. LUAs would be excluded from the remaining area to retain habitat connectivity and natural settings associated with the ACEC. Overall impacts to wildlife and threatened and endangered species are expected to range from negligible to minor which would be an improvement as compared to Alternative A.

The proposed Cuerda de Lena ACEC encompasses approximately 58,500 acres of public lands. This ACEC is proposed to protect habitat for the endangered Sonoran pronghorn as well as protect habitat for other wildlife species, including the cactus ferruginous pygmy-owl. A vast majority of the ACEC is public land with approximately 70 acres of private land and approximately 640 acres of State land. It is recommended that lands not in public ownership be acquired to further protect habitat for the Sonoran pronghorn as funding and opportunities arise. Overall impacts to wildlife and threatened and endangered species within the ACEC would be expected to range from negligible to minor which would be an improvement as compared to Alternative A.

Under Alternative D, the proposed Lower Gila River Terraces and Historic Trails ACEC would encompass approximately 76,200 acres of public lands. The intent of the ACEC would be to protect cultural and historic trails and increase habitat availability by limiting surface disturbing activities within its boundaries. Route designation and the criteria used for minimization would decrease impacts to wildlife and cultural resources by allowing IDTs to evaluate and reduce the amount of roads, trails and routes that would be in conflict with wildlife management goals and objectives. Overall impacts to wildlife and cultural and historic trail resources would be expected to be negligible to minor which would be an improvement as compared to Alternative A to this area.

The development of interpretive sites along the Anza Trail may have a minor to moderate impact to the ACEC and its wildlife and cultural resources due to the expected increase in human visitation.

Under Alternative D, the proposed Saddle Mountain ACEC would encompass approximately 48,500 acres. The intent of the ACEC would be to increase habitat availability by limiting surface disturbing activities within its boundaries with a focus on bighorn sheep habitat conservation. Route designation and the criteria used for minimization would decrease impacts to wildlife by allowing IDTs to evaluate and reduce the amount of roads, trails and routes that would be in conflict with wildlife management goals and objectives. Overall impacts to wildlife would be expected to be negligible to minor which would be an improvement as compared to Alternative A to this area.

From Travel Management on Areas of Critical Environmental Concern

A portion of the Coffeepot-Batamote ACEC would be designated closed to motorized use and motorized use within the remaining portion of the ACEC would be limited to designated routes. As compared to Alternative C, substantially more routes within the ACEC would be designated as closed to motorized use under Alternative D, providing more protection to the ACEC resource

values. Certain routes would be designated as closed to motorized use. These include the segments of routes within the braided wash northwest and southeast of Coffeepot Well as well as duplicative and spur routes within the former ACEC area. Within the expanded ACEC area, most of the route closures would be duplicative and spur routes located in the western portion of the ACEC between Ajo and the Batamote Mountains. Routes that would be designated as closed include routes that are in Ten Mile and Sikort Chuapo, and Darby Arroyo washes or their tributaries. The route network located east of the Batamote Mountains that is interconnected with the BGR East road network would also be designated as closed. A better-established route from the Gas Pipeline Road to the southeastern foothills of Batamote Mountains would remain designated as open. Certain routes within the ACEC would be designated as administrative use only. Impacts would be expected to range from negligible to moderate.

It is proposed that the Cuerda de Lena ACEC be closed to public entry from March 15th through June 15th in accordance to the Sonoran pronghorn recovery team recommendations. This closure to entry to the public allows the pronghorn females to birth uninterrupted, allows new born antelope the opportunity to wean without distractions and allows male pronghorn the ability to seek females for procreation undisturbed. By closing the area to public entry during this timeframe, negligible impacts to the Sonoran pronghorn are expected. This closure would also assist the lesser long-nosed bat in foraging without human disturbance from the general public and allow the cactus ferruginous pygmy-owl to breed, hunt and brood uninterrupted. Overall impacts would be expected to be negligible to minor.

Impacts are expected to be negligible on the Lower Gila Terraces and Historic Trails ACEC and the Saddle Mountain ACEC. The reduction of the number of routes under this alternative would have a protective effect on the cultural and historic trail resources. This is expected to be minor to moderate.

From Vegetation Resources on Areas of Critical Environmental Concern

Impacts would be the same as those described under Alternative C for the Coffeepot-BatamoteCoffeepot-Batamote ACEC.

Prohibiting the collection of trees, shrubs, and cacti and prohibiting wood harvesting would protect the botanical resource values of the Cuerda de Lena ACEC. Restoration and rehabilitation using both active and passive methods based on site conditions, using native plants as the first priority, and pursuing an integrated weed management approach to control invasive species would be protective of the botanical resource values of the ACEC.

Prohibiting the collection of trees, shrubs, and cacti and prohibiting wood harvesting would protect the botanical resource values of the Lower Gila Terraces and Historic Trails Saddle Mountain ACECs. Restoration and rehabilitation using both active and passive methods based on site conditions, using native plants as the first priority, and pursuing an integrated weed management approach to control invasive species would be protective of the botanical and cultural resource values of the ACEC. Impacts would be negligible.

From Visual Resources on Areas of Critical Environmental Concern

Under this alternative the Coffeepot-BatamoteCoffeepot-Batamote ACEC would be expanded south past HWY 85 to encompass approximately 77,600 acres. The majority of the Coffeepot Botanical ACEC would be assigned to VRM Class II. The highway and the southernmost portion

would be assigned as Class III. This, along with the management decision to manage the viewshed of the Batamote-Coffeepot Mountains to protect scenic values of the viewsheds, would be a more protective designation than under Alternative A. Associated restrictions on development/use would protect the scenic and natural landscape values of the ACEC, as well as protect the other resource values of the ACEC. Impacts would be expected to range from negligible to minor.

The Cuerda de Lena ACEC encompasses approximately 59,300 acres. The majority of the ACEC would be assigned as Class II VRM. The area along HWY 85 would be assigned as Class III. The proposed ACEC was designed to protect habitat for the endangered Sonoran pronghorn. VRM restrictions would enhance habitat for the pronghorn by reducing visual obstructions in areas utilized by the pronghorn within Class II VRM areas. Impacts would be expected to range from negligible to minor.

Lower Gila Terraces and Historic Trails ACEC in its entirety encompasses approximately 144,500 acres. Under this Alternative Class II and III classifications would be assigned. A majority of the ACEC contains VRM Class II and some Class III to a lesser degree. The proposed VRM classifications would assist in protecting habitat along the Fred J. Weiler Green belt to assist in the management of migratory birds as well as terrestrial and aquatic species. Impacts are expected to range from negligible to minor. These class II designations would indirectly affect cultural and historic resources by eliminating the scope and visual impact of development in the ACEC. Expected impacts to cultural resources are minor to moderate.

The Saddle Mountain ACEC encompasses approximately 48,500 acres. The majority of the ACEC is proposed as Class II and Class III along two pipelines within the ACEC. The Class II assignment would reduce the amount of visual obstructions within the ACEC and could benefit wildlife by reducing areas of avoidance created by visual obstructions. Impacts would be expected to range from negligible to minor.

From Water Resources on Areas of Critical Environmental Concern

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

Impacts are expected to be negligible for the Cuerda de Lena ACEC, Lower Gila Terraces and Historic Trails ACEC and Saddle Mountain ACEC.

From Wilderness Characteristics on Areas of Critical Environmental Concern

The majority of the Coffeepot-Batamote-Sauceda ONA ACEC would be allocated as lands manged to protect wilderness characteristics. These lands would be closed to mineral entry and location under Alternative D, protecting them from surface disturbing activities. Impacts are expected to range from negligible to minor.

The majority of the Cuerda de Lena ACEC would be allocated as lands manged to protect wilderness characteristics. These lands would be closed to mineral entry and location under Alternative D, protecting them from surface disturbing activities. Impacts are expected to range from negligible to minor.

A small portion of the Lower Gila Terraces and Historic Trails ACEC would be allocated as lands manged to protect wilderness characteristics. These lands would be closed to mineral entry and location under Alternative D, protecting them from surface disturbing activities. Impacts are expected to range from negligible to minor.

The majority of the Saddle Mountain ACEC would be allocated as lands manged to protect wilderness characteristics. These lands would be closed to mineral entry and location under Alternative D, protecting them from surface disturbing activities. Impacts are expected to range from negligible to minor.

4.19.6.2.2. National Byways

No national byways have been allocated under this alternative in the Lower Sonoran.

4.19.6.2.3. National Historic Trails

From Minerals Management on National Historic Trails

Under this alternative, an ACEC allocation would include all of the non- SDNM areas and would carry with it certain restrictions. These restrictions of no saleables and No Surface Occupancy under the leasable program would have a far more protective effect than under Alternative A, at a minor to major level both directly and indirectly due to the reduction or elimination of surface disturbing activities associated with mineral exploration, development, and extraction for the long term.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts would be similar to Alternative A, except for additional restrictions outside of the Fred J. Weiler Greenbelt, but under the allocation of the Gila Bend Mountains Wildlife Habitat Area. These restrictions in the WHA of avoidance for saleable minerals and a No Surface Occupancy restriction for leasables would have a protective effect on the National Historic Trail resources at a minor to moderate level for the long term by either reducing or eliminating the ground disturbance from minerals prospecting, extraction, and associated vehicle damage.

From Recreation Management on National Historic Trails

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Special Designations on National Historic Trails

The existing Juan Bautista de Anza National Historic Trail designation with its Comprehensive Management Plan (NPS) in the implementation phase may affect directly the Trail segments and sites associated with it for the long term due to its status as a nationally important resource.

Management of the National Historic Trail and its resources under an ACEC would have a farther reaching protective direct and indirect effect on Trail resources at a minor to major level of intensity over the long term throughout the area than under Alternative A due to a very limited approach to the development of interpretive facilities and no surface disturbing installations of them.

From Travel Management on National Historic Trails

Impacts would be the same as those described under Alternative A, except for a much larger reduction in the number of routes. Fewer routes may have a beneficial effect on National Historic Trail resources as there may be fewer places where impacts would occur.

From Visual Resources on National Historic Trails

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Wilderness Characteristics on National Historic Trails

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

4.19.6.2.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

Implementation of Alternative D measures for cultural and heritage resources would likely contribute to naturalness to a greater degree than would Alternatives A, B, and C due to increased emphasis on resource protection and less emphasis on development for public visitation. Under Alternative D for cultural resource management, site allocation and management for resource protection would be emphasized. Sites currently available for public interpretation would be maintained, but additional sites would not be allocated to public use. No SCRMAs would be allocated in the Lower Sonoran. Impacts are still anticipated to be negligible.

From Lands & Realty Actions on Wilderness Areas

The entire Monument would be allocated as a LUA Exclusion area and no multiuse utility corridors would be allocated. The absence of multiuse utility corridors and new installations along the western boundary of the Sierra Estrella Wilderness would indirectly increase naturalness and opportunities for solitude within the north ½ of the Sierra Estrella Wilderness to a moderate degree over the long term. No additional powerlines, pipelines and associated support infrastructure would be constructed within sight of this wilderness; thus current conditions would be maintained. Impacts would be negligible.

From Livestock Grazing on Wilderness Areas

Under Alternative D, all livestock grazing allotments would be closed to grazing when current permits expire. This action would result in moderate and long-term enhancements to naturalness as all forage allocated to livestock would become available to native wildlife. Moreover, vegetation trampling, barren sites surrounding waters, along fence lines and in staging areas, trailing, and vegetative breakage/damage would also be eliminated, along with the sight of abundant livestock waste. Such actions would result in increased contributions to naturalness and solitude when compared to Alternatives A, B, and C. Range developments for livestock would be removed, posing long-term detractions from naturalness as water sources used by native wildlife would no longer be available. Opportunities to view wildlife could undergo major impairment or loss. On-the other-hand, removal of artificial waters developed by humans would, over the long-term, enhance the naturalness of the wilderness areas.

From Priority Wildlife Species and Habitat Management on Wilderness Areas

In the Lower Sonoran, the Gila Bend WHA (255,700-acres), which would be inclusive of the Woolsey Peak and Signal Mountain Wildernesses, would be allocated to protect native vegetation and expansive, unfragmented wildlife habitat and movement corridors. The management decisions and impacts would be similar to those described in Alternative C, with the impacts potentially reaching the moderate level.

Under Alternative D, no new artificial wildlife waters would be constructed and existing wildlife waters would be removed. This would have two impacts. First, wilderness Areas may appear more natural overtime due to the removal of human installed wildlife infrastructure. Second, and on-the-other-hand, removal of waters may cause substantial population declines to bighorn sheep and other native wildlife populations in wilderness areas. These populations are reliant to such water sources. There removal would result in impacts to naturalness and a loss of outstanding wildlife viewing opportunities. Such actions under Alternative D would pose substantially greater minor to moderate detractions to naturalness from the removal of all wildlife water catchments compared to Alternatives A and C. In contrast to Alternative B, under which the density of wildlife water catchments would be increased, no net increase or decrease to naturalness would be discernable between the alternatives as both could lead to unnatural wildlife population levels. Overall impacts would be negligible.

From Recreation Management on Wilderness Areas

Impacts would be similar to those described under Alternative A and B for the Lower Sonoran.

From Special Designations on Wilderness Areas

Impacts would be similar to those described under Alternative A for the Lower Sonoran.

From Travel Management on Wilderness Areas

Impacts would be similar to those described under the analysis for Alternative C for the Lower Sonoran.

From Vegetation Resources on Wilderness Areas

Moderate impacts on vegetative resources are anticipated under Alternative D. The curtailment of grazing would allow natural ecological processes to occur and be emphasized within the Signal Mountain and Woolsey Peak Wilderness Areas. Both ephemeral and annual grazing forage would be maintained for use only by wildlife. Passive restoration of surface disturbances would be emphasized under Alternative D, except where active restoration is required to stabilize sites. Use of native species in all active restoration projects would be required, and an integrated weed management program to control invasive species would be put into place. Moderate long-term contributions to naturalness would result from the use of native species and control of invasive species as limiting the spread of non-native vegetation would reduce the size and intensity of wildfires, which in turn destroy native vegetation. Impacts in terms of contributions to naturalness due to these vegetation management actions would be similar to those under Alternative C, and greater than under Alternatives A and B.

From Visual Resources on Wilderness Areas

Wilderness areas would be slightly more protected from offsite visual impacts under Alternative D than in preceding alternatives. Public lands adjacent to the Woolsey Peak and Signal Mountain Wildernesses would be classified as VRM Class II. This classification would offer the wilderness areas more protection from indirect visual impacts. Public lands adjacent to the Sierra Estrella Wilderness will also primarily be classified as VRM Class II, although a portion of adjacent public lands along a major utility corridor will remain managed as VRM Class III. Public lands managed to Class III present a negligible to minor potential for off-site visual effects on the Sierra Estrella Wilderness.

From Wilderness Characteristics on Wilderness Areas

Allocated lands manged to protect wilderness characteristics in the Lower Sonoran would be next to the northwestern boundaries of the Woolsey Peak and Signal Mountain wildernesses, and near the southeastern boundary of the Woolsey Peak Wilderness. Minor protective contributions and enhancements to naturalness and opportunities for solitude and primitive, unconfined recreation would occur in those portions of wilderness areas adjacent to or near allocated lands manged to protect wilderness characteristics. Visitors would be afforded a much larger landscape where naturalness could be appreciated and additional opportunities for outstanding solitude and primitive, unconfined recreation realized. Impacts would be negligible.

4.19.6.3. Sonoran Desert National Monument

4.19.6.3.1. Areas of Critical Environmental Concern

No ACECs are allocated in this Alternative for the SDNM. The Monument's proclamation provides the necessary protection that an ACEC would provide.

4.19.6.3.2. National Byways

From Lands & Realty on National Byways

Impacts from Lands & Realty Management actions on the designation of Arizona State Route 238 and I-8 as National Scenic Byways would be negligible as the utility corridor is not brought forward for consideration in Alternative D. Conditions will remain as they are currently with no additional impacts. This action would have minor to moderate effects on the retention of scenic, natural, vistas and recreational opportunities along these byways.

From Recreation Management on National Byways

Impacts on special designations from the designation of I-8 as a National Scenic Byway would be minor by affording some landscape and scenery management emphasis along the 10 miles of the South Maricopa Mountains Wilderness boundary next to the highway. Currently, except for the highway itself, the surrounding Sonoran Desert landscapes are exceedingly natural with wilderness to the north and uninterrupted vistas to the south. The impacts from Special Designations on the designation of Arizona State Route 238 as a National Scenic Byway would be negligible, as described under Alternative C.

From Special Designations on National Byways

Impacts on special designations from the designation of I-8 as a National Scenic Byway would be minor by affording some landscape and scenery management emphasis along the 10 miles of the South Maricopa Mountains Wilderness boundary next to the highway. Currently, except for the highway itself, the surrounding Sonoran Desert landscapes are exceedingly natural with wilderness to the north and uninterrupted vistas to the south. The impacts from Special Designations on the designation of Arizona State Route 238 as a National Scenic Byway would be negligible, as described under Alternative C.

From Travel Management on National Byways

Impacts are anticipated to be negligible.

From Visual Resources on National Byways

Impacts from VRM management actions on the designation of Arizona State Route 238 and I-8 as National Scenic Byways would be moderate as the surrounding lands would be managed under Class I visual prescriptions. The current conditions of naturalness, scenery, vistas, would be maintained on both sides of the South Maricopa Mountains Wilderness.

4.19.6.3.3. National Historic Trails

From Minerals Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts would be the same as those described under Alternative C for the Monument, except that there would be some additional restrictions on the use of heavy equipment which may minimize the level of direct effect on the Anza NHT and associated resources during construction or maintenance. Impacts would be minor.

From Recreation Management on National Historic Trails

Impacts would be the same as those described under Alternative B for the Monument.

From Special Designations on National Historic Trails

Impacts would be the same as those described under Alternative D for the Lower Sonoran, except, no ACECs exists within the Monument that would provide the protection to NHT resources, therefore, similar management prescriptions for the NHT exist to provide similar protective direct and indirect effects on trail resources at a minor to major level of intensity over the long term.

From Travel on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument, except for a much larger reduction in the number of routes. Fewer routes may have a beneficial effect on the Anza NHT resources and Monument objects as there may be fewer places where impacts would occur. Impacts would range from minor to moderate.

From Visual Resources on National Historic Trails

Under this alternative, allocation of the Anza NHT corridor and the associated Monument objects would lie in a narrow VRM Class II (approximately 67 percent of the trail area in the Monument) Management zone, surrounded on both sides by a management zone of VRM Class I (approximately 33 percent of the trail area in the Monument). Management of the narrow NHT corridor under a VRM Class II in the immediate, "foreground" landscape and VRM Class I in the remainder of the surrounding "middleground" to "background" landscape would have a far more beneficial effect than under Alternative A on the essential characteristics and attributes of a NHT. Management of activities and developments would be more restrictive in terms of visual intrusions and ground disturbing activities on the historic landscape, leading to a more protection of the NHT resources and associated Monument objects, at a minor to moderate level of intensity. This alternative would offer the highest level of protection from incompatible developments and visual intrusion upon this historic landscape. Intensity of these effects would be felt at a minor level within the SDNM over the long term.

From Wilderness Characteristics on National Historic Trails

Under this alternative, portions of allocated lands manged to protect wilderness characteristics lie within the central boundaries of the NHT within the Monument. Prescriptions for avoiding the placement of new s, restoration of disturbed areas, and minimizing the intrusions of new and existing developments within allocated lands manged to protect wilderness characteristics would offer an increased level of protection over Alternative A for a high potential segment of the Anza NHT, as a Monument object, and its associated resources. Impacts would be minor.

4.19.6.3.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

From Lands & Realty on Wilderness Areas

No utility corridors would be designated in the SDNM and new utility installations would not be constructed along State Route 238 or I-8. Visual and scenic conditions would remain as they currently are. Potential visual impacts described under Alternatives B and C would not occur. Overall, this action would offer a slight visually protective influence on the South Maricopa Mountains Wilderness in the north and a moderate visual protective effect on the wilderness area's south side.

From Livestock Grazing on Wilderness Areas

Impacts would be the same as those described under Alternative D for the Lower Sonoran

From Priority Wildlife Species and Habitat Management on Wilderness Areas

Impacts would be the same as those described under Alternative D for the Lower Sonoran, except that no WHAs would be designated within the SDNM.

From Recreation Management on Wilderness Areas

Under Alternative D, recreation management and establishment of an SRMA would contribute to naturalness and opportunities for solitude and primitive, unconfined recreation to a greater degree than any other alternative, because the largest part of lands adjacent to the wilderness areas would be managed for nonmotorized recreational opportunities consistent with wilderness. One SRMA would be designated and 96 percent of it would be allocated to back country RMZ. Impacts would be negligible to minor.

From Special Designations on Wilderness Areas

There are no impacts on wilderness areas from Arizona State Route 238 being designated as a National Scenic Byway under Alternative C. I-8 being designated as a National Scenic Byway would have moderate impacts on naturalness and solitude within the South Maricopa Mountains Wilderness. A protective management emphasis would be placed for preservation of scenic, cultural, historic and recreation values along this highway contributing to a unique travel experience through the Monument's Sonoran Desert landscapes, and maintain scenic and natural views, both within and outside the wilderness.

From Travel Management on Wilderness Areas

Under Alternative D, 11 motorized routes providing access to the wilderness areas, six motorized routes representing 17 miles of wilderness boundary, and two cherrystem roads representing 10-miles of wilderness boundary would be designated as closed to motorized vehicle use. This action would contribute to a moderate degree to naturalness and solitude in adjacent wilderness areas than would Alternatives A, B and C. Motorized trespass and indirect recreation and resource impacts would no longer occur along roads unavailable for public use.

From Vegetation Resources on Wilderness Areas

Impacts are the same as described under Alternative D for the Lower Sonoran.

From Visual Resources on Wilderness Areas

Compared to preceding alternatives, all lands adjacent to existing wilderness areas would be managed as VRM Class I. This classification would better preserve the existing natural character of landscapes next to wilderness, contributing an additional minor level of protection from off-site and indirect visual impacts on the wilderness. This effect, in turn, would protect the scenic and naturalness values of the wilderness areas.

From Wilderness Characteristics on Wilderness Areas

Three of the areas allocated as lands manged to protect wilderness characteristics in the SDNM would adjacent or near to the North and South Maricopa Wildernesses. Minor protective contributions and enhancements to naturalness and opportunities for solitude and primitive, unconfined recreation would occur in those portions of wilderness areas adjacent to or near allocated lands manged to protect wilderness characteristics. Visitors would be afforded a much larger landscape where naturalness could be appreciated and additional opportunities for outstanding solitude and primitive, unconfined recreation realized. Indirectly, solitude

and primitive recreation opportunities could be moderately enhanced as visitors seeking a wilderness-type experience would have more landscapes offering and protecting such opportunities than presented under Alternatives A, B, C and E.

4.19.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

Under Alternative E, special designations in the two Decision Areas would be the same as those described under Alternative D, except the acres would decrease or stay the same among the four ACECs. Management prescription within theseACECs would also be less restrictive than those for Alternative D. Agua Caliente Road would also be added as a scenic byway in the Lower Sonoran.

4.19.7.1. Both Decision Areas

4.19.7.1.1. Areas of Critical Environmental Concern

No unique impacts.

4.19.7.1.2. National Byways

No unique impacts.

4.19.7.1.3. National Historic Trails

From Air Quality Resources on National Historic Trails

Impacts would be the same as those described under Alternative C for both Decision Areas.

From Cultural and Heritage Resources on National Historic Trails

Impacts would be the same as those described under Alternative C for both Decision Areas.

From Lands & Realty on National Historic Trails

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Livestock Grazing on National Historic Trails

Impacts could be the same as those described under Alternative A for both Decision Areas.

4.19.7.1.4. Wilderness Areas

No unique impacts.

4.19.7.2. Lower Sonoran

4.19.7.2.1. Areas of Critical Environmental Concern

From Cultural and Heritage Resources on Areas of Critical Environmental Concern

Under Alternative E impacts to wildlife and threatened and endangered species would be similar to Alternative D except: The reduction in acres under Alternative E is based on elevation requirements and soil characteristics needed by the Acuna cactus. Under Alternative E an area of approximately 61,300 acres of public lands would be designated as the Coffeepot-Batamote ACEC. Livestock facilities could be developed to improve livestock distribution and natural resource conditions and when the facilities are not in conflict with wildlife or cultural resources. Impacts to wildlife are expected to be greater than D; however impacts would range from negligible to minor with proper management.

Alternative E is similar to Alternative D except: under Alternative E: The Cuerda de Lena ACEC would be closed to mineral material disposals. By closing the area to mineral material disposals habitat would remain connected and available for wildlife use. Valid existing rights will be respected; however surface disturbance would be minimized through plans of operation where appropriate. Using plans of operations on existing rights foot prints of operations could be decreased in the ACEC to allow for habitat availability for all wildlife species. Impacts from Alternative E would be greater than D; however, overall impacts would be expected to range from negligible to minor.

Under Alternative E impacts would be similar to D except: Alternative E mineral material disposals would not be allowed within 500 feet of cliff faces to protect raptor nesting areas as well as cultural and heritage sites in the Lower Gila Terraces ACEC and Historic Trails ACEC. Impacts from Alternative E would be the same as Alternative D.

Impacts would be the same as those described under Alternative D for the Saddle Mountain ACEC.

From Lands & Realty on Areas of Critical Environmental Concern

As under Alternative C and D, the El Paso Natural Gas utility corridor would be removed, providing for protection of resource values (particularly visual) of the ACEC from development of this corridor. In addition, the Coffeepot ACEC would become an avoidance area for all LUAs, including utility-scale renewable energy development sites. Lands would also be retained. Negligible impacts would be expected.

Under Alternative E, the Cuerda de Lena ACEC would become a LUA avoidance area and would be prohibited from utility-scale renewable energy development. Lands would also be retained in the ACEC. Therefore, impacts would be negligible.

El Paso Natural Gas utility corridor would be a removed and impacts would be similar to those discussed in Alternative D. The Lower Gila Terraces and Historic Trails ACEC contains lands manged to protect wilderness characteristics under this alternative, which would be managed as avoidance areas for all LUAs. The ACEC would also prohibit utility-scale renewable energy development. All Federal lands within the ACEC would also be retained. These actions would present positive impacts on the management of this ACEC.

Impacts would be the same as those described under Alternative E for the Saddle Mountain ACEC, except conditions might slightly lessen as the Palo Verde to Devers and El Paso Natural Gas multiuse utility corridors are still present under this alternative. Impacts would range from minor to moderate.

From Livestock Grazing on Areas of Critical Environmental Concern

Livestock facilities could be developed to improve livestock distribution and natural resource conditions and when the facilities are not in conflict with wildlife or cultural resources. Allowing grazing within the ACEC could improve habitat characteristics for wildlife species within the ACEC. Livestock developments would be mitigated to allow passage, such as fences, and use, such as water sources, by wildlife. Impacts to wildlife and threatened and endangered species are expected to range from negligible to minor.

Livestock facilities could be developed to improve livestock distribution and natural resource conditions and when the facilities are not in conflict with wildlife or cultural resources. Allowing grazing within the Cuerda de Lena ACEC could improve habitat characteristics for wildlife species within the ACEC. Livestock developments would be mitigated to allow passage, such as fences, and use, such as water sources, by wildlife. Impacts to wildlife and threatened and endangered species are expected to range from negligible to minor.

Livestock facilities could be developed to improve livestock distribution and natural resource conditions and when the facilities are not in conflict with wildlife or cultural resources. Allowing grazing within the Lower Gila Terraces and Historic Trails ACEC could improve habitat characteristics for wildlife species within the ACEC. Livestock developments would be mitigated to allow passage, such as fences, and use, such as water sources, by wildlife. Impacts to wildlife and threatened and endangered species are expected to range from negligible to minor. Areas where livestock gather in number may impact cultural and historic trail resources to a minor to moderate level.

Livestock grazing would be managed to ensure the resource values of the Saddle Mountain ACEC are maintained and protected. Managing livestock grazing in this manner would allow the persistence of habitat for wildlife species within the ACEC and reduce competition for resources needed by wildlife for life cycle requirements. Overall impacts from Alternative E would be expected to range from negligible to minor.

From Minerals Management on Areas of Critical Environmental Concern

Washes in the ACEC would be closed to disposal of mineral materials. Closing washes to the disposal of material minerals would retain wash characteristics for wildlife species in the ACEC and reduce the amount of fragmentation and retain natural settings within the xeroriparian systems. Management of mineral uses would be through plans of operation. Valid existing rights would be respected; however, potential surface disturbance would be minimized through plans of operations where appropriate. Impacts to wildlife are expected to be greater than D; however impacts would range from negligible to minor with proper management.

Alternative E is similar to Alternative D except: under Alternative E: The Cuerda de Lena ACEC would be closed to mineral material disposals, closed to leasable Minerals, and open to locatable minerals with appropriate stipulations and NTLs. . By closing the area to mineral material disposals habitat would remain connected and available for wildlife use. Valid existing rights

will be respected; however surface disturbance would be minimized through plans of operation where appropriate. Using plans of operations on existing rights foot prints of operations could be decreased in the ACEC to allow for habitat availability for all wildlife species. Impacts from Alternative E would be greater than D; however, overall impacts would be expected to range from negligible to minor.

Portions of the Lower Gila Terraces and Historic Trails ACEC would be closed to mineral leasing. This would have a protective effect on the cultural and historic trails of the ACEC. Impacts to would are expected to range from negligible to minor.

Saddle Mountain ACEC would be closed to mineral leasing. Impacts would be expected to range from negligible to minor.

From Priority Wildlife Species and Habitat Management on Areas of Critical Environmental Concern

Although seasonal closures to avoid potential effects to cactus ferruginous pygmy-owl would be implemented under Alternative E in a slightly different manner than under Alternative C, both would be equally protective of the owl. Unlike Alternative C but similar to Alternative D, there would be no additional protection potential afforded though a natural resource allocation overlapping the Coffeepot-Batamote ACEC.

Alternative E is similar to Alternative D except: under Alternative E: The Cuerda de Lena ACEC would be closed to mineral material disposals. By closing the area to mineral material disposals habitat would remain connected and available for wildlife use. Valid existing rights will be respected; however surface disturbance would be minimized through plans of operation where appropriate. Using plans of operations on existing rights foot prints of operations could be decreased in the ACEC to allow for habitat availability for all wildlife species. Impacts from Alternative E would be greater than D; however, overall impacts would be expected to range from negligible to minor.

Impacts from priority wildlife would be negligible on the Lower Gila Terraces and Historic Trails ACEC and the Saddle Mountain ACEC.

From Recreation Management on Areas of Critical Environmental Concern

Recreation management decisions would provide protection of resource values of the Coffeepot-Batamote-Sauceda ONA ACEC in much the same way as described under Alternative D, with some elements of Alternative C. The proposed ACEC, however, would be within the Ajo Trails SRMA. With the exception of motorized routes that would be within the passage RMZ, nearly the entire ACEC would be within the back country RMZ (62,500 acres, with only 500 acres in Frontcountry RMZ). Impacts from requiring equestrian and stock animal users with SRPs to use certified weed-free feed and encouraging others to provide weed-free feed for their animals would be the same as under Alternative C, which would slightly less protective of resource values in the ACEC than under Alternative D. Impacts from allowing paintball activities in certain areas that would likely be outside of ACECs would be the same as under Alternative C. Geocache sites would be prohibited in cultural resource sites of the ACECs, protecting cultural resource values of the ACEC. Impacts would be expected to range from negligible to minor. All camping (vehicle-based and primitive) would be limited to designated sites within the ACEC from February 1 to September 15 to protect pygmy-owls during the breeding, nesting, and

dispersal season. Designating camping areas within the ACEC would allow the general public to utilize the ACEC while providing protections to the owl during life cycle requirements.

Impacts are the same as those describe under Alternative D for the Cuerda de Lena, Lower Gila Terraces and Historic Trails ACEC, and Saddle Mountain ACECs.

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

From Soil Resources on Areas of Critical Environmental Concern

Impacts will be the same as those described under Alternative B for the Coffeepot and Cuerda de Lena ACECs.

Impacts are expected to negligible for the Lower Gila Terraces and Historic Trails ACEC and Saddle Mountain ACEC.

From Special Designations on Areas of Critical Environmental Concern

Under Alternative E, impacts to wildlife and threatened and endangered species would be similar to Alternative D. However, the reduction in acres under Alternative E is based on elevation requirements and soil characteristics needed by the Acuna cactus. Under Alternative E an area of approximately 61,300 acres of public lands would be designated as the Coffeepot-Batamote ACEC.

Impacts to wildlife are expected to be greater than D; however impacts would range from negligible to minor with proper management which would be an improvement as compared to Alternative A and B.

Alternative E is similar to Alternative D. However, under Alternative E, the Cuerda de Lena ACEC would be closed to mineral material disposals. By closing the area to mineral material disposals habitat would remain connected and available for wildlife use. Valid existing rights will be respected; however surface disturbance would be minimized through plans of operation where appropriate. Using plans of operations on existing rights foot prints of operations could be decreased in the ACEC to allow for habitat availability for all wildlife species. Impacts from Alternative E would be greater than D; however, overall impacts from the special designation would be expected to range from negligible to minor which would be an improvement as compared to Alternative A.

The development of interpretive sites along the Anza NHT may have a minor to moderate impact to the ACEC and its wildlife and cultural resources due to the expected increase in human visitation.

Impact would be the same as those described under Alternative D for the Lower Gila Terraces and Historic Trails ACEC in the Lower Sonoran, except, under Alternative E, mineral material disposals would not be allowed within 500 feet of cliff faces to protect raptor nesting areas and important cultural sites. Impacts from Alternative E would be the same as Alternative D which would be an improvement as compared to Alternative A. Overall impacts from the special designation would be expected to range from negligible to minor which would be an improvement as compared to Alternative A for this area.

Impact would be the same as those described under Alternative D for the Saddle Mountain ACEC in the Lower Sonoran, except, livestock grazing would be managed to ensure the resource values of the ACEC are maintained and protected. Managing livestock grazing in this manner would allow the persistence of habitat for wildlife species within the ACEC and reduce competition for resources needed by wildlife for life cycle requirements. Overall impacts from Alternative E overall impacts from the special designation would be expected to range from negligible to minor which would be an improvement as compared to Alternative A for this area.

From Travel Management on Areas of Critical Environmental Concern

Under Alternative E, portions of routes within the proposed Coffeepot-Batamote ACEC, would be designated as closed and additional routes within the ACEC would be designated as administrative use only. The reduction of motorized routes open to motorized use would reduce the amount of noise, dust, vandalism, and vegetative and soil damage in the ACEC. Management of nonmotorized, mechanized travel and hiking and equestrian travel would be protective of resource values in the same manner as described under Alternative C. Motorized vehicle use would be restricted in washes that contain occupied or suitable cactus ferruginous pygmy-owls habitat from February 1 to September 15 to protect pygmy-owls during the breeding, nesting, and dispersal season. All other areas would be limited to existing or designated routes. With restrictions in large washes and limiting motorized use to existing or designated routes that contain the owl or habitat characteristics for the owl, the public is still afforded recreational opportunities while protecting the owl and its life cycle requirements. Overall impacts would be negligible to minor.

Impacts are the same as those describe under Alternative D for the Cuerda de Lena, Gila River Terraces, and Saddle Mountain ACECs.

From Vegetation Resources on Areas of Critical Environmental Concern

Prohibiting the collection of trees, shrubs, and cacti and prohibiting wood harvesting would protect the botanical resource values of the ACEC. Restoration and rehabilitation using both active and passive methods based on site conditions, using native plants as the first priority, and pursuing an integrated weed management approach to control invasive species would be protective of the botanical resource values of the ACEC.

Prohibiting the collection of trees, shrubs, and cacti and prohibiting wood harvesting would protect the botanical resource values of the Cuerda de Lena ACEC. Restoration and rehabilitation using both active and passive methods based on site conditions, using native plants as the first priority, and pursuing an integrated weed management approach to control invasive species would be protective of the botanical resource values of the ACEC.

Impacts would be the same as those described under Alternative D for the Lower Gila Terraces and Historic Trails ACEC and Saddle Mountain ACEC.

From Visual Resources on Areas of Critical Environmental Concern

Under this alternative the Coffeepot-BatamoteCoffeepot-Batamote ACEC would encompass approximately 61,300 acres. The majority of the Coffeepot Botanical ACEC would be assigned to VRM Class II. The El Paso Natural Gas ROW/Gas Pipeline Road would be Class III. This, along with the management decision to manage the viewshed of the Batamote-Coffeepot Mountains to protect scenic values of the viewsheds, would be a more protective designation than under

Alternative A. Associated restrictions on development/use would protect the scenic and natural landscape values of the ACEC, as well as protect the other resource values of the ACEC. Impacts would be expected to range from negligible to minor.

The Cuerda de Lena ACEC encompasses approximately 59,300 acres. The entire ACEC would be assigned as Class III VRM. The proposed ACEC was designed to protect habitat for the endangered Sonoran pronghorn. VRM restrictions could enhance habitat for the pronghorn by reducing visual obstructions in areas utilized by the pronghorn within Class III VRM areas. VRM Class III restrictions are not as stringent as Class III allowing potential visual obstructions that may cause avoidance areas by the pronghorn. Impacts would be expected to range from negligible to moderate.

The Lower Gila Terraces and Historic Trails ACEC in its entirety encompasses approximately 144,500 acres. Under this Alternative, Class II and III classifications would be assigned. A majority of the ACEC contains VRM Class III and some Class II to a lesser degree. The proposed VRM classifications would assist in protecting habitat along the Fred J. Weiler Green belt to assist in the management of migratory birds as well as terrestrial and aquatic species. Impacts are expected to range from negligible to moderate.

The allocation of VRM Class III would indirectly impact the integrity of historic trails, cultural resources, and historic landscape settings by allowing visual intrusions on the landscape. This would deteriorate the integrity of these heritage resources at a minor to moderate level of intensity.

The Saddle Mountain ACEC encompasses approximately 48,500 acres. The majority of the ACEC is proposed as Class IV and III. And a small portion in the northwest as Class II. The Class II assignment would reduce the amount of visual obstructions within the ACEC and could benefit wildlife by reducing areas of avoidance created by visual obstructions. The Class III and VI classifications would allow for more obstruction within the ACEC and could potentially create large avoidance areas for some wildlife species. Impacts would be expected to range from negligible to moderate.

From Water Resources on Areas of Critical Environmental Concern

Impacts would be the same as those described under Alternative C for the Coffeepot ACEC.

Impacts are expected to be negligible for the Cuerda de Lena, Lower Gila Terraces and Historic Trails, and Saddle Mountain ACECs.

From Wilderness Characteristics on Areas of Critical Environmental Concern

Portions of the Coffeepot-Batamote-Sauceda ONA ACEC would be allocated as lands manged to protect wilderness characteristics, which would be protective of the resource values of the ACEC as described under Alternative C. Impacts would be negligible.

No lands manged to protect wilderness characteristics would be allocated in the Cuerda de Lena ACEC. Impacts would be negligible.

No lands manged to protect wilderness characteristics would be allocated near the GLower Gila Terraces and Historic Trails ACEC. Impacts would be negligible.

A small portion of the Saddle Mountain ACEC would be allocated as lands manged to protect wilderness characteristics, which would be protective of the resource values of the ACEC. Impacts would be from negligible.

4.19.7.2.2. National Byways

From Lands & Realty on National Byway

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Recreation Management on National Byway

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Special Designations on National Byway

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Travel Management on National Byway

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Visual Resources on National Byway

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

4.19.7.2.3. National Historic Trails

From Minerals Management on National Historic Trails

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts would be the same as those described under Alternative D for the Lower Sonoran, except that the restrictions would overlap with NHT only in far fewer areas. Impacts are anticipated to be moderate.

From Recreation Management on National Historic Trails

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Special Designations on National Historic Trails

Impacts would be the same as those described under Alternative D for the Lower Sonoran, except that some interpretive facilities would be developed. As additional interpretive media is developed for the trail, increasing visitation may impact the trail resources directly in a minor

level by vehicle encroachment, and trampling. Affects would be far less than that expected under Alternative A due primarily to restrictions in place under the ACEC allocation.

From Travel Management on National Historic Trails

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Visual Resources on National Historic Trails

Impacts would be the same as those described under Alternative D for the Lower Sonoran.

From Wilderness Characteristics on National Historic Trails

Impacts would be negligible, as no lands manged to protect wilderness characteristics would be allocated within or near the NHT boundaries.

4.19.7.2.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

Impacts would be similar to those described under Alternative D for the Monument. Although the Gila River Terraces and Lower Gila Historic Trail SCRMA would not be allocated under Alternative D or E, the area would become an ACEC, providing similar protections. Similarly, although no SCRMA would be allocated the SDNM, the cultural resources would receive similar protection as under Alternative D.

From Livestock Grazing on Wilderness Areas

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Priority Wildlife Species and Habitat Management on Wilderness Areas

Management of the Gila Bend WHA in the Lower Sonoran would have impacts similar to those described for Alternatives C and D. This, in addition to decisions protecting core areas of wildlife habitat, emphasizing connectivity of wildlife habitat, removing ineffective wildlife water developments, requiring use of native vegetation in restoration efforts, and measures to maintain populations of native wildlife, especially sensitive species, would result in Alternative E's biological and ecological decisions contributing to naturalness and associated wilderness values to a greater degree than those under Alternatives A and B, and nearly equal to those of Alternatives C and D. Wildlife waters would be developed and maintained on a case-by-case basis and would have impacts similar to those described under Alternative A. Impacts would be negligible.

From Recreation Management on Wilderness Areas

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Special Designations on Wilderness Areas

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Travel Management on Wilderness Areas

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Vegetation Resources on Wilderness Areas

Decisions requiring use of native vegetation in restoration efforts, and measures to maintain populations of native sensitive species, would result in Alternative E's biological and ecological decisions contributing to naturalness to a minor, but slightly greater degree, than those offered under Alternatives A, B or C.

From Wilderness Characteristics on Wilderness Areas

The designation of 55,400 acres of the Lower Sonoran as lands manged to protect wilderness characteristics would have no impacts on wilderness areas; these areas are not in close proximity to designated wilderness.

4.19.7.3. Sonoran Desert National Monument

4.19.7.3.1. Areas of Critical Environmental Concern

No ACECs are allocated in this Alternative for the SDNM. The Monument's proclamation provides the necessary protection that an ACEC would provide.

4.19.7.3.2. National Byways

From Lands & Realty on National Byways

Impacts would be the same as those described under Alternative C in the Monument, except, impacts from lands and realty Management actions on the designation of Arizona State Route 238 and I-8 as a National Scenic Byway would range up to moderate due to visual impacts from the potential installation of underground utility installations and upgrades of the Interstate ROW. Such installations south of I-8 could have moderate impacts on the scenic, natural, vistas and recreational opportunities along this byway. Currently, except for the highway itself, the surrounding classic Sonoran Desert landscapes are exceedingly natural with wilderness to the north and uninterrupted vistas to the south.

From Recreation Management on National Byways

Impacts would be the same as those described under Alternative C in the Monument, except, management actions on the designation of I-8 as a National Scenic Byway would be negligible.

From Special Designations on National Byways

Impacts would be the same as those described under Alternative C in the Monument, except, impacts on Special Designations from the designation of I-8 as a National Scenic Byway would be minor by affording some landscape and scenery mangement emphasis along 10 miles of the South Maricopa Mountains Wilderness next to the highway. Currently, except for the highway

itself, the surrounding classic Sonoran Desert landscapes are exceedingly natural with wilderness to the north and uninterrupted vistas to the south. The impacts from Special Designations on the designation of Arizona State Route 238 as a National Scenic Byway would be negligible, as described under Alternative C.

From Travel Management on National Byways

Impacts would be the same as those described under Alternative D in the Monument.

From Visual Resources on National Byways

Impacts from VRM management actions on the designation of Arizona State Route 238 would be the same as described under Alternative C, except impacts from VRM management on the designation of I-8 as National Scenic Byways would be potentially more adverse than Alternative D. Under Alternative D, the lands south of I-8 would be managed as VRM Class 1 areas; no noticeable visual disturbances would be allowed. Under Alternative E, the area would be managed under Class III prescriptions as a utility corridor. Impacts produced by installation of underground utilities for up to ½ mile south of the highway could moderately impair scenic vistas southward over the short-term. Mitigation, soil banking, narrow or restricted LUA widths, and large-scale plant restoration efforts would be needed to bring the impacts down to a minor intensity if the utility corridor was fully occupied by underground installations.

4.19.7.3.3. National Historic Trails

From Minerals Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument.

From Priority Wildlife Species and Habitat Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument.

From Recreation Management on National Historic Trails

Impacts would be the same as those described under Alternative B for the Monument.

From Special Designations on National Historic Trails

Impacts would be the same as those described under Alternative D for the Monument, except that some interpretive facilities would be developed. As additional interpretive media is developed for the trail, increasing visitation may impact the trail resources and Monument objects directly in a minor to moderate level by vehicle encroachment, and trampling. Affects would be far less than that expected under Alternative A due primarily to restrictions in place.

From Travel Management on National Historic Trails

Impacts would be the same as those described under Alternative C for the Monument.

From Visual Resources on National Historic Trails

Impacts would be the same as those described under Alternative C for the Monument, except that VRM Class II management would be extended over about 31 percent of the Anza NHT in the Monument and its associated landscape and resources. This will have a protective effect on the Anza NHT to a minor to moderate level of intensity.

From Wilderness Characteristics on National Historic Trails

Impacts would be negligible, as no lands manged to protect wilderness characteristics would be allocated within or near the NHT boundaries.

4.19.7.3.4. Wilderness Areas

From Cultural and Heritage Resources on Wilderness Areas

Impacts would be the same as those described under Alternative D for the Monument.

From Livestock Grazing on Wilderness Areas

Impacts would be the same as those described under Alternative B for the Monument.

From Priority Wildlife Species and Habitat Management on Wilderness Areas

Impacts would be the same as those described under Alternative E for the Monument, except that no WHAs would be designated within the SDNM, as the Monument proclamation protects many of the natural resources intended for protection in the WHAs.

From Recreation Management on Wilderness Areas

Impacts would be the same as those described under Alternative C for the Monument.

From Special Designations on Wilderness Areas

Impacts would be the same as those described under Alternative D for the Monument.

From Travel Management on Wilderness Areas

Potential impacts to wilderness areas from Travel Management under Alternative E would be slightly less than those described under Alternative D. Six miles of boundary road would be closed instead of the about 11-miles closed under Alternative D. Moreover, public use on five other wilderness access roads would be curtailed, as opposed to a total of 11 roads where access is cut under Alternative D. Overall, Alternative E provides more protection to wilderness values than Alternative A, B and C, and less protection than afforded by Alternative D.

From Vegetation Resources on Wilderness Areas

Impacts would be the same as those described under Alternative E for the Monument.

From Wilderness Characteristics on Wilderness Areas

Allocations to lands manged to protect wilderness characteristics under Alternative E would have no direct impacts on wilderness areas, with, by and large, impacts similar to Alternative C. Proposed wilderness character allocations are several miles south of I-8. Indirectly, solitude and primitive recreation opportunities could be slightly enhanced as visitors seeking a wilderness-type experience would have more landscapes offering and protecting such opportunities than presented under Alternatives A and B, and less than offered under Alternatives C and D.

4.20. IMPACTS ON HAZARDOUS MATERIALS & PUBLIC SAFETY

The impacts of management decisions on the occurrence of or risks associated with hazardous materials and wastes, solid wastes, and public health and safety are discussed in this section. Risks associated with hazardous materials, wastes, and public health and safety are directly proportionate to the types and frequency of resource use within the Decision Areas. Typically, the presence of hazardous materials and wastes may be related to vehicular travel and the use of fuels and other hazardous substances associated with vehicles. These types of spills and releases usually occur as a result of a vehicular accident, either from the vehicle itself or from hazardous materials and/or wastes that the vehicle might be transporting. Spills and releases of hazardous substances may also occur during recreational activities such as recreational shooting, or during other uses of public lands, including livestock grazing, utility line installation and maintenance, and mining. Similarly, the threat to public health and safety is related to the use of motor vehicles (including ATVs and motorcycles), recreational target shooting, abandoned mines and prospects, the proximity of military operations at the BGR, the presence of UXO (especially in the Sand Tank Mountains Area of SDNM), livestock operations, activities related to smuggling and undocumented aliens (UDAs), wildfires, and natural hazards.

4.20.1. METHODS OF ANALYSIS

4.20.1.1. Indicators

Potential of public injury related to:

- Vehicle use,
- Recreational activities (specifically target shooting),
- Spills or releases of hazardous substances,
- Utility installations,
- Abandoned mines and prospects,
- The proximity of military operations at the BGR,
- The presence of UXO,
- Livestock operations,
- Activities related to smuggling and undocumented aliens (UDAs),
- Wildfires, and
- Natural hazards.

4.20.1.2. Assumptions

- The following assumptions regarding the future management of public safety and hazardous materials management are made:
- It is assumed that a certain degree of safety risk is inherent in any human activity. Proper safety precautions mitigate the risk of accident or injury, but circumstances beyond normal expectations can always arise.
- The natural hazards that typically occur in the desert environment would include rugged terrain, seasonally extreme temperatures, intense sunlight, and lack of drinking water, flash floods, and the presence of venomous or otherwise dangerous wildlife. These risks would be present under all alternatives at whatever particular level of activity is undertaken or type of activity is performed.
- In all areas where construction or maintenance of motorized routes, fences, campgrounds, nonmotorized trails, trailheads, LUAs, wildlife under/overpasses, and any other activity could occur, there is the potential for an inadvertent spill or release of hazardous materials or wastes. It is assumed that use of appropriate protocol during construction activities would occur, thereby lessening that risk.
- The use and application of mechanical, chemical, biological means, as well as the use of prescribed fires to control noxious weeds carries the inherent risk for spills and releases of hazardous chemicals. It is assumed that any materials used would be applied according to and in coordination with appropriate Federal, State, county, municipal, and tribal agencies, as well as in accordance with all manufacturers' directions. It is also assumed that any resulting effect would be localized.

4.20.1.3. Program Areas with no Impacts on Hazardous Materials & Public Safety

No impacts to Hazardous Materials & Public Safety are anticipated for management actions relating to:

- Air Quality
- Cave Resources
- Cultural and Heritage Resources
- Paleontological Resources
- Priority Wildlife Species and Habitat Management
- Special Designations
- Visual Resources
- Vegetation Resources
- Water Resources

- Soil Resources
- Wild Horse & Burro Management
- Wilderness Characteristics

4.20.1.4. Qualitative Intensity Scale

The intensities of impacts are the same as those described in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375).

4.20.2. COMMON TO ALL ALTERNATIVES

4.20.2.1. Both Decision Areas

From Wildland Fire Management on Hazardous Materials & Public Safety

The risks associated with exposure to wildfires are similar under all alternatives, because wildfires could occur in any location or circumstance given the needed components. Wildfires have the potential to endanger persons or property; however, the plant cover in the Decision Areas is generally too sparse to carry wildfire effectively or to generate fires with sufficient heat to be self-propagating. Accordingly, as the impact of these topics would be common to all alternatives, they will not be discussed individually in the following analysis. Impact could range from negligible to major.

4.20.2.2. Lower Sonoran

No unique impacts are identified for the Lower Sonoran under Common to All Alternatives.

4.20.2.3. Sonoran Desert National Monument

No unique impacts are identified for the SDNM under Common to All Alternatives.

4.20.3. ALTERNATIVE A (NO ACTION)

4.20.3.1. Both Decision Areas

From Minerals Management on Hazardous Materials & Public Safety

Under Alternative A, there is no formal inventory of known and suspected historic and abandoned mining claims. As a result, sites are closed and remediated as they are discovered in the Planning Area or if the sites present an immediate safety concern. Impacts from the lack of an inventory could result in minor to major impacts as the potential for public injury within these unknown sites would still exist.

In addition, all caves, mines, wells, abandoned structures, or other confined spaces would be closed to public entry unless a particular site is signed as open for such entry, or entry is authorized under a special use permit, which would further protect public health and safety.

From Special Designations on Hazardous Materials & Public Safety

Management actions related to special designations (specifically within the five designated wilderness areas, the Vekol Valley Grasslands and Coffeepot-Batamote ACECs) call for limited surface disturbing activities and development within their boundaries. As a result, these areas are remote and in some cases difficult to access. In remote areas like these, medical assistance could be delayed in the event of injury due to recreational activities. Impacts would be negligible to minor.

From Travel Management on Hazardous Materials & Public Safety

Since recreational activities are most often conducted in areas that can be accessed by motor vehicle via designated routes, the opportunity for access to more remote areas via designated routes would potentially cause interaction with the smugglers and UDAs. Under Alternative A the greatest number of open vehicle route miles of any of the alternatives exists, making access more available and detection of unauthorized entry less noticeable by law enforcement. No TMA closures, included seasonal closures, are identified under Alternative A. As a result, the opportunity to access remote and low-lying areas for illegal activity is greater than with the other alternatives.

4.20.3.2. Lower Sonoran

From Lands & Realty on Hazardous Materials & Public Safety

In the Lower Sonoran, ten utility corridors corresponding to the existing LUAs would continue to be designated under Alternative A, including corridors for natural gas pipelines, utility lines, pipelines, and electrical transmission lines. LUAs would also be approved on a case-by-case basis throughout the Decision Area. Therefore, the potential for new authorizations and maintenance on existing LUAs such as utility lines would occur more within this alternative than any other proposed alternative. As a result, the potential for accidents related to utility construction and maintenances would increase as more surface disturbance activities take place. Impacts would be minor.

Impacts from land tenure decisions would be negligible.

From Livestock Grazing on Hazardous Materials & Public Safety

Alternative A currently presents the greatest amount of AUMs (17,541) compared to all of the action alternatives. Therefore, the potential for public safety risks, such as encounters with agitated livestock, or visitor mishaps at range improvements such as stock ponds, fences, or wells would be the greatest under Alternative A. Impacts to public safety are anticipated to be minor.

From Hazardous Materials & Public Safety on Hazardous Materials & Public Safety

Under Alternative A, the BLM would maintain the existing inventory of abandoned mine sites and hazardous waste sites and update this inventory as sites are discovered and reported. Use of a response-only approach to public safety at the mine sites would limit the ability of the BLM to proactively prevent endangerment of the public's health and safety. Known abandoned mines would continue to be characterized and prioritized for containment and/or cleanup responses based on available funding. These activities would be conducted to determine the potential for the presence of high levels of heavy metals in waste rock or tailings, as well as ground or surface water quality degradation. Maintenance of this inventory would be helpful at these known sites, but the existence of other undocumented sites pose some risk of hazardous and solid waste dumping in the abandoned mine shafts. Impacts from a response oriented inventory would present moderate impacts. Impacts would be moderate.

Requiring the public to obtain permits to enter the Sentinel Plain area south of I-8 would decrease public injury from military activities associated with the Barry Goldwater Air Force Range. Impacts would be moderate.

From Recreation Management on Hazardous Materials & Public Safety

By providing the most miles of open routes for travel, Alterative A would allow for the greatest opportunity for motorists to experience safety risks related to vehicle accidents with individuals recreating on public lands (recreating such as off road target shooting, hiking, or camping), livestock grazing activities, and utility development. Impacts would be minor to moderate.

Under Alternative A, lands designated as SRMAs would comprise about 41 percent of the total acreage in the Lower Sonoran, while ERMAs would comprise the remaining lands. Since recreation use in ERMAs is unstructured and recreation management actions are limited to those of a custodial nature (managing visitor health and safety conflicts, user conflicts, and challenges to resource stewardship objectives), the occurrence of littering and wildcat dumping would more likely occur in ERMAs compared to SRMAs. Impacts would be minor.

The Sentinel Plain Lava Flow SRMA would be managed under Alternative A to facilitate compatible recreational use while protecting public safety in the vicinity of the BGR. The SRMA was relinquished from the BGR in 2001 and is contaminated with scattered UXOs. The area is also vulnerable to additional, although unintended, UXO contamination from aircraft delivered ordnance training activities that occur on the adjacent BGR. Existing management decisions direct the BLM and the Air Force to consider means of cleaning up existing UXOs and preventing additional UXO contamination. Visitors are exposed to a safety risk. The current lack of an entry permit required to enter this SRMA from the Lower Sonoran under Alternative A would leave visitors uninformed concerning the potential presence of UXO hazards. Impacts would be minor to moderate.

A number of recreational target shooting areas are located in the Lower Sonoran. Most target shooting areas are located near established travel routes. Travel management under Alternative A provides for the greatest number of open travel route miles, allowing for the greatest opportunity for off-road target shooting, although target shooting would be allowed only outside of developed areas. Alternative A does not address the risk of lead contamination in soils from bullets and the buildup of shooting debris and lacks of specific management prescriptions for recreational target shooting, which could increase the risk of injury. The lack of directives regarding cleanup of trash or spent shells under Alternative A combined with the highly-disbursed nature of recreational target shooting could result in the buildup of solid waste in a number of locations in the Decision

Areas. Under Alternative A, concern would continue regarding recreational target shooting activities conducted at popular sites where shooting is officially unsupervised, random, and, at times, concentrated. There would also be continued concern over the safety of specific shooting locations and practices and the use of automatic weapons. Impact would be moderate.

From Travel Management on Hazardous Materials & Public Safety

Current travel management decisions would remain in place under Alternative A. As such, the potential for spills and releases of hazardous materials in the event of a vehicular accident exists. Under Alternative A, approximately 12 percent of the Lower Sonoran (primarily wilderness areas and the Coffeepot Botanical ACEC) would be closed to motorized travel. All motorized vehicles would be limited to existing and/or designated roads and vehicle routes. Hazardous materials spills that could occur as a result of an automobile accident could contaminate the soil and/or water. Under Alternative A, 1670 miles of routes would be open for public use in the Lower Sonoran and. This larger number of route miles would allow for the greatest disbursement of traffic throughout the Decision Areas among the alternatives, potentially reducing the likelihood of vehicular accidents. While vehicular accidents could occur anywhere along these routes, accidents are more likely to occur in some specific locations. Based on projected population growth and the increase in demand for public lands, more congestion on the roadways would likely occur in the future. Also under Alternative A, no seasonal limitations on routes have been identified, leaving washes and other thermally sensitive areas available to public vehicular use. In the event of flooding, the potential exists for a vehicle to be stranded, risking the safety of its occupants, and possibly resulting in an inadvertent spill or release of a hazardous substance into the floodwaters and onto public lands or into the groundwater through infiltration.

4.20.3.3. Sonoran Desert National Monument

From Lands & Realty on Hazardous Materials & Public Safety

In the SDNM Decision Area, three utility corridors corresponding to the existing LUAs would continue to be designated under Alternative A. LUAs would also be approved on a case-by-case basis throughout the Decision Area, as long as they do not negatively impact the Monument objects. Therefore, the potential for new authorizations and maintenance on existing LUAs such as utility lines would occur more within this alternative than any other proposed alternative. As a result, the potential for accidents related to utility construction and maintenances would increase as more surface disturbance activities take place. Impacts would be minor. Impacts would be minor.

Impacts from land tenure decisions would be negligible.

From Livestock Grazing on Hazardous Materials & Public Safety

While allotments south of I-8 would be closed once current permits expire in the Monument, Alternative A would still allow the greatest amount of AUMs (8,703) within the Monument, compared to all of the action alternatives. Therefore, the potential for public safety risks, such as encounters with agitated livestock, or visitor mishaps at range improvements such as stock ponds, fences, or wells would be the greatest under Alternative A. Impacts to public safety are anticipated to be minor.

From Hazardous Materials & Public Safety on Hazardous Materials & Public Safety

Impacts would be the same as those under Alternative A for the Lower Sonoran, except, the Sand Tank Mountains, formerly known as "Area A", south of I-8, is restricted to entry by permit only, in an effort to decrease public injury from military activities associated with the Barry Goldwater Air Force Range. Impacts would be moderate.

From Recreation Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative A for the SDNM, except, lands designated as SRMAs would comprise about 30 percent of the total acreage in the Monument, while ERMAs would comprise the remaining lands. Since recreation use in ERMAs is unstructured and recreation management actions are limited to those of a custodial nature (managing visitor health and safety conflicts, user conflicts, and challenges to resource stewardship objectives), the occurrence of littering and wildcat dumping would more likely occur in ERMAs compared to SRMAs. Impacts would be moderate.

In SDNM, all visitors would need to obtain a permit prior to entering the Sand Tank Mountains to protect public safety, which would decrease the risks associated with UXOs in the area. This would result in the decrease of potential public injury in this area. Impacts would be minor.

A number of recreational target shooting areas are located in the SDNM Decision Areas. Most target shooting areas are located near established travel routes. Travel management under Alternative A provides for the greatest number of open travel route miles, allowing for the greatest opportunity for off-road target shooting, although target shooting would be allowed only outside of developed areas. Alternative A does not address the risk of lead contamination in soils from bullets and the buildup of shooting debris and lacks of specific management prescriptions for recreational target shooting, which could increase the risk of injury. The lack of directives regarding cleanup of trash or spent shells under Alternative A combined with the highly-disbursed nature of recreational target shooting could result in the buildup of solid waste in a number of locations in the Decision Areas. Under Alternative A, concern would continue regarding recreational target shooting activities conducted at popular sites where shooting is officially unsupervised, random, and, at times, concentrated. There would also be continued concern over the safety of specific shooting locations and practices and the use of automatic weapons. Impacts are expected to be moderate.

From Travel Management on Hazardous Materials & Public Safety

Current travel management decisions would remain in place under Alternative A. As such, the potential for spills and releases of hazardous materials in the event of a vehicular accident exists. Under Alternative A, all motorized vehicles would be limited to existing and/or designated roads and vehicle routes.

Hazardous materials spills that could occur as a result of an automobile accident could contaminate the soil and/or water. The larger number of route miles opened in Alternative A would allow for the greatest disbursement of traffic throughout the Decision Areas among the alternatives, potentially reducing the likelihood of vehicular accidents. While vehicular accidents could occur anywhere along these routes, accidents are more likely to occur in some specific

locations. Based on projected population growth and the increase in demand for public lands, more congestion on the roadways would likely occur in the future. Also under Alternative A, no seasonal limitations on routes have been identified, leaving washes and other thermally sensitive areas available to public vehicular use. In the event of flooding, the potential exists for a vehicle to be stranded, risking the safety of its occupants, and possibly resulting in an inadvertent spill or release of a hazardous substance into the floodwaters and onto public lands or into the groundwater through infiltration.

4.20.4. ALTERNATIVE B

4.20.4.1. Both Decision Areas

From Minerals Management on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative B for both Decision Areas, except that under Alternative B, an inventory of known and suspected historic and active mining claims would be established and updated annually and response or remedial actions would be developed based upon the determined risks. Management of hazardous materials would be more proactive than under Alternative A, thereby decreasing the risks to public health and safety. In addition, all caves, mines, wells, abandoned structures, or other confined spaces would be closed to public entry unless a particular site is signed as open for such entry, or entry is authorized under a special use permit, which would further protect public health and safety.

From Special Designations on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A for both Decision Areas.

4.20.4.2. Lower Sonoran

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A for the Lower Sonoran. However, the risks (impacts) related to public safety from LUA construction would be slightly minimized, as 329,300 acres would be allocated as LUA avoidance areas and 118,400 acres would be allocated as LUA exclusion areas. Impacts would be minor.

From Livestock Grazing on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A for the Lower Sonoran. However, the risks (impacts) related to public safety from human-livestock interaction would be minimized, as there would be approximately 40% fewer AUMs than in Alternative A. Impacts would be minor to negligible.

From Hazardous Materials & Public Safety on Hazardous Materials & Public Safety

Alternative B calls for establishing an inventory of all known abandoned mine sites and hazardous waste areas within the Decision Areas and to proceed with closing these sites to the public. Alternative B also calls for establishing priorities for remediation of physical safety hazards, posting signs, and closing areas to public access where public safety is an issue could substantially decrease the risk of human injury and death related to vehicle use, uncontrolled recreational activities (specifically target shooting), spills or releases of hazardous substances, utility installations, abandoned mines and prospects, the presence of UXO, livestock operations, activities related to smuggling and undocumented aliens (UDAs), wildfires, and natural hazards. Positive impacts from these actions would be moderate to major, as injuries would decrease substantially over the life of the plan.

Similar to Alternative A, Alternative B would still require the public to obtain permits to enter the Sentinel Plain area south of I-8 would decrease public injury from military activities associated with the Barry M Goldwater Air Force Range. Impacts would be moderate.

From Recreation Management on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A for the Lower Sonoran, except, lands designated as SRMAs under Alternative B would comprise about 70 percent of the total acreage in the Decision Area (29 percent more than under Alternative A), while ERMAs would comprise only about 50 percent of the Decision Area. This would result in less opportunity for littering and illegal dumping under Alternative B due to the larger number of acres managed under the more intensively-managed SRMA areas. Portions of the Lower Gila Historic Trails and Saddle Mountain SRMAs and Saddle Mountain ERMA would be designated to the back country RMZ and include areas that would be unavailable for motorized travel, and thus decreasing the risk of vehicular traffic accidents. A 40-acre area within the Ajo Trails SRMA would be designated as a limited motorized and mechanized vehicle use area where vehicle types are limited to those that are 50 inches wide or less (i.e. ATVs or motorcycles). Those qualified vehicles participating in these activities have an increased chance for accident or injury in the area due to rough terrain and unforeseen obstacles. However, due to the strict designation of this activity, risk would be limited to the allocated areas. Along with the Ajo Trails SRMA, the Buckeye Hills East Trails and Painted Rock Mountains Trails SRMAs would emphasize motorized and intensive use recreational opportunities, presenting additional risk for accident or injury, but these impacts would be expected to be relatively localized. Other SRMAs would be established under Alternative B to provide for nonmotorized day use activities. While the risk of accident or injury exists with any recreational activities, the lack of motorized activities would tend to decrease the opportunity for serious injury or hazardous spills.

The Sentinel Plain Lava Flow SRMA would be restricted to entry by permit only to protect public health and safety from the presence of possible munitions and UXOs. An entry permit and the associated instructions for accessing the area would provide visitors with information concerning the potential presence of UXO hazards, which should reduce risk of accident or injury. In the SDNM, impacts from obtaining a permit prior to entering the Sand Tank Mountains would be the same as under Alternative A.

As most target shooting areas are located near established travel routes, having slightly fewer miles of routes available under Alternative B for off-road target shooting would reduce the opportunity for shooters to leave shooting debris and materials behind. Under Alternative B, recreational target shooting would be managed to provide for removal of all brass, targets, target litter, and other materials from public lands at the close of each shooting visit. In addition, the use

of targets and target materials that do not add litter are required under this alternative. However, disbursed recreational target shooting would most likely increase with the availability of more lands managed for recreational use, creating the potential for injury from inappropriate use or the use of automatic weapons. Both recreational shooters as well as recreational visitors within the range of fire would be at risk.

From Travel Management on Hazardous Materials & Public Safety

Under Alternative B, outside of designated wilderness, vehicles would be limited to routes designated as open or available for nonmotorized, mechanized vehicle use. Under this alternative, approximately 11 percent of the public lands in the Lower Sonoran would be closed to public travel (compared to about 12 percent under Alternative A), leaving an additional 806,960 acres available for travel along designated routes. This increased availability for route usage would slightly increase over Alternative A (by 28 percent or almost 806,960 acres), increasing proportionately the risk of injury or hazardous spill from an automobile accident. Alternative B would provide slightly less opportunity for recreational activities than Alternative A that could pose a safety risk than Alternative A, such as off-road target shooting, hiking, and camping.

Vehicle access from highways onto public lands that cross highways, railroads, or other LUA barriers may elevate the potential of a vehicular accident, potentially resulting in the release of hazardous substances and injury. Legal public access to public lands for motorized and nonmotorized travel would be developed under Alternative B, reducing the risk of accidents in these areas compared to Alternative A.

Access to locations where illegal drug production might occur would be slightly less available than under Alternative A, but detection of unauthorized entry would be slightly more noticeable by law enforcement officers. Travel management area closures are identified for the Painted Rocks camping area and for the pronghorn seasonal closure area under Alternative B, which would somewhat restrict the opportunity to access remote and low-lying areas for illegal activity compared to Alternative A, slightly decreasing the risk to visitor safety from personal encounters or from hazardous materials.

4.20.4.3. Sonoran Desert National Monument

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described for Alternative A in the SDNM, however, the entire Monument would be allocated as a LUA avoidance area, which would have the same decreasing risk effects to public safety related to the construction of LUAs as under Altenraitve A, as the LUA avoidance area allocation would allow for LUA development within the Monument, while making sure that all Monument objects would be protected. Impacts would be minor.

From Livestock Grazing on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A for the SDNM. However, the risks (impacts) related to public safety from human-livestock interaction would be slightly minimized, as there would be approximately 40% fewer AUMs than in Alternative A. Impacts would be minor to neglibible. 8,500 acres would be fenced off, so impacts in the exclosure would be negligible.

From Hazardous Materials & Public Safety on Hazardous Materials & Public Safety

Impacts would be the same as those described in Alternative B for the Lower Sonoran. However, similar to Alternative A, the Sand Tank Mountains, formerly known as "Area A", south of I-8, is restricted to entry by permit only, in an effort to decrease public injury from military activities associated with the Barry Goldwater Air Force Range. Impacts would be moderate.

From Recreation Management on Hazardous Materials & Public Safety

Under Alternative B, the entire SDNM would be allocated as one SRMA with about 76 percent of the lands managed within the back country RMZ where motorized travel is not permitted. This would reduce motorized travel use, thereby reducing the likelihood of hazardous materials spills from accidents compared to Alternative A. The allocation of more acres to the back country RMZ and fewer acres to the front country RMZ under Alternative B would concentrate visitor use to the latter, potentially increasing the number of accidents involving motorized vehicles. The front country RMZ would also experience more-concentrated levels of litter and debris than the back country RMZ, requiring a greater cleanup effort.

In the SDNM, dispersed recreational target shooting would most likely increase in all areas except developed recreational sites. Under Alternative B, recreational target shooting would be managed to provide for removal of all brass, targets, target litter, and other materials from public lands at the close of each shooting visit. In addition, the use of targets and target materials that do not add litter are required under this alternative. However, disbursed recreational target shooting would most likely increase with the availability of more lands managed for recreational use, creating the potential for injury from inappropriate use or the use of automatic weapons. Both recreational shooters as well as recreational visitors within the range of fire would be at risk.

From Travel Management on Hazardous Materials & Public Safety

68 percent of the SDNM would remain open to travel on designated routes and impacts would be similar to Alternative A. This would reduce the area where vehicular accidents could occur in the Decision Areas. At the same time, the reduced miles of routes would result in slightly more concentrated traffic on the remaining open routes, which would slightly increase the possibility for traffic accidents. Alternative B would provide slightly less opportunity for recreational activities than Alternative A that could pose a safety risk than Alternative A, such as off-road target shooting, hiking, and camping.

Vehicle access from highways onto public lands that cross highways, railroads, or other LUA barriers may elevate the potential of a vehicular accident, potentially resulting in the release of hazardous substances and injury. Legal public access to public lands for motorized and nonmotorized travel would be developed under Alternative B, reducing the risk of accidents in these areas compared to Alternative A.

Access to locations where illegal drug production might occur would be slightly less available than under Alternative A, but detection of unauthorized entry would be slightly more noticeable by law enforcement officers. Travel management area closures for the pronghorn seasonal closure area under Alternative B, which would somewhat restrict the opportunity to access remote and

low-lying areas for illegal activity compared to Alternative A, slightly decreasing the risk to visitor safety from personal encounters or from hazardous materials.

4.20.5. ALTERNATIVE C

4.20.5.1. Both Decision Areas

From Minerals Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative B for both Decision Areas.

From Special Designations on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative B for both Decision Areas, except more acres would be allocated to ACECs, which would slightly increase the potential for a delay in safety responses in these remote areas. Impacts would be negligible to minor.

4.20.5.2. Lower Sonoran

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A and B for the Lower Sonoran, however, the risks (impacts) related to public safety from LUA construction would be slightly minimized, as Alternative C would remove a section of the El Paso Natural Gas corridor that travels from Gila Bend to the Tohono O'odham Indian Reservation and 402,400 acres would be allocated as LUA avoidance areas and 247,000 acres would be allocated as LUA exclusion areas. Impacts would be minor.

From Livestock Grazing on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

From Hazardous Materials & Public Safety on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Recreation Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative A for the Lower Sonoran, except, lands designated as SRMAs under Alternative C would comprise about 70 percent of the Lower Sonoran, while ERMAs comprise only about 31 percent of the lands. This would result in less opportunity for littering and illegal dumping compared to Alternatives A and B due to the larger number of acres more intensively managed under the SRMA designation. Impacts from the Ajo Trails (including the 40-acre OHV area) and Buckeye Hills East Trails SRMAs would be the same as described under Alternative B. The acreage allocated for the Painted Rock Mountains Trails SRMA under Alternative C would represent over twice the acreage as would occur under

Alternative B, decreasing the risk of accident or injury due to rough terrain and unforeseen obstacles compared to Alternative B.

As most target shooting areas are located near established travel routes, the slight reduction in miles of routes under Alternative C would further reduce the opportunity for shooters to leave shooting debris and materials behind, as well as reduce the risk of injury to the recreational shooter as well as other visitors passing through the area. Impacts from requiring the removal of all brass, targets, target litter, and other materials from public lands at the close of each shooting visit and the use of targets and target materials that do not add litter would be the same as under Alternative B.

From Travel Management on Hazardous Materials & Public Safety

Impacts from lands closed to OHV travel would be the same as under Alternative B in the Lower Sonoran, except that, under Alternative C, there would have a reduction in miles of routes open to the public in the Lower Sonoran compared to Alternative A, which would reduce the area where vehicular accidents could occur. In addition, seasonally closing some routes that are located in washes would reduce the risk of stranded or abandoned automobiles in flooded washes that could result in releases of hazardous materials or wastes compared to Alternatives A and B. At the same time, reducing the miles of routes open to the public would concentrate traffic on the remaining open routes, increasing the possibility for traffic accidents to occur due to congestion. Based on the projected population growth and the increase in demand for public lands, more congestion on the roadways would likely continue to occur in the future. As Alternative C provides for fewer open travel route miles than Alternatives A or B, there would be a reduced opportunity for recreational activities that could pose a safety risk. These would include off road target shooting, hiking, camping, or any recreational activity that would provide exposure to accident or injury.

Compared to Alternatives A and B, fewer miles of routes available for travel under Alternative C would create less opportunity for visitors to travel to remote areas and encounter smugglers and UDAs, thus reducing safety risks associated with such encounters.

Although designating fewer miles of open routes within the Decision Areas under Alternative C would create fewer opportunities for illegal and solid waste dumping along established roadways compared to Alternatives A or B, anticipated increases in population and use of public land would tend to increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

4.20.5.3. Sonoran Desert National Monument

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described for Alternative B in the SDNM, however, only two ½ mile wide multiuse corridors would be allocated in the Monument and the entire Monument, which would slightly reduce impacts related to public safety risks with LUA construction and maintenance as the potential area for larger utility lines would be decreased. Impacts would be minor.

From Livestock Grazing on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A for the SDNM, however, the risks (impacts) related to public safety from human-livestock interaction would be slightly minimized, as there would be the same amount of AUMs as Alternative A, but all grazing would be perennial, thus minimizing the time herds are in the allotments. Impacts would be minor.

From Hazardous Materials & Public Safety on Hazardous Materials & Public Safety

Impacts would be the same as those described in Alternative B for the SDNM.

From Recreation Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative A for the SDNM, except, about 89 percent of the SDNM would be managed within the back country RMZ, which would slightly reduce motorized travel more than under Alternative B, thereby further reducing the total area exposed to hazardous materials spill from accidents and the associated risks to public health and safety. On the other hand, concentrating visitor use in the front country RMZ would increase the potential for vehicle accidents and associated injury in this RMZ. Litter and debris would also likely increase in the front country RMZ due to concentrated use, which would require a greater cleanup effort. In the SDNM, impacts from obtaining a permit prior to entering the Sand Tank Mountains would be the same as under Alternative A.

As most target shooting areas are located near established travel routes, the slight reduction in miles of routes under Alternative C would further reduce the opportunity for shooters to leave shooting debris and materials behind, as well as reduce the risk of injury to the recreational shooter as well as other visitors passing through the area. Impacts from requiring the removal of all brass, targets, target litter, and other materials from public lands at the close of each shooting visit and the use of targets and target materials that do not add litter would be the same as under Alternative B. Impacts from limits placed on recreational target shooting in the SDNM would be similar to Alternative B, with the exception that fully automatic weapons would be prohibited, eliminating the risk of such use to public health and safety.

From Travel Management on Hazardous Materials & Public Safety

Impacts from lands closed to OHV travel would be the same as under Alternative B in the SDNM. Under Alternative C, there would be a 13 percent reduction in miles of routes open in the SDNM, which would reduce the area where vehicular accidents could occur. In addition, seasonally closing some routes that are located in washes would reduce the risk of stranded or abandoned automobiles in flooded washes that could result in releases of hazardous materials or wastes compared to Alternatives A and B. At the same time, reducing the miles of routes open to the public would concentrate traffic on the remaining open routes, increasing the possibility for traffic accidents to occur due to congestion. Based on the projected population growth and the increase in demand for public lands, more congestion on the roadways would likely continue to occur in the future. As Alternative C provides for fewer open travel route miles than Alternatives A or B, there would be a reduced opportunity for recreational activities that could pose a safety risk. These would include off road target shooting, hiking, camping, or any recreational activity that would provide exposure to accident or injury.

Compared to Alternatives A and B, fewer miles of routes available for travel under Alternative C would create less opportunity for visitors to travel to remote areas and encounter smugglers and UDAs, thus reducing safety risks associated with such encounters.

Although designating fewer miles of open routes within the Decision Areas under Alternative C would create fewer opportunities for illegal and solid waste dumping along established roadways compared to Alternatives A or B, anticipated increases in population and use of public land would tend to increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

4.20.6. ALTERNATIVE D

4.20.6.1. Both Decision Areas

From Livestock Grazing on Hazardous Materials & Public Safety

Eliminating livestock grazing in both Decision Areas under Alternative D would eliminate the potential for injury from interaction with stock animals. Additionally, much of the fencing would be removed throughout the area, decreasing risks caused from fences. Impacts would therefore be negligible.

From Minerals Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative B for both Decision Areas.

From Special Designations on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative B for both Decision Areas, except more acres would be allocated to ACECs, which would slightly increase the potential for a delay in safety responses in these remote areas. Impacts would be negligible to minor.

4.20.6.2. Lower Sonoran

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative C for the Lower Sonoran, however, the risks (impacts) related to public safety from LUA construction would be minimized the greatest under Alternative D, as a section of the El Paso Natural Gas corridor that travels from Gila Bend to the Tohono O'odham Indian Reservation would be removed, as well as the Palo Verde to Devers and Gila Bend to Santa Rosa multiuse utility corridors. Alternative D would also have the most acres allocated as a LUA Exclusion Area (560,800 acres) and 246,100 acres would be allocated as LUA avoidance area. Impacts would be negligible to minor.

From Public Safety Management on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Recreation Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative A for the Lower Sonoran, except, While the percentage of the Lower Sonoran that would be managed as SRMAs would be similar to Alternative A, impacts from hazardous materials and risks to public safety would decrease under Alternative D because fewer routes would be designated as open for vehicular travel. Alternative D emphasizes a more diverse, less intensely managed visitor experience, which would reduce the risk of motorized vehicle-related accidents.

As most target shooting areas are located near established travel routes, providing the least miles of routes open to the public under Alternative D would reduce the opportunity for shooters to leave shooting debris and materials behind, as well as reduce the risk of injury to shooters and other recreationists. Impacts from requiring the removal of all brass, targets, target litter, and other materials from public lands at the close of each shooting visit and the use of targets and target materials that do not add litter would be the same as under Alternatives B and C.

From Travel Management on Hazardous Materials & Public Safety

Under Alternative D, almost four times the length of routes of the Lower Sonoran would be closed to vehicular travel compared to Alternatives B and C, which would greatly reduce the number of automobile accidents. Alternative D also proposes the least number of miles of routes open to the motorized use, further reducing the potential for automobile accidents. At the same time, this fewer number of route miles would allow for more concentration of traffic on the remaining open routes, increasing the possibility for traffic accidents to occur due to congestion. Based on projected population growth and the increase in demand for public lands, more congestion on the roadways would likely to occur in the future. By providing for the least miles of routes open to the public, Alternative D would reduce opportunities for recreational activities that could pose a safety risk more than any other alternative, including off road target shooting, hiking, camping, or any recreational activity that would provide exposure to accident or injury.

Alternative D would provide the fewest miles of routes available for travel among the alternatives, which would create the least opportunity for visitors to travel to remote areas and encounter smugglers and UDAs, thus reducing safety risks from such encounters.

Although designation the fewest miles of open routes within the Decision Areas under Alternative D would create the fewest opportunities for illegal and solid waste dumping along established roadways among the alternatives, anticipated increases in population and use of public lands would tend to increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

4.20.6.3. Sonoran Desert National Monument

From Lands & Realty on Hazardous Materials & Public Safety

Public safety risks (impacts) would be eliminated under Alternative D for the Monument, as there would be no future LUAs authorized within the Monument, as the entire Monument would be a LUA Exclusion Area and no multiuse utility corridors would be designated. Impacts would be negligible to minor.

From Hazardous Materials & Public Safety on Hazardous Materials & Public Safety

Impacts would be the same as those described in Alternative B for the SDNM.

From Recreation Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative A for the SDNM, except, one SRMA would be allocated with 89 percent of the lands being managed within the back country RMZ. This would reduce motorized travel use more than any other alternative, thereby further reducing the risk of automobile accidents and associated injury and hazardous material spills. On the other hand, the allocation of the lands in SDNM to the back country RMZ would further concentrate the visitor use in the front country RMZ, increasing the risk of accidents and hazardous spills. The front country RMZ would also likely experience more litter and debris, requiring a greater cleanup effort. Impacts from obtaining a permit prior to entering the Sand Tank Mountains would be the same as under Alternative A. In the SDNM, all forms of recreational target shooting would be prohibited, which would eliminate all target shooting-related risks throughout the Monument.

From Travel Management on Hazardous Materials & Public Safety

Under Alternative D, almost two times the length of routes of the SDNM would be closed to vehicular travel compared to Alternatives B and C, which would greatly reduce the number of automobile accidents. Alternative D also proposes the least number of miles of routes open to the motorized use, further reducing the potential for automobile accidents. At the same time, this fewer number of route miles would allow for more concentration of traffic on the remaining open routes, increasing the possibility for traffic accidents to occur due to congestion. Based on projected population growth and the increase in demand for public lands, more congestion on the roadways would likely to occur in the future. By providing for the least miles of routes open to the public, Alternative D would reduce opportunities for recreational activities that could pose a safety risk more than any other alternative, including off road target shooting, hiking, camping, or any recreational activity that would provide exposure to accident or injury.

Alternative D would provide the fewest miles of routes available for travel among the alternatives, which would create the least opportunity for visitors to travel to remote areas and encounter smugglers and UDAs, thus reducing safety risks from such encounters.

Although designation the fewest miles of open routes within the Decision Areas under Alternative D would create the fewest opportunities for illegal and solid waste dumping along established roadways among the alternatives, anticipated increases in population and use of public lands would tend to increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

4.20.7. Alternative E (Preferred Alternative)

4.20.7.1. Both Decision Areas

From Minerals Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative B for both Decision Areas.

From Special Designations on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative B for both Decision Areas, except more acres would be allocated to ACECs, which would slightly increase the potential for a delay in safety responses in these remote areas. Impacts would be negligible to minor.

4.20.7.2. Lower Sonoran

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A and B for the Lower Sonoran, however, the risks (impacts) related to public safety from LUA construction would be slightly minimized, as Alternative E would remove a section of the El Paso Natural Gas corridor that travels from Gila Bend to the Tohono O'odham Indian Reservation (similar to Alternative C) and 372,400 acres would be allocated as LUA avoidance areas and 255,700 acres would be allocated as LUA exclusion areas. Impacts would be minor.

From Livestock Grazing on Hazardous Materials & Public Safety

Impacts from encounters with agitated livestock or visitor mishaps at range improvements would be the same as under Alternative A for the Lower Sonoran..

From Hazardous Materials & Public Safety on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

From Recreation Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative A for the Lower Sonoran, except, lands designated as SRMAs under Alternative E would comprise about 69 percent of the total acreage, while ERMAs comprise only about 31 percent of the lands. Overall impacts would be similar to Alternative C due to similar percentage of the Decision Area being allocated to SRMAs and ERMAS, as well as similar management strategies for these recreation management areas.

Impacts from recreational target shooting in the Lower Sonoran would be similar to Alternative C, with the exception that recreational target shooting sites may be developed in areas where demand is high and an appropriate location is available, reducing the risk of injury to either the shooter or a passer-by.

From Travel Management on Hazardous Materials & Public Safety

Impacts from travel management decisions relating to acres closed to motorized travel and miles of routes designated closed to public use would be most similar to Alternative C. Following this, Alternative E would allow more opportunities for recreational activities that could pose a safety risk compared to Alternative D, but less opportunity compared to Alternatives A and B.

Based on the total miles of route open to the public within the Decision Areas, the opportunities for illegal and solid waste dumping along established roadways would be similar to Alternative C. As under all alternatives, anticipated increases in population and use of public land along would tend to increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

Impact from encounters with smugglers and UDA would be similar to that described under Alternative C.

4.20.7.3. Sonoran Desert National Monument

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described for Alternative D in the SDNM.

From Livestock Grazing on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative C for the Monument.

From Hazardous Materials & Public Safety

Impacts would be the same as those described in Alternative B for the SDNM.

From Recreation Management on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative A for the SDNM, except, As under Alternatives A, B, C, and D, the SDNM SRMA would be designated under Alternative E. Recreational management strategy for this SRMA would be same as that identified under Alternative C, thus resulting in similar impacts. Impacts from allocating roughly 87 percent of the SDNM under Alternative E to the back country RMZ would also be similar to Alternative C, which would allocate 91 percent of the SDNM to the back country RMZ. Impacts from require visitors to obtain a permit prior to entering the Sand Tank Mountains would be the same as described under Alternative A.

Impacts in the SDNM due to the prohibition of recreational target shooting would be the same as under Alternative D.

From Travel Management on Hazardous Materials & Public Safety

Impacts from travel management decisions relating to acres closed to motorized travel and miles of routes designated closed to public use would be most similar to Alternative C. Following this, Alternative E would allow more opportunities for recreational activities that could pose a safety risk compared to Alternative D, but less opportunity compared to Alternatives A and B.

Based on the total miles of route open to the public within the Decision Areas, the opportunities for illegal and solid waste dumping along established roadways would be similar to Alternative C. As under all alternatives, anticipated increases in population and use of public land along would tend to increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

Impact from encounters with smugglers and UDA would be similar to that described under Alternative C.

4.21. IMPACTS ON SOCIOECONOMICS

This section assesses economic and social effects of the Planning Area alternatives. Many public-land uses generate revenue and are discussed in this section. Other uses that do not generate revenue but are just as vital to the public are also discussed. Communities within Maricopa, Pima, and Pinal Counties are closely associated with public lands and thus constitute the study area for socioeconomic values for the RMP. The resource management decisions expected to have the greatest impacts to socioeconomics in the study area include those relating to the management of energy and minerals, grazing, recreation, and lands and realty. Other resource management disciplines expected to have some impact on socioeconomic conditions that vary by alternative include management of biological and ecological resources; cultural resources; visual resources; wilderness characteristics; travel management; and special designations.

4.21.1. METHODS OF ANALYSIS

4.21.1.1. Indicators

When analyzing impacts to social and economic resources, the following impact indicators are used:

- Employment and income at the personal, household, business, or community level
- Access as measured by miles of open/closed routes and acres of special designations
- Additionally, the values of sense of place and sense of well-being are important methods of evaluating impacts to social values. These methods are more challenging to measure but are mentioned throughout this analysis.

4.21.1.2. Assumptions

The following assumptions regarding socioeconomics are made:

- Visitor use is expected to increase as populations increases. Increased visitation will have economic impacts to communities in the study area that serve as stopping points for services near public lands.
- All alternatives for management of SDNM support the objectives of Presidential Proclamation 7397 and consequently contribute to the protection of social values in the Monument.
- Since the SDNM proclamation honors prior existing rights, private inholdings will be developed, decreasing the amount of open space available within SDNM.
- Management actions that influence employment, demand for goods and services, business growth, and visitation within this broad study area will affect socioeconomics. Impacts will most greatly be felt in small rural communities that economically and socially rely, at least partially, on resources uses within the Decision Areas, including vegetation products, lands and realty, livestock grazing, minerals, recreation, and travel.

- Any action that enhances the quality of recreation experience or creates additional facilities or improved access will potentially increase visitation. Increased visitation will stimulate increased expenditures for goods and services in the local and regional economies. This in turn will tend to encourage additional business activity and population growth.

- Hunting management and the number and types of habitat improvement projects aimed at improving health and vitality of game animals will affect local economies in terms of influencing the number and types of hunters coming to the Decision Areas and the number and success of professional outfitters

- Actions that increase renewable energy and mining activities will tend to stimulate the local and regional economies, both through increased employment and demand for goods and services for the mining operation itself. Duration of this effect will depend upon the magnitude of energy production and mineral deposits and market demand for the products. Conversely, actions eliminating current renewable energy and mining activities or discouraging or precluding new renewable energy and mining activities will tend to decrease or at least limit local and regional economic benefits.

- Changes in allowable grazing could influence ranchers within the Decision Areas, which, in turn, could affect local communities dependent upon ranching operations in terms of tax revenue from livestock sales and the purchase of equipment and feed. In SDNM, the proclamation's termination of livestock grazing permits south of I-8 in 2008-09 will result in an economic and social cost to the permittees.

- Land disposals that ultimately lead to the development for residential use or commercial and light industrial development will have an economic impact in terms of employment and earnings, as well as increased tax base for the area. According to the proclamation, all public lands in SDNM will be retained, except exchange may be considered to further the protective purposes of the Monument. The continuation of policy to retain Federal land (surface and subsurface estate) will preclude economic activity that could potentially be associated with land development activity on disposed lands. The BLM will receive no revenue from land disposal in the Monument. All SDNM lands will remain a part of the Monument in perpetuity. This will protect the Monument and sustain it as permanent open space for the growing area that surrounds it.

4.21.1.3. Program Areas with no Impacts on Socioeconomics

No impacts to socioeconomics are anticipated for management actions relating to:

- Cave Resources

- Paleontological Resources

- Wild Horse & Burro Management

4.21.1.4. Qualitative Intensity Scale

The intensities of impacts are the same as those described in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375).

4.21.2. COMMON TO ALL ALTERNATIVES

4.21.2.1. Both Decision Areas

From Air Quality, Hazardous Materials & Public Safety, Water Resources, Soil Resources, and Wildland Fire Management on Socioeconomics

Actions to manage air quality, public safety, water resources, and watersheds and soils would contribute to the overall social well-being of the public but would vary little by alternative. Wildland Fire management would continue to have positive socioeconomic impacts related to the protection of life and property, fire ecology, aesthetics, and the employment and expenditures related to these programs.

4.21.2.2. Lower Sonoran

No unique impacts are identified for the Lower Sonoran under Common to All Alternatives.

4.21.2.3. Sonoran Desert National Monument

From Lands & Realty on Socioeconomics

The proclamation guidance against commercial utility-scale renewable energy sites on SDNM renders the BLM unable to plan for the development of utility-scale renewable energy within SDNM at a time when such energy is becoming more economical, and is increasingly addressed in community planning. Closure of the Monument to utility-scale renewable energy development is expected to have negligible to minor impacts on utility-related revenue sources.

From Minerals Management on Socioeconomics

For all alternatives in the SDNM, mineral development is restricted by the proclamation to mining for locatable minerals only on valid existing claims. Where development on valid existing rights occurs, economic gains would be realized commensurate with the scale of the activity. However, it is expected that social impacts would be negligible and localized in scale as any proposal to develop valid existing rights would be subject to site-specific, case-by-case review of mine plans of operation, to ensure that undue and unnecessary degradation of resources does not occur. Currently there are no existing claims in SDNM.

From Travel Management on Socioeconomics

Impacts of individual route designations within the SDNM are expected to have similar impacts across all alternatives. Under all action alternatives, route designations are designed to minimize conflicts among users, while promoting safety and protection of resources.

Primary impacts to socioeconomic resources from route designation stem from accessibility for recreation such as motorized and nonmotorized trail-based recreation (OHV driving, mountain biking, hiking, etc.) along with access to other activities (such as hunting, wildlife viewing,

geocaching, etc.). Generally, more access leads to more recreation, which leads to more potential for recreation-related income/revenue.

While each alternative has varying amounts of designations for primitive roads as open, administrative, size restraints, seasonal and permanent closures, none is different enough to vary in impacts to socioeconomic values. Impacts from all alternatives to area income/revenue are expected to be negligible to minor.

4.21.3. ALTERNATIVE A (NO ACTION)

Alternative A would not address issues related to major events that have shaped the socioeconomic setting in the Planning Area since the previous planning efforts. The result would be conflicting uses of public land. Revenue to private industry/businesses would continue to accrue from the following activities on public land, with the amount of revenue varying widely: production of mineral materials, ancillary facilities to support copper mining, grazing, land disposal for development, accommodation of utilities, and camping at fee campgrounds.

Overall, the social well-being of those who feel all roads should be open, or who need motorized access because of physical limitations, would increase while the social well-being of recreationists who prefer solitary and quiet experiences could decrease. Opportunities for hunting or the quality of hunting experiences would likely decrease as more people recreate on public lands and would provide no means to manage wildlife habitat in response to growing population pressures. Groups and individuals who give a very high prior¬ity to resource use may feel that enough resource use, such as minerals production and grazing, would be allowed on public lands under this alternative. Groups and individuals who give a very high prior¬ity to resource protection may feel the resources they are concerned about would not be adequately protected.

4.21.3.1. Both Decision Areas

From Cultural and Heritage Resources on Socioeconomics

The lack of RMP decisions concerning heritage resources would tend to impede the development of cultural tourism. Under this alternative, prioritization of other resource objectives over cultural protection, interpretation, and education may result in decreased cultural tourism, having a negligible to minor negative effect on nearby revenue streams related to cultural tourism.

From Minerals Management on Socioeconomics

Under this alternative, production of salable, leasable, and locatable minerals on public lands would continue to provide mineral material at current levels. Since investment in locatable mineral development in the Planning Area is expected to increase, this alternative is expected to have minor to moderate impacts on local economic growth in employment and income in the surrounding communities.

Restricting mineral development in the SDNM to valid and existing rights would have negligible to moderate negative effects on employment and economics associated with mineral development.

Continued mineral development could cause a loss of scenic views and natural landscapes, which would decrease the social well-being of those individuals or groups who value these resources.

Overall, impacts on social well-being are anticipated to be negligible to moderate, depending on the development of mineral resources.

From Priority Wildlife Species and Habitat Management on Socioeconomics

Healthy wildlife populations are intertwined with wildlife viewing and hunting visitation, and such expenditures would not likely increase as result of management actions under Alternative A, having no impact on the area economy.

The lack of WHA allocations and specific habitat protection would disappoint those who value wildlife protection. Restoration by mostly passive means and lack of specific decisions to use native plants would slowly return damaged sites to natural conditions and may result in minor negative impacts in the social well-being of area residents who value natural desert ecosystems.

From Recreation Management on Socioeconomics

While OHV use, hiking, hunting, and other forms of recreation would continue to be managed under current conditions, population-driven increases in demand would likely result in a negligible to minor increase in economic contributions and employment attributable to recreation, camping, and tourism on public lands. The continuation of existing recreation management programs would result in relatively minor economic impacts due to visitor expenditures.

Associated social effects, such as conflicts among uses, would continue and possibly escalate, having minor to moderate negative impacts on the social well-being of recreation users.

From Special Designations Management on Socioeconomics

Continued management of existing special designations such as the Coffeepot Botanical and Vekol Valley Grasslands ACECs, the Fred G. Weiler Green Belt, and the Juan Bautista de Anza NHT is expected to result in no change in social and economic impacts to the local economy.

From Travel Management on Socioeconomics

Alternative A would close an estimated 15 miles of routes in the Lower Sonoran, leaving 1670 miles open (99 percent) for public use. In the SDNM, Alternative A would close 27 miles of routes in the Monument, leaving 568 miles open (89 percent) for public use. This alternative provides the most opportunity for people who are dependent on vehicular access to enjoy the resources of the national Monument. Because visitation is expected to increase and because there are few restrictions on use and public access, this alternative is expected to have negligible to minor impacts on increased recreation-related employment and income.

Management of motorized use as proposed under Alternative A would provide for high levels of motorized access on designated routes, lending to positive experiences for those who value motorized access. However, the social well-being of groups and individuals, who feel some roads, should be closed to motorized use, or who value solitude experiences, would thus diminish under Alternative A. The overall impact of travel management to social well-being is expected to be negligible under this alternative.

From Vegetation Resources on Socioeconomics

Commercial landscapers who remove native vegetation by permit, and sell the plants would continue to benefit economically from such actions. While allowing the collection of native plant material for personal and commercial use would align with cultural values that depend on native plant collection, it may also result in deterioration of resource values. Management under Alternative A for vegetation would have no/negligible impact on current social and economic values since it is expected that no major changes would result from management actions.

From Visual Resources on Socioeconomics

Under Alternative A, the large acreage in VRM classes III and IV (78 percent of the Lower Sonoran and 49 percent of the SDNM) would support active uses of public lands, such as more intensive recreation uses in both Decision Areas, and mineral development and LUAs in the Lower Sonoran. While this would meet social and economic demands associated with those uses, such VRM class assignments could allow for the degradation of visual resources, attracting fewer visitors seeking scenic views. Over time, it is expected that management of visual resources would have a minor affect on visitor-related revenue. Additionally, loss of scenic value would have a negligible to moderate negative impact on the social values of residents who have expressed a desire to maintain the scenic views of the Sonoran Desert.

From Wilderness Characteristics Management on Socioeconomics

Coupled with increasing population growth and demand for recreation and public use of public lands, not allocating lands managed to protect wilderness characteristics could result in a degradation of those characteristics. In the long term, there would be a lack of prescriptions to keep the lands as secluded, remote, and peaceful as area residents wish that they would be. Overall, social well-being of people or groups who prefer solitary and quiet experiences would see minor to moderate declines and the social well-being of those who prefer more developed experiences would see minor to moderate increases.

4.21.3.2. Lower Sonoran

From Lands & Realty on Socioeconomics

The continuation of existing management of realty actions would have negligible to moderate impacts on the potential economic activity associated with development related to lands and realty transactions. In the Lower Sonoran, disposal of 18,900 acres could remove the potential for those parcels to serve as undeveloped open space, thereby affecting negatively those who value open, uninterrupted tracks of land. However, making 8,000 acres available for exchange only may offset any open space losses. If land is disposed through sale, negligible to moderate increases in area income can be expected due to potential development and property tax revenue.

In the Lower Sonoran, ten 1-mile wide existing utility corridors would remain and this alternative would allow for additional use. This would have a negligible to moderate impact on area economic development, depending on the nature of the development.

Development within existing or new LUAs would have negligible to moderate negative social impacts related to the location of the development, and negligible to minor economic impacts on the service population affected by infrastructure improvements Economic benefits to the

local communities from growing interest in solar development on public lands are expected to be moderate to major.

From Livestock Grazing on Socioeconomics

Under Alternative A, grazing in the Lower Sonoran and north of I-8 outside the SDNM would be expected to continue at current levels, having a no impact on income trends, while supporting the traditional ranching lifestyle. Since there would be no change in the authorized level of grazing use, the real estate value of ranch properties would remain unchanged, thereby having no effect on local real estate prices.

4.21.3.3. Sonoran Desert National Monument

From Lands & Realty on Socioeconomics

In the SDNM, three 1-mile utility corridors would remain. The corridors would support the growing needs of an increasing population in the study area. Development within existing or new LUAs would have potential negligible to minor social impacts related to location of the development, and negligible to minor economic impacts on the service population affected by infrastructure improvements. Few limitations on alignments may decrease the costs for LUA developments and would allow economic opportunity for new LUAs within the Decision Areas, having a negligible to moderate positive economic impact.

From Livestock Grazing on Socioeconomics

Allotments south of I-8 within the SDNM were closed when existing permits expired, per the Monument proclamation. Closure of these allotments caused a minor to moderate economic loss to ranchers who held the permits and a negligible to minor loss to the traditional ranching lifestyle in this area. In contrast, closing the allotments may allow the land to return to a more natural state, further protecting the resources of the SDNM and having a negligible to minor positive impact for those individuals and groups who believe grazing should cease in the Monument. Under Alternative A livestock grazing would continue to be permitted on a case-by-case basis, based on rangeland health evaluations conducted during the permit rrenewalprocess.

4.21.4. ALTERNATIVE B

Alternative B would allow for the greatest number of uses and would emphasize opportunities for those uses, especially those involving motorized access and developed forms of recreation. This alternative would require the most intensive management. Coordination among the BLM, local communities, and other public and private partners would result in both resource protection and revenue to private industry/businesses. Revenue effects to private industry/businesses from mining, and land disposition would be similar to those under Alternative A. Alternative B would have more utility corridors, communication sites, and participation in utility-scale renewable energy development than any other action alternative.

Overall, the social well-being of those who value access and resource use would be greatest under Alternative B, while the social well-being of recreationists who prefer solitary and quiet experiences would be less than any other action alternative. Opportunities for hunting and

wildlife viewing would be enhanced through increased access and hands-on management. While several of the management decisions present in Alternative B would address resource protection more than those in Alternative A, in most cases only small acreage would receive protection. The emphasis on motorized recreational uses under Alternative B would not limit contributions to the economy from users that enjoy motorized recreation. The development of recreational facilities and increased acreage of community interface and front country RMZs could increase revenue associated with developed recreation opportunities. On the other hand, some groups and individuals who give a very high priority to resource protection may feel the resources they are concerned about would not be adequately protected under Alternative B.

4.21.4.1. Both Decision Areas

From Cultural and Heritage Resources on Socioeconomics

Cooperative planning of heritage tourism projects and promotion of cultural tourism could increase visitation and tourism-associated revenue, having a greater potential for increased local economic impacts than under Alternative A. More than Alternative A, prioritized management of certain cultural areas would provide opportunities for increased public visitation and interpretation, thereby increasing social well-being of people who value cultural opportunities.

From Livestock Grazing on Socioeconomics

While grazing would continue in the long-term, under Alternative B it would be reduced from Alternative A by almost 40 percent. This alternative would allow fewer ranching opportunities and less associated income than afforded in Alternative A, having a moderate to major impact on the income of affected ranchers and a negligible to minor impact to local communities. Coordination and consultation with affected parties would be the same as described in alternative A.

Minor negative impacts would be expected for the ranching lifestyle. Reduced grazing would have a greater positive impact on the social wellbeing of those who think that grazing should be limited.

From Priority Wildlife Species and Habitat Management on Socioeconomics

Employment and income is expected to remain the same or have minor increases over Alternative A due to management actions protecting wildlife movement corridors that will increase opportunities for healthy wildlife and associated hunting, wildlife viewing, and photography.

The lack of WHA allocations under Alternative B, however, would have similar impacts as Alternative A. Restoration by active means and use of native plants would return damaged sites to natural conditions faster than under Alternative A, aligning better with the social values of those who value maintaining natural desert ecosystems.

From Travel Management on Socioeconomics

As under Alternative A, some forms of visitation and associated economic activity may increase under Alternative B due to few restrictions on public access, even though some decisions may slightly limit public access in order to meet resource goals and objectives. Overall, sales and rental businesses associated with motorized recreation would likely increase, while the sales of supplies and gear associated with nonmotorized recreation may decrease, as compared to Alternative A.

There may be a negligible to minor positive impact to the economies of local communities but little or no net change in employment with recreation use on public lands under Alternative B.

This alternative provides more access than any other action alternative but – when compared to Alternative A – the closures might have minor negative impacts on the social wellbeing of those who value motorized access to the Planning Area. Overall, Alternative B would provide the least opportunity for solitude and nonmotorized recreation and would diminish the social well-being of groups and individuals who participate in these activities.

From Vegetation Resources on Socioeconomics

Impacts would be similar to those described in Alternative A for both Decision Areas.

From Wilderness Characteristics on Socioeconomics

Impacts would be similar to those described in Alternative A for both Decision Areas.

4.21.4.2. Lower Sonoran

From Lands & Realty on Socioeconomics

Alternative B allows for 36,300 acres available for disposal by any method – almost twice as many acres as Alternative A. 3,400 acres are made available for R&PP and no lands would be made available for exchange only. PILT payments to the counties would decrease compared to Alternative A during land disposals, but those lands would become subject to property tax, which typically generates more revenue than PILT payments. Overall impacts to revenue/income are expected to be negligible to minor. The social values of those people or groups who value retention of public lands would decline, but there would be increased opportunities for other agencies or groups to apply for parcels through the R&PP Act compared to Alternative A. Overall social impacts are expected to be minor.

Alternative B would allow for the development of utilities within the designated corridors, with the least amount of LUA exclusion areas of any action alternative. Fewer limitations on alignments may decrease the costs for LUA developments. Adjacent communities would not need to accommodate transmission lines where the lines could be put on public lands because ten BLM utility corridors would provide sufficient, yet limited, locations for new utilities. Placement of communication facilities would not be allowed to conflict with wildlife management, aligning with the social values of those people or groups who value intact wildlife areas but possibly increasing costs to communication companies. Impacts are anticipated to be negligible to minor.

Compared to Alternative A, the BLM's participation in utility-scale renewable energy development could increase, having minor to major impacts on utility-associated revenue.

From Minerals Management on Socioeconomics

Impacts would be similar to those described in Alternative A for both Decision Areas.

From Recreation Management on Socioeconomics

Recreation management under Alternative B would serve a large and growing recreational demand in the study area. In the Lower Sonoran, the 646,600 acres of SRMAs (including 53 percent back country and 34 percent front country) would provide a wide variety of recreational opportunities and allow for intensive use. Management decisions under Alternative B would allow for the development of a larger number of recreational facilities on public lands compared to Alternative A, which would accommodate the highest number and density of visitors. Communities next to SRMAs would likely experience more sales of goods and services to support the particular recreational activities of the developed areas than in Alternative A.

Overall, potential increases in recreation-related employment and income would be greatest under this alternative, though somewhat similar to Alternative E. The greatest negative impacts to social well-being would be felt by those who value primitive, nonmotorized recreation and quiet open space. On the other hand, those who value motorized recreation will experience the most well-being under this action alternative.

From Special Designations on Socioeconomics

While this alternative enlarges the Coffeepot Mountain ACEC (from 8,900 acres to 14,372 acres) not designating several potential ACECs may result in deterioration of the resources currently present, conflicting with the social well-being of people or groups who value these resources but aligning with the social well-being of people or groups who value fewer restrictions on public lands.

From Visual Resources on Socioeconomics

In the Lower Sonoran, Alternative B would allocate the majority of public lands as VRM Class III and Class IV (83 percent). Effects are expected to be similar to Alternative A, but with greater intensity.

4.21.4.3. Sonoran Desert National Monument

From Lands & Realty on Socioeconomics

As described for the Lower Sonoran, this alternative provides the least amount of LUA exclusion. Three one wide mile utility corridor would be designated , therefore, impacts would be similar to Alternative A.

From Recreation Management on Socioeconomics

The entire SDNM would be managed as a SRMA, with 76 percent managed as back country and 22 percent managed as front country. This alternative has the least amount of back country of any action alternative. Front country acreage would be near rapidly growing communities to the north of SDNM, which would likely receive revenue from spending on goods and services to support the particular recreational activities of the developed areas. Overall economic impacts, however are expected to be similar to Alternative A, but slightly greater intensity.

From Special Designations on Socioeconomics

Designation of the Highway 238 and I-8 as scenic byways in the SDNM would increase tourism and related spending in the area, at a negligible to minor level. The current character of these roads would be maintained through more active management than under Alternative A and align with the social well-being of people or groups who value protection of natural and cultural resources as well as public access and visitation. In the SDNM, Alternative B would discontinue the designation for the Vekol Valley Grasslands ACEC, which may counter social values specific to this designation. However, the impacts would be negligible because the resources within this area would be managed to a similar or greater level of protection under the Monument proclamation.

From Visual Resources on Socioeconomics

In the SDNM, Alternative B would not allocate any acreage to VRM Class IV but would allocate 22 percent of the area to VRM Class III. This alternative has more land allocated to Class I and II than Alternative A, but less than any action alternative. Impacts would be similar to those described in Alternative A, only at a slightly less intensity.

4.21.5. ALTERNATIVE C

Alternative C would respond to recent trends in the Planning Area by balancing "hands-on" resource protection with human use and influence. Revenue to private businesses from mineral materials and locatable minerals would be similar to Alternative B. Revenue from land disposition would be similar to other alternatives. No ephemeral grazing would be permitted. Management to accommodate infrastructure (e.g., utility corridors, telecommunication sites, and utility-scale renewable energy opportunities) would provide sufficient locations, albeit fewer than under Alternative B.

Overall, Alternative C would positively impact the social well-being of recreationists who prefer solitary and quiet experiences. On the other hand, the social well-being of those who feel all roads should be open, or who need motorized access because of physical limitations, could decline compared to Alternatives A and B. Opportunities for hunting and wildlife viewing would be enhanced through a focus on protecting wildlife habitat and providing suitable, but limited, access. Groups and individuals who give a very high priority to resource use may feel that not enough resource use would be allowed on public lands under this alternative. Likewise, some groups and individuals who give a very high priority to resource protection may feel the resources they are concerned about would be adequately protected. Emphasis of nonmotorized recreational uses, increased management and protection of wildlife habitats, and designated route closures and use limitations would limit contributions to the economy from users that enjoy motor¬ized recreation. The Planning Area might receive a similar amount of business revenue related to the public land as it would under Alternative B, but more of the recreation revenue would be associated with cultural and ecotourism and less would be associated with motorized recreation.

4.21.5.1. Both Decision Areas

From Cultural and Heritage Resources on Socioeconomics

Unlike Alternatives A and B, Alternative C would allocate 127,600 acres of SCRMAs in the Lower Sonoran and 49,800 acres of SCRMAs in the SDNM, which would be intensively managed for protection of resources and scientific research. Cultural management prescriptions would have

a joint emphasis on public visitation and scientific research/resource protection, but with fewer sites selected for public visitation than under Alternatives A and B, thereby possibly having a smaller economic impact than in Alternative B. Like Alternative B, cooperative planning of heritage tourism projects with tribes, other agencies, and organizations could specifically affect local economies in surrounding communities by increasing visitation and tourism-associated revenue at a negligible to minor level.

From Livestock Grazing on Socioeconomics

Under Alternative C, perennial grazing would be the same as Alternative A. However, this alternative would allow no ephemeral grazing. This could affect some cattle ranchers who rely on ephemeral grazing. Grazing would continue in the long-term with similar maintenance of a traditional ranching lifestyle as Alternative A, although perhaps with the need to rely on other cattle production options, such as feedlots. Net income to ranchers would likely decrease compared to Alternative A, but would be greater than B because perennial livestock numbers would be larger.

From Priority Wildlife Species and Habitat Management on Socioeconomics

Compared to Alternatives A and B, Alternative C would be more successful maintaining healthy wildlife populations and natural landscapes, which tend to attract visitors to the Decision Areas. This will be accomplished through the creation of four WHAs, along with expanded management for wildlife movement corridors. As a result, visitor-related expenditures would increase in response to ecological/biological management actions under Alternative C as compared to Alternatives A and B.

From Special Designations on Socioeconomics

Alternative C would allocate 63,300 acres of ACECs – more than under Alternatives A and B but less than under Alternatives D and E. The designation would have improved effects on the social well-being of people or groups who value these resources and degrading effects on the social well-being of people or groups who value fewer restrictions on public lands.

From Travel Management on Socioeconomics

In the Lower Sonoran, there would be 529 fewer miles of routes open to the public than proposed under Alternative A and 429 fewer miles than proposed under Alternative B. In the SDNM, 190 fewer miles of routes would be open to the public than proposed under Alternative A and 140 fewer miles than proposed under Alternative B. Under Alternative C, management emphasis would be placed on resource protection, which is still consistent with serving both the social values of the protection of resources and public access/use opportunities on public land. Although not as dense as under Alternatives A and B, the motorized route network under Alternative C would still be responsive to the desires of individuals and groups who feel public lands should remain open to motorized access, enhancing their social well-being, albeit less than under Alternatives A and B. Alternative C would provide an increased opportunity for solitude and nonmotorized recreation, increasing the social well-being of groups and individuals who participate in these activities.

Compared to Alternatives A and B, potential decreases in visitation may occur for some users as a result of more restrictions on use and decreased public access. In general, sales and

rental businesses associated with motorized recreation under Alternative C would be slightly lower compared to Alternative A and B, while the sales of supplies and gear associated with nonmotorized recreation may be slightly higher. There may be a slight impact to the economies of local communities.

From Vegetation Resources on Socioeconomics

Impacts would be similar to those described in Alternative B. Resource values would be further protected under Alternative C by not permitting wood harvesting in the Decision Area, although such actions may have a minor to moderate negative social and economic impact to those residents or visitors who harvest wood.

Compared to Alternatives A and B, the focus on controlling invasive species would include requiring SRP users to use certified weed-free feed for their animals would result in decreased introduction and spread of invasive species. Such actions would increase the cost to users. However, the social values associated with maintaining native species on public lands would be met.

In the SDNM, impacts from restrictions on harvesting vegetation would be similar to Alternative B.

4.21.5.2. Lower Sonoran

From Lands & Realty on Socioeconomics

Impacts from land tenure decisions would be similar to Alternative B.

In the Lower Sonoran, future development of utilities within designated utility corridors would be allowed under Alternative C, although there would be one less corridor than under Alternative B. As under Alternative B, the BLM would consider transmission line siting outside the corridors on a case-by-case basis. In addition to special designations, WHAs, SCRMAs, ACECs, and allocated lands managed to protect wilderness characteristics would be avoidance areas as under Alternative B. Routing around these areas could be costly to utility companies and ultimately to consumers.

Communication sites would also be accommodated as in Alternative B, further aligning with the social values of those people or groups who value intact wildlife areas but possibly increasing costs to communication companies.

The BLM would evaluate utility-scale renewable energy sites on a case-by-case basis and authorize them if the project is consistent with other management objectives for the area. WHAs, SCRMAs, ACECs, and allocated lands managed to protect wilderness characteristics would be avoidance areas under Alternative C. While the BLM would not work with industry to identify priority areas for utility-scale renewable energy development, there could still be numerous sites permitted in the Lower Sonoran given the high potential for solar energy facility development.

From Minerals Management on Socioeconomics

The revenue yield from mineral extraction would be somewhat reduced compared to Alternatives A and B because mineral material disposals in ACECs, SCRMAs, WHAs, and allocated Lands Managed to Protect Wilderness Characteristics would be approved in a manner that maintains

or enhances the resources for which the designation was made. Leasable mineral development would be unlikely and would be subject to similar stipulations. The effects of management decisions for locatable minerals are the same as described under Alternative B, except for additional stipulations concerning natural resource protection where mineral development occurs.

From Recreation Management on Socioeconomics

Management of recreation in Alternative C would balance motorized and nonmotorized uses with resource protection, which would meet overall recreational demand. While the sales and rental of recreational vehicles and equipment would be greater than Alternative A, especially in gateway communities, the increase would not be as high compared to Alternative B. On the other hand, mechanized vehicle use, equestrian recreation, and hiking would involve equipment expense that could offset any losses associated with motorized recreational activities.

SRMAs would be of similar size as under Alternative B, more land would be allocated to back country in order to serve Alternative C's management focus on balancing motorized and nonmotorized uses. While the total number of visitors to public lands could be as high as under Alternative B, motorized recreation use may decrease and nonmotorized recreation use may increase. Groups or individuals who value both types of recreational activities would have a range of places to enjoy them.

From Visual Resources Management on Socioeconomics

Under Alternative C, less area of the Lower Sonoran (48 percent) would be assigned to VRM Classes III and IV and more area would be assigned to VRM Class I and II (52 percent) than Alternatives A and B. The social well-being of visitors and residents who desire protection of scenic views would increase, along with associated tourism spending. However, the reduced acreage in Class III and IV would reduce opportunities for more developed recreation and mining use, each with associated negative impacts to local economies and social values.

From Wilderness Characteristics Management on Socioeconomics

Alternative C would allocate 128,100 acres in the Lower Sonoran as lands managed to protect wilderness characteristics. Compared to Alternatives A and B, which have no lands managed to protect wilderness characteristics allocations, the social well-being of people or groups who prefer more developed experiences and opportunities would decrease and the social well-being of recreationists who prefer solitary, quiet experiences would increase.

Impacts to the local economy are anticipated to be negligible as employment and income are expected to remain unchanged despite the lands managed to protect wilderness characteristics allocations.

4.21.5.3. Sonoran Desert National Monument

From Lands & Realty on Socioeconomics

In the SDNM, two one-half mile utility corridor would be designated – as under Alternative B – however, only transportation and underground utility uses with their ancillary above ground facilities would be allowed in the corridor under Alternative C. This would likely increase costs to

utility companies and their customers and slightly decrease the ability of utility companies to meet the growing needs of the Planning Area.

In contrast to both Alternatives A and B, communication facilities would not be allowed within SDNM and no communication sites would be designated. Such actions would protect the visual and/or natural resources of the Monument, as well as increasing the costs to meet the growing communication needs of the Planning Area.

From Recreation Management on Socioeconomics

As under Alternative B, the entire SDNM would be established as a SRMA; however, under Alternative C, 88 percent would be allocated as back country and 11 percent allocated as front country, with more acreage assigned to back country compared to Alternative B. As a result, the front country recreational demand would be less served and the less intensive back country demand would be better served under Alternative C, with the social value for dispersed and primitive nonmotorized, non-mechanized recreation opportunities at SDNM being more recognized. Communities would still be likely to receive revenue from spending on goods and services to support the particular recreational activities of the area.

From Visual Resources Management on Socioeconomics

Under Alternative C, 88 percent of lands would be allocated as VRM Class I and II, while 12 percent would be allocated as VRM Class III and IV. Overall, the allocations proposed by Alternative C would likely attract more visitors seeking scenic views than the allocations proposed by Alternatives A and B, thereby likely increasing tourist spending on a negligible to minor level.

From Wilderness Characteristics Management on Socioeconomics

Alternative C would allocate 112,200 acres in the SDNM as lands managed to protect wilderness characteristics. Compared to Alternatives A and B, the social well-being of people or groups who prefer more developed experiences and opportunities would decrease and the social well-being of recreationists who prefer solitary, quiet experiences would increase.

4.21.6. ALTERNATIVE D

Alternative D would respond to recent trends in the Planning Area by emphasizing resource protection and nonmotorized recreation in remote settings. Its overall management would be the least intensive of all alternatives. Several of the programs that provide an income would be curtailed or terminated, including reductions in lands available for mineral entry and the closing of all grazing allotments, negatively affecting private businesses. Alternative D proposes the least land eligible for disposal. Alternative D also proposes the smallest acreage available for utility corridors and the least potential utility-scale renewable energy site acreage, and would require some utilities to be placed underground, an expensive option. Alternative D's emphasis on nonmotorized recreational uses, designated route closures, and use limitations would limit contributions to the economy from users that enjoy motorized recreation, but may increase contributions to the economy from users that enjoy nonmotorized recreation. Overall, there would be fewer revenue-generating recreational uses under Alternative D compared to all other alternatives.

Overall, there would be positive effects to the social well-being of recreationists who prefer solitary and quiet experiences. The social well-being of those who feel all roads should be open, or who need motorized access because of physical limitations, could decline. Opportunities for hunting and wildlife viewing would be enhanced by a focus on protecting wildlife habitat, but may be impaired by limitations on access.

4.21.6.1. Both Decision Areas

From Cultural and Heritage Resources on Socioeconomics

Similar to Alternatives A and B, no allocation would be made for SCRMAs under Alternative D, with cultural resource protection being accomplished through ACEC designations. Compared to Alternative C, the BLM's investment in combined site protection and development would decrease, potentially decreasing the number of cultural tourists and recreational users to the area. There would be a concurrent decrease in associated spending in the surrounding communities; however, the social well-being of those people or groups who value resource protection would increase over the other alternatives.

From Livestock Grazing on Socioeconomics

Compared to all other alternatives, net income to pertinent ranchers would be reduced the most. Impacts are expected to be major as revenue from livestock grazing would cease all together.

The termination of grazing throughout both Decision Areas under Alternative D would be interpreted by some as the end of a ranching tradition, while it would be interpreted by others as an effort to return public lands to a more natural state.

From Priority Wildlife Species and Habitat Management on Socioeconomics

As under Alternative B, managing uses to protect wildlife and wildlife habitat would require investment for wildlife health, with a long-term social and economic effect on maintaining the integrity of the Sonoran Desert. Under Alternative D, more opportunities would exist for hunting, wildlife viewing, and photography than under Alternatives A and B, but less than under Alternative C.

In addition, Alternative D would remove existing wildlife waters, which could further decrease opportunities for hunting, wildlife viewing, and photography. This would especially be true in times of drought when wildlife populations may decline due to the removal of all wildlife waters. Restoration by passive means and use of native plants would return damaged sites to natural conditions slower than under the other alternatives, which would align with the social values of maintaining natural desert ecosystem. Overall, this alternative is expected to create less revenue to local economies than Alternatives A, B, and C.

From Recreation Management on Socioeconomics

Alternative D would allocate much less land to SRMAs – 100,200 acres versus to more than 600,000 acres in Alternatives B and C for the Lower Sonoran and no SRMAs in the SDNM. Resource protection measures such as ACECs would be in place under Alternative D and consistent with management goals to emphasize nonmotorized and undeveloped recreation

opportunities. The reduced variety of recreational opportunities, market niches, and visitor facilities under Alternative D would provide for a reduced number and density of visitors compared to Alternatives B and C.

As the demand for more intensive recreational uses is likely to increase in the surrounding communities due to increases in the population, communities adjacent to the Decision Areas would not likely receive revenue associated with spending on goods and services to support the particular recreational activities of the developed areas.

Alternative D emphasizes resource protection/conservation and nonmotorized, primitive recreation, which would increase the social well-being of people or groups who value protection, solitude, quiet, and other traits of remote areas over the other alternatives. In contrast, motorized recreation enthusiasts would experience the largest decrease in opportunities for recreation throughout the Decision Areas. The sales and rental of recreational vehicles and equipment would likely decrease as compared to Alternatives A, B, and C, especially in gateway communities; however, sales and rental of equipment and supplies for nonmotorized forms of recreation may offset this loss to some degree.

From Special Designations on Socioeconomics

In contrast to Alternative C, it would be unlikely that visitation would increase due to proposed protection of resources because access to places where people-place connections exist would decrease under Alternative D. Such places under Alternative D would include wildlife, cultural, and special areas, and areas managed for species and habitat. Under Alternative D, total ACEC designations would protect natural and cultural resources and the outstanding landscape and scenic features present on a total of 263,700 acres, more than under A, B, or C.

Resources currently present would receive increased protection compared to the other alternatives, aligning with the social well-being of people and groups who value increased protection of public lands, while decreasing the social well-being of people or groups who value resource use and access.

From Travel Management on Socioeconomics

In the Lower Sonoran, motorized access to public lands would be reduced most compared to all other alternatives; both by closing 378,300 acres to motorized vehicle use and by limiting open routes to an estimated 904 miles or 54 percent of available routes. In the SDNM, motorized vehicles would be limited to 261 miles of routes (41 percent of all available routes). In addition, allocated lands managed to protect wilderness characteristics would be closed to motorized use areas. The net result would be to offer more remoteness to those who value this quality than the other alternatives, but fewer opportunities for more intensive recreational experiences and convenient access. Those who are physically limited to visit public lands by motorized vehicle would be excluded from more portions of the Decision Areas than under the other alternatives. Among nonmotorized users, those who prefer not to share routes with motorized vehicles would tend to be attracted to the routes that are closed to motorized use. It is unlikely that the designated routes and trails under Alternative D would address the growing recreation and tourism demand for motorized use and access, which could lead to a reduced level of use that could damage sensitive resources.

The most potential for decreased visitation due to increased restrictions on use and reduced opportunities for public access would occur under Alternative D. These include restrictions on motorized access, camping, recreational target shooting, equestrian use, and nonmotorized mechanized use, as well as seasonal closures, not allowing group tours for cultural resources, and closing environmentally sensitive areas. Economic activity associated with visitation to public lands could be shifted to other recreation sites within the general area that are not as restrictive. Nonetheless, given the increasing urbanization in the area and the wider attraction of Monument designation, the overall visitation to public lands from local and regional residents is expected to increase or remain unchanged despite the restrictive management under Alternative D.

From Vegetation Resources on Socioeconomics

In contrast to Alternative A, B, and C, collection of native plant material would be prohibited in both Decision Areas under Alternative D. This would result in a decline of the social and economic well-being of those people or groups who have a cultural attachment to collection, while resource values would receive increased protection.

Also in contrast to Alternatives A, B, and C, the focus on controlling invasive species would include requiring all equestrian and stock animal users to use certified weed-free feed and refrain from consuming forage on public lands. This would result in largest decrease in introduction and spread of invasive species. This alternative would most increase the cost to users but decrease costs to the BLM. The social values associated with maintaining native species on public lands would be met.

From Wilderness Characteristics on Socioeconomics

Alternative D prescribes the most acreage to allocated lands managed to protect wilderness characteristics: 276,500 acres in Lower Sonoran and 153,000 acres in the SDNM. Impacts would be similar to Alternative C, only with larger intensity.

4.21.6.2. Lower Sonoran

From Lands & Realty on Socioeconomics

Under Alternative D, more acreage would be made available for retention than under any other Alternative. Acreage available for R&PP and disposal by any means would be similar to Alternative B. Revenue associated with land development would be the least under this Alternative, as compared to others. The social well-being of those individuals or groups who value retention of public lands would increase compared to other alternatives.

In the Lower Sonoran, Alternative D would designate the least number of corridors than any other alternative, although all designated corridors would be one mile wide. More acreage would be in LUA exclusion areas than under any other Alternative.

These actions under Alternative D would promote resource conservation for the protection and enhancement of natural and cultural resources, further aligning with the social values of those people or groups who value intact wildlife and cultural areas, more so than under any other alternative. At the same time, these decisions would reduce the economic opportunity for new LUAs on public lands. As a result, alternate routings may be needed to provide new utility

service to the potential service population, which could potentially be at increased costs to the utility company and ultimately to the consumer.

Impacts from management of utility-scale renewable energy under Alternative D would be similar to those under Alternative C, although somewhat more restrained as ACECs would be exclusion areas for utility-scale renewable energy development sites outside of designated corridors, and lands managed to protect wilderness characteristics would only be available for location with special stipulations.

From Minerals Management on Socioeconomics

Under Alternative D, the most land would be closed to mineral entry in the Lower Sonoran. This would reduce the revenue yield to the BLM and mining industry, although there is not sufficient data available to project whether the reduction in the acreage would increase the cost of mineral materials in the region. For mineral materials and leasables, the revenue yield would be further reduced because permit approvals in WHAs would be based on whether the mineral extraction could be done in a manner that maintains or enhances the resources for which the designation was made.

From Visual Resources on Socioeconomics

In the Lower Sonoran, Alternative D would allocate the most acreage to VRM Classes I and II (77 percent of the Decision Area), the least acreage to VRM Classes III (21 percent of the Decision Area). This would result in an increase in the social well-being of visitors and residents who desire protection of scenic views compared to Alternatives A, B, and C.

4.21.6.3. Sonoran Desert National Monument

From Lands & Realty on Socioeconomics

No utility corridors would be designated within the SDNM, although existing LUA would be retained. As under Alternative C, communication sites would be not be designated in SDNM and new communication facilities would be prohibited. These actions under Alternative D would promote resource conservation for the protection and enhancement of natural and cultural resources, further aligning with the social values of those people or groups who value intact wildlife and cultural areas, more so than under any other alternative. At the same time, these decisions would reduce the economic opportunity for new LUAs on public lands. As a result, alternate routings may be needed to provide new utility service to the potential service population, which could potentially be at increased costs to the utility company and ultimately to the consumer.

From Visual Resources on Socioeconomics

In the SDNM, Alternative D would allocate the most acreage to VRM Class I and II (100 percent) no acreage allocated in Classes III or IV. This would protect visual and scenic resources in all landscapes across the SDNM, attracting the most visitors seeking scenic views. While the increased acreage in VRM Class I would align with those groups or individuals who value scenic views, the allocation would impact those users who value more intensive uses of public lands.

4.21.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

Alternative E would respond to recent trends in the Planning Area by providing for a range of recreational and cultural visitation experiences while providing resource protection. There would be intensive management of uses and "hands-on" resource protection measures. Revenue effects to private industry/businesses and to the BLM from recreation would be similar to Alternative B, while effects from mining and land disposition would be similar to Alternative C, and effects from grazing would be similar to Alternative A. With several utility corridors in Alternative E, the BLM could present the many options to energy providers for transmission line siting, helping meet energy demand at a relatively low cost. Utility-scale renewable energy development prescriptions would be similar to Alternative B, but more areas would be avoidance or exclusion areas under Alternative E.

Alternative E would provide a variety of recreational experiences with enough additional controls to protect resources and to provide for additional niche markets, such as cultural and heritage tourism. Overall, there would be positive effects to the social well-being of recreationists who prefer solitary and quiet experiences and to the social well-being of those who feel a majority of roads should remain open. Opportunities for hunting and wildlife viewing would be enhanced through a focus on protecting wildlife habitat and providing suitable access. Groups and individuals who give a very high prior¬ity to resource use may feel that not enough resource use would be allowed on public lands under this alternative, though more resource use would occur under this alternative than under Alternatives C or D. Some of the groups and individuals who give a very high priority to resource protection may feel the resources they are concerned about (e.g., wildlife, visual resources, and desert ecosystems) would be adequately protected.

4.21.7.1. Both Decision Areas

From Cultural and Heritage Resources on Socioeconomics

Alternative E would be similar to Alternative D in the Lower Sonoran by not allocating SCRMAs (outside of the Monument) but providing protection to resources in the Saddle Mountain area through ACEC designation. However, the BLM's investment in combined site protection and development would be similar to Alternative C and may result in slightly increased visitation compared to Alternatives A and D, with an associated increase in spending in the surrounding communities.

From Livestock Grazing on Socioeconomics

Grazing under Alternative E would be classified similar to Alternative A. Impacts in terms of maintaining a traditional ranching lifestyle and resultant economic impact would be similar to that described under Alternatives A. Impacts from Grazing in the SDNM would be similar to those in Alternative B for the Monument.

From Priority Wildlife Species and Habitat Management on Socioeconomics

Wildlife and habitat management under Alternative E would provide opportunities for hunting, wildlife viewing, and photography similar to Alternative C, but more than under Alternatives

A, B, and D, due to allocating a WHA in the Lower Sonoran while still providing some public access and wildlife waters.

From Recreation Management on Socioeconomics

In the Lower Sonoran, Alternative E would allocate a similar number of acreage to SRMAs as Alternative C. Front country allocation would be similar to Alternative D and back country allocation would be similar to Alternative B. In addition, a greater variety of recreational opportunities and visitor facilities would be provided under Alternative E, although to a lesser degree than in Alternatives A and B. Management of the SRMAs would be similar to Alternative B, but would spur somewhat different spending on goods and services.

As under Alternative B, the entire SDNM would be a SRMA, with less area managed as front country than C, but more than B. Under Alternative E, the 78,700 acres allocated to the front country RMZ would accommodate sustainable motorized and mechanized access for camping, picnicking, and other activities near rapidly growing communities to the north of SDNM and the Town of Buckeye. The communities would benefit from spending on goods and services to support the particular recreational activities of the developed areas. The 406,500 acres allocated to back country would provide opportunities for visitors to engage in primitive nonmotorized, non-mechanized activities. Visitor facilities would be provided offsite in coordination with the local communities, and provide a potential opportunity for a development project in the local communities.

From Special Designations on Socioeconomics

Under Alternative E, there would be the most total acres under ACEC designation compared to other alternatives. This management strategy would align with the social well-being of people and groups who value increased protection of public lands and the social well-being of people or groups who value resource use and access.

From Travel Management on Socioeconomics

Overall, impacts to visitation from increased restrictions on use and public access would be most similar to Alternative C. In addition, increased restrictions on public access to meet resource goals and objectives would be similar to Alternative C.

From Vegetation Resources on Socioeconomics

As under Alternative B, collection of native plant material for personal use and scientific purposes in the Lower Sonoran would align with cultural values; however, resource values would be further protected under Alternative C by not permitting wood harvesting, which is similar to Alternative D. Impacts from requiring a special use permit for collecting plant material in the SDNM would be the same as under Alternative B. Impacts from controlling invasive species and requiring the use of certified weed-free feed would be similar to Alternative C.

From Wilderness Characteristics on Socioeconomics

Alternative E would designate fewer acres in both Decision Areas than proposed under Alternatives C and D as lands managed to protect wilderness characteristics. As a result,

Alternative E would meet both the social well-being of people or groups who prefer solitary, quiet experiences and the social well-being of people or groups who prefer more developed experiences and opportunities. Proposals for use of lands managed to protect wilderness characteristics would be considered on a case-by-case basis and would not likely be permitted, increasing costs similar to Alternative C.

4.21.7.2. Lower Sonoran

From Lands & Realty on Socioeconomics

Impacts from land tenure decisions would be similar to Alternative C.

In the Lower Sonoran, utility corridors would be limited to 8 one mile wide corridors and the core mountain area of the Saddle Mountain ACEC would be an exclusion area for LUAs, which is similar to Alternative D. Like Alternative C, other ACECs and allocated lands managed to protect wilderness characteristics would be avoidance areas. These decisions would allow for the future development of utilities within designated utility corridors, increasing the economic opportunity for new LUAs on public lands compared to Alternatives A and D. As a result, new utility service to the potential service population would be met, which could potentially reduce costs to the utility company and ultimately the consumer while still promoting resource conservation more than Alternatives A, B, and C, and aligning with the social values of those people or groups who value intact wildlife and cultural areas.

Impacts from utility-scale renewable energy development prescriptions would be similar to Alternative D, albeit more widespread as ACECs and lands managed to protect wilderness characteristics would be avoidance areas for utility-scale renewable energy development sites and facilities outside of designated corridors, other than with special stipulations. The core mountain area of Saddle Mountain ACEC would be an exclusion area.

From Minerals Management on Socioeconomics

Under Alternative E, the economic effects of mineral resource extraction would be similar to those under Alternative C.

From Visual Resources on Socioeconomics

Impacts would be similar to those described in Alternative B.

4.21.7.3. Sonoran Desert National Monument

From Lands & Realty on Socioeconomics

In the SDNM, no utility corridors would be designated, which is the same as Alternatives D. Compared to Alternative B, this would greatly increase costs to utility companies and their customers while protecting the visual resources and open space views in the Monument. Impacts in the SDNM would be similar to Alternative D.

4.22. IMPACTS ON ENVIRONMENTAL JUSTICE

This section assesses environmental justice effects of the Planning Area alternatives. Public-land uses can cause adverse effects to communities defined by environmental justice constraints.

As mentioned in Chapter 3, *Affected Environment* (p. 251), the communities of Buckeye, Gila Bend, Goodyear, Tolleson, Ak Chin Village, Gila River Indian Community, Arlington, Tonopah, Mobile, Palo Verde, Sentinel, Rainbow Valley, Ajo, the Tohono O'odham Nation, Why, Apache Junction, Casa Grande, Florence, the Gila River Indian Community, Maricopa, Stanfield, the community bordering the eastern portion of the SDNM, Globe, and Miami all have characteristics of either minority populations greater than 36.2 percent or more than 13.2 percent of the community live below the poverty level.

The resource management decisions expected to have the greatest impacts to socioeconomics in the study area includes those relating to the management of energy and minerals and lands and realty

4.22.1. METHODS OF ANALYSIS

4.22.1.1. Indicators

The following impact indicators are used when conducting analysis on Environmental Justice:

- Adverse impacts to low income or minority communities as measured by potential reduced income/employment to these communities.
- Actions that could lead to an impediment to economic development in low income or minority communities.

4.22.1.2. Assumptions

See assumptions described for socioeconomic impacts.

4.22.1.3. Program Areas with no Impacts on Environmental Justice

Management actions from all program areas except for lands and realty and minerals are not expected to have an impact on environmental justice in the Planning Area and are not discussed further.

4.22.2. COMMON TO ALL ALTERNATIVES

4.22.2.1. Both Decision Areas

No unique impacts are identified that are common to all alternatives for both Decision Areas.

4.22.2.2. Lower Sonoran

No unique impacts are identified that are common to all alternatives for the Lower Sonoran.

4.22.2.3. Sonoran Desert National Monument

From Minerals Management on Environmental Justice

Under all alternatives, no adverse impacts are anticipated from minerals management to adjacent low income or minority communities from mineral management within the SDNM

From Travel Management on Environmental Justice

There would be no impacts to communities with environmental justice concerns from management of the SDNM under Alternative A.

The route designation of within the SDNM is not expected to have any impact on low-income and/or minority communities and is therefore not discussed further in this analysis.

4.22.3. ALTERNATIVE A (NO ACTION)

4.22.3.1. Both Decision Areas

From Lands & Realty Management on Environmental Justice

The community of Mobile is considered both a minority and low-income community. Three landfills and three utility corridors with existing utility lines currently exist in the Mobile area. The density of major utility lines and landfills in the Mobile area is much higher than in the remainder of the region and areas near major utility lines and landfills typically have lower property values and more difficulty attracting development than do areas without such facilities. Management decisions to designate these utility corridors within the Mobile area could be a continuing impediment to local economic development; impacts are expected to be negligible to major, depending on the proposed actions.

Utility corridors are also located within or adjacent to several of the other minority or low-income areas in the study area, but there is not necessarily a disproportionate effect of existing utility lines on those communities as major utility lines are present near most population centers, regardless of their minority or income status.

4.22.3.2. Lower Sonoran

From Minerals Management on Environmental Justice

Ajo, Globe, and Miami area are minority communities. Ajo and Miami are also low-income communities. Should there be a resurgence in copper mining, this population would likely benefit from some of the jobs created. However, under Alternative A, no disproportionate negative impacts are expected due to current minerals management.

4.22.3.3. Sonoran Desert National Monument

No unique impacts are identified for Alternative A for the the SDNM.

4.22.4. ALTERNATIVE B

4.22.4.1. Lower Sonoran

From Lands & Realty on Environmental Justice

The community of Mobile would be affected by the continuation of the utility corridors as described under Alternative A.

Under Alternative B, the additional Gila Bend-Santa Rosa alternate corridor and Tucson Electric Power, North corridor would potentially intensify the effects of corridors in the Mobile area via reduced potential for other economic development. Impacts are expected to be minor.

Maintaining the I-8 corridor would increase the acreage of corridors near the minority and low-income areas of Gila Bend, Casa Grande, and Stanfield, could also which could reduce potential for other economic development. Impacts are expected to be minor.

From Minerals Management on Environmental Justice

Impacts are likely to be similar to those described under Alternative A.

4.22.4.2. Sonoran Desert National Monument

From Lands & Realty on Environmental Justice

In the SDNM, impacts would be similar to those discussed in Alternative A.

4.22.5. ALTERNATIVE C

4.22.5.1. Both Decision Areas

From Lands & Realty on Environmental Justice

The community of Mobile would be affected by utility corridors as described under Alternative A. However, the requirement that utilities in the Santa Rosa-Gila Bend corridor be placed underground in the SDNM might discourage its use. Less use of this corridor in the Monument could concentrate uses in the Mobile area similar to Alternative B.

The effects maintaining the I-8 corridor on Gila Bend, Casa Grande, and Stanfield would be as described for Alternative B.

The community of Mobile would be affected by utility corridors as described under Alternative A. However, the requirement that utilities in the Santa Rosa-Gila Bend corridor be placed underground in the SDNM might discourage its use. Less use of this corridor in the Monument could concentrate uses in the Mobile area similar to Alternative B.

4.22.5.2. Lower Sonoran

From Minerals Management on Environmental Justice

Impacts are expected to be similar to but lower intensity than described for Alternatives A and B.

4.22.5.3. Sonoran Desert National Monument

No unique impacts have been identified for Alternative C for the SDNM.

4.22.6. ALTERNATIVE D

4.22.6.1. Both Decision Areas

From Lands & Realty on Environmental Justice

As under Alternative A, the community of Mobile would be affected by utility corridors. Differing from the other alternatives, however, would be the removal of the Santa Rosa-Gila Bend corridor on SDNM. Such actions would mean either that the corridor just to the east of the Monument in the Mobile area would not be used as it would have no major utility grid connection to its west or that uses would be concentrated in corridors outside the Monument. A portion of the I-8 corridor east of Gila Bend and another portion west of Stanfield would also be truncated because of the removal of the corridor from SDNM. A smaller number of potential utility lines in the area compared to other alternatives would likely mean the least potential negative economic development impact to the community of Mobile.

4.22.6.2. Lower Sonoran

From Minerals Management on Environmental Justice

Impacts are expected to be similar to but lower intensity than described for Alternatives A, B and C.

4.22.6.3. Sonoran Desert National Monument

No unique impacts have been identified for Alternative D for the SDNM.

4.22.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.22.7.1. Both Decision Areas

From Lands & Realty on Environmental Justice

Impacts to minority and low-income populations in the Planning Area would be similar to that described under Alternative C.

4.22.7.2. Lower Sonoran

From Minerals Management on Environmental Justice

Impacts to minority and low-income populations in the Planning Area would be similar to that described under Alternative C.

4.22.7.3. Sonoran Desert National Monument

No unique impacts have been identified for Alternative C for the SDNM.

4.23. IMPACTS ON TRIBAL INTERESTS

This section presents potential impacts of the alternatives on tribal interests, specifically archaeological, historic, and American Indian resources, as determined through changes in the resources or access to them. As discussed in Chapter 3, *Affected Environment* (p. 251), the locations of most cultural resource sites in the Planning Area are not known, which makes analyzing impacts to such resources difficult. In general, archaeological, historic, and American Indian resources may be impacted by unauthorized collection, vandalism, erosion, trampling, OHV use off-road, fire, mechanized surface disturbance, and loss of access to sacred or traditional use and gathering areas.

4.23.1. METHODS OF ANALYSIS

4.23.1.1. Indicators

No indicators were used to analyze impacts from program areas on tribal interests.

4.23.1.2. Assumptions

No assumptions were used to analyze impacts from program areas on tribal interests.

4.23.1.3. Program Areas with no Impacts on Tribal Interests

There would be no impacts to tribal interests from actions proposed under the following program areas:

- Air Quality
- Cave Resources
- Paleontological Resources
- Soil Resources
- Water Resources
- Wild Horse & Burro Management
- Hazardous Materials & Public Safety

4.23.1.4. Qualitative Intensity Scale

The intensities of impacts are the same as those described in Table 4.1, “Qualitative Terms for the Intensity of Impacts” (p. 375).

4.23.2. COMMON TO ALL ALTERNATIVES

4.23.2.1. Both Decision Areas

From Wildland Fire Management on Tribal Interests

There have been minimal vegetation treatment projects in the past because fuel loads are generally low with reduced chance of catastrophic fire. As a result, any treatments to reduce fuel load in the Decision Area would be small scale and localized, resulting in negligible to moderate impacts. Treatment efforts would help to stop root damage and erosion of deposits and structures from invasive species and help to keep archaeological and historical resources intact. Impacts from wildland fire management on American Indian resources would be moderate.

4.23.2.2. Lower Sonoran

No unique impacts are identified for the Lower Sonoran that are Common to All Alternatives.

4.23.2.3. Sonoran Desert National Monument

No unique impacts are identified for the SDNM that are Common to All Alternatives.

4.23.3. ALTERNATIVE A (NO ACTION)

4.23.3.1. Both Decision Areas

From Cultural and Heritage Resources on Tribal Interests

Under Alternative A, ongoing protection would be provided to archaeological and historical sites. Maintaining designated public use sites in both Decision Areas would provide opportunities to educate the public about past activities and allow for public enjoyment of these resources. Cultural inventories, documentation, research, protective measures, monitoring, and Site Steward Patrols would continue to provide information about the past in the Decision Areas and to protect cultural resource sites. The impact to archaeological and historical resources would be minor.

Continuing to interpret and direct the public to public use sites could lead to damage and vandalism to American Indian resources at these areas. Opportunities also would be available to interpret and explain past and current American Indian uses of the resources and areas near these public use sites from an American Indian perspective. The presence of the general public at some of these sites may deter American Indian visits and activities. Impacts would be moderate and site specific.

Unauthorized collection and vandalism to archaeological and historical sites by visitors would also be expected to increase. Some sites would be monitored, as applicable, deterring impacts from visitors. A substantial portion of monitoring would continue to be conducted by Site Stewards, who would assist in providing information to apprehend vandals. Law enforcement would continue to be used to stop the destruction of the public lands. Educational efforts would continue to encourage protection of cultural resources and generate an appreciation of the values

being protected. The impact would be detectable but it would be negligible and localized within small areas.

From Livestock Grazing on Tribal Interests

Compaction of soil, additional erosion, and displacement of artifacts associated with livestock grazing would continue under Alternative A. Impacts to archaeological and historic resources would be minor and could be mostly averted by avoiding archeological and historical resources when locating wells and other grazing related developments.

From Priority Wildlife Species and Habitat Management on Tribal Interests

Water developments in cooperation with AGFD for wildlife on public lands would also affect cultural resources and native habitats due to their development in areas that were used by American Indians for habitation and gathering resources.

From Recreation Management on Tribal Interests

Recreation use in the Decision Areas would increase due to an increase in regional population, as well as new interest in the area due to the designation of the SDNM. More intense recreational use on lands near the communities would result in more impacts to archaeological and historical resources. Impacts in some-specific areas near communities or on some types of archaeological sites, such as caves, rock shelters, or rock art, could be moderate or major for specific sites.

From Special Designations on Tribal Interests

No new ACECs would be established in the Decision Areas. This would allow for continued surface disturbance and intrusions that would affect both cultural resources and/or TCPs. The impacts would range from landscape to site specific and would be moderate and long-term.

From Travel Management on Tribal Interests

Impacts from travel management primarily stem from management actions that restrict or increase access. Increased access to cultural sites could increase contact by visitors who could intentionally damage sites by collecting surface artifacts, vandalizing, illegally digging. Visitors can also unintentionally damage sites by camping on or driving across sites. In fact, studies have shown that damage to sites is mainly concentrated within several hundred yards of roads (Sullivan et al. 2002). Reducing such access by closing roads or restricting travel could thus protect cultural resources. On the other hand, increased access can allow for the increased presence of law enforcement, cultural resource personnel, and site stewards for purposes of monitoring sites and areas. Increasing access could also increase the amount of cultural resource inventories and research. Finally, increased access would allow for the increased presence of the public, which can also deter vandalism.

Under Alternative A, motor vehicles would be restricted to existing or designated roads. This would limit impacts associated with motorized vehicle use on or near sites. However, all existing open routes would remain open, including routes that could be damaging resources. In addition, continued route proliferation could occur due to the lack of a travel management plan. Alternative A would designate the most miles of routes open to motorized use by the public compared to

the other alternatives, which would result in moderate impacts to cultural resources. Increased access leads to more opportunities for vandalism to occur and for continued monitoring of the area to stop such damage. Alternative A would provide the most motorized access to TCPs and other traditional use or sacred areas by American Indians. This type of access would make it more likely that damage, and vandalism to American Indian TCPs and other traditional use or sacred and archaeological sites by other visitors using motorized and mechanized vehicles would occur.

From Vegetation Resources on Tribal Interests

Lack of current public policy to protect vegetation under Alternative A would increase the opportunity for fragmentation, loss, or alteration of these resources. This, in turn, would affect plant resources that have strong cultural and medicinal values for American Indians. Restoration activities, especially in the Sonoran Desert Ecological Zone, would affect archaeological and historical resources. Eradication of noxious weeds may involve surface disturbance, which would impact archaeological and historical sites. Any surface disturbing activity would need to avoid sites eligible for listing on the NRHP and an agreed upon buffer would be established around villages, as requested by the Tribes. Mitigation of some impacts would be provided through Section 106 procedures. Conversely, restoration projects could promote the health and sustainability of vegetation that is gathered by American Indians. Overall impacts from ecological and biological management on American Indian resources would be moderate.

From Visual Resources on Tribal Interests

Under Alternative A, most acres would remain in VRM Classes III and IV, which would mean that archeological and cultural resources would be less protected due to a lower level of mitigation being required to protect the visual aspects of resources and landscapes. Traditional use areas would similarly be affected due to visual intrusions and surface disturbance. Major modifications to the visual landscape could be allowed under Class IV. VRM Class I and II categories, on the other hand, would help protect cultural resource sites and landscapes from visual intrusions and surface disturbance under Alternative A; however, such categories would limit research excavations.

From Wilderness Characteristics on Tribal Interests

No areas would be allocated as lands managed to protect wilderness characteristics under Alternative A.

4.23.3.2. Lower Sonoran

From Lands & Realty on Tribal Interests

Land disposals would impact archaeological and historical resources because the lands and associated resources would leave the protection provided by Federal laws. Impacts would be long term permanent and major.

Land use authorizations such as ROW, permits, or leases would cause long-term impacts to archaeological and historical resources. There would also be impacts from lands and realty authorizations due to new areas being opened through maintaining access routes that would create

new routes for motorized recreation. Other actions proposed by local communities under R&PP leases could also impact archaeological and historical resources. These and impacts mentioned above would be mitigated under Section 106 of the NHPA. Overall, impacts from lands and realty would be moderate.

From Minerals Management on Tribal Interests

Most of the Lower Sonoran would be open to mineral exploration and development under Alternative A. Impacts to archaeological and historical resources in the Lower Sonoran from associated ground disturbance would be moderate. Increased access due to the construction of roadways to mines would result in an increase in the likelihood that impacts from vandalism would occur. Impacts would be site specific and could be major, resulting in a loss of information on the local and regional history and prehistory. Mining activities could disrupt access to TCPs and other traditional use or sacred areas and the additional noise and disturbance associated with active mining sites could disturb some activities at nearby TCPs and other traditional use or sacred areas. Impacts would be major and would be site specific. Section 106 procedures may reduce some impacts.

4.23.3.3. Sonoran Desert National Monument

From Lands & Realty on Tribal Interests

No acres would be disposed of in the SDNM.

From Minerals Management on Tribal Interests

The SDNM would remain closed to new mineral entry under all alternatives.

4.23.4. ALTERNATIVE B

4.23.4.1. Both Decision Areas

From Cultural and Heritage Resources on Tribal Interests

Impacts from cultural resource research and other allowable uses would be the same as described under Alternative A and remain minor. There would be no new special designations under Alternative B for cultural resources. This would allow for a greater opportunity of resource loss and/or damage due to increased access and disturbance in areas with TCPs and other traditional use or sacred areas and archeological and historic resources. Impacts would be moderate and long-term. Permitted activities such as SRPs or outfitters and guides would be educated about the provisions of the Archaeological Resources Protection Act and Native American Grave Protection and Repatriation Act, which would help protect archaeological and historical sites. Establishments of visitor limits, supplemental rules, or restrictions on a case-by-case basis based on various strategies, including carrying capacity or LAC, could protect archaeological and historical sites.

From Livestock Grazing on Tribal Interests

Impacts from livestock grazing would be the same as described for Alternative A.

From Recreation Management on Tribal Interests

Impacts from recreation management would be the same as described under Alternative A.

From Special Designations on Tribal Interests

Areas and resources that have importance to American Indians would have no greater protection than under Alternative A due to no new ACECs being established in the Decision Areas. This would allow for continued surface disturbance and intrusions that would affect both cultural resources and/or TCPs. The impacts would range from landscape to site specific and would be moderate and long-term.

From Travel on Tribal Interests

In the Lower Sonoran, the types of impacts from travel management would be similar to impacts discussed under Alternative A. Overall impacts would decrease, however, because routes damaging cultural resources would be closed and a travel management plan intended to control and stop proliferation of routes would be in place. Alternative B would slightly reduce impacts to undisturbed areas by visitors and vandals. This would slightly increase the difficulty for American Indians to access TCPs and other traditional use or sacred areas. Overall impacts would range from minor to moderate.

From Vegetation Resources on Tribal Interests

Restoration activities, especially the restoration of the Sonoran Desert Ecological Zone and the development of wildlife waters could affect archaeological and historical resources. Eradication of noxious weeds may involve surface disturbance, which would impact archaeological and historical sites. Conversely, restoration projects could promote the health and sustainability of vegetation that is gathered by American Indians. Impacts from ecological and biological resources management on American Indian resources would be minor to moderate.

From Visual Resources on Tribal Interests

As under Alternative A large areas of the Decision Areas would primarily be allocated to VRM Class III and IV, resulting in similar impacts. Slightly more area would be allocated to VRM Class I and II under Alternative B, resulting in slightly more protection to archeological and cultural resources and TCPs. Impacts from VRM would be moderate and long-term.

From Wilderness Characteristics on Tribal Interests

No areas would be allocated as lands managed to protect wilderness characteristics under Alternative A.

4.23.4.2. Lower Sonoran

From Lands & Realty on Tribal Interests

Impacts from land disposals would be the same as described under Alternative A, although impacts would be more widespread as more acres would be available for disposal under Alternative B.

From Minerals Management on Tribal Interests

The impacts from mining would the same as described under Alternative A for the Lower Sonoran.

4.23.4.3. Sonoran Desert National Monument

From Lands & Realty on Tribal Interests

Impacts would be the same as those described in Alternative A.

From Minerals Management on Tribal Interests

The impacts from mining would the same as described under Alternative A for the SDNM.

4.23.5. ALTERNATIVE C

4.23.5.1. Both Decision Areas

From Cultural and Heritage Resources on Tribal Interests

Compared to Alternatives A and B, a greater emphasis would be placed on cultural resource research and other allowable uses under Alternative, which would lead to a greater understanding of American Indian resources in the Decision Areas, thus benefiting such resources. Impacts from research and other allowable uses would range from minor to moderate.

From Livestock Grazing on Tribal Interests

Impacts would be the same as those describe for Alternative B.

From Priority Wildlife Species and Habitat Management on Tribal Interests

Impacts in Alternative C would be similar to Alternative B. The primary exception is that several WHAs would be allocated, which would increase the protection of ecological and biological resources in the allocated areas. In addition, no new wildlife waters would be developed, eliminating disturbance associated with such developments that would occur under Alternative B.

From Recreation Management on Tribal Interests

Impacts from recreation management would be similar to those described under Alternative A.

From Special Designations on Tribal Interests

Under Alternative C, more acres would be protected under ACEC designation than under Alternatives A and B, which would provide greater protection to resources in these areas.

From Travel Management on Tribal Interests

Under Alternative C, impacts from travel management would be similar to Alternative B; however, fewer miles of roads would be open to the public, resulting in fewer opportunities for vandalism and less impacts on archeological and historical resources from roads. Closing more miles of roads under Alternative C would also make it more difficult for American Indians to visit TCPs and other traditional use or sacred areas and for researchers to access sites. Overall impacts would be minor.

From Vegetation Resources on Tribal Interests

Impacts would be negligible.

From Visual Resources on Tribal Interests

Alternative C would involve acreage under VRM Class I and II standards compared to Alternatives A and B, which would protect a greater number of American Indian resources due to less ground disturbance and visual intrusion in resources areas and landscapes. The impacts would be minor and long-term.

From Wilderness Characteristics on Tribal Interests

Under Alternative C, 128,100 acres in the Lower Sonoran and 112,200 acres in the SDNM would be allocated as lands managed to protect wilderness characteristics. Both TCPs and other traditional use or sacred areas would benefit from associated management actions to protect wilderness characteristics. Impacts would be minor.

4.23.5.2. Lower Sonoran

From Lands & Realty on Tribal Interests

Impacts from land tenure adjustments under Alternative C would be similar to Alternatives A and B. However, Alternative C would make fewer acres available for disposal than Alternative B, resulting in less impacts; however, impacts would be greater than under Alternative A due to more acres that would be made available for disposal.

From Minerals Management on Tribal Interests

The impacts from mining would be the same as under Alternatives A and B.

4.23.5.3. Sonoran Desert National Monument

From Lands & Realty on Tribal Interests

Impacts would be the same as those described in Alternative B.

From Minerals Management on Tribal Interests

The impacts from mining would the same as described under Alternative A for the SDNM.

4.23.6. ALTERNATIVE D

4.23.6.1. Both Decision Areas

From Cultural and Heritage Resources on Tribal Interests

Under Alternative D, a greater emphasis would be placed on cultural resource protection compared to Alternatives A, B or C. Impacts from protection would be minor. Only research that was not ground disturbing would be allowed, which would limit understanding of American Indian resources in the Decision Areas.

From Livestock Grazing on Tribal Interests

There would be no impacts from grazing under Alternative D because public lands would ultimately be closed to grazing.

From Priority Wildlife Species and Habitat Resources on Tribal Interests

Impacts from ecological and biological resources under Alternative D would be similar to Alternative B and C except that one large WHA would be allocated, which would increase the protection of ecological and biological resources in these areas. In addition, no new wildlife waters would be developed and all existing wildlife waters would be removed. As a result, there would be no new disturbance related to new wildlife waters and existing disturbances would be removed.

From Recreation Management on Tribal Interests

By providing fewer points of access for recreation use, Alternative D would result in the least amount of ground disturbance and intrusions from visitors to archeological and historical resources, TCPs, and plant communities that are important to American Indians. Impacts would be minor across most of the area but could be high in areas of concentrated recreation use.

From Special Designations on Tribal Interests

The greatest number of acres would be protected by ACEC designations under Alternative D. This would provide the greatest protection to archeological and historical resources, TCPs, and plant communities that are important to American Indians. The benefits from this alternative would moderate and long-term.

From Travel on Tribal Interests

The least number of miles of routes would be open to the public under Alternative D, providing the greatest protection to American Indian resources among the alternatives. There would be less surface disturbance and intrusion into resource gathering areas and reduced impacts on archeological and historical resources and TCPs and other traditional use or sacred areas. However, access for American Indians into TCPs and other traditional use or sacred areas would

be more difficult given that fewer routes would be open. Impacts from surface disturbance and motorized intrusions would be negligible to minor and benefits would be moderate.

From Vegetation Resources on Tribal Interests

Vegetation resources would be enhanced due to better-protected vegetative communities. On the other hand, there would be potentially fewer areas available for gathering resources by American Indians due to limited motorized vehicle access. Impacts from surface disturbance and motorized intrusions would be negligible to minor while benefits would be moderate.

From Visual Resources on Tribal Interests

Alternative D proposes the most acres to be assigned to VRM Class I and II among the alternatives. This means that the visual integrity of historic and archaeological landscapes and resources, TCPs, and other traditional use or sacred areas and plant communities important to American Indians in the Decision Areas would be more protected than under the other alternatives. Impacts would be moderate.

From Wilderness Characteristics on Tribal Interests

The greatest number of acres would be allocated lands managed to protect wilderness characteristics under Alternative D compared to the other alternatives. As a result, Alternative D would provide less access for vandalism along routes but potentially greater opportunities for vandalism away from routes.

4.23.6.2. Lower Sonoran

From Lands & Realty on Tribal Interests

Impacts from land tenure adjustments would be similar to Alternatives A, B, and C. The fewest number of acres would be available for disposal under Alternative D and would thus have the least impact on American Indian resources.

From Minerals Management on Tribal Interests

Under Alternative D, the fewest number of acres would be open to mining, which would protect traditional cultural places and other traditional use or sacred areas from increases in access and surface disturbance associated with active mining operations. Impacts would be minor due to the smaller potential for destruction or damage to archaeological and historical sites during mineral exploration or development.

4.23.6.3. Sonoran Desert National Monument

No acres would be disposed of in the SDNM.

From Minerals Management

The impacts from mining would the same as described under Alternative A for the SDNM.

4.23.7. Alternative E (Preferred Alternative)

4.23.7.1. Both Decision Areas

From Cultural and Heritage Resources on Tribal Interests

Impacts from cultural resource management would be the same as described under Alternative C.

From Lands & Realty on Tribal Interests

Impacts from land tenure would be the same as described under Alternatives A. Impacts from land disposals would be similar to Alternative C due to similar acres available for disposal.

From Livestock Grazing on Tribal Interests

Impacts from grazing would be the same as described under Alternative A.

From Priority Wildlife Species and Habitat Management on Tribal Interests

Impacts from ecological and biological resources under Alternative E would be similar to Alternative B, with the exception that one large WHA would be allocated, increasing the protection of ecological and biological resources in these areas.

From Recreation Management on Tribal Interests

Impacts from recreation would be the same as described under Alternatives C for both Decision Areas.

From Special Designations on Tribal Interests

Impacts from designating 4 ACECs would increase the protection of ecological and biological resources in these areas.

From Travel Management on Tribal Interests

The types of impacts from travel management decisions would be the same as described under Alternative B. Overall, impacts would be less intense than under Alternatives B and most similar to C due to the decrease of miles of roads that would be open to motorized public travel under Alternative E. Overall impacts would be moderate.

From Vegetation Resources on Tribal Interests

Impacts would be negligible.

From Visual Resources on Tribal Interests

Impacts would be negligible.

From Wilderness Characteristics on Tribal Interests

Under Alternative E, impacts from allocating lands managed to protect wilderness characteristics would be the same as under Alternatives C and D; however, impacts would be more limited as fewer acres would be managed as such under Alternative E.

4.23.7.2. Lower Sonoran

From Minerals Management on Tribal Interests

Impacts from mineral development would be similar to those described under Alternative A, with the exception that Saddle Mountain would be closed to salable mineral material disposal, protecting American Indian resources in this area.

4.23.7.3. Sonoran Desert National Monument

From Lands & Realty on Tribal Interests

Impacts would be the same as those described in Alternative D.

From Minerals Management on Tribal Interests

The impacts from mining would the same as described under Alternative A for the SDNM.

4.24. CUMULATIVE IMPACTS

Cumulative impacts are those effects on the environment that result from incremental impacts of management direction contained in this Proposed Plan/FEIS when added to the effects of other past, present, and reasonably foreseeable future actions, regardless of what agency (federal, tribal, state, or local) or private entity undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508). Analysis focuses on the cumulative impacts from actions within and outside the Planning Area.

Potential cumulative impacts, projects, and actions in the Planning Area were determined by examining other plans in the region, by talking with local governments and state and federal land managers, and from information provided by the BLM staff. Projects outside the Planning Area were only considered if they would have the potential to affect resources in the region.

4.24.1. METHODS OF ANALYSIS

4.24.1.1. Indicators

See indicators identified previously for each specific resource or resource use.

4.24.1.2. Assumptions

The following assumptions were used when considering cumulative impacts:

- The timeframe for this cumulative impact analysis encompasses past activities for the past one hundred years in the Planning Area. It also includes present activities and anticipated future activities that may extend 20 years into the future, which is the assumed life of the management plans.
- All of the Reasonably Foreseeable Development Scenarios mentioned in Section 4.1.6, "Reasonably Foreseeable Development ScenarioS" (p. 376) would occur over the next 20 years.

4.24.1.3. Qualitative Intensity Scale

The intensities of impacts are the same as those described in Table 4.1, "Qualitative Terms for the Intensity of Impacts" (p. 375).

4.24.2. COMMON TO ALL ALTERNATIVES

4.24.2.1. Both Decision Areas

Cumulative Impacts on Air Resources

Cumulative impacts on air resources would be similar under all alternatives. Cumulative air quality impacts in the Planning Area have been addressed by air quality nonattainment plans and air quality maintenance plans that MAG and ADEQ have been required to prepare for approval by the EPA. These plans are required because the Phoenix area is a nonattainment area for several air pollutants and these plans are, in reality, quantitative cumulative air quality impact assessments.

Three main factors are anticipated to contribute to the cumulative impacts on air quality:

- Anticipated population growth in the Planning Area, especially the rapid growth in the Phoenix nonattainment areas.
- Anticipated increased emissions from additional OHV use both within and outside of the Decision Areas.

With the continued use and development of BLM-neighboring lands, dust is likely to persist as a problem in the Decision Areas into the foreseeable future. Air resources on public lands may be affected by offsite use, agricultural activities, and development regardless of the RMP alternative selected. It is assumed that offsite sources are the major contributors to dust within the Planning Area, there would be negligible differences in cumulative impacts to air resources from the BLM activities proposed under each RMP alternative.

Cumulative Impacts on Special Designations

Areas of Critical Environmental Concern. Over the next 20 years, ACEC lands will be primarily affected by urban expansion and population growth, OHV use and nonmotorized

recreation, mineral development, and rights-of-way for roads and energy. Over the long term, the implementation of the Proposed Action or alternatives could result in direct and indirect cumulative impacts to the relevant and important criteria for which the ACECs were designated. On-the-other-hand, strict application of the ACEC management prescriptions and actions could lessen or avoid the most extreme impacts.

Long-term and cumulative impacts on ACECs from urban expansion, rights-of-way, energy development, and motorized and nonmotorized recreation uses are similar to those described for wilderness. Mineral development could impact some of the ACEC's cultural, recreation, geologic or scenic values near urban areas due to demand for minerals and construction sand and gravel. Cultural resources would be subject to increased theft or vandalism due to increasing recreation use in areas with significant cultural resources.

Wildlife resources in the ACEC may experience the most notable cumulative impacts. Increase human use would disrupt wildlife or modify their behavior. Rights-of-way for roads and energy would cut or impair wildlife corridors and animal movement. In addition to traffic, recreation activities and land uses that would contribute increased ambient noise levels, along with noise from OHV use and other dispersed recreational activities. Several of the ACEC areas contain noise or human activity-sensitive areas of wildlife habitat and species (e.g., desert tortoise, Sonoran pronghorn antelope, big horn sheep for which, increased noise levels and human activity can have a substantial impact.

Juan Bautista de Anza National Historic Trail. The Anza NHT is a cultural resource of national significance. Cumulative impacts to the trail's integrity must be considered, including the visual impacts of land uses on the historic trail corridor. Impacts that enhance or degrade the visual resource, recreation values and the integrity of the setting, feeling, and historic association with trail need to be analyzed.

Trail segments within the SDNM remain once of the least disturbed landscapes along the entire 1,200 mile length of the Anza NHT. This setting is protected by national monument status, but the Anza NHT would be impacted by increased public interest and use, growing urbanization to the north and east outside of the monument, and fragmented land ownership and uses in other part of the Planning Area.

The Anza NHT is primarily affected by the OHV use and the existing and proposed ROWs for transportation, communication and energy developments. To a lesser extent, visitation and vandalism of the NHT would also affect its integrity. Population growth and the resulting increase in recreational use are expected to have a significant impact on the NHT and its historic landscape setting. Additional population, particularly in the Maricopa and Pinal County areas would result in more recreational use of the NHT, which would increase OHV traffic along the trail corridor, the potential for vandalism, and demands for new ROWs corridor over the life of the plan.

New roads would cross the trail in potentially many areas outside the SDNM, especially to the east. The roads would all impair or destroy the natural character of the landscape. Other state and private lands east of the monument will become both urbanized and residential. Trail values will be lost in these areas.

Implementation of large road or energy projects in the corridor outside of the SDNM would forever change the landscape of this area, irreparably degrade the integrity of the Anza NHT and it will diminish the public's experience and understanding of the historic expedition and the cultural landscape of that period. The continuing decline in air quality and the regional haze of

smog and dust in the central and southwest parts of Arizona will reduce the long-range vistas once enjoyed by trail visitors.

Urbanization would impact the historic feel of the landscape and impact the dark night skies of the area, which is another important experience enjoyed by visitors to the desert.

Wilderness Areas. Population growth in the Phoenix/Tucson urban corridor and the resulting increase in recreational use are expected to have a moderate to significant impact to wilderness areas in the Planning Area over the life of the plan. Increases in motorized and non-motorized use during the life of this plan could have minor to potentially major impacts on the three components of wilderness character: solitude, naturalness, and opportunities for primitive/unconfined recreation.

In the next 20 years, designated wilderness areas will be primarily affected by the number and proximity of adjacent motorized travel corridors, the volume and type of traffic on those corridors, the sights and sounds of urbanizing human development near or on the borders of wilderness, continuing human and drug smuggling impacts on the Borderlands, the intensity of military and civilian over flights, and the quantity and type of recreational users.

The North Maricopa Mountains, South Maricopa Mountains, Sierra Estrella and Table Top wildernesses, areas with good hiking trails and/or good paved road access will be most influenced with increased visitation, more vehicular incursions, growing trail and off trail recreation use, and exposure to the sights and sounds of adjacent human activities. Moreover, the North Maricopa Mountains, South Maricopa Mountains, and Sierra Estrella wilderness areas each border federal, private and state lands annexed into cities and slated for large scale residential development, transportation corridors and solar energy development. Solitude opportunities and the perception of natural landscapes may be impaired the most due to more people and visitor-to-visitor contacts, greater noise, and more urban light impacts. The interiors of these four areas described above should protect good to outstanding wilderness characteristics over the life of the plan.

The Woolsey Peak and Signal Mountain wilderness areas may experience moderate visitor use increases, anticipate moderately increased amounts of motorized recreation use along their boundaries, and be subject to increased noise and light pollution. Wilderness values, on the whole, will remain as they are today as the two areas are rugged and remote, lack any visitor amenities, and have no hiking or equestrian trails.

The Table Top and South Maricopa Mountains wilderness areas will continue to be subject to ongoing levels of incursions by drug smugglers and human traffickers. Over-the-long-term smuggling-related roads, trails, look outs and trash accumulations would continue, damaging wilderness values and discouraging primitive recreation opportunities. This resource damage and decline in primitive recreation opportunities, while not irreversible, is difficult to reclaim and restore.

Cumulative Impacts on Water Resources

The cumulative impacts on water resources would be similar under all alternatives. Because activities on both private and public lands affect water resources, the impacts of development cumulatively affect watershed conditions. As a result, many watercourses in central Arizona have been degraded by increased sediment load due to soil disturbance resulting from urbanization, livestock grazing, and recreation. Furthermore, leachate from mining and tail-water drainage from agriculture has historically degraded water quality in the region. Under Alternative A, these

activities would continue to affect water resources. However, under Alternative D, the cumulative effects on water resources are expected to be less than under any other alternative given that recreation and mining would be more restricted and grazing would be prohibited.

Cumulative Impacts on Soil Resources

The cumulative effects on soils would be similar under all alternatives and are expected to be limited to a particular site. Management practices in the Planning Area and activities on private lands have led to some detrimental soil conditions, some of which persist over the long term. Additionally, as private lands continue to be developed, especially near the Phoenix metropolitan area, soil becomes compacted and displaced. As a result, impacts to watershed conditions may occur through the loss of vegetation.

Cumulative Impacts on Visual Resources

Allocating VRM Classes establishes standards for managing the effects of surface disturbing activities. Potential impacts of the alternatives on visual resources are based on the potential management decisions to create visual changes in or contrasts on the landscape. The analysis shows that the VRM Classes have a spectrum or range of potential impacts by each alternative. In Alternative A, the visual impacts potentially come from valid and existing rights and activities. Alternatives B, C, and E reflect differentiating impacts along with the highly protective measures in Alternative D. During the life of the plan, population growth of the large and small communities of this planning area will contribute and impact the natural night sky conditions as well as the general landscape, regardless of which Alternative is implemented. The Lower Sonoran and SDNM Decision Areas will continue to serve as undeveloped open space as the private and State lands are developed with the SDNM potentially being surrounded by land annexed into cities and towns in the next decade.

Cumulative Impacts on Wilderness Characteristics

The cumulative impacts analysis area for wilderness characteristics includes Lands with Wilderness Characteristics in the Lower Sonoran Field Office and the Sonoran Desert National Monument, and certain lands surrounding such areas, as deemed necessary to satisfactorily assess impacts on the resource. Past and present action within the planning area and RFD Scenarios over the next 20 years has the potential to cause cumulative impacts on wilderness characteristics.

Wilderness characteristics in areas not managed to protect those characteristics could be lost or impaired due to urban expansion and population growth. Simply put, more people mean more motorized and nonmotorized recreation use, along with associated community needs like roads, power, utilities, sand and gravel pits, and ROWs. The majority of these recreation uses and community growth developments could occur on BLM lands and contribute to the overall availability and quality of naturalness and non-motorized recreation settings, and associated solitude.

Wilderness characteristics in areas not managed to protect those characteristics could be lost or impaired due to increasing demand for ROW for utilities, renewable energy, and roads. Vast solar developments would remove a large amount of public land from recreation-related visitor use, contributing to greater concentrations of visitors within the SDNM and LSFO public lands.

Greater user concentrations would detract from or decrease the quality of solitude and primitive recreation activities.

Wilderness characteristics are primarily affected by the number and proximity of motorized travel corridors; the volume and type of traffic on those corridors; and the quantity and type of recreational users. Population growth and the resulting increase in recreational use are expected to eventually impact lands with wilderness characteristics. An increase in motorized and nonmotorized use during the life of the plan could have major impacts on solitude, naturalness, and opportunities for primitive and unconfined recreation, mainly on lands not managed to protect such characteristics.

Recreational developments in the Saddle Mountain SRMA and the Ajo SRMA would impair naturalness and opportunities for primitive recreation and solitude. On-the other hand, comprehensive travel management and recreation management planning could avoid adverse impacts altogether in some areas through maintenance of visual standards and recreation settings. Designation ofERMAs throughout the range of alternatives would disallow most recreation road construction, maintenance upgrades, or new facilities, except in response to visitor health and safety or conflicts with other resource uses. This would, in effect, globally protect or enhance wilderness characteristics. Recreational developments within the SDNM would have no direct or indirect impacts on wilderness characteristics.

Increased use of civilian and military airspace will add to noise from aircraft operations. Moreover, the new F-35 military fighter, nosier than current aircraft, may be deployed over the Decision Area's airspace. Increased levels of noise will constrain opportunities for solitude and quiet landscapes. Not much can be done to mitigate this impact and all areas with wilderness character will be subject to aircraft noise to varying degrees. Noise influences are however, both transitory and temporary, and subject to the auditory sensitivity of each individual user.

Without significant management intervention, wildlife populations and areas with special resource values are expected to continue a downward trend over the next 20 to 25 years. Accordingly, active wildlife management actions and ACEC prescriptions are anticipated on most Decision Area lands, both on lands with and without wilderness characteristics. Wildlife catchments, access roads, enclosures for owls and pronghorn, land and OHV closures and stringent Sonoran desert tortoise habitat protection stipulations are anticipated. Mostly, these actions will protect or even enhance wilderness characteristics. To a minor extent, wildlife management, special designations, and recreation visitor use projects can adversely affect localized areas with wilderness characteristics. These impacts normally come from the installation, maintenance, and use of catchments, fences, drinkers and visitor management facilities.

Livestock grazing will not impact lands with wilderness characteristics over the long-term. Livestock numbers and active management practices are expected to remain at or below current levels, and potentially end in parts of the SDNM and near urban lands. To a minor extent, specific range management projects could affect areas with wilderness characteristics. These impacts normally come from the installation, maintenance, and use of range waters, fences, and corrals.

BLM will consider wilderness characteristics when assessing impacts from mining, which are likely to occur when these activities are permitted to occur on lands with such wilderness characteristics. Wilderness characteristics in some areas will be directly impaired or lost due to development of locatable and salable minerals, with the greatest potential in the Ajo Block and Gila Bend Mountains. About 10% of land with wilderness character, but not managed to

protect wilderness characteristics could be adversely impacted over the long term, with a loss of naturalness, and decreased solitude and primitive recreation opportunities.

The BLM can make a variety of land use plan decisions to protect wilderness characteristics, such as comprehensive travel management planning, application of land health standards, wildlife habitat planning, or site-specific cultural or recreation plans. These plans normally include application of VRM objectives to guide the placement of roads, trails, and other facilities; establishing conditions of use to be attached to permits, leases, and other authorizations to achieve the desired level of resource protection; and designating lands and travel routes as open, closed, or limited to OHVs, or actions initiated to achieve a desired visitor experience or setting. All comprehensive and activity-based planning efforts and implementation of such plans can serve to protect wilderness characteristics generally over the long term.

Air quality management and compliance issues may better protect wilderness characteristics on lands with such character due to potential limitations and regulation of OHV travel on dirt roads and washes. Restrictions will increase over the life of the plan due to the expansion of community development and nonattainment areas (PM2.5 and PM10). Such restrictions will include use limits and closures on use of dirt roads and changes in operating procedures; potentially both directly and indirectly protect wilderness characteristics

Long-term protection of public land resources like wilderness characteristics is based, in part, on the use of an adaptive management approach to consider the magnitude of potential impacts, and then mitigate, implement, monitor, and adapt. Using this approach, BLM can make adjustments to its best management practices and mitigation measures, as necessary. Adaptive management and mitigation would be considered as follows: (1) Consider the magnitude of the potential adverse environmental impacts, based on the environmental conditions. (2) Develop detailed best management practices and mitigation measures in response to these adverse impacts. (3) Identify monitoring protocols to determine the effectiveness of these practices and measures given the outcome. (4) Consider the cost of implementation and monitoring. (5) Determine the need to adapt or modify the best management practices and mitigation measures, based on monitoring.

Cumulative Impacts on Travel Management

When analyzing cumulative impacts on travel management, the study area would extend beyond the planning area so that connectivity to regional centers beyond the planning area's boundaries (such as Yuma, AZ and Quartzite, AZ) are analyzed. Therefore, the study area for cumulative impacts on travel management would include Yuma, Maricopa, Pima, La Paz, and Pinal counties.

Since Arizona statehood in 1912, vehicles have been an essential part of outdoor activity and transportation. At statehood, there were no use restrictions on the use of vehicles, as vehicle use was just becoming popular and the State's population was a mere 300,000 people. Vehicle capability was improved with the advent of four wheel drive in the 1940s. Vehicular impacts were negligible at this time, due to the fact that cross country travel was infrequent.

Widespread use of earthmoving equipment to create new roads between 1930 and 1980 accelerated the expansion of vehicle usage, creating moderate and major impacts throughout the State. During the same timeframe, vehicular access in southwestern Arizona was counteracted and curtailed. Since statehood, vehicle access in southwestern Arizona was largely influenced by changes in land jurisdictions. Much of the lands in the State was portioned into wildlife refuges and wilderness areas, military lands, state lands, linear canals, dams, wilderness areas,

or conveyed to private ownership. Millions of acres in Arizona still exist for vehicle access, however only a few percent are actually used for travel as a result of limiting travel to roads and trails. Further reductions in the number and connectivity of the remaining roads and trails create a major cumulative impact when taken into context the past actions limiting such use, such as changes in land jurisdiction.

Today, the increasing pressure on transportation and access needs from population growth, continuing changes in land tenure, new permitted mining activities and land use authorizations on public lands (such as utility-scale renewable energy developments), and benefit based recreation outcomes which call for access restrictions to primitive roads for resource protection management actions have presented minor to major impacts on travel management throughout southwestern Arizona. Considering that non-motorized hiking and equestrian travel will not be limited to roads and trails, cumulative impact do not exist for this type of use. Bicycle use will be affected in a similar manner as motor vehicle use due to having tires and policies which limit wheeled vehicles to roads and trails. Mitigation measures from these cumulative actions include:

- Population: designation of long distance travel corridors from WUI to provide protections for access corridors. This would be associated with the active collaboration with local jurisdictions to provide managed trail experiences.
- Land Tenure: BLM would continue to create road reservation and easements for continued access on lands that are transferred out of federal ownership.
- Mining Activities and Land Use Authorizations: designate public vehicle access within ROWs (such as utility corridors) or around site specific uses to provide continued access.
- Resource Protections Measures (specifically from priority wildlife habitat and air quality resources): Engineer solutions to allow for continued access such as fencing, exclosures/enclosures, create low dust surfaces to prevent PM-10/fugitive dust closures.
- Benefits Based Recreation Outcomes and Restricted Access: acquire access in key corridors through licenses, and limit locations of recreation sites to a sufficient distance from roads to ensure no conflict with camping and road use.

4.24.2.2. Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Given the expected increases in the population centered in Phoenix, Maricopa, Buckeye, Goodyear, and Apache Junction, use of the public lands surrounding those areas would similarly increase. Land use authorizations, minerals development, and recreation would have the most extensive cumulative impacts on cultural resources in the Planning Area. Land use authorizations, including rights-of-way for development of powerlines, pipelines, fiber optic lines, roads, and solar energy would be expected to continue to increase with the public demand for services. Studies on new proposed highway segments suggest that highway planners believe these population centers would need additional connection to neighboring communities. This would in turn suggest that population would further increase in those areas. Minerals development may increase due to market forces in the region. Saleables would increase as a response to popular demand associated with development. Recreation in the Planning Area would similarly increase, especially in areas near population centers. The cultural resources in the Planning Area would

experience minor to major levels of impacts by the ground disturbing activities of these types of individual projects. History has shown that many of these utility lines lie parallel to one another and have cumulatively affected the same sites several times. The number of ground disturbing projects is quite concentrated near the population centers. Trends suggest that a handful of sites are threatened by damage or destruction due to these projects each year. Fortunately, many are avoided by project redesign. The remaining sites are subject to mitigation measures that reduce or minimize the effects of the projects to a negligible to moderate level.

Cumulative Impacts on Minerals

Minerals development is dependent on resource demand and is not constrained by local land management decisions. If mineral deposits are removed from availability by planning decisions, the resource will simply be developed at another location, be it local (on non-BLM lands), regional, national, or international. Since particular environmental impacts are location specific, the eventual cumulative impacts of necessary minerals development could be more or less than if the resources within the decision area were developed. The economic impact of developing low unit value minerals (sand & gravel, crushed rock, etc.) from outside the market area could be significant since the primary expense for these commodities is usually transportation.

4.24.2.3. Sonoran Desert National Monument

Cumulative Impacts on Cultural and Heritage Resources

Land Use Authorizations would be excluded in wilderness and along the Anza NHT. Utility scale renewable energy facilities would be excluded from the SDNM. Land Use Authorizations would be avoided in selected areas. This has a protective effect on the Monument objects and cultural resources in the SDNM. However, these activities would be pushed over onto other land jurisdictions and other public lands outside of the Monument. The level of intensity would be minor to major on the cultural resources, especially if the projects require intensive ground disturbing activities. Mitigation measures would be applied that would bring the impacts to a minor to moderate level.

The SDNM is withdrawn from new mineral entry, which has a major protective effect on Monument objects and cultural resources. This would have the effect of pushing mineral exploration and development onto neighboring land jurisdictions with the effect of minor to major levels of impact on cultural resources, where mineral potential is high.

Grazing would be unavailable south of Interstate 8, pursuant to the Proclamation. This has the effect of pushing grazing activities over onto State and private lands, where impacts to the cultural resources would be at a negligible to minor level. Grazing on the allotments north of the Interstate was analyzed at an implementation level for their effects on the cultural resources and Monument objects.

Cumulative Impacts on Minerals

Since Federal minerals within the SDNM have been withdrawn from all types of appropriation and development and there are no prior existing mineral rights, no minerals development will occur and impacts will result.

4.24.3. ALTERNATIVE A (NO ACTION)

4.24.3.1. Both Decision Areas

Cumulative Impacts on Wilderness Characteristics

The cumulative adverse impacts from the No Action alternative on wilderness characteristics would be greatest under this alternative. No lands would be managed to maintain wilderness characteristics. Community growth, ROW, management of recreation and nonmotorized recreation uses and mineral development each could contribute to adverse effects, both directly and indirectly. Wilderness characteristics could be potentially lost or diminished in all areas, but adverse affects are more likely in areas close to urban and populated rural areas, including lands in the south part of the Ajo Block, around Saddle Mountain, and within the Gila Bend Mountains block. Wilderness Characteristics on lands within the SDNM would be slightly diminished in the Butterfield Stage and Margie's Peak areas due to high public use, but altogether fully maintained elsewhere.

Cumulative Impacts on Lands and Realty

Cumulative impacts to lands and realty occur through changes in the designation and development of land resources and in changes to access of the land. Under Alternative A, access would be the least restrictive to land use authorizations on federal land compared to any action alternatives due to the fact that LUA and utility-scale renewable energy development avoidance and exclusion areas would not be introduce and all ten 1-mile wide utility corridors that run through the planning area would be maintained. As a result, future utility development would not be shifted to other nearby private or state lands; therefore, future utility development needs would be easily met to address the increasing energy and resource demands associated with the population growth projected over the next 20 years. Overall cumulative impact from Alternative A to lands and realty management would be minor.

Cumulative Impacts on Socioeconomics

Potential cumulative effects of growth and development on social and economic values many include:

- The loss of ranching and related western lifestyles;
- Changes in the social leadership structure resulting from increases in urban values and reduced ranching. In general, the greatest effects would be related to economics because the actions proposed in this RMP would not, in most cases, have major social impacts in the Planning Area.
- Increased spending for recreational goods and services. Nearby communities provide local services to recreationists and would continue to benefit from recreation under the current management.

Under current management, 26,900 acres of BLM-managed public land would be available for disposal by sale or exchange. The disposition of BLM land is not expected to be growth inducing because much of the Planning Area is growing rapidly already and would continue to do so

independently of BLM land disposals. Therefore, Alternative A would have no measurable cumulative impact on growth and development in the State, and growth in and near the Planning Area would continue to impact resources on public lands.

4.24.3.2. Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts would be similar to those in the Common to All, except for the following items. The lack of a Transportation plan would have the effect of experiencing a proliferation of routes within the Planning area, regardless of land ownership. This would have a minor to moderate impact on cultural sites, especially in areas with higher site density. The lack of a requirement to keep large scale utility lines within established utility corridors would affect cultural resources to a minor to major level of intensity due to the line placement being allowed in more areas and not concentrating them. Under Alternative A, a large percentage of the BLM lands in the Planning Area would be open to mineral entry, so most saleable mineral development would take place on BLM lands, rather than on other jurisdictions. This would impact cultural resources more on BLM lands to a minor to moderate level. Mitigation measures would reduce or minimize impacts to a negligible or minor level. The lack of management strategies for recreation would allow recreation to occur randomly in a number of different areas. This lack of management structure and amenities would allow impacts on cultural sites that would be at a minor to moderate level.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Protected species within the decision and adjacent areas have endured both historic and recent declines in population and distribution. The principal common factor in these declines has been extensive loss, fragmentation, curtailment, and adverse modification of habitat. Short- and long-term effects to protected species stem from a variety of activities including mining, livestock grazing, OHV use, camping, military training, agriculture, road construction, and development of utility corridors, surface water impoundments, groundwater withdrawals, and commercial, residential, and recreational development. Fencing, canals, and vehicle routes have all limited the ability of the Sonoran pronghorn to move across its former range to find forage and water, contributing to increased vulnerability to drought, increased mortality (especially of fawns), and an overall decrease in population size and range. Actions that have resulted in additive or interactive effects that have acted to support the survival of many protected species include the designation of national monuments, wildlife refuges, BLM administered Wilderness Areas and the BMGR. Most important among these countervailing actions are the long-term land use and management actions such as the Sonoran Pronghorn Recovery Plan and Desert Tortoise Range Wide Plan that provide habitat protection and conservation for many of these species on Federal lands, and specific recovery efforts directed at individual species. Increased human population growth within the region will likely lead to further loss and fragmentation of habitats for protected species from development and the increased demand for recreation. Continued surface water impoundments and groundwater withdrawals could impact those protected species that require riparian areas and vegetation, such as the southwestern willow flycatcher, as these areas become drier and upland vegetation emerges.

Alternative A does not have LUP level decisions regarding special status species; however, management of habitat is based upon existing conservation measures. Important habitats for

special status plant and animal species would be protected on a case-by-case basis to maintain known existing populations. Additional management attention would be directed toward populations of listed, proposed, candidate, and other special status species through inventory and monitoring of known populations to document population levels and status. Existing populations would be maintained or increased through protection of these species and their habitats. Measures to ensure that species-specific plans such as the Desert Tortoise Rangewide Plan are followed, including the no-net loss of habitat will protect habitat for tortoise and incidentally protect habitat for other special status species.

The Coffeepot Botanical ACEC (8,900 acres) would remain under Alternative A. By continuing the designation of this area as an ACEC, a number of special status species habitats will be protected, including habitat for the Acuña cactus, cactus ferruginous pygmy-owl, and desert tortoise. Water developments would continue to be evaluated based on the AGFD's wildlife water development standards. Some special status species such as Sonoran pronghorn would generally benefit from water developments, and thus expand their distribution into previously unoccupied areas. Management actions under Alternative A would allow many existing land uses and authorizations to continue and a number of new land uses and authorizations to be approved without consideration of potential conflicts with or other impacts on special status species. All existing and future compliance requirements for special status species would have to be met, so these species would be afforded a similar level of protection as they would under Alternatives C, D, and E. However, any additional additive and complimentary benefits for special status species that could be gained from the management decisions included in the Alternatives C, D, and E would not necessarily be realized. Overall, the long-term decline in native vegetation and special status species habitats due to land uses, conversion to urban or agricultural uses, surface water impoundment, and groundwater withdrawal would continue under Alternative A and cumulatively the effects would range from minor to major for wildlife species in general.

Cumulative Impacts on Visual Resources Management

Under Alternative A, increased demand for infrastructure will result in more on-ground projects. Visual impacts from proposed utilities, communication sites, and energy facilities have been primarily in lower elevation areas with low slope and allocations in the VRM III or IV resulting in minor to moderate effects. Overall cumulative impacts to visual resources from unauthorized causal recreational use including travel management would be minor to moderate.

Cumulative Impacts on Livestock Grazing

Cumulative impacts to livestock grazing are usually those that affect available forage, water, and space. If implemented, the overall cumulative impacts from Alternative A would result in livestock operations at or near current capacity, but with the likelihood of AUM reductions due to loss of lands to other resource uses, and a gradual reduction of available land and forage for other resources, such as recreation, energy development, land disposal, mineral development, wildfires, and wildlife habitat enhancement.

Alternative A contains the least restrictions on recreation activities. Because recreational use is expected to increase throughout the Decision Area due to an increase in the region's population, the greatest impacts to livestock grazing would likely occur from recreation. For example, the entire Lower Sonoran would be open to recreational target shooting. Cumulatively, impacts from this would include soil disturbance and loss of vegetation from vehicles and human trampling,

litter from shell casings and targets that are often left behind, and potential injury and/or death of livestock. These combined impacts could cause avoidance or displacement of cattle in affected areas, which could negatively affect livestock distribution patterns and forage availability.

Another impact to available space for livestock is wildland fires, which are increasing with the population growth and human expansion into public areas. Managing areas as suitable for wildland fire and allowing naturally ignited wildland fire, prescribed fire, and treatments would have cumulative impacts on the amount of forage and area available for livestock grazing in the short term, but could improve vegetation condition in the long term in fire-adapted communities. The level of impact would vary depending upon the size of the area burned. However, fire in Sonoran Desert communities that are not fire adapted would reduce the amount of forage available to livestock on a longer term. Suppression of wildfires in the Sonoran Desert would have short term-impacts by removing vegetation, but would reduce overall impacts to livestock forage in the long term by retaining the vegetative communities and stabilizing the soil. Impact intensities could range from negligible to major, depending on the size of the burn. These impacts would be similar under all alternatives.

Illegal immigration and smuggling will continue to impact public lands at current or increasing levels. Impacts may shift as illegal immigrants and smugglers adapt to new border enforcement techniques. Damage to natural and recreation resources, and related public safety concerns, will increase as resource crime and vandalism incidents swell in the growing public land-urban interface. The cost to repair and restore fences and water developments will grow and require more agency resources over the life of the plan. Furthermore, the growth of metropolitan areas will increase illegal dumping in the boundary lands. Hazardous materials and spills may also increase in these areas. Each of these impacts cumulative affects the area of quality forage and space for both livestock and wildlife.

Emphasis is placed on protection of the vegetative communities across the Decision Area. Management actions, such as requiring mitigation or avoidance of vegetation removal for projects in order to protect vegetation resources, would protect or restore vegetation communities and would generally increase available forage for livestock grazing. Actions that would reduce, damage, or destroy vegetation communities would generally decrease available forage for livestock grazing. Any of these actions are likely to be negligible to minor in scale and in some cases may be short term.

Fencing developments can cumulatively impact the amount of land and forage available to livestock. While pasture fencing tends to be conducive to good grazing management by allowing rotational/rest regimes, it can also be detrimental to livestock and wildlife movement across the landscape. There is often a tenuous balance between improving rangeland resources through the use of fencing to manage or exclude livestock, and minimizing fencing for the benefit of wildlife movement and dispersal. This is particularly important along wildlife corridors. For instance, restrictions on new fencing in bighorn sheep habitat that improve bighorn sheep movement can impact livestock grazing by making livestock operations less efficient, limiting livestock management options, or closing or restricting areas to livestock grazing. Fencing certain important cultural resource sites to exclude grazing would result in a small decrease in forage, but few sites would need to be fenced. Individually, activities associated with management of cultural and paleontological resources would affect relatively small, localized areas. Even cumulatively, the amount of acreage involved with multiple cultural sites and excavations would still remain small. Mineral development within the 614,900 acres currently open to mineral entry could impact livestock operations by disturbing surfaces and decreasing vegetation and add to fenced-out areas.

Restricting developments and ground disturbing activities from areas of significant desert pavement, cryptogamic crust, and soils that are vulnerable to disruption or have high wind or water erosion potential could have a minor impact by limiting the location of livestock management facilities. Allowing projects in these areas if mitigation occurs could offset this impact. Likewise, restrictions on placement of new water developments could impact distribution of livestock. The intensity of these impacts would generally be minor.

Emphasis is placed on protection of the vegetative communities across the Decision Area. Management actions, such as requiring mitigation or avoidance of vegetation removal for projects in order to protect vegetation resources, would protect or restore vegetation communities and would generally increase available forage for livestock grazing. Actions that would reduce, damage, or destroy vegetation communities would generally decrease available forage for livestock grazing. Any of these actions are likely to be negligible to minor in scale and in some cases may be short term.

Cumulative Impacts on Recreation

Over the life of this plan, continued population growth of the large and small communities of this region will contribute to greater visitation to the Planning Area. The communities of Maricopa, Goodyear, Buckeye, and Gila Bend are expected to continue expanding their boundaries through annexation; other communities may incorporate; and the major extent of the Decision Areas will border on or be included in incorporated cities and towns, with little county-administered land. For the majority of Maricopa County, western Pinal County, and western Pima County, the Lower Sonoran will continue to serve as undeveloped open space as private and State lands are developed. Opportunities to attain beneficial outcomes would be moderately less than for the action alternatives due to custodial management of the recreation resource over 70% of the Decision Area, combined with case-by-case management of other resource uses.

Cumulative Impacts on Travel Management

Impacts would be the same as those described under the Common to All Alternatives section for both decision areas. Past and present actions would not be halted or addressed (such as pressures from population growth), as management actions would not change under Alternative A. As a result of not having travel management assets identified and no plan to retain current access opportunities, there would be a continual loss of access points to BLM lands. Cumulative impacts overall would range from minor to major.

4.24.3.3. Sonoran Desert National Monument

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts would be the same as those listed in the Common to All section, with the following exceptions. The lack of a site specific Recreational SRMA with management prescriptions for the SDNM would have the effect of allowing non-compatible uses occur on the Monument, which would have a minor to major effect on Monument objects and cultural sites on the SDNM. The lack of a Transportation plan would have the effect of experiencing a proliferation of routes within the SDNM. This would have a minor to moderate impact on the 46 Monument objects and cultural sites, in the six areas that were analyzed at an implementation level. Nineteen of those sites may have characteristics that would make them eligible for the National Register

and would require appropriate mitigation measures. No effects to other land jurisdictions cultural sites would be anticipated under this travel management alternative. No restrictions on target shooting would be in place under this alternative, so direct and indirect impacts to Monument objects and cultural sites would continue. These were analyzed at an implementation level. These impacts include projectile strikes to features and trash and trampling on Monument objects and cultural resources at a minor to moderate level.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Protected species within the SDNM decision and adjacent areas, and throughout their range, have endured both historic and recent declines in population and distribution. The principal common factor in these declines has been extensive loss, fragmentation, curtailment, and adverse modification of habitat. Short- and long-term effects to protected species stem from a variety of activities including mining, livestock grazing, OHV use, camping, military training, agriculture, road construction, and development of utility corridors, surface water impoundments, groundwater withdrawals, and commercial, residential, and recreational development. Actions that have resulted in additive or interactive effects that have acted to support the survival of many protected species include the designation of national monuments, wildlife refuges, BLM-administered Wilderness Areas and the BMGR. Most important among these countervailing actions are the long-term land use and management actions such as the Desert Tortoise Range Wide Plan that provides habitat protection and conservation for many of these species on Federal lands, and specific recovery efforts directed at individual species. Increased human population growth within the region will likely lead to further loss and fragmentation of habitats for protected species from development and the increased demand for recreation.

Water developments would continue to be evaluated based on the AGFD's wildlife water development standards. Some species throughout the planning area, such as Desert bighorn sheep would generally benefit from water developments, and thus expand their distribution into previously unoccupied areas that lack water but contain suitable habitat. Removing vegetation in areas could assist wildlife in short term dispersal in a relatively secure manner, however could increase predation on some species with the removal of cover for escape. Livestock grazing in the SDNM, south of I-8, were terminated when existing grazing permits expired, as directed by Presidential Proclamation 7397. Impacts to wildlife or priority species associated with livestock grazing include competition for space, forage, cover, and water resources. Typically, negligible and minor impacts to wildlife are expected to occur where livestock use is in conformance with standards and guides, as measured through rangeland health assessments. These assessments in the monument are designed to address resources in context with monument objects.

The Vekol Valley ACEC (3,500 acres) would remain under Alternative A. Currently there are 3,500-acres of public lands within the Vekol Valley Grasslands ACEC. This ACEC was designated to protect a grassland system. Currently, the Vekol Valley ACEC lies within the Sonoran Desert National Monument however it was designated before the conception of the SDNM. The ACEC has an existing decision of the previous RMP, to "close the Vekol Valley Grassland area of critical environmental concern to off-highway vehicle use," and remains in effect. In the SDNM, 160,700 acres are closed to motor vehicle uses. This closure includes approximately 157,600 acres for designated wilderness and 3,500 acres for the Vekol Valley Grassland ACEC. The designation of wilderness affords the highest level of protection of unfragmented habitat. These wilderness areas contain priority wildlife habitat for Sonoran desert tortoise, desert bighorn sheep, and potential foraging habitat for Lesser long-nose bats. 247,700 acres are designated as limited to existing

routes. Impacts to wildlife are expected to occur from unauthorized route expansion as they occur. Overall, the long-term decline in native vegetation and special status species habitats due to land uses would continue under Alternative A within the SDNM and cumulatively the effects would range from minor to major for wildlife species in general.

Cumulative Impacts on Visual Resources Management

Alternative A presents the greatest impact to visual resources within the SDNM, although overall potential impacts are moderate. Cumulative impacts from transportation and access will have the most effects due to increased OHV use, affecting vegetation and soils leading to moderate or major impacts. Cumulative impacts from VRM Class allocation are expected to be moderate in comparison with the Visual Resource Inventory.

Cumulative Impacts on Livestock Grazing

Cumulative impacts would be similar to those discussed under Alternative A for the Lower Sonoran, except, there would be a decrease in acres available to livestock grazing due to incompatibility with the protection of Monument objects. Ranchers and operators may be persuaded to transfer their operations to non-federal lands, but likelihood would be minor.

Cumulative Impacts on Recreation

The SDNM may be entirely surrounded by land annexed into cities or towns within ten years. For the majority of Maricopa County, western Pinal County, and western Pima County, the SDNM Decision Area will continue to serve as undeveloped open space as private and State lands are developed. A greater production of public benefits from recreation experiences would accrue from implementation of the action alternatives for management of other resources and the recreation resource. This is due to the interaction of management of other resources with the impact of managing the SDNM as a SRMA. However, under Alternative A, the SDNM would not be managed as an SRMA and the opportunities to attain beneficial outcomes would be moderately less than for the action alternatives due to custodial management of the recreation resource over 70% of the monument, combined with case-by-case management of other resource uses.

Cumulative Impacts on Travel Management

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

4.24.4. ALTERNATIVE B

4.24.4.1. Both Decision Areas

Cumulative Impacts on Wilderness Characteristics

Cumulative impacts would be similar to Alternative A, but to a slightly less degree. Alternative B has moderate levels of landscape-based protective prescriptions. Comprehensive travel management would be the most effective tool in maintaining wilderness characteristics.

Cumulative Impacts on Lands and Realty

Cumulative impacts to lands and realty under Alternative B would be similar to Alternative A, with the exception that some federal lands within the planning area would be allocated as avoidance and exclusion areas to LUA and utility-scale energy development. However, compared to Alternatives C, D, and E, Alternative B would allow federal lands to accommodate the most projected utility development due to limits in the amount of acreage allocated as an avoidance or exclusion area and all 10 1-mile wide multiuse utility corridors would be maintained. Overall cumulative impact from Alternative B to lands and realty management would be minor.

Cumulative Impacts on Socioeconomics

Impacts from growth and development are anticipated to be the same as Alternative A. Under this Alternative, 39,700 acres of land would be available for disposal by sale or exchange, a total that is 47 percent greater than under Alternative A. Because the disposition of BLM-managed public land is not expected to be a major growth-inducing action, this alternative would have no measurable cumulative impact on growth and development.

4.24.4.2. Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Impacts would be the same as those described in the Common to All section except for the following. Transportation planning would allow route designation on the BLM lands within the Planning Area. Under Alternative B, the maximum number of routes would be available compared to any other Alternative. This would make the BLM lands far more attractive and access far easier than surrounding jurisdictions for vehicle based activities. Minerals would be subject to additional segregations and withdrawals on selected areas than would be experienced under Alternative A. Land use authorizations for large linear utility lines would have to be placed in one of the designated utility corridors, which under Alternative B, have a wider profile. A number of avoidance and exclusion areas would be designated under B as well. These restrictions would have somewhat of a protective effect on cultural resources in those selected areas. The utilities and minerals activities may shift off of BLM lands onto State and private lands where impacts to cultural resources may be at a minor to major level.

Recreational activities would be promoted under Alternative B, due to additional opportunities being offered. Specific marketing strategies in each SRMA may have a cumulative impact on the area the people choose to recreate in. Under B, the strategy would draw additional motorized recreational use from surrounding lands, which would have the effect of increasing visitation to areas on BLM. Increased visitation in some areas may have a minor to moderate intensity on the cultural resources present. Visitation in non-BLM lands may decrease in some areas.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Current regional conditions and threats to special status species would be the same as described for Alternative A. The incremental effects of Alternative B would generally be the same as described for Alternative A except that it would establish specific goals, objectives, and management actions that support recovery efforts for known populations of special status species. Alternative B would also introduce wildlife movement corridors to assist wildlife in moving from one area to another in a relatively safe manner to the tune of approximately 168,000 acres of mixed ownership in various locations throughout the decision area. Overall, the long-term it

would be expected that declines in special status species habitats within the decision and adjacent areas would continue in areas that lack protection for wildlife habitats. Cumulatively effects would range from negligible to moderate for wildlife species in general.

Cumulative Impacts on Visual Resources Management

Cumulative impacts from lands and realty actions such as utility and solar projects will be moderate compared to Alternative A due to the shift from VRM Class IV into Class III. Although recreation management will be more developed, impacts will be moderate due to the allocation of the VRM Classes. With the reduction in roads, the route network will generally result in an improved visual character, and impacts will be minor. Negative moderate and minor impacts to VRM Class II and III allocation, respectively, would be similar to but more concentrated than under Alternative A.

Cumulative Impacts on Livestock Grazing

Impacts would be similar to those described under Alternative A for the Lower Sonoran, except, Alternative B identifies the greatest amount of public lands suitable for appropriate multiple uses, with an emphasis on motorized and developed recreational opportunities. Therefore, recreation and urban expansion are likely to cause the majority of impacts to livestock grazing. As described for Alternative A, the cumulative effects of the individual resources would coalesce in the loss of space, forage, and water for livestock use.

Overall cumulative impacts would be similar to Alternative A, except with an aggregate increase in effects. The cumulative impacts would include managing livestock operations with a 40 percent reduction in permitted AUMS; the increased impacts from recreation, including damage and/or loss of land and forage, harassment and/or injury to cattle, and vandalism to range developments; the likelihood of future AUM reductions due to additional loss of lands to other resource uses; and gradual reduction of available land and forage for other resources, such as recreation, energy development, land disposal, mineral development, wildfires, and wildlife habitat enhancement. Individually and possibly collectively, permittees across the Lower Sonoran would likely experience increased costs of operations for the maintenance of vandalized fences and water developments while incurring a reduction in the value of their base properties as connected to a reduction in their grazing preference, as well as a 40 percent reduction in their potential income from their livestock revenues. Often livestock operators choose to run reduced numbers for a variety of reasons (drought, fire, personal finances, etc), so impacts from reduced AUMs might not affect overall economic impacts of Alternative B. However, all of these impacts combined could potentially make continued livestock grazing untenable in the Decision Area, which could encourage grazing uses to be placed on nearby state and private lands.

Cumulative Impacts on Recreation

Opportunities to attain beneficial outcomes produced from recreation experiences would accrue cumulatively to a moderately greater degree than A, principally due to management of 70 % of the decision area as SRMA's together with slightly less availability of motorized travel routes.

Cumulative Impacts on Travel Management

Cumulative impacts to travel management would be similar to Alternative A as a result of continuing to limit vehicular travel to routes with the exception that designating all routes and increasing fines for violating the designated routes policy could further create feelings of restriction by visitors to public lands. A countervailing effect could be that routes, once designated, have more protection from the impacts identified in Alternative A. Further limitations placed on vehicular travel by the creation of avoidance areas for LUAs would cause additional competition for available areas, increasing the level of impact from moderate to major. Recreation zoning in alternative B would be the most vehicle use friendly, helping to reduce the effects of opportunity loss occurring on other jurisdictions or other areas on BLM. Overall the effects of all actions prior, current and foreseeable create a moderate effect on travel management.

4.24.4.3. Sonoran Desert National Monument

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts would be the same as those listed in the Common to All section, with the following exceptions. Three utility corridors would be designated within the SDNM, which would have minor to major impacts on Monument objects and cultural resources. The increasing population would demand services through utility lines that would apply for placement within these corridors. Grazing under this Alternative would see a reduction in preference within the allotments under permit to operate. This was analyzed at an implementation level. Generally, the sites known to occur in the SDNM allotments have neglible to minor impacts due to grazing activities. A reduction in preference may have the effect of pushing grazing activities off of the Monument and onto other land jurisdictions, which would have a similar impact on cultural resources on those lands. Management of recreation on the Monument would be more directed under the designation of a SRMA and would tend to promote the SDNM as a destination with facilities. Numbers of visiting public would increase under this strategy and would be drawn to the amenities offered. This would have a minor impact on the Monument objects and cultural resources on the SDNM due to the higher number of visitors expected. There would be some draw of visitors from surrounding land jurisdictions to take advantage of the amenities offered. This would have a protective effect on those cultural resources there. No competitive motor sports would be allowed in the SRMA. This would push this use onto other lands and may have a negligible to minor effect on the cultural resources there. Under Alternative B, target shooting would be prohibited on 80 % of the SDNM. This was analyzed at an implementation level. Indirect impacts from trampling and trash accumulation to Monument objects and cultural resources would be expected at a minor level of intensity. The prohibition to shooting in such an extensive area of the SDNM would have the effect of pushing some of this use onto neighboring land jurisdictions and other public lands. The effect on the sites in those areas may experience a minor to moderate level of impacts from direct damage and indirect impacts. Transportation planning under Alternative B was analyzed at an implementation level. Under this alternative, more routes would be open and 45 cultural sites and Monument objects would be affected either directly or indirectly by the designation of these routes. Mitigation measures would be employed to reduce or minimize the effects of this action. Additional visitation may be drawn from neighboring jurisdictions to experience these routes. This may have a negligible to minor effect on those cultural resources.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Current regional conditions and threats to special status species would be the same as described for Alternative A. The incremental effects of Alternative B would generally be the same as described for Alternative A, except that it would establish specific goals, objectives, and management actions that support recovery efforts for known populations of special status species. While similar to Alternative A, this alternative does not carry forward the 3,500 acres for the Vekol Valley grassland ACEC. Negligible impacts to wildlife are anticipated from dropping the ACEC designation. Managing the grassland under the monument proclamation affords a greater protection. Overall, the long-term decline in native vegetation and special status species habitats due to land uses would continue under Alternative B within the SDNM and cumulatively the effects would range from negligible to moderate for wildlife species in general.

Cumulative Impacts on Visual Resources Management

Cumulative impacts from transportation and access would range from negligible to moderate, because the designated route network would reduce visual impacts throughout the monument. Minor visual impacts are expected with the allocation of VRM Classes compared with Alternative A.

Cumulative Impacts on Livestock Grazing

Cumulative impacts would be similar to those under Alternative A, except that Alternative B identifies the greatest amount of public lands suitable for appropriate multiple uses, with an emphasis on motorized and developed recreational opportunities. Therefore, recreation and urban expansion are likely to cause the majority of cumulative impacts to livestock grazing. As described for Alternative A, the cumulative effects of the individual resources would coalesce in the loss of space, forage, and water for livestock use.

Under Alternative B, managing 8,500 fewer acres with more fence lines, fewer waters, and a reduction of 40% in the authorized grazing preference could have a major impact by reducing the long-term viability of some livestock operations, especially when considered with the cumulative impacts of the closure of those areas south of I-8, as well. The reduction in livestock numbers could leave some operators on the SDNM with herd sizes too small to support their current operations. Operators would have to acquire additional lands outside of BLM lands in order to support a viable operation, which, in some cases, could be cost-prohibitive. All associated range improvement projects within and outside the fenced exclosures would have to be addressed on a case-by-case basis. Combined impacts from this alternative would likely be minor to moderate for allotments such as Beloat, Arnold, Hazen, and Lower Vekol, but could be moderate to major for operators of the Bighorn and Conley Allotments.

Cumulative Impacts on Recreation

Opportunities to attain beneficial outcomes produced from recreation experiences would accrue cumulatively to a moderately greater degree than in A, principally due to management of the SDNM as a Destination SRMA together with management of motorized access and travel routes for targeted benefits

Cumulative Impacts on Travel Management

Cumulative impacts would be the same as those described under Alternative A for the Lower Sonoran, except that further limitations placed on vehicular travel by protecting Monument objects could increase impacts to travel management raising the cumulative impact from moderate to Major. Recreation zoning in Alternative B would be the most vehicle use friendly, helping to reduce the effects of opportunity loss occurring on other jurisdictions or other areas on BLM. Overall the effects of all actions prior, current and foreseeable create a moderate effect on travel management.

4.24.5. ALTERNATIVE C

4.24.5.1. Both Decision Areas

Cumulative Impacts on Wilderness Characteristics

Alternative C presents an array of resource-based land use designations and prescriptions supportive of maintaining wilderness characteristics. This is true both in lands managed and not managed to maintain wilderness characteristics. Some areas with wilderness characteristics in the south part of the Ajo Block and within the Gila Bend Mountains could suffer loss or diminishment of such characteristics due to site-specific effects from urban growth, ROW, motorized recreation use and mining. As under Alternative B, comprehensive travel management would be the most effective tool in maintaining wilderness characteristics in areas not managed as such.

Cumulative Impacts on Lands and Realty

Cumulative impacts to lands and realty under Alternative C would be similar to Alternative B, with the exception that more federal lands within the planning area would be allocated as avoidance and exclusion areas to LUAs and utility-scale energy development. Under Alternative C, there would only be nine multiuse utility corridors allocated in the planning area (all corridors within the SDNM would be decreased to .5 miles wide and the TEP multiuse utility corridor would be removed). Compared to Alternatives A and B, more utility development would be shifted to non-federal lands, as large portions of federal lands within the planning area would be off limits to surface disturbing activities. Federal lands would not play a large role in housing the large demand for solar energy development projects as anticipated in the RFD Scenarios. Overall cumulative impacts from Alternative C to lands and realty management within the planning area over the next 20 years would be minor to moderate.

Cumulative Impacts on Socioeconomics

Cumulative impacts are anticipated to be the same as Alternative B.

4.24.5.2. Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Impacts to cultural resources would be similar to those listed in the Common to All section, except for the following. The Transportation planning would have slightly fewer designated routes that that proposed under Alternative B. Minerals would experience a similar set of segregations and

withdrawals on special selected areas with cultural, recreation, or wildlife values, similar to those under Alternative B. Saleable minerals would experience greater restrictions, which may have the effect of pushing some operators over onto State and private lands in the Planning Area. Land use authorizations would have additional avoidance and exclusion areas applied to some areas, which also may have the effect of pushing some actions onto State or private lands. Under Alternative C, there are fewer SRMA's identified than Alternative B, but more than Alternative A. These additional restrictions would have an overall protective effect on cultural resources than that offered under Alternative A. Cumulative impacts to cultural resources within the Planning Area would be at the minor to major level of intensity in some areas with higher site densities.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Current regional conditions and threats to special status species would be similar to those described for Alternative A. Alternative C would have the strongest management influence on maintaining and promoting the conservation and enhancement of habitat for special status species through a number of resource allocation and special area designation decisions. Under Alternative C, approximately 425,000 acres would be allocated as WHAs, 296,000 acres of mixed ownership for wildlife movement corridors and would introduce 63,000 acres as the Coffeepot Batamote ACEC encompassing the Coffeepot Mountain ACEC. These allocations and their management prescriptions would allow for the protection of large areas of intact habitat and decrease the effects of habitat fragmentation and curtailment. Alternative C introduces a total of 425,000 acres of mixed ownership available for WHAs. The WHAs would include portions of the following areas: The Batamote Mountains, the Cuerda De Lena area near Ajo, the Gila Bend Mountains and Saddle Mountain. WHAs would provide minimal protection to wildlife habitats and would still allow many disruptive land uses to continue. Overall, the long-term decline in the quality and quantity of special status species habitats would likely be slowed, as large areas of habitat would be protected on BLM-administered lands. However, the loss of special status species habitat elsewhere in the region would not be stopped, but rather these protected areas would serve as refuges for wildlife as the surrounding lands are potentially developed. Cumulatively effects would range from negligible to moderate for wildlife species in general.

Cumulative Impacts on Visual Resources Management

Visual impacts due to on-ground development would be minor. Shifts from Class III to Class II would result in greater constraints and more stringent designs. Fewer developments as well as improved designs will reduce the impacts to the landscape. Recreation management would be less developed in comparison to Alternative B but more than Alternative A. It is expected that visual impacts would be negligible to moderate, because VRM Classes would lessen the impacts. Overall impacts in comparison to Alternative A would be fewer, but moderate under Class II.

Cumulative Impacts on Livestock Grazing

Alternative C attempts to balance resource protection with human use and influence. The proposed combination of natural processes and "hands on" techniques would reduce the need for intensive livestock management and mitigation efforts needed to avoid or reduce impacts to and from livestock grazing.

If Alternative C would to be implemented, cumulative impacts would result in the continued livestock operations at or near the current capacity, but with no supplemental ephemeral forage

allocated for perennial/ephemeral allotments (these allotments would be reclassified as perennial only); the likelihood of future AUM reductions and season of use restrictions due to loss of lands to other resource uses; and gradual reduction of available land and forage for other resources, such as recreation, energy development, land disposal, mineral development, wildfires, and wildlife habitat enhancement.

Cumulative Impacts on Recreation

Opportunities to attain beneficial outcomes produced from recreation experiences would accrue to a moderately greater degree than from implementation of alternatives A and B, principally due to management of 79% of the decision area as SRMA's together with allocation of a Special Cultural Recreation Management Area, higher VRM standards, and allocation of areas for management of wilderness character.

Cumulative Impacts on Travel Management

Cumulative impacts to travel management would be similar to Alternative B as a result of continuing to limit vehicular travel to routes, except that impacts would be greater due to fewer miles of routes designated as open, due to the presence of Lands Managed to Maintain Wilderness Characteristics and wildlife designations that would limit the designated route system. Limitations placed on vehicular travel by the creation of avoidance areas for LUAs would cause additional competition for available areas, maintaining the level of impact at moderate, but could increase to major by the end of the life of the plan. Recreation zoning in Alternative C would be less vehicle use friendly than Alternative B, thus adding to the increase in impacts to vehicular use. Non-motorized recreation would be improved; however, few designated non-motorized trails would be affected. The net sum of these actions creates a moderate cumulative impact on the travel management.

4.24.5.3. Sonoran Desert National Monument

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts would be the same as those listed in the Common to All section, with the following exceptions. Two utility corridors would be designated within the SDNM, which would have minor to major impacts on Monument objects and cultural resources. The increasing population would demand services through utility lines that would apply for placement within these corridors. Recreation impacts would be the same as those under Alternative B. Impacts from Recreation would be the same as those listed under Alternative B. Under Alternative C, target shooting would be prohibited on 99% of the SDNM, leaving only 1,000 acres open to this activity. This was analyzed at an implementation level. Indirect impacts from trampling and trash accumulation to Monument objects and cultural resources would be expected at a negligible level of intensity, since no sites have been observed in that area. The prohibition to shooting in such an extensive area of the SDNM would have the effect of pushing some of this use onto neighboring land jurisdictions and other public lands. The effect on the sites in those areas may experience a minor to moderate level of impacts from direct damage and indirect impacts. Under Alternative C, transportation planning was analyzed at an implementation level. A number of routes were closed for a better balance between all open and a large number closed. Even with this strategy, 43 sites and Monument objects would be affected directly and indirectly by those routes designated as

open. The net change in impact from Alternative B to C is negligible, as only two sites make the difference. So the impacts under this Alternative would be nearly the same as B in terms of travel.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Current regional conditions and threats to special status species would be the same as described for Alternative B. The incremental effects of Alternative C would generally be the same as described for Alternative B except that it would establish specific goals, objectives, and management actions that support recovery efforts for known populations of special status species. Impacts to wildlife are expected to be negligible due to the level of protection prescribed in the proclamation. Overall, the long-term decline in native vegetation and special status species habitats due to land uses would continue at a slower rate under Alternative C within the SDNM and cumulatively the effects would range from negligible to moderate for wildlife species in general.

Cumulative Impacts on Visual Resources Management

Effects would be minor with transportation by the reduction of routes and the corresponding visible surface disturbance. Under Alternative C visual impacts would be generally similar to Alternatives A and B, but with fewer impacts on Class II landscapes than Alternative A.

Cumulative Impacts on Livestock Grazing

If implemented, Alternative C would adjust livestock numbers or require more intensive management (pasture rotations, seasonal removals, etc.), this would affect operator costs and would likely have moderate to major cumulative impacts. For example, the closure of portions of allotments south of I-8 has already impacted the management and finances of those permittees affected by the Proclamation. Cumulatively, more intense management of those areas north of I-8, including increased pasture rotations and seasonal removals, could bankrupt some livestock operators or make future operations untenable. However, individualized consultation, coordination, and cooperation with the effected parties would help lessen financial impacts to the operator while also decreasing impacts of grazing on rangeland resources and Monument objects.

Cumulative Impacts on Recreation

Opportunities to attain beneficial outcomes produced from recreation experiences would accrue to a moderately greater degree than from implementation of Alternative A and to a minor degree greater than from implementation of Alternative B, principally due to management of the SDNM as a SRMA together with allocation of a Special Cultural Recreation Management Area and implementing higher VRM standards.

Cumulative Impacts on Travel Management

Cumulative impacts would be similar to those described under Alternative C for the Lower Sonoran Decision Area.

4.24.6. ALTERNATIVE D

4.24.6.1. Both Decision Areas

Cumulative Impacts on Wilderness Characteristics

All lands with wilderness characteristics would be managed to maintain those characteristics under this alternative. No general or widespread cumulative adverse impacts are anticipated from urban growth, ROW or mineral development. There will be cumulative beneficial impacts from Decision Area management actions associated with comprehensive management of motorized recreation, management actions delegated by wildlife habitat conservation and ACEC designations, required comprehensive planning for travel management and livestock grazing, and air quality prescriptions.

Cumulative Impacts on Lands and Realty

Under Alternative D, the most federal lands would be excluded from surface disturbing activities compared to any other alternative and there would only be seven multiuse utility corridors allocated in the planning area (all corridors within the SDNM would be eliminated). Most utility development that would take place over the next 20 years would have to take place on nearby state and private lands, as natural resources on federal lands would be protected. Federal lands would not play a large role in housing the large demand for solar energy development projects as anticipated in the RFD Scenarios. Overall cumulative impacts from Alternative D to lands and realty management within the planning area over the next 20 years would be moderate.

Cumulative Impacts on Socioeconomics

Impacts from growth and development are anticipated to be the same as Alternative A. Under this Alternative, 29,600 acres of land would be available for disposal by sale or exchange, which is 47 percent greater than land available in Alternative A. Since the disposition of BLM-managed public lands is not expected to be a major growth inducing action, since much of the Planning Area, this alternative would have no measurable cumulative impact on growth and development.

4.24.6.2. Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts to cultural resources under Alternative D are similar to those under the Common to All, with the following exceptions. The Transportation planning would present the most restrictive route network of any of the Alternatives. More routes would be closed or limited use under this scenario than the other alternatives, which would have the effect of pushing more vehicle use onto neighboring land jurisdictions, or concentrating the use onto fewer routes on BLM lands. Access may be limited to some areas, which could have a protective effect in some situations. Minerals would experience the same set of segregations and withdrawals, plus an addition of all of the proposed ACECs as withdrawn from mineral entry. This would have the effect of pushing operators onto State and private lands. The most restrictive list of avoidance and exclusion areas for Land Use Authorizations would be experienced under Alternative D.

This would have a profound protective effect on the cultural resources on BLM lands, but would also expose other cultural resources on other jurisdictions to minor to major impacts. In recreation, only two SRMAs would be proposed for a far less intensively managed use. Fewer amenities would be offered, so this would have the effect of concentrating use where amenities were available.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Current regional conditions and threats to special status species would be similar to those described for Alternative A and B. While Alternative D generally would be the most protective of special status species, restrictive of developed uses, and would result in fewer special status species conflicts from land use authorizations than any of the other Alternatives under consideration for the decision area. The Gila Bend Mountains WHA (255,000 acres) would provide for a large intact area of habitat that would begin at the Gila River Corridor and extend west all the way to U.S. Highway 95 and south from I-10 to I-8. This large area of mostly intact habitat and vegetation would decrease the overall effects of habitat fragmentation and curtailment on some species. Alternative D would also contain approximately 814,000 acres as wildlife movement corridors throughout both decision areas. Alternative D would also designate approximately 267,000 acres as ACECs for special status species restricting land uses to protect these habitats. Overall, Alternative D would slow the long-term decline in the quantity and quality of some special status species habitats. Cumulatively effects would range from negligible to moderate for wildlife species in general.

Cumulative Impacts on Visual Resources Management

With the VRM shifting to Class II, impacts would be negligible to minor, because of developmental constraints and areas managed for more primitive experiences in the Decision Area. There would be less projects being able to comply with the VRM criteria. Some areas would be impacted to resolve resource or user conflicts, but overall visual impacts would be negligible or minor on account of less intensive recreation management. In comparison between the VRM and Visual Resource Inventory, cumulative impacts would be negligible and are likely to be more beneficial.

Cumulative Impacts on Livestock Grazing

Under Alternative D, the decision to eliminate grazing from the Lower Sonoran Decision Areas would eliminate any impacts to or from livestock grazing. This would have major impacts on the economic viability of cattle operations throughout the region and Planning Area because permittees would be required to turn to other means to sustain their herds or get out of the ranching business altogether. In turn, those towns and communities that are dependent on the ranching industry could see moderate to major economic impacts and grazing would be heavily dependent on private and state lands in the Planning Area. Impacts would be major.

Cumulative Impacts on Recreation

Opportunities to attain beneficial outcomes produced from recreation experiences would be similar to A and moderately less than for B and C as recreation resources will be managed custodially on 75% of the decision area and beneficial outcomes will not be actively produced. Additionally, allocating cultural sites for conservation for future use; designating the least total

mileage and percentage of routes for motorized use; and managing to the highest VRM standards would preclude easy access to facilitated recreation opportunities.

Cumulative Impacts on Travel Management

Cumulative impacts to travel management would be similar to Alternative B, except, recreation zoning in Alternative D would be the least vehicle use friendly, thus adding to the increase in impacts to vehicular use. Non-motorized recreation would be the best of any alternative. The sum of these actions and regional actions creates a major impact on the travel management.

4.24.6.3. Sonoran Desert National Monument

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts would be the same as those listed in the Common to All section, with the following exceptions. In Alternative D, no utility corridors would be designated within the SDNM. This is a major protective effect on the Monument objects and cultural resources within the SDNM. The increasing public demand for utilities would be pushed entirely onto neighboring BLM lands and other jurisdictions, which would have a minor to major impact on the cultural resources of those areas. Mitigation measures would be employed to reduce or minimize those impacts to a minor to moderate level. Under Alternative D, grazing activities would slowly be discontinued through several management actions. This was analyzed at an implementation level. No sites or Monument objects would be affected by this management action on the SDNM. This would have the effect of pushing grazing activities off of the Monument completely and onto other land jurisdictions, which would have negligible to moderate impacts on cultural resources on those lands. Under Alternative D, the SRMA designated for the SDNM would be managed for an undeveloped style of recreation. No facilities and very little structure would be employed under this regime. Increasing numbers of visitors are expected to use this area, but without proper direction and facilities. Impacts to the Monument objects and the cultural sites may be at a negligible to moderate level due to the lack of designated facilities designed to handle additional visitation. Trampling, vehicle travel off the routes and the accumulation of trash may be expected to impact sites. Since target shooting would be prohibited under this alternative, no effect to Monument objects or cultural resources would be anticipated. This was analyzed at an implementation level. Under Alternative D, a transportation planning scheme of the maximum number of routes would be closed or limited to use. This would have a protective effect on Monument objects and cultural resources within the SDNM. Seventeen sites were identified as either directly or indirectly impacted by the designation of these routes. This was analyzed at an implementation level. Mitigation measures would be used to reduce or minimize the impacts due to this activity which would bring the level of impact to minor to moderate. Closing such a high number of routes would have the effect of concentrating use on the remaining routes, and on lands outside of the SDNM. These other jurisdictions may experience additional route proliferation which would impact sites there to a minor to moderate level. Reducing access into some areas may have a minor protective effect.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Current regional conditions and threats to special status species would be the same as described for Alternative A. The incremental effects of Alternative C would generally be the same as described

for Alternative D except that it would establish specific goals, objectives, and management actions that support recovery efforts for known populations of special status species. Impacts to wildlife are expected to be negligible due to the level of protection prescribed in the proclamation. Overall, the long-term decline in native vegetation and special status species habitats due to land uses would continue at a slower rate than alternative C, under Alternative D within the SDNM and cumulatively the effects would range from negligible to moderate for wildlife species in general.

Cumulative Impacts on Visual Resources Management

Visual cumulative impacts from transportation and access would be negligible to minor, because motorized routes would be reduced in Alternative D. For the most part, visual impacts would be the same as Alternatives B and C with Alternative D having fewer impacts on Class II and considerably less in Class III than Alternative A.

Cumulative Impacts on Livestock Grazing

Cumulative impacts would be the same as those described under Alternative D for the Lower Sonoran.

Cumulative Impacts on Recreation

Opportunities to attain beneficial outcomes produced from recreation experiences would accrue to a minor degree greater than from implementation of Alternatives A, B, and C, principally due to management of the SDNM as a SRMA together with allocation of cultural sites for conservation for future use; having the least total mileage and percentage of routes available for motorized use; and having the highest VRM standards, which, in combination, would limit easy access to targeted recreation opportunities.

Cumulative Impacts on Travel Management

Cumulative impacts would be the same as those described under Alternative C for the SDNM, except that limiting vehicular travel to only licensed drivers with a prohibition on vehicles displaying OHV decal vehicles in the SDNM would cause additional competition for available areas outside SDNM. Recreation zoning in Alternative D would be the least vehicle use friendly, thus adding to the increase in impacts to vehicular use. Non-motorized recreation would be the best of any alternative. The sum of these actions and regional actions creates a major impact on the travel management.

4.24.7. ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.24.7.1. Both Decision Areas

Cumulative Impacts on Wilderness Characteristics

Cumulative impacts on wilderness characteristics would be similar to Alternative C. Alternative E has considerable land use designations and protective prescriptions supportive of maintaining wilderness characteristics. This is true both in lands managed and not managed to maintain wilderness characteristics.

Cumulative Impacts on Lands and Realty

Cumulative impacts under Alternative E would be similar to those described under Alternative C, with the exception that the cumulative impacts for the SDNM would be similar to Alternative D.

Cumulative Impacts on Socioeconomics

Impacts from growth and development are anticipated to be the same as Alternative A. Under this Alternative, 39,600 acres of land would be available for disposal by sale or exchange, which is 47 percent greater than land available in Alternative A. Since the disposition of BLM-managed public lands is not expected to be a major growth inducing action, this alternative would have no measurable cumulative impact on growth and development.

4.24.7.2. Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts to cultural resources under Alternative E are similar to those under the Common to All, with the following exceptions. The Transportation planning and Minerals activities would have effects similar to Alternative C. Land Use Authorizations would have a more protective effect on cultural resources than Alternative C, because additional avoidance and exclusions would apply for the ACEC areas. Recreation would have an effect somewhere between Alternative B and C. Recreational opportunities would be offered across the Decision Area, which would draw some visitors from other areas especially in the winter seasons.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Current regional conditions and threats to special status species would be the same as described for Alternative A, C and D. However alternative E provides a balance through multiple uses and incorporates a better approach to manage key ecosystems and special status species habitats while providing opportunities for resource uses that meet social and economic needs. The Gila Bend Mountains WHA (255,000 acres) would provide for a large intact area of habitat that would begin at the Gila River Corridor and extend west all the way to U.S. Highway 95 and south from I-10 to I-8. This large area of mostly intact habitat and vegetation would decrease the overall effects of habitat fragmentation and curtailment on special status species. Alternative E would also incorporate approximately 227,000 acres of mixed ownership as wildlife movement corridors, and approximately 250,000 acres as ACES, similar to those in Alternative D. Overall, the long-term incremental effects of Alternative E would be similar in nature to those described for Alternative C and D; however, the decline of special status species habitats would be slowed to the greatest extent of the Alternatives. Cumulatively effects would range from negligible to moderate for wildlife species in general.

Cumulative Impacts on Visual Resources Management

It is expected that development impacts, recreation management, and transportation and access would be similar to Alternative C. The LSFO would have negligible to minor impacts to Classes I and III in comparison to Alternative A and potentially major impacts to Class II landscapes.

Impacts to Class IV would be similar to Alternatives A and B, but less beneficial effects to Alternatives C and D.

Cumulative Impacts on Livestock Grazing

Cumulative impacts would be the same as those described under Alternative C for the Lower Sonoran.

Cumulative Impacts on Recreation

Cumulative impacts would be the same as those described under Alternative C for the Lower Sonoran.

Cumulative Impacts on Travel Management

Cumulative effects from the preferred alternative would be most similar to Alternative C. A moderate level of cumulative impact would be expected. Some of BLM's actions would help to offset the loss of physical access by designating routes and making a commitment to acquire access, thus stopping the slow loss of access. Furthermore, creating an Open use area near Ajo would satisfy local OHV enthusiasts, possibly reducing their concerns over losing route mileage. Route modeling in Alternative C preserves access to most destinations, cutting off access on spur routes, reclaiming routes and some short cut or redundant routes. Allocation of Areas Managed to Maintain Wilderness Characteristics would be in locations that would have minor effects on the existing route system and thus unlikely to affect future designated routes more than minorly. Desert Tortoise is on the Candidate Species list for becoming a T&E species. Tortoise's effect on a designated route system is difficult to predict, however, its listing would likely cause the designation of large OHV closed areas in Category I areas, which have lower road densities today. Considering these impacts to travel management and the route system, cumulative impacts would be expected to be moderate.

4.24.7.3. Sonoran Desert National Monument

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts would be the same as those listed in the Common to All section, with the following exceptions. Under Alternative E, Land Use Authorizations impact would be the same as those under D for utility corridors. Under Alternative E, grazing would see a reduction in preference and reduced use levels, which would affect fewer sites overall. This would have a protective effect compared to Alternative A to a moderate level. Some grazing activities and use would be pushed onto neighboring land jurisdictions and would affect cultural resources at the same level of intensity. Recreation, under Alternative E would have the same effects as those under Alternative C. Target shooting under Alternative E would have the same effect as that under Alternative D: no effect. Under Alternative E, transportation planning effects on Monument objects and cultural resources would be similar to those under Alternative C.

Cumulative Impacts on Priority Wildlife Species and Habitat Resources

Current regional conditions and threats to special status species would be the same as described for Alternative A, C and D. However alternative E provides a balance through multiple uses and incorporates a better approach to manage key ecosystems and special status species habitats while providing opportunities for resource uses that meet social and economic needs. Overall, the long-term decline in native vegetation and special status species habitats due to land uses would continue at a slower rate than either alternative C or D under Alternative E within the SDNM and cumulatively the effects would range from negligible to minor for wildlife species in general.

Cumulative Impacts on Visual Resources Management

Transportation and access impacts are expected to be similar to Alternative C. SDNM would have negligible to minor impacts to Classes I in Alternatives C, B and D, and fewer impacts on Class II landscapes than Alternatives A and B, however, more impacts than C and D. Impacts to visual resources would be considerably less than Alternative A in Class III landscapes. Impacts on Class IV would be the same as in Alternatives B, C and D.

Cumulative Impacts on Livestock Grazing

The Beloat and the Conley Allotments would experience the greatest cumulative impacts, which would be slightly different under all other alternatives, but would nevertheless affect the forage, water, and space, which would eventually impact the sustainability of livestock grazing on these two allotments. For example, the Beloat Allotment has already seen all areas south of I-8 closed to livestock grazing per the Proclamation when the grazing permit expired in 2008. Further, Alternative E proposes to make the Conley Allotment within the SDNM boundaries unavailable to livestock grazing. This could make the use of the fragmented parcels outside the Monument boundary difficult to manage. Additionally, Alternatives B, C, and E propose to remove even more land from livestock use. Water sources within each of the proposed exclosures would have to be relocated outside the fenced areas and cattle would have to be monitored closely until they become accustomed to the new changes. Recreation and public use of the Bighorn and Conley Allotments could remove additional lands and forage, and place more restrictions on water developments. These combined impacts could make livestock grazing on the entire allotments unmanageable and cost-prohibitive.

Cumulative Impacts on Recreation

Cumulative impacts would be the same as those described under Alternative C for the SDNM.

Cumulative Impacts on Travel Management

Impacts would be the same as those described under Alternative E for the Lower Sonoran.

4.25. IMPLEMENTATION LEVEL ANALYSIS

4.25.1. METHODOLOGY FOR ANALYZING IMPLEMENTATION-LEVEL DECISIONS WITHIN THE SDNM

Activity-level decisions proposed for implementation in tandem with the development of the Lower Sonoran and SDNM RMP include:

- Designation of routes in the SDNM that are approved for motorized and nonmotorized public use;
- AUM allocations for administering livestock grazing in the SDNM based on the findings from the grazing compatibility analysis (which can be found in Appendix E, *Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument* (p. 1039)); and
- Decisions for administering target shooting based on the findings from the target shooting analysis within the SDNM (which can be found in Appendix G, *Sonoran Desert National Monument Recreational Target Shooting Analysis* (p. 1183)).

Because all implementation and activity-level decisions take place only within the SDNM Decision Area, only program areas that are responsible for managing Monument objects (refer to Appendix A, *Sonoran Desert National Monument Presidential Proclamation* (p.)) have analyzed these decisions in detail. Program areas that manage these objects include cultural and heritage resources (Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920)), Priority Wildlife Species and Habitat resources (Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920)), and vegetation resources (Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931)). Special designations also manages a Monument object (i.e. the Juan Bautista de Anza NHT); however, impacts to the Anza NHT are discussed with the cultural and heritage Monument objects in Table 4.31, "Impacts from Implementation Level Decisions on Priority Species Monument Objects" (p. 920).

Impacts are quantified to the extent practical with available data. Qualitative terms have been established to indicate the level of intensity an impact will have on a resource. These intensities range from negligible to major. The three program areas that manage Monument objects have further defined these terms specific to their program area, and in some cases have outlined particular thresholds. These definitions can be found in the beginning of each program area's general RMP impacts analysis, while the general definitions can be found in Section 4.1.6, "Reasonably Foreseeable Development ScenarioS" (p. 376).

4.25.1.1. Route Designations

To assist in analyzing impacts related to designating route systems within the SDNM, the Monument was divided into 18 site-specific sample areas. These sample areas were identified by the BLM travel specialists as areas where there are known travel issues and public use concerns (for a more general descriptions of each of these site specific sample areas, refer to Table S.1, "Description of SDNM Site-Specific Sample Areas " (p. 1314) in Appendix S, *Route Evaluation Methodology & Impact Analysis* (p. 1311) and the detailed, large-scale SDNM Route Designations map included on the CD version of the RMP). Each resource specialist selected

sample areas that were representative of the related objects their program area managed, then gathered resource data and analyzed impacts from the designation of individual routes as opened, closed, and limited within those sample areas.

4.25.1.2. Livestock Grazing

Implementation-level analysis of impacts related to livestock grazing within the Monument was conducted at the allotment level (refer to Maps 2-8a, 2–8b, 2–8c, 2–8d and 2–8e for allotments within the Monument). The cultural, priority species (wildlife) and vegetation specialist gathered resource data at the allotment level, then analyzed impacts that would take place within those allotments from the actions presented by each individual alternative.

4.25.1.3. Target Shooting

Unlike the implementation-level impacts from route designations and livestock grazing, target shooting impacts were not analyzed by a geographic sample area or by allotment, but rather throughout the entire Monument. Because the management decision to allow or prohibit target shooting in certain areas of the Monument is an activity-level action, impacts were analyzed at the implementation level, and areas where target shooting was allowed was the focus area for the analysis.

4.25.2. IMPLEMENTATION-LEVEL ANALYSIS FOR CULTURAL & HISTORICAL SITES MONUMENT OBJECTS

Impacts from implementation-level decisions on cultural and historical sites Monument objects are presented below in Table 4.30, “Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects” (p. 907).

Table 4.30. Impacts from Implementation Level Decisions on Cultural and Historical SitesMonument Objects

SDNM Monument Objects Managed by Cultural Archeological and Historical Sites
Impact Indicators
Number of disturbed or damaged **Archeological and Historical Sites**: rock art sites, lithic quarries, scattered artifacts, large villages, permanent habitat sites, acres within the Juan Bautista de Anza NHT, Mormon Battalion Trail, and Butterfield Overland Stage Route. Damages to sites include: ● Damage to the arrangement or structure of features; ● Artifacts broken, missing, or rearranged; ● Site or historic trail elements re-arranged; ● Subsurface cultural and historic deposits re-arranged; ● Evidence of trampling that has disturbed deposits or accelerated processes of erosion at archaeological sites or on historic trail attributes; ● Loss of archaeological context and associated opportunities for scientific research; ● Damage to historic sense of a particular period of time or feeling of the prehistoric site, the historic trail, or associated site’s context;

- Changes to the historic setting, to the level that the prehistoric site, the historic trail(s), and associated site values are diminished.

SDNM Archeological and Historical Sites					
	Number of Known Sites				
	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Area Analyzed	Sites within or near Open Routes				
Area 1 & 2	4 (3*)	4 (3*)	4 (3*)	4 (3*)	4 (3*)
Area 4	2 (1*)	2 (1*)	1 (1*)	0	1 (1*)
Area 7	28 (7*)	28 (7*)	28 (7*)	6 (6*)	28 (7*)
Area 8	3 (1*)	3 (1*)	3 (1*)	3 (1*)	3 (1*)
Area 9	4 (2*)	4 (2*)	4 (2*)	3 (2*)	3 (2*)
Area 10	5 (5*)	4 (5*)	3 (5*)	1 (5*)	4 (5*)
* Sites appear to have the characteristics to make them eligible for the NRHP.					
Allotment Analyzed	Sites within Open and Available Acres for Livestock Grazing				
Arnold	0	0	0	0	0
Beloat	5 (2*)	5 (2*)	5 (2*)	0	5 (2*)
Bighorn	9 (9*)	9 (9*)	6 (6*)	0	9 (9*)
Conley	21 (9*)	20 (9*)	20 (9*)	0	0
Hazen	4 (5*)	4 (5*)	5 (5*)	0	4 (5*)
Lower Vekol	4 (3*)	4 (3*)	4 (3*)	0	4 (3*)
Area Analyzed	Sites within Acres Open to Target Shooting				
Entire Monument	233	47 (1*)	0	0	0

Assumptions

- The Area of Potential Effect (APE) on the SDNM for travel management impacts on cultural and heritage resources and the Monument objects managed by this program as listed above are 0.25 mile on either side of all routes.

- No changes in route designations within wilderness areas preclude any effects to cultural resources and Monument objects.

- There is a higher probability that cultural resources are present within or near river corridors, spring locations, historic trails, and high-quality arable land with access to water.

- Measures that withdraw land, restrict surface development, or reduce or eliminate heavy concentrations of livestock to protect resources provide direct and indirect protection of historic trail and associated cultural resources from disturbance and from incompatible and unauthorized activities.

- Natural processes such as erosion or weathering degrade the integrity of many types of historic trail and cultural resources over time. Human visitation, recreation, OHV use, livestock grazing, fire and non-fire vegetation treatments, and other activities can increase the rate of deterioration through natural processes. While the effect of a few incidents may be negligible, the effect of repeated actions or visits over time will intensify impacts.

- Vandalism or unauthorized collecting will continue to destroy historic trails and associated cultural resources. Exposure or access to areas where these resources are present will increase the risk of vandalism or unauthorized collection of artifacts.

- Surface disturbing activities can vary in nature and include mechanical/vehicular, livestock/wildlife, and human -caused. Ground disturbing activities from mechanical/vehicular means are assumed to have the potential to impact cultural resources by damaging features, crushing or compacting subterranean features, rearranging features, pushing soils to remove or excavate the original surface, and disturbing the contextual arrangement of features and artifacts. Ground disturbing activities from wildlife and livestock can occur when an animal burrows or wallows in soft soils and damages features. Other animal activities can disturb original subsurface cultural soil horizons, crush or compact surface artifacts, and rearrange the context of artifacts and features. Human ground disturbance can occur from fire contamination, trampling, digging, vandalism, and unauthorized collection.

- Little of the Area has been inventoried for cultural resources, and there is no predictive modeling or sensitivity mapping available to estimate or quantify resource density. The potential exists for cultural resources on most of the Area, but the presence and significance of resources and impacts cannot be quantified. Most of the length of the Anza NHT has not been inventoried for associated cultural resources.
- Site monitoring, non-project-related inventories, interpretive development, site stabilization and other proactive management activities would continue.
- Inventory data is legacy data, collected over the course of 34 years.

Impacts on Cultural, Archeological and Historic Sites Monument Objects from SDNM Route Designations

Alternative A (No Action)

Alternative A (No Action) SDNM Route Designation Action

- No routes would be formally designated under Alternative A; therefore, the existing routes would remain open.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 1 & 2	-	-	-	12.5	-	-	-	-	-
Area 4	-	-	-	11.8	-	-	-	-	-
Area 7	-	-	-	12.8	-	5.2	-	-	-
Area 8	-	-	-	0.3	-	-	-	-	-
Area 9	-	-	-	13.7	-	-	-	-	-
Area 10	-	-	-	14.9	-	-	-	-	-

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative A (No Action) SDNM Route Designation Actions
Areas 1 & 2	8002, 8003, 8003A, 5005, 8005A, 8005B, 8005C, 8005D	There are four known cultural sites in these areas; three have the characteristics to be eligible for the NRHP. Use along the routes in these areas has been heavy, and high vehicle speeds are common, creating gouges, high-cut bank berms, and additional route deviations. Recent trail restorations have addressed these issues while in the temporary closure. If current condition means a return to the former management regime before the closure, routes will increase in high volume; vehicle damage will expand beyond route berms and edges, leading to erosion, encroachment, and route deviations, thus increasing the possibility of cultural sites being trampled, disturbed, and displaced. The likelihood of sites losing their integrity would be high. Impacts would be moderate.
Area 4	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000X, 8000Y, 8001, 8001F, 8001G, 8002, 8002G, 8002H, 8005, 8005D,	There are two known cultural sites in this area, but only one site has the characteristics to be eligible for the NRHP. The two sites have been impacted indirectly by the proliferation of additional routes created by the public, which has lead to unauthorized camping, trash accumulation, and unauthorized collection of artifacts. If this route management scheme were to continue, impacts would be similar to those described under Areas 1 and 2 in Alternative A, and impacts would be moderate.

	8005E, 8005H, 8005I	
Area 7	8008, 8008B, 8008D, 8008E, 8008F, 8008H, 8008I, 8009F, 8011, 8026, 8026B	There are 28 known cultural sites in this area, and seven sites have the characteristics to be eligible for the NRHP. The routes in this area are maintained at a primitive level. The 5.2 miles of parallel routes are primarily in washes and receive extremely low levels of traffic. Closure of these routes, and keeping 12.8 miles of low-use routes open in this area, would have a negligible effect on these sites and Monument objects. These routes offer access into otherwise remote areas, slightly increasing threats to these along the routes. Under Alternative A, negligible impacts to the approximately 17 known cultural sites that lie within a ¼ mile of the route would be anticipated.
Area 8	8011	There are three known cultural sites in this area, one of which, the Big Horn Station historic site, has characteristics to be eligible for the NRHP. The area has low visitor use due to the lack of safe legal access; however, new illegal routes enevitably will be created as interest in the site increases. Currently, there is a lack of safe legal access off of I-8, so the public cannot legally access the Big Horn Station historic site or other places within this portion of the SDNM. Impacts are anticipated to range from negligible to moderate, as illegal route usage could increase in high volume, vehicle damage would expand beyond route berms and edges, leading to erosion, encroachment, and route deviations, thus increasing the possibility of cultural sites being trampled, disturbed, and displaced.
Area 9	8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8009F, 8010, 8026, 8043, 8044, 8045, 8046	There are five known cultural sites in this area, two of which have the characteristics to be eligible for the NRHP. Sites within this area have been impacted from past route use and maintenance, cutting into the site and disturbing a small portion of the substrate. Sites still retain some integrity. Vekol Road is maintained at a class 3 level of maintenance. The existing route in Area 9 is high volume, so all route improvements would lead to higher speeds, which may increase the chances of vehicle encroachment onto sites. When route maintenance is done and when speeds increase, it would lead to soils thrown up onto adjacent site features, leading to an increase in erosion on sites. This would occur at a minor to moderate level of intensity and have a possibility of affecting the four known sites within ¼ mile of these routes. Impacts overall would be moderate.
Area 10	8008F, 8009C, 8009E, 8011A, 8011C, 8011D, 8011F, 8011G, 8015, 8015A, 8015B, 8015C	There are five known cultural sites in this area, all of which have the characteristics to be eligible for the NRHP. The routes within this area are maintained at a primitive level. The cultural sites within this area have been impacted from past route use; however, all of the sites retain their integrity. The routes in this area offer access into remote areas, increasing the threats of vandalism and unauthorized collection for the five known sites within ¼ mile of each of the routes. While threats exist, a negligible level of effect is expected.

Alternative B

Alternative B SDNM Route Designation Actions

- Approximately 24.2 miles of road and 494.4 miles of primitive road would be open to motorized vehicles. An additional 4.2 miles of road would be constructed and opened to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 1 and 2	0.2	-	-	9.1 (1.9*)	-	1.4	-	-	-
Area 4	1.2	-	-	10.4	-	0.2			
Area 7	-	-	-	13.5 (0.4**)	-	4.1	-	-	-
Area 8	-	-	-	0.3		-	-	-	-

Area 9	6.4	-	-	7.4	-	-	-	-	-
Area 10	-	-	-	9.8 (1.5**)	-	3.5	-	-	-
*Open to nonmotorized use only**Limited to 50 feet									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative B SDNM Route Designation Actions
Areas 1 & 2	8002, 8003, 8003A, 5005, 8005A, 8005B, 8005C, 8005D	Impacts would be similar to Alternative A, except, within Alternative B, usage on 9.1miles of route would change to primitive, nonmotorized. This would have a more protective effect on this segment than Alternative A. Diverting traffic off the two nonmotorized route segments would lead to slowing the speed of traffic. This would have a protective effect on the features and Monument objects within ¼ mile of these routes. Impacts would be negligible.
Area 4	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000X, 8000Y, 8001, 8001F, 8001G, 8002, 8002G, 8002H, 8005, 8005D, 8005E, 8005H, 8005I	Impacts would be similar to those described in Area 4 under Alternative A, except 0.2 miles of access routes off of the pipeline route would be closed. This would reduce the visitation to the eligible cultural site in this area, thus leading to a minimization of impacts compared to Alternative A and decreasing the impacts to a negligible intensity.
Area 7	8008, 8008B, 8008D, 8008E, 8008F, 8008H, 8008I, 8009F, 8011, 8026, 8026B	Impacts within Areas 7 would be the same as those described under Alterative A.
Area 8	8011	The Bighorn Station historic site lies within this area. It is proposed that this site would be allocated to public use for the purpose of developing an interpretive area. This area lies in a zone where a new access route is proposed. This access route would address the problem of a lack of safe legal access off of I-8, so that the public could access the Big Horn Station historic site and other places within this portion of the SDNM. This new route would be designed to minimize impacts to undiscovered cultural resources that may lie in the area. It is anticipated that there would be a negligible level of impacts. The Big Horn Station historic site currently has low visitor usage due to the lack of safe legal access. The addition of the new route connecting a freeway exit to the site may have the effect of increasing public visitation to the site to a minor level of intensity. Design of the site's interpretive facilities would be done in a way that would minimize impacts anticipated by this change. The installation of the interpretive facilities would be contingent upon the development of safe, legal access.

Area 9	8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8009F, 8010, 8026, 8043, 8044, 8045, 8046	Impacts would be the same as those described under Alternative A for the Monument.
Area 10	8008F, 8009C, 8009E, 8011A, 8011C, 8011D, 8011F, 8011G, 8015, 8015A, 8015B, 8015C	One of the five cultural sites within ¼ mile of designated routes in this area lies on a route that would be open, so the impact for the open routes would be moderate. By reducing the volume and type of vehicles to limited usage and closed to all uses on 3.5 miles of the route, it is anticipated that impacts on the site values would be less than under Alternative A. This would be a minor level of effect. Under Alternative B, there would be an overall reduction in numbers of visitors into more remote portions of this area, leading to a decreasing threat of vandalism and trampling on the five known sites within ¼ mile of these routes. It is anticipated that effects to the site values would be less than under Alternative A. Impacts are anticipated to have a minor level of intensity.

Alternative C

Alternative C SDNM Route Designation Action

- Approximately 24.2 miles of road and 358.1 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 1 and 2	-	-	-	6.1 (4.9*)	-	1.4	-	-	-
Area 4	1.2	-	-	8.7	-	1.9	-	-	-
Area 7	-	-	-	11.5 (0.4^)	0.7	5.4	-	-	-
Area 8	-	-	-	0.3	-	-	-	-	-
Area 9	6.4	-	-	6.8	0.3	0.3	-	-	-
Area 10	-	-	-	5.3	-	9.6	-	-	-
*Open to nonmotorized use only**Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative C SDNM Route Designation Actions
Areas 1 and 2	8002, 8003, 8003A, 5005, 8005A, 8005B, 8005C, 8005D	Unlike Alternative A, the 6.1 miles of routes in Alternative C would be managed as primitive, nonmotorized routes. This would eliminate vehicle use on these routes and therefore have a more protective effect on this segment than Alternative A because use would be restricted to hiking and equestrian use. North-south routes would become access to trail heads (rt. 3002, 3022, and 3027) would require designated parking areas and staging areas at the end of each access route for nonmotorized users to access the trail as hikers and equestrians. Adopting this alternative would have effect of increasing traffic on 3003, 3063, 3100, 3109, 3062, and 3002 routes, so that a loop could be driven. There may be some increased vehicle use along the 6.1 miles of open routes due to the removal of the east end of the trail from motorized use. Additional unknown sites within ¼ mile of these routes would be subject to fewer threats than under Alternative A from trampling and vehicle encroachment. Impacts are anticipated to be minor.

Area 4	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000X, 8000Y, 8001, 8001F, 8001G, 8002, 8002G, 8002H, 8005, 8005D, 8005E, 8005H, 8005I	Impacts would be similar to those in Alternative A for Area 4, except that all but one access route off the pipeline route would be closed. This would reduce visitation to the eligible cultural site, leading to a greater reduction of impacts to the site, thus leading to a minimization of impacts compared to Alternative A and decreasing the impacts to a negligible intensity.
Area 7	8008, 8008B, 8008D, 8008E, 8008F, 8008H, 8008I, 8009F, 8011, 8026, 8026B	Impacts within Area 7 would be the same as those described under Alterative A.
Area 8	8011	Impacts would be similar to those discussed under Alternative A.
Area 9	8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8009F, 8010, 8026, 8043, 8044, 8045, 8046	Impacts would be the same as those described under Alternative A for the Monument.
Area 10	8008F, 8009C, 8009E, 8011A, 8011C, 8011D, 8011F, 8011G, 8015, 8015A, 8015B, 8015C	Unlike Alternative A, 9.6 miles of route would be "closed to all uses" under this alternative. This would have a more protective effect than Alternative A by eliminating vehicle use on the routes and encroachment onto the sites over the long term. Further human visitation and the threat of vandalism would be curbed due to the distance to any open routes. The elimination of several long segments of route into the middle of this remote area would eliminate vehicle access and reduce visitation considerably more than under Alternative A. This would lead to the elimination of vehicle encroachment and the reduction of vandalism and unauthorized collection on five known sites that exist along the ¼ mile wide area on either side of the routes. The open routes would have impacts similar to Alternative A. Overall impacts would be decreased to minor intensities from Alternative A.

Alternative D

Alternative D SDNM Route Designation Action

- Approximately 24.2 miles of road and 200 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designation									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 1 & 2	0.2	-	-	1 (8.4*)	-	1.6	-	-	-
Area 4	1.2	-	-	5.6	1.0	4.0	-	-	-
Area 7	-	-	-	(0.8**)	-	17.2	-	-	-
Area 8	-	-	-	0.3	-	-	-	-	-
Area 9	6.4	-	-	6.5	-	0.9	-	-	-
Area 10	-	-	-	-	1.3	13.5	-	-	-
*Open to nonmotorized use only**Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative D SDNM Route Designation Actions
Areas 1 and 2	8002, 8003, 8003A, 5005, 8005A, 8005B, 8005C, 8005D	Unlike Alternative A, most of the route segments in these areas would be managed as primitive, nonmotorized routes or for administrative use only. This would eliminate vehicle use on the closed routes and limit use on the administrative-use segment. This would have a more protective effect on this segment than under Alternative A because use would be restricted to hiking and equestrian use. More miles of the historic trail (the Juan Bautista de Anza NHT) would be managed as primitive routes than under the other alternatives. This comports well with the intent of the Juan Bautista de Anza NHT Comprehensive Management Plan. One segment would be managed as an "administrative use only." This designation would limit vehicle use to a negligible level of intensity. The designation of several long segments of route to nonmotorized use in this area would eliminate vehicle access and reduce visitation considerably more than under Alternative A. This would lead to the elimination of vehicle damage and encroachment on the unknown sites that may exist along the ¼ mile wide area on either side of the routes. Also, the designation of this alternative would lead to the development of designated parking and camping areas at each point where access routes intersect the nonmotorized sections of the historic trail in this area. Impacts would be decreased to negligible to minor intensities from Alternative A.
Area 4	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000X, 8000Y, 8001, 8001F, 8001G, 8002, 8002G, 8002H, 8005, 8005D, 8005E, 8005H, 8005I	Impacts would be negligible, as all of the access routes off the pipeline road would be closed.
Area 7	8008, 8008B, 8008D, 8008E, 8008F, 8008H, 8008I, 8009F, 8011, 8026, 8026B	Closure of 95% of the routes in this remote area would have a more protective effect than under Alternative A on 28 known sites that lie within ¼ mile of the routes. Eliminating vehicle use would nearly eliminate visitation to all of the sites except those in proximity to other open routes. Vehicle damage, encroachment, and threats from unauthorized collection would be reduced or eliminated. Impacts would be decreased to minor intensities.
Area 8	8011	Impacts would be similar to those discussed under Alternative A.
Area 9	8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8009F, 8010, 8026, 8043, 8044, 8045, 8046	Impacts would be the same as those described under Alternative A for the Monument; however, under Alternative D, feeder routes from the south, i.e. 6095 and 6010, would be closed. This would have the effect of reducing the volume of use on the northern and middle portions of route 6001. Under Alternative D, the volume would be reduced, which would lead to fewer vehicle incursions into the area within ¼ mile of the routes. This offers slightly more protection than that offered under Alternative A, which would have a minor level of intensity.

Area 10	8008F, 8009C, 8009E, 8011A, 8011C, 8011D, 8011F, 8011G, 8015, 8015A, 8015B, 8015C	In Alternative D, all but 1.3 mile of the 14.9 miles of route would be "closed to all uses." This would have a more protective effect than under Alternative A by eliminating vehicle use on the roads and encroachment onto the sites over the long term. In addition, visitation would be greatly reduced to all five sites in the ¼ mile area on either side of these routes because access would be on foot. Lower visitation would lead to fewer threats of vandalism, unauthorized collection, and vehicle encroachment. This would offer far more protective management than under Alternative A, therefore impact intensities would be decreased to minor.

Alternative E (Preferred Alternative)

Alternative E (Preferred Alternative) SDNM Route Designation Action

Approximately 24.2 miles of road and 331 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 1 and 2	0.2	-	-	6.1 (6*)	-	0.3	-	-	-
Area 4	1.2	-	-	10.6	-	-	-	-	-
Area 7	-	-	-	11.7	-	6.2	-	-	-
Area 8	-	-	-	0.3	-	-	-	-	-
Area 9	6.4	-	-	6.9	-	0.5	-	-	-
Area 10	-	-	-	10.3	-	4.6	-	-	-
*Open to nonmotorized use only**Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative E (Preferred Alternative) SDNM Route Designation Actions
Areas 1 and 2	8002, 8003, 8003A, 5005, 8005A, 8005B, 8005C, 8005D	Impacts would be the same as those described in Alternative C for these areas.
Area 4	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000X, 8000Y, 8001, 8001F, 8001G, 8002, 8002G, 8002H, 8005, 8005D, 8005E, 8005H, 8005I	Impacts would be the same as those described under Alternative C for Area 4.
Area 7	8008, 8008B, 8008D, 8008E, 8008F, 8008H, 8008I, 8009F, 8011, 8026, 8026B	Impacts would be the same as those described under Alternative A for Area 7.

Area 8	8011	Impacts would be the same as those described in Alternative B for Area 8.
Area 9	8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8009F, 8010, 8026, 8043, 8044, 8045, 8046	Impacts would be the same as those described in Alternative A for Area 9.
Area 10	8008F, 8009C, 8009E, 8011A, 8011C, 8011D, 8011F, 8011G, 8015, 8015A, 8015B, 8015C	Impacts would be the same as those described in Alternative B for Area 10.

Impacts on Cultural and Heritage Monument Objects from SDNM Livestock Grazing

Alternative A (No Action)

Alternative A (No Action) SDNM Livestock Grazing Action

SDNM Grazing Allotments	
Allotment	**Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)**
Arnold	0
Beloat	776
Bighorn	2,812
Conley	3,403
Hazen	886
Lower Vekol	826

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative A (No Action) SDNM Livestock Grazing Actions
Arnold Allotment	No sites have been recorded or inventoried within this allotment on the SDNM; therefore, there are no known direct or indirect impacts.
Beloat Allotment	One of the two cultural sites within the allotment lies in an area along a densely vegetated wash with soft soils. It is likely that livestock would congregate more in an area like this and would threaten the physical integrity of the site by disturbing the artifacts through crushing and some displacement. Livestock congregating in the wash also may cut down the banks and reduce soil retaining vegetation, which could lead to erosion near the site. Site features and physical integrity may be disturbed or damaged by the ensuing erosion. Impacts are anticipated to be negligible to the upland cultural site and potentially moderate to the site in the wash.
Bighorn Allotment	Four of the nine cultural sites within this allotment exist along densely vegetated washes or near an earthen livestock tank where livestock typically congregate. These four sites would experience the same impacts as those described for the Beloat Allotment under Alternative A above. Impacts are anticipated to be negligible for the five cultural sites in the uplands, and potentially moderate for the sites in the washes.
Conley Allotment	One of the ten cultural sites within the allotment lies along a densely vegetated wash with soft soils. This site and any of the other nine sites that may lie along the densely vegetated washes or near an earthen livestock tank would experience the same impacts as those described for the Beloat Allotment under Alternative A. Impacts are anticipated to be negligible to moderate, depending on the location of each site.
Hazen Allotment	None of the five cultural sites within this allotment exist along densely vegetated washes, or near an earthen livestock tank where livestock typically congregate, therefore, impacts would be negligible.
Lower Vekol Allotment	None of the three cultural sites within this allotment exist along densely vegetated washes or near an earthen livestock tank where livestock typically congregate; therefore, impacts would be negligible.

Alternative B

Alternative B SDNM Livestock Grazing Action

SDNM Grazing Allotments	
Allotment	**Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)**
Arnold	0
Beloat	541
Bighorn	2,301
Conley	1,572
Hazen	531
Lower Vekol	646

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative B SDNM Livestock Grazing Actions
Arnold Allotment	No sites have been recorded or inventoried within this allotment on the SDNM; therefore, there are no known direct or indirect impacts.
Beloat Allotment	Impacts are anticipated to be the same as those described under Alternative A for the Beloat Allotment, but to a lesser degree, as AUMs would decrease by 235. Impacts are expected to decrease to negligible to minor intensities.
Bighorn Allotment	Impacts are anticipated to be the same as those described under Alternative A for the Bighorn Allotment, but to a much lesser degree, as AUMs would decrease by 781 and 56,341 acres would become unavailable to livestock (these numbers include areas south of I-8, as well). Those objects of the Monument found to be incompatible with livestock grazing would be directly fenced off with approximately 14 miles of proposed fenceline. . Additionally, the Happy Camp Public Use Site proposed under this alternative, may require fencing to prevent impacts from livestock. Cultural surveys would be conducted to ensure no cultural resources are impacted by the installation of the fence. Additionally, salt blocks and supplements would not be permitted within 1/4 mile of the Anza-Butterfield Trail to decrease impacts from livestock. Impacts from livestock on cultural resources are expected to decrease to minor intensities from Alternative A.
Conley Allotment	Impacts are anticipated to be the same as those described under Alternative A for the Conley Allotment, but to a much lesser degree, as AUMs would decrease by 1,831 and 6,010 acres would become unavailable to livestock. Those objects of the Monument found to be incompatible with livestock grazing would be directly fenced off with approximately 69 miles of fenceline. Additionally, approximately 10 acres around North Tank would be fenced off to prevent further impacts from livestock. The Anza-Butterfield Interpretive Trail Area and the Christmas Camp Public Use Site proposed under Alternative B may need to be fenced to prevent impacts from livestock. Due to the decrease in permitted livestock and the fencing to prevent further impacts to cultural objects within certain parts of the Monument, Cultural surveys would be conducted to ensure no cultural resources are impacted by the installation of any proposed fences. impacts are expected to decrease to minor intensities from Alternative A.
Hazen Allotment	Impacts are anticipated to be the same as those described under Alternative A for the Hazen Allotment, but to a much lesser degree, as AUMs would be cut in half (531 AUMs). Impacts are expected to decrease to negligible to minor intensities.
Lower Vekol Allotment	Impacts are anticipated to be the same as those described under Alternative A for the Lower Vekol Allotment, but to a much lesser degree, as AUMs would decrease by 180 and 54 acres would be removed from livestock use.. Impacts are expected to decrease to negligible to minor intensities.

Alternative C

Alternative C SDNM Livestock Grazing Action

SDNM Grazing Allotments	
Allotment	**Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)**
Arnold	0
Beloat	936
Bighorn	2,278
Conley	2,212
Hazen	873
Lower Vekol	793

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative C SDNM Livestock Grazing Actions
Arnold Allotment	No sites have been recorded or inventoried within this allotment on the SDNM; therefore, there are no known direct or indirect impacts.
Beloat Allotment	Impacts would be similaar as those described under Alternative A for the Beloat Allotment.
Bighorn Allotment	Impacts from livestock on the Bighorn Allotment are anticipated to be similar as those described under Alternative A and B for the Bighorn Allotment, but to a lesser degree, as AUMs would decrease by 534 and the area made unavailable for livestock grazing would increase to 70,565 acres. Approximately 27 miles of fencing is anticipated to be needed to prevent impacts from livestock on portions of the Monument found to be incompatible with livestock grazing. Impacts from livestock are expected to decrease to minor intensities due to the decrease in numbers and the fenced exclosure. Other impacts under this alternative are expected to be the same as Alternative B.
Conley Allotment	Impacts are anticipated to be the same as those described under Alternative A for the Conley Allotment, but to a lesser degree, as AUMs would decrease by 1,191. Fewer miles of fenceline would be needed for this alternative, thus decreasing the potential impacts of fence installation on cultural resources. All other impacts are similar to Alternative B for this allotment.
Hazen Allotment	Impacts would be the same as those described under Alternative A for the Hazen Allotment.
Lower Vekol Allotment	Impacts would be the same as those described for Alternative A for the Lower Vekol Valley Allotment, except that about 670 acres of unavailable lands would be fenced of with about 3 miles of fenceline. Impacts from this would be similar to those described in Alternative B.

Alternative D

Alternative D SDNM Livestock Grazing Action

- Impacts would be negligible, as all allotments currently available to grazing would be closed to grazing when current permits expire. North Tank and other proposed interpretive sites and trail heads would not need to be fenced because impacts from livestock to cultural and historical sites would be eliminated.

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative D SDNM Livestock Grazing Actions

- Impacts would be negligible, as all allotments currently available to grazing would be closed to grazing when current permits expire.

Alternative E (Preferred Alternative)

Alternative E (Preferred Alternative) SDNM Livestock Grazing Action

SDNM Grazing Allotments	
Allotment	**Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)**
Arnold	0
Beloat	552
Bighorn	1,633
Conley	0
Hazen	400
Lower Vekol	529

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative E (Preferred Alternative) SDNM Livestock Grazing Actions
Arnold Allotment	No sites have been recorded or inventoried within this allotment on the SDNM; therefore, there are no known direct or indirect impacts.
Beloat Allotment	Impacts would be the same as those described under Alternative B and C for the Beloat Allotment.
Big Horn Allotment	Impacts are anticipated to be the same as those described under Alternative A for the Bighorn Allotment, but to a much lesser degree, as AUMs would decrease by 868. The number of acres made unavailable, and the miles of fenceline, would be the same as in Alternative C. Impacts are expected to be similar to Alternative C except that fewer cattle would be present to affect cultural resources.

Conley Allotment	This alternative would make the entire Conley Allotment inside the SDNM boundaries unavailable for livestock grazing. Due to the fact that there are no AUMs proposed for the Conley Allotment, impacts to cultural resources are expected to be negligible.
Hazen Allotment	Impacts would be the same as those described for Alternative B for the Hazen Allotment.
Lower Vekol Allotment	Impacts would be the same as those described for Alternative B for the Lower Vekol Valley Allotment.
Impacts on Cultural and Heritage Monument Objects from SDNM Target Shooting	
Alternative A (No Action)	
Alternative A (No Action) SDNM Target Shooting Management Actions	
• The entire Monument would remain open to recreational target shooting.	
Impact Analysis from Alternative A (No Action) SDNM Target Shooting Actions	
• Direct impacts from firearm projectiles are negligible. BLM trailhead cultural facilities, including interpretive signs, register boxes, and restrooms, have been and would continue to be directly impacted by firearm projectiles to a moderate level of intensity for the long term. Vehicle damage, excessive human trampling of local vegetation and soils, erosion, trash and target debris accumulation, alteration of site features and artifacts, and unauthorized collection of artifacts are the kinds of disturbance and damage that would occur at minor to moderate levels of intensity. • Petroglyph sites have been impacted directly by firearms projectiles striking panels. If unchecked, this type of damage would continue over the long term. This target shooting activity is associated with large accumulations of trash, excessive human trampling and climbing over the rocks with petroglyphs, and vegetation mashing. This activity then leads to displaced rock panels and boulders and erosion in this area, which would continue over the long term at a minor to moderate level of intensity.	
Alternative B	
Alternative B SDNM Target Shooting Management Actions	
• Under Alternative B, 95,900 acres of the total 486,400 acres of the SDNM would be available for target shooting activities.	
Site Specific Area (Refer to Map 4-1)	**Impact Analysis from Alternative B SDNM Target Shooting Actions**
• The majority of cultural and archeological sites that are eligible for the NRHP lie in areas closed to target shooting. All but one of the 47 known cultural sites within the 19.7% of the Monument that would remain open to target shooting are archaeological in nature and would be subject to the indirect impacts of this activity discussed in Alternative A rather than the direct impact of a projectile shot from a firearm. Impacts are expected to be negligible to moderate in intensity.	
Alternative C	
Alternative C SDNM Target Shooting Management Action	
• Only available areas that have been identified as compatible with Monument objects without posing a safety risk to Monument visitors (approximately 1,134 acres) would remain open to target shooting. The rest of the Monument would be closed to target shooting.	
Impact Analysis from Alternative C SDNM Target Shooting Action	
• Generally, impacts would be negligible because the areas identified as available for target shooting are small and are widely scattered. Only 1,134 acres out of the total SDNM acreage of 486,300 would be available. No sites have been recorded within any of the available areas. Because no cultural sites have been recorded in these open areas, impacts would be negligible.	
Alternative D	
Alternative D SDNM Target Shooting Management Actions	
• The entire Monument would be closed to target shooting.	
Impact Analysis from Alternative D SDNM Target Shooting Action	
• Impacts would be negligible, as the SDNM would be closed to target shooting.	
Alternative E (Preferred Alternative)	
Alternative E (Preferred Alternative) SDNM Target Shooting Management Action	
• The entire Monument would be closed to target shooting.	
Impact Analysis from Alternative E (Preferred Alternative) SDNM Target Shooting Actions	
• Impacts would be negligible, as the SDNM would be closed to target shooting.	

4.25.3. IMPLEMENTATION-LEVEL ANALYSIS FOR PRIORITY WILDLIFE & HABITAT SPECIES MONUMENT OBJECTS

Impacts from implementation-level decisions on priority species Monument objects are presented below in Table 4–31.

Table 4.31. Impacts from Implementation Level Decisions on Priority Species Monument Objects

Monument Objects Managed by Priority Wildlife Habitat Species

- Sand Tank Mountains,
- Diversity of Plant and Animal Species,
- Saguaro Cactus Forests,
- Wildlife,
- A Functioning Desert Ecosystem.

Impact Indicators

- Sand Tank Mountains:
  - Acres of disturbed habitat within the Sand Tank Mountains
- Diversity of Plant and Animal Species
  - Acres of disturbed palo verde-mixed cacti habitat
- Saguaro Cactus Forests:
  - Acres of disturbed palo verde-mixed cacti habitat
- Wildlife:
  - Degradation or improvement of wildlife habitat quality
  - Reduction or increases in wildlife populations in general
  - Connectivity of habitats for wildlife usage
- Functioning Desert Ecosystem
  - Acres of disturbed paloverde-mixed cacti habitat
  - Acres of disturbed creosote-bursage habitat

Wildlife includes: Sonoran desert tortoise, desert bighorn, red back whiptail, raptors, javelina, owls (elf, western screech), mule deer, Sonoran pronghorn, mountain lion, gray fox, bobcat, lesser long-nosed bat, California leaf-nosed bat, cave myotis bat, and Sonoran green toad.

SDNM Grazing Allotments					
	Acres of Potentially Disturbed Habitat				
	Alt. A	Alt. B	Alt. C	Alt. D	Alt. D
Area Analyzed	Route Designations				
Area 15	939	774	528	263	461
Area 16	382	242	186	108	211

Impact Indicators					
Allotment Analyzed	**Livestock Grazing**				
Arnold	1,631	1,631	1,631	0	1,631
Beloat	33,797	33,797	33,797	0	33,797
Bighorn	91,687	88,795	74,784	0	88,783
Conley	77,747	71,726	50,448	0	0
Hazen	31,638	31,638	31,638	0	31,638
Lower Vekol	15,663	15,617	14,997	0	15,459
Area Analyzed	**Target Shooting**				
Entire Monument	482,334	69,500	1,134	0	0
* Sites appear to have the characteristics which would make them eligible for the NRHP.					

Assumptions

- Wildlife habitat would be managed for wildlife and migratory birds with an emphasis on priority species.
- Priority species habitat would be managed for the benefit of species as a priority over other resource allocations or uses.
- All surface-disturbing activities would include mitigation and adaptive management to reduce impacts to priority wildlife and priority species and their habitat.
- In general, vegetative communities are considered to be in good condition but small localized impacted areas may be present.
- Although some areas are more suitable for different classes and species of wildlife, the impacts from different classes of wildlife would be similar and would not be discussed separately.
- Typically, negligible and minor impacts to wildlife are expected to occur where use is infrequent and human interactions are few. Interactions are few in areas where roads and trails are infrequently used such as but not limited to, rough roads or wilderness trails.

Impacts on Priority Species Monument Objects from SDNM Route Designations

Alternative A (No Action)

Alternative A (No Action) SDNM Route Designation Actions

- No routes would be formally designated under Alternative A. therefore, the existing routes would remain open.

SDNM Route Designations									
Area Analyzed	**Roads**			**Primitive Roads**			**Trails**		
	Open	**Admin Only**	**Closed**	**Open**	**Admin Only**	**Closed**	**Open**	**Admin Only**	**Closed**
Area 15	-	-	-	18.2	-	-	-		-
Area 16	-	-	-	15.2	-	0.2	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative A (No Action) SDNM Route Designation Actions

Assumptions		
Area 15	8000, 8000J, 8002, 8002E, 8002H, 8003, 8003A, 8003B, 8005, 8005A, 8005B, 8005D, 8005E, 8005F, 8005G, 8037, 8037F, 8037G, 8037L, 8037Q, 8037R, 8039, 8039A, 8039B, 8039H, 8039I,8039J, 8039K, 8039L	Within existing non-designated routes, 939 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Impacts are occurring based on the lack of control over motorized travel due to a lack of route designation system. Even though use is infrequent on the routes within Area 15, disturbances to some of the objects within the Monument can still occur. Disturbance range from wildlife mortality from vehicle impact and crushing, disturbance of viable habitat, to no disturbance at all in remote locations where there are no routes or access. If current conditions were to be maintained, impacts would range from negligible to moderate intensities.
Areas 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	Within existing non-designated routes, 382 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Impacts would be similar to those described in Area 15 for Alternative A.

Alternative B

Alternative B SDNM Route Designation Action

- Approximately 24.2 miles of road and 494.4 miles of primitive road would be open to motorized vehicles. An additional 4.2 miles of road would be constructed and opened to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 15	1.2	0.4	-	16.5	-	-	-	-	-
Area 16	-	-	-	15.2	-	0.2	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative B SDNM Route Designation Actions
Areas 15	8000, 8000J, 8002, 8002E 8002H, 8003 8003A, 8003B 8005, 8005A 8005B, 8005D 8005E, 8005F 8005G, 8037 8037F, 8037G 8037L, 8037Q 8037R, 8039	• Within designated routes, 774 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Impacts would be similar to those described in Area 15 for Alternative A, except, the 17.7 miles of open routes would allow a greater amount of access to areas of importance for objects and could increase unneeded traffic into some areas that could affect the persistence of some objects. Impacts would be expected to range from negligible to moderate on objects. • No route closures are anticipated for this area under Alternative B.

Assumptions		
	8039A, 8039B 8039H, 8039I 8039J, 8039K, 8039L	
Areas 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	• Within designated routes, 242 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Impacts would be similar to those described in Area 16 for Alternative A, except, the 15.2 miles of open routes would allow a greater amount of access to areas of importance for objects and could increase unneeded traffic into some areas that could affect the persistence of some objects. Impacts would be expected to range from negligible to moderate on objects. • The 0.2 miles of closure are in key habitats for a number of Monument objects and could increase habitat availability and connectivity and improve populations at a local level. However the areas that would be closed would decrease the access for administrative purposes and could affect the ability to conduct health and habitat assessments for objects. Impacts from closing these 0.2 miles would be expected to range from negligible to minor based on necessity to access some areas for administrative use.

Alternative C

Alternative C SDNM Route Designation Actions

- Approximately 24.2 miles of road and 358.1 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 15	1.2	0.4	-	15.5(0.7*)	-	0.3	-	-	-
Area 16	-	-	-	6.1(1.3^)	-	7.9	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative C SDNM Route Designation Actions
Areas 15	8000, 8000J, 8002, 8002E 8002H, 8003 8003A, 8003B 8005, 8005A 8005B, 8005D 8005E, 8005F 8005G, 8037 8037F, 8037G	• Within designated routes, 528 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Impacts would be similar to those described in Area 15 for Alternative A, except, impact intensities would decrease to negligible to minor, as only 16.6 miles of open routes would be designated. • Impacts related to habitat improvements from closing 0.3 miles of primitive routes would be similar to those described in Alternative B for Area 15, however administrative access limitations for wildlife purposes would increase compared to Alternative B; therefore, impacts would be minor.

Assumptions		
	8037L, 8037Q 8037R, 8039 8039A, 8039B 8039H, 8039I 8039J, 8039K, 8039L	
Areas 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	● Within designated routes, 186 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Impacts would be similar to those described in Area 16 for Alternative A, except, the 6.1 miles of open routes would allow a greater amount of access to areas of importance for objects and could increase unneeded traffic into some areas that could affect the persistence of some objects. Similar to Alternative B, impacts would be maintained at negligible to moderate levels. ● The closure of 7.9 miles would be similar to those described in Alternative B for Area 16, however administrative access limitations for wildlife purposes would slightly increase compared to Alternative B; therefore, impacts would remain at minor.

Alternative D

Alternative D SDNM Route Designation Actions

- Approximately 24.2 miles of road and 200 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 15	1.2	0.4	-	7.4(0.6*)	0.5	8.1	-	-	-
Area 16	-	-	-	2.6	1.7	11	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative D SDNM Route Designation Actions
Areas 15	8000, 8000J, 8002, 8002E 8002H, 8003 8003A, 8003B 8005, 8005A 8005B, 8005D 8005E, 8005F 8005G, 8037 8037F, 8037G	Within designated routes, 263 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Alternative D would close 8.1miles of route within this area. Closing large areas, with no or limited administrative access to important habitat areas for objects, could create new impacts by eliminating the ability to perform health and habitat assessments as they relate to objects and could result in minor to moderate impacts. Minor to moderate impacts could be related to but not limited to invasive species, water sources not functioning properly, habitat degradation, population die-offs and waste being left on the landscape without access to address the issue. However closing the 8.1 miles to routes could increase habitat availability, habitat connectivity and within the closed route area could increase the population of objects at a local level.

Assumptions		
	8037L, 8037Q 8037R, 8039 8039A, 8039B 8039H, 8039I 8039J, 8039K, 8039L	
Areas 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	Within designated routes, 108 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Impacts would be similar to those described in Area 16 for Alternative A, except, the 2.6 miles of open routes is substantially less compared to any other alternative. However, the limited amount of open routes in this area would concentrate use only within areas that the public can legally access. Concentrated use could cause mortality, degradation of habitat and avoidance of the area by some objects creating minor to moderate impacts. The closure of 11 miles closures would be similar to those described in Alternative B for Area 16, however administrative access limitations for wildlife purposes would increase compared to Alternative B; therefore, impacts would be negligible to moderate.

Alternative E (Preferred Alternative)

Alternative E (Preferred Alternative) SDNM Route Designation Actions

- Approximately 24.2 miles of road and 331 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 15	1.2	0.4	-	15.9(0.6*)	-	-	-	-	-
Area 16	-	-	-	7.1 (1.3^)	-	6.9	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative E (Preferred Alternative) SDNM Route Designation Actions
Areas 15	8000, 8000J, 8002, 8002E 8002H, 8003 8003A, 8003B 8005, 8005A 8005B, 8005D 8005E, 8005F 8005G, 8037 8037F, 8037G	Impacts would be the same as those described under Alternative C for Area 15, except, slightly less miles of routes would be open (15.9 miles) under Alternative E for this area, equating to 461 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat being disturbed. Impacts would still be negligible to minor.

Assumptions		
	8037L, 8037Q 8037R, 8039 8039A, 8039B 8039H, 8039I 8039J, 8039K, 8039L	
Areas 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	Impacts would be the same as those described under Alternative C for Area 16, except, slightly less miles of routes would be open (7.1 miles) under Alternative E for this area, equating to 211 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat being disturbed. Impacts would still be negligible to minor. Impacts from route closures would be the same as Alternative C, except, slightly less miles would be closed to motorized travel (approximately 6.9 miles), under Alternative E. Impacts would remain at minor.

Impacts on Priority Wildlife & Habitat Species Monument Objects from SDNM Livestock Grazing

Alternative A (No Action)

Alternative A (No Action) SDNM Livestock Grazing Action

SDNM Grazing Allotments	
Allotment	**Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)**
Arnold	0
Beloat	776
Bighorn	2,812
Conley	3,403
Hazen	886
Lower Vekol	826

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative A (No Action) SDNM Livestock Grazing Actions
Arnold Allotment	Impacts would be negligible as there are no proposed AUMs in the Arnold Allotment for Alternative A. Interactions between wildlife and livestock would only occur when ephemeral grazing is permitted. Additional waters for both livestock and wildlife would become available when ephemeral use is permitted, pursuant to the Special Ephemeral Rule.
Beloat Allotment	The Beloat Allotment consists of 23,645 acres of Sonora-Mojave Creosotebush-White Bursage Desert Scrub, 10,144 acres of Sonoran Paloverde-Mixed cacti Desert Scrub habitat, and 2,053 acres of Xeroriparian habitat, which are habitats for bighorn sheep and desert tortoise. Maintaining the current level of AUMs within this allotment could result in the loss or reductions in canopy cover within these habitats, which in turn could cause some wildlife to avoid areas that are needed for thermal refuge, nesting and/or foraging. These impacts to Monument objects would generally be negligible to minor in intensity. Range improvement projects would be considered pursuant to 43 CFR 4120-3.
Bighorn Allotment	The Bighorn Allotment consists of 45,330 acres of Sonora-Mojave Creosotebush-White Bursage Desert Scrub, 195 acres of Sonoran-Mojave Mixed Salt Desert Scrub, 46,155 acres of Sonoran Paloverde-Mixed cacti Desert Scrub, and 13,393 acres of Xeroriparian, which are habitats for bighorn sheep, lesser long-nosed bat, and desert tortoise. Impacts would be the same as those described for the Beloat Allotment. Impacts to objects would be expected to range from negligible to minor.

Assumptions	
Conley Allotment	The Conley Allotment consists of 1,668 acres of Sonoran-Mojave Mixed Salt Desert Scrub, 30,427 acres of Sonoran Paloverde-Mixed cacti Desert Scrub, and 1,393 acres of Xeroriparian, which are habitats for bighorn sheep, lesser long-nosed bat, and desert tortoise. Impacts would be the same as those described for the Beloat Allotment. Impacts to objects would be expected to range from negligible to minor.
Hazen Allotment	The Hazen Allotment consists of 17,062 acres of Sonora-Mojave Creosotebush-White Bursage Desert Scrub, 238 acres of Sonoran-Mojave Mixed Salt Desert Scrub, 14,336 acres of Sonoran Paloverde-Mixed cacti Desert Scrub, and 726 acres of Xeroriparian, which are habitats for bighorn sheep, Tucson shovel-nosed snake, and desert tortoise. Impacts would be the same as those described for the Beloat Allotment. Impacts to objects would be expected to range from negligible to minor..
Lower Vekol Allotment	The Lower Vekol Allotment consists of 5,256 acres of Sonora-Mojave Creosotebush-White Bursage Desert Scrub, 114 acres of Sonoran-Mojave Mixed Salt Desert Scrub, 10,285 acres of Sonoran Paloverde-Mixed cacti Desert Scrub, and 197 acres of Xeroriparian, which are habitats for bighorn sheep, Tucson shovel-nosed snake, and lesser long-nosed bat. Impacts would be the same as those described for the Beloat Allotment. Impacts to objects would be expected to range from negligible to minor.

Alternative B

Alternative B SDNM Livestock Grazing Action

SDNM Grazing Allotments	
Allotment	**Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)**
Arnold	0
Beloat	541
Bighorn	2,031
Conley	1,572
Hazen	531
Lower Vekol	646

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative B SDNM Livestock Grazing Actions
Arnold Allotment	Impacts would be negligible and similar to Alternative A.
Beloat Allotment	Impacts are anticipated to be the same as those described under Alternative A for the Beloat Allotment, just to a lesser degree, as AUMs would be decrease by 235. This increase in available forage for wildlife is expected to be negligible to minor. Ungulates such as mule deer and bighorn sheep travelling the corridor between the North Maricopa Mountains Wilderness Area and the Sierra Estrells Wilderness Area could encounter approximately 20 fewer cattle, an impact that is likely negligible to minor.
Bighorn Allotment	Impacts on important vegetation communities and wildlife habitat are anticipated to be the same as those described under Alternative A for the Bighorn Allotment, just to a much lesser degree, as AUMs would be decrease by 781. This increase in available forage is expected to be minor to moderate. On the Bighorn Allotment, approximately 2,974 acres of the creosote bush/ bursage vegetative community were found to be incompatible with livestock grazing. Therefore, under Alternative B, approximately 14 miles of wildlife-friendly fence is proposed to exclude livestock from these areas. Maintenance of water facilities within these exclosures would become the responsibility of State and Federal agencies for the continued benefit of wildlife. The proposed fenceline may impact some ungulate movement along known wildlife corridors in the South Maricopa Mountain Wilderness Area and beyond (see Map 2-2b). However, fencing would adhere to BLM stipulations, with the top and bottom strands smooth wire so as not to restrict wildlife movement. Fencing should have negligible impacts on the Tucson shovel-nosed snake, the lesser long-nosed bat, or the Sonoran desert tortoise. Impacts are expected to be negligible to minor and are to the benefit of wildlife.

Assumptions	
Conley Allotment	On the Conley Allotment, approximately 5,552 acres of various vegetative communities were found to be incompatible with livestock grazing. Under Alternative B, approximately miles of fencing would be needed to prevent further impacts from livestock on this vegetation/habitat. However, no known wildlife corridors would be directly or indirectly impacted by the fencing proposed in this alternative. Additionally, under Alternative B, AUMs would be decreased by 1,831 (or approximately 153 cows yearlong) from Alternative A . The combination of increased forage and habitat availability is expected to offset the impacts from increased fencing. Maintenance of water sources inside the exclosures would become the responsibility of Federal and State agencies for the benefit of wildlife. Impacts are expected to be negligible to minor and are to the benefit of wildlife.
Hazen Allotment	There were no areas of the Hazen Allotment found to be incompatible with Monument objects. However, because of the important wildlife habitat and travel corridors for bighorn sheep in the North Maricopa Mountains Wilderness Area and the Sierra Estrella Wilderness Area, a decrease of 531 AUMs is proposed under this alternative. Impacts are anticipated to be the same as those described under Alternative A for the Hazen Allotment, just to a much lesser degree. No additional fencing is proposed. Impacts to priority wildlife species are expected to be negligible to minor.
Lower Vekol Allotment	Approximately 2 miles (or 7 acres) of Sandy Wash ecological sites were found to be incompatible with livestock grazing on the Lower Vekol Allotment. Impacts are anticipated to be the same as those described under Alternative A for the Lower Vekol Allotment, just to a much lesser degree, as AUMs would be decreased by 180. Impacts are expected to be negligible to minor.

Alternative C

Alternative C SDNM Livestock Grazing Action

SDNM Grazing Allotments	
Allotment	**Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)**
Arnold	0
Beloat	936
Bighorn	2,278
Conley	2,212
Hazen	873
Lower Vekol	793

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative C SDNM Livestock Grazing Actions
Arnold Allotment	Alternative C does not apply to allotments designated as ephemeral only. Impacts would be the same as described for Alternative A.
Beloat Allotment	Impacts are anticipated to be similar tos those described under Alternative B for the Beloat Allotment, just to a lesser degree, as AUMs would be decrease d by 384. Impacts to wildlife from livestock are expected to be negligible to minor.
Bighorn Allotment	Impacts in forage availability are anticipated to be similar to those described under Alternative A for the Bighorn Allotment, just to a much greater degree, as 534AUMs originally allocated for livestock would become available for wildlife. More acres would be fenced off under this alternative than under Alternative B, but because fencing would incorporate existing fences and topographic barriers, only 27 miles of new fenceline is proposed. The topographic barriers (e.g, cliffs, rocky outcrops, gorges) make it difficult for cattle to navigate, but would not affect mule deer or bighorn sheep movement. Water sources within the exclosed areas would become the responsibility of State and Federal agencies. The combination of increased habitat and increase forage would have minor to moderate beneficial impacts to priority wildlife species.
Conley Allotment	Under Alterntative C, nearly half of the Conley Alltoment would be fenced off, using a combination of 18 miles of new fence, as well as existing fences and natural topographic features. Impacts are anticipated to be similar to those described under Alternative B for the Conley Allotment, with an AUM decrease of 1,191. Impacts would be similar to those described for the Bighorn Allotment, Alternative C. Water sources within the exclosed areas would become the responsibility of State and Federal agencies. The combination of increased habitat and increased forage would have minor to moderate beneficial impacts to priority wildlife species.

Assumptions	
Hazen Allotment	Under Alternative C, there would be a decrease of only 13 AUMs (or 1 cow grazing yearlong). Therefore, impacts would be very similar as those described under Alternative A for the Hazen Allotment.
Lower Vekol Allotment	Impacts would be similar to those described for Alternative A and B for the Lower Vekol Valley Allotment except that approximately 3 miles of fence would be built to eliminate impacts of livestock on the xeroriparian vegetative resources found to be incompatible with livestock grazing. This wildlife-friendly fencing is expected to have negligible impacts on priority wildlife species.

Alternative D

Alternative D SDNM Livestock Grazing Action

All allotments currently allocated for livestock grazing would become unavailable for grazing when current permits expire.

Impact Analysis from Alternative D SDNM Livestock Grazing Actions

Implementation of Alternative D would result in the cessation of livestock grazing through the management action to close all currently open grazing allotments. This decision would remove any livestock grazing impacts on the vegetative resources and Monument objects. Approximately 8,703 AUMs of forage would become available to wildlife. However, the expectation is that the impacts on the creosote bush/ bursage communities and the palo-verde-mixed cactus communities from the cessation of grazing would generally be small, and only slightly noticeable changes to vegetative resources would occur. Where the impacts from livestock grazing on vegetation are more noticeable (such as in the xeroriparian areas), the results of removing livestock would be more apparent (i.e. regrowth of heavily utilized vegetation, some reestablishment of vegetation around watering facilities and heavily used livestock trails). During years of increased winter rainfall the fuel load created from the growth of annual species (up to 2000lbs./ acre + air dry weight) would not be subject reduction from livestock grazing, which could result in increased frequency and/or intensity of fire in these non-fire adapted ecosystems. Approximately 130 miles of fenceline throughout the SDNM would be removed after permits expire. The burden of removing fences would fall on State and Federal wildlife managers. Fences along rights-of-way, such as highways, roads, railways, and utility corridors, would remain in place. A total of 14 wildlife catchments are located north of I-8 and would be maintained by Federal and State wildlife managers. In addition a total of 9 corrals, approximately 236 miles of fence would be considered for removal. The removal of the corrals and the fences would assist wildlife's ability to move across the landscape without impediments to objects as related to fencing. Impacts from removing the fences and corrals would be expected to be negligible to moderate depending on the areas of fence to be removed. The burden of maintaining of 1 fenced reservoir, 16 unfenced reservoirs, 4 storage tanks, 2 troughs, 5 wells, 5 miles of pipeline, and 1 windmill would fall on State and Federal wildlife managers. The combination of increased forage availability, fewer fences restricting movement, and no competition with livestock at water sources on the entire Monument would be expected to range from negligible to moderate.

Alternative E (Preferred Alternative)

Alternative E (Preferred Alternative) SDNM Livestock Grazing Action

SDNM Grazing Allotments	
Allotment	**Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)**
Arnold	0
Beloat	552
Bighorn	1,633
Conley	0
Hazen	400
Lower Vekol	529

Site Specific Area (Refer to Map 4-1)	Impact Analysis from Alternative E (Preferred Alternative) SDNM Livestock Grazing Actions
Arnold Allotment	Impacts would be similar to Alternative A. The Arnold Allotment would continue to be considered for ephemeral use pursuant to the Special Ephemeral Rule.
Beloat Allotment	Under Alternative E, there would be a reduction of AUMs from the current 776 to 552 AUMs. Proposed actions and subsequent impacts would be similar to those described under Alternative B for the Beloat Allotment and would benefit wildlife species.

Assumptions	
Big Horn Allotment	Impacts are anticipated to be similar to those described under Alternative B for the Bighorn Allotment, except that AUMs would decrease from the existing 2,812 to 1,633, a reduction of 42% that would become available wildlife forage. Impacts of this alternative are expected to be negligible to minor and to the benefit of wildlife.
Conley Allotment	Under this alternative, the entire portion of the Conley Allotment that falls within the Monument boundaries would become unavailable for grazing. Additionally, rather than the fencing proposed under Alternative B or C, pasture fences within the Monument would be removed, and a fence separating the SDNM and LS portions of the allotment would be considered. Conley's 3,403 AUMs within SDNM would become available forage for wildlife. However, much of the Conley consists of a creosote bush/bursage community; therefore, impacts from this decision would likely not be noticeable for many years. In contrast, the xeroriparian areas, particularly along Waterman Wash, are expected to experience minor to moderate improvements in forage and habitat availability. Impacts are expected to be to the benefit of wildlife species.
Hazen Allotment	Impacts would be similar to those described for Alternative A for the Hazen Allotment, except that 294 AUMs of forage would become available to wildlife. Impacts to wildlife from this difference are expected to be negligible to minor.
Lower Vekol Allotment	Impacts would be the same as those described for Alternative B for the Lower Vekol Valley Allotment, except that 297 AUMs would become available for wildlife. Impacts to wildlife from this difference are expected to be negligible to minor.
Impacts on Priority Wildlife & Habitat Species Monument Objects from SDNM Target Shooting	
Alternative A (No Action)	
Alternative A (No Action) SDNM Target Shooting Management Actions	
• The entire Monument would remain open to recreational target shooting.	
Impact Analysis from Alternative A (No Action) SDNM Target Shooting Actions	
• Retaining target shooting throughout the entire Monument would act to disperse the impacts of recreational target shooting throughout the Monument and, target shooting would continue in areas that are known to be unsuitable for this activity. Due to observed increases in recreational target shooting activity since designation of the SDNM, the BLM would expect to see impacts to Monument objects, to include wildlife, spread over an increasingly larger area of the SDNM as new target shooting sites are established and existing sites grow in extent. Impacts could include but are not limited to the direct loss, mortality or injury of individual animal species and avoidance of traditional habitats while target shooting is taking place. Impacts would be expected to range from negligible to moderate depending on the location and duration of target shooting and impacts to wildlife in the immediate area.	
Alternative B	
Alternative B SDNM Target Shooting Management Actions	
• Under Alternative B, 95,900 acres of the total 486,400 acres of the SDNM would be available for target shooting activities.	
Impact Analysis from Alternative B SDNM Target Shooting Actions	
• Recreational target shooting would be prohibited on approximately 390,500 acres, or 80.3%, of the SDNM determined to be unsuitable for this activity due to a prevalence of Monument objects. Recreational target shooting would continue on approximately 95,900 acres, or 19.7%, of the SDNM where Monument objects are not prevalent. Impacts to wildlife would be expected to decrease as compared to Alternative A. Wildlife would be afforded the opportunity to remain in traditional habitats with relatively few interruptions from human disturbance associated with target shooting. Mortality and harassment form target shooting and human disturbance would be expected to decrease, as compared to Alternative A, as the amount of open areas for target shooting are limited to 19.7% of the Monument. Most mobile wildlife species, would avoid target shooting areas and human interactions to a certain degree. Impacts would be expected to range from negligible to moderate.	
Alternative C	
Alternative C SDNM Target Shooting Management Actions	
• Only sites (totaling less than 1,134 acres) that have been identified as being compatible with Monument objects and do not pose a safety risk to Monument visitors would remain open to target shooting, while the rest of the Monument would be closed to target shooting.	
Impact Analysis from Alternative C SDNM Target Shooting Action	

Assumptions
● Impacts to wildlife would be expected to decrease as compared to Alternative A and B. Wildlife would be afforded the opportunity to remain in traditional habitats with very few interruptions from human disturbance associated with target shooting. Mortality form target shooting and harassment would be expected to dramatically decline, as compared to Alternative A and B, as the amount of open areas are for target shooting are restricted to 0.2% of the Monument. Most mobile wildlife species, would avoid target shooting areas and human interactions to a certain degree. Impacts would be expected to range from negligible to minor.
Alternative D
Alternative D SDNM Target Shooting Management Actions
● The entire Monument would be closed to target shooting.
Impact Analysis from Alternative D SDNM Target Shooting Action
● Impacts would be negligible, as the SDNM would be closed to target shooting.
Alternative E (Preferred Alternative)
Alternative E (Preferred Alternative) SDNM Target Shooting Management Actions
● The entire Monument would be closed to target shooting.
Impact Analysis from Alternative E (Preferred Alternative) SDNM Target Shooting Actions
● Impacts would be negligible, as the SDNM would be closed to target shooting.

4.25.4. IMPLEMENTATION-LEVEL ANALYSIS FOR VEGETATION MONUMENT OBJECTS

Impacts from implementation-level decisions on vegetation Monument objects are presented below in Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931).

Table 4.32. Impacts from Implementation Level Decisions on Vegetation Monument Objects

Monument Objects Managed by Vegetation
● Sand Tank Mountains ● Diversity of Plant and Animal Species ● Saguaro Cactus Forests ● Vegetation Communities: Creosote-Bursage, Desert Grassland, and Washes ● Functioning Desert Ecosystem
Impact Indicators
● Sand Tank Mountains ○ Acres of disturbed paloverde-mixed Cacti Vegetation Community. ● Diversity of Plant and Animal Species ○ Acres of woodland assemblages, paloverde-mixed cacti vegetation communities. ● Saguaro Cactus Forests ○ Acres of disturbed saguaro cacti and nurse plant areas. ● Vegetation Communities: Creosote-Bursage, Desert Grassland, and Washes ○ Acres of creosote-bursage, desert grassland, and wash areas. ● Functioning Desert Ecosystem ○ Acres of disturbed vegetation communities.

SDNM Monument Object Indicators					
	Acres of Potentially Disturbed Vegetation Communities				
	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Area Analyzed	**Route Designations**				
Areas 6, 7, 9, 10, 11, 12, 14, 16, and 17	310	283.3	190.4	89.8	192.5
Areas 1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	259.9	239.8	173.3	126.3	154.7
Areas 5, 7, 11, 12, 16, and 17 (miles in wash)	21.5 miles	21.5 miles	7.4 miles	1.5 miles	1.3 miles
Area 13	0	7.8	725	0	725
Area 16	48	29.6	20.1	7.8	22.8
Allotment Analyzed	**Livestock Grazing**				
Arnold	1,631	1,631	1,631	0	1,631
Beloat	33,797	33,797	33,797	0	33,797
Bighorn	91,687	88,795	74,784	0	88,783
Conley	77,747	71,726	50,448	0	0
Hazen	31,638	31,638	31,638	0	31,638
Lower Vekol	15,663	15,617	14,997	0	15,459
Area Analyzed	**Target Shooting**				
Entire Monument	482,334	69,500	1,134	0	0
* Sites appear to have the characteristics which would make them eligible for the NRHP.					

Assumptions

- All surface-disturbing activities would include mitigation and adaptive management to reduce impacts to priority wildlife and priority species and their habitat.
- In general, vegetative communities are considered to be in good condition but small localized impacted areas may be present

Alternative A (No Action)

Alternative A (No Action) SDNM Route Designation Actions

- No routes would be formally designated under Alternative A, therefore; the existing routes would remain open.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
6, 7, 9, 10, 11, 12, 14, 16, and 17	-	-	-	98.4	-	3.8	34.3	-	-
1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	-	-	-	104.5	-	0.2	34.3	-	-
5, 7, 11, 12, 16, and 17	-	-	-	67.3	-	3.8	-	-	-
13	-	-	-	-	-	4.7	-	-	-
16	-	-	-	8.2	-	0.2	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	*BLM Routes in Site Specific Area (*maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative A (No Action) SDNM Route Designation Actions

Areas: 6, 7, 9, 10, 11, 12, 14, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001G, 8001H, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009C, 8009E, 8009F, 8010, 8011, 8011A, 8011C, 8011D, 8011F, 8011G, 8012, 8013, 8013A, 8014, 8014A, 8015, 8015A, 8015B, 8015C, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8026, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037O, 8037P, 8038B, 8038E, 8039, 8039K, 8039C, 8039D, 8039M, 8043, 8044, 8045, 8046	These areas represent the paloverde-mixed cacti, saguaro cactus forest and the woodland communities. Approximately 310 acres of the 303,300 acres of this community would be potentially disturbed by designated open routes in these areas. The direct loss of individual plants and saguaros and potential increased soil erosion in areas surrounding the routes, resulting from soil compaction on the routes, could lead to conditions that do not support a functioning and healthy community. In addition there could be an increase in potential for the spread of noxious/invasive weeds from vehicle traffic. Impacts would be expected to be negligible due to the small acreage impacted and that the paloverde-mixed cacti community generally consists of rocky, shallow soils that are well armored with gravels and rock or exposed bedrock. This results in less susceptibility to impacts from vehicle use. The majority of these acres within this community, which includes the largest portion of the saguaro cactus forest, are additionally protected within existing wilderness areas which has few routes.
Areas: 1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000J, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000V, 8000W, 8000X, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8002E,	These areas represent the creosote bush-bursage community. Approximately 259.9 acres of the 179,600 acres of this community would be potentially disturbed by designated open routes in these areas. This community is the most susceptible to impacts from vehicle use due to the more erosive nature of the soils. Impacts would generally be negligible, but could reach minor or moderate if route proliferation leads to direct loss of vegetation and conditions leading to severe erosion particularly during wet periods when the roads are difficult to travel. Impacts can be minimized in this community by road closures, route limitations or stabilization of routes. The direct loss of individual plants and potential increased soil erosion in areas surrounding the routes, resulting from soil compaction on the routes, could lead to conditions that do not support a functioning and healthy community. In addition there could be an increase in potential for the spread of noxious/invasive weeds from vehicle traffic.

	8002G, 8002H, 8003, 8003A, 8003B, 8004, 8004E, 8004F, 8004H, 8005, 8005A, 8005B, 8005C, 8005D, 8005E, 8005F, 8005H, 8005I, 8006H, 8006I, 8007C, 8007K, 8008, 8008C, 8008K, 8009K, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8018, 8019, 8021, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037L, 8037O, 8037P, 8037Q, 8037R, 8038B, 8038E, 8039, 8039A, 8039B, 8039C, 8039D, 8039H, 8039I, 8039J, 8039K, 8039L, 8039M	
Areas: 5, 7, 11, 12, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007C, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009F, 8011, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8039C, 8039D, 8039M	These areas represent the desert wash community 21.5 miles of the 970 total miles of the desert wash community would be potentially disturbed by designated open routes in these areas. This community is susceptible to impacts from vehicle use due to the direct loss of vegetation, channel alteration and/or bank alteration. In most cases the vegetated bank soils are associated with the creosote bush-bursage community and are more susceptible to erosion. Impacts would generally be negligible, but could reach minor if route proliferation leads to additional loss of vegetation and severe erosion along the banks and vegetated channel sand bars in the larger braided washes. Impacts can be minimized in this community by road closures or route limitations.
Area 13	8007, 8007E, 8007G	Under Alternative A, no miles of routes within Area 13 are designated as “open” to motorized vehicles; therefore, there would be no impacts. This area represents the desert grassland community.

Area 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	This area represents the Sand Tank Mountains. Approximately 48 acres of the area would be potentially disturbed by designated open routes. Several vegetation communities are located within the Sand Tank Mountains area (paloverde-mixed cacti community and saguaro cactus forest, creosotebush-bursage and desert washes). The potential impacts to these communities are due to the direct loss of vegetation, channel alteration and/or bank alteration. Impacts would generally be negligible, but could reach minor or moderate if route proliferation leads to additional loss of vegetation and severe erosion. Impacts can be minimized in this community by road closures or route limitations.

Alternative B

Alternative B SDNM Route Designation Actions

- Approximately 24.2 miles of road and 494.4 miles of primitive road would be open to motorized vehicles. An additional 4.2 miles of road would be constructed and opened to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Clo-sed	Op-en	Admin Only	Closed	Open	Admin Only	Closed
6, 7, 9, 10, 11, 12, 14, 16, and 17	6.6	-	-	94.7	-	0.8	34.3	-	-
1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	7.0	0.4	-	93.9 (3.1 *)	-	0.2	34.3 (1.4*)	-	-
5, 7, 11, 12, 16, and 17	3.5	-	-	67.6	-	-	-	-	-
13	-	-	-	4.7	-	-	-	-	-
16	-	-	-	8.4	-	-	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative B SDNM Route Designation Actions
Areas: 6, 7, 9, 10, 11, 12, 14, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001G, 8001H, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009C, 8009E, 8009F, 8010, 8011, 8011A, 8011C, 8011D, 8011F, 8011G,	Approximately 283.3 acres of the paloverde-mixed cacti community and saguaro cactus forest would be potentially disturbed by designated open routes in these areas. The impacts would be the same intensity as Alternative A for these areas, negligible, however slightly minimized with 26.7 fewer acres impacted due to road closures.

	8012, 8013, 8013A, 8014, 8014A, 8015, 8015A, 8015B, 8015C, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8026, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037O, 8037P, 8038B, 8038E, 8039, 8039K, 8039C, 8039D, 8039M, 8043, 8044, 8045, 8046	
Areas: 1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000J, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000V, 8000W, 8000X, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8002E, 8002G, 8002H, 8003, 8003A, 8003B, 8004, 8004E, 8004F, 8004H, 8005, 8005A, 8005B, 8005C, 8005D, 8005E, 8005F, 8005H, 8005I, 8006H, 8006I, 8007C, 8007K, 8008, 8008C, 8008K, 8009K, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8018, 8019, 8021, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037L,	Approximately 239.8 acres of this community would be potentially disturbed by designated open and administrative use only routes in these areas. Impacts would be negligible and similar to Alternative A, but could increase if route proliferation occurs.

	8037O, 8037P, 8037Q, 8037R, 8038B, 8038E, 8039, 8039A, 8039B, 8039C, 8039D, 8039H, 8039I, 8039J, 8039K, 8039L, 8039M	
Areas: 5, 7, 11, 12, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007C, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009F, 8011, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8039C, 8039D, 8039M	Impacts would generally be negligible, and the same as Alternative A
Area 13	8007, 8007E, 8007G	7.8 acres of the grassland community would be potentially disturbed by designated open routes in the Vekol Valley Grassland ACEC. This community is susceptible to impacts from vehicle use due to the more erosive nature of the soil. Impacts from routes would be the direct loss of individual plants and potential increased soil erosion in areas surrounding the routes, leading to conditions that do not support a functioning and healthy vegetation community. Impacts would generally be minor, but could reach moderate if mitigation of routes does not occur resulting in conditions leading to severe erosion. Impacts can be minimized in this community by road closures, route limitations or stabilization of routes which would minimize the level of impact to vegetation. This would result in improved conditions for these sites to reclaim and revegetate.
Area 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	Approximately 29.6 acres of the area would be potentially disturbed by designated open routes. Impacts would be the same as those described under Alternative A and generally would be negligible.
Alternative C		
Alternative C SDNM Route Designation Actions		

- Approximately 24.2 miles of road and 358.1 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
6, 7, 9, 10, 11, 12, 14, 16, and 17	6.6	-	-	55.7 (31.3 ^)	-	8.5	34.3	-	-
1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	7.0	0.4	-	67.3 (6.7*) (17.7 ^)	-	5.4	34.3 (1.4*)	-	-
5, 7, 11, 12, 16, and 17	3.5	-	-	33.0 (31.3 ^)	-	3.3	-	-	-
13	-	-	-	-	4.7	-	-	-	-
16	-	-	-	6.1 (1.3^)	-	0.9	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative C SDNM Route Designation Actions
Areas: 6, 7, 9, 10, 11, 12, 14, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001G, 8001H, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009C, 8009E, 8009F, 8010, 8011, 8011A, 8011C, 8011D, 8011F, 8011G, 8012, 8013, 8013A, 8014, 8014A, 8015, 8015A, 8015B, 8015C, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8026, 8037, 8037A, 8037B, 8037C, 8037E,	The impacts would be the same intensity as Alternative B for these areas, negligible, however minimized with 92.9 fewer acres impacted due to road closures.

	8037F, 8037G, 8037H, 8037K, 8037O, 8037P, 8038B, 8038E, 8039, 8039K, 8039C, 8039D, 8039M, 8043, 8044, 8045, 8046	
Areas: 1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000J, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000V, 8000W, 8000X, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8002E, 8002G, 8002H, 8003, 8003A, 8003B, 8004, 8004E, 8004F, 8004H, 8005, 8005A, 8005B, 8005C, 8005D, 8005E, 8005F, 8005H, 8005I, 8006H, 8006I, 8007C, 8007K, 8008, 8008C, 8008K, 8009K, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8018, 8019, 8021, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037L, 8037O, 8037P, 8037Q, 8037R, 8038B, 8038E, 8039, 8039A, 8039B, 8039C, 8039D, 8039H, 8039I, 8039J, 8039K, 8039L, 8039M	The impacts would be the same intensity as Alternative B for these areas, negligible, however minimized with 66.5 fewer acres impacted due to road closures.

Areas: 5, 7, 11, 12, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007C, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009F, 8011, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8039C, 8039D, 8039M	Impacts would generally be the same as those described under Alternative A, just substantially decreased, as only 7.4 miles of routes would be open in wash areas. Impacts would be negligible.
Area 13	8007, 8007E, 8007G	Impacts from routes could potentially be the same as Alternative A, although somewhat reduced since public use would not be allowed. Impacts would likely be negligible.
Area 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	Impacts would be the same as those described under Alternative A, just substantially decreased. Impacts would be negligible.

Alternative D

Alternative D SDNM Route Designation Actions

- Approximately 24.2 miles of road and 200 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
6, 7, 9, 10, 11, 12, 14, 16, and 17	6.6	-	-	22.5 (1.8*)	6.1	65.2	-	-	-
1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	7.0	0.4	-	37.2 (8.4*)	7.3	44.2	34.3 (1.4 *)	-	-
5, 7, 11, 12, 16, and 17	3.5	-	-	11.0 (1.7*)	0.3	50.1	-	-	-
13	-	-	-	-	-	4.7	-	-	-
16	-	-	-	2.6	1.7	4.1	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative D SDNM Route Designation Actions

Areas: 6, 7, 9, 10, 11, 12, 14, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001G, 8001H, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009C, 8009E, 8009F, 8010, 8011, 8011A, 8011C, 8011D, 8011F, 8011G, 8012, 8013, 8013A, 8014, 8014A, 8015, 8015A, 8015B, 8015C, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8026, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037O, 8037P, 8038B, 8038E, 8039, 8039K, 8039C, 8039D, 8039M, 8043, 8044, 8045, 8046	The impacts would be the same as Alternative C for these areas, negligible, however minimized with 100.6 fewer acres impacted due to road closures.
Areas: 1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000J, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000V, 8000W, 8000X, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8002E,	The impacts would be the same intensity as Alternative C for these areas, negligible, however minimized with 47 fewer acres impacted due to road closures.

	8002G, 8002H, 8003, 8003A, 8003B, 8004, 8004E, 8004F, 8004H, 8005, 8005A, 8005B, 8005C, 8005D, 8005E, 8005F, 8005H, 8005I, 8006H, 8006I, 8007C, 8007K, 8008, 8008C, 8008K, 8009K, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8018, 8019, 8021, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037L, 8037O, 8037P, 8037Q, 8037R, 8038B, 8038E, 8039, 8039A, 8039B, 8039C, 8039D, 8039H, 8039I, 8039J, 8039K, 8039L, 8039M	
Areas: 5, 7, 11, 12, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007C, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009F, 8011, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8039C, 8039D, 8039M	Impacts would generally be the same as those described under Alternative A, just substantially decreased, as only 1.5 miles of routes would be open in wash areas. Impacts would be negligible.
13	8007, 8007E, 8007G	Impacts are the same as those described under Alternative A.

Area 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	Impacts would be the same as those described under Alternative A, just substantially decreased by 12.3 acres of disturbance. Impacts would be negligible.

Alternative E (Preferred Alternative)

Alternative E (Preferred Alternative) SDNM Route Designation Actions

- Approximately 24.2 miles of road and 331 miles of primitive road would be open to motorized vehicles. Approximately 37 miles of trail would be allocated as open to nonmotorized and non-mechanical vehicles.

SDNM Route Designations									
Area Analyzed	Roads			Primitive Roads			Trails		
	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
6, 7, 9, 10, 11, 12, 14, 16, and 17	6.6	-	-	63.9 (31.3^)	0.3	-	34.3	-	-
1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	7.0	0.4	-	72.5 (6.7*) (17.7^)	0.3	-	34.3 (1.4*)	-	-
5, 7, 11, 12, 16, and 17	3.5	-	-	35.9 (31.3^)	0.3	-	-	-	-
13	-	-	-	4.7	-	-	-	-	-
16	-	-	-	7.1 (7.1^)	-	-	-	-	-
*Open to nonmotorized use only, **Limited to 50 feet, ^ Seasonally Closed									

Site Specific Area (Refer to Map 4-1)	BLM Routes in Site Specific Area (maps only available on CD version of DLUP – EIS)	Impact Analysis from Alternative E (Preferred Alternative) SDNM Route Designation Actions
Areas: 6, 7, 9, 10, 11, 12, 14, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001G, 8001H, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007, 8007A, 8007B, 8007C, 8007D, 8007F, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009C, 8009E, 8009F, 8010, 8011, 8011A, 8011C, 8011D, 8011F, 8011G, 8012, 8013, 8013A, 8014, 8014A, 8015, 8015A, 8015B, 8015C, 8016, 8016A, 8016B, 8016D, 8017, 8018,	The impacts would be the same as Alternative C for these areas.

	8019, 8021, 8026, 8026B, 8026, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037O, 8037P, 8038B, 8038E, 8039, 8039K, 8039C, 8039D, 8039M, 8043, 8044, 8045, 8046	
Areas: 1, 3, 4, 5, 6, 12, 14, 15, 16, and 17	8000, 8000A, 8000B, 8000C, 8000D, 8000E, 8000F, 8000G, 8000J, 8000I, 8000K, 8000L, 8000M, 8000N, 8000O, 8000P, 8000Q, 8000R, 8000S, 8000T, 8000U, 8000V, 8000W, 8000X, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8002E, 8002G, 8002H, 8003, 8003A, 8003B, 8004, 8004E, 8004F, 8004H, 8005, 8005A, 8005B, 8005C, 8005D, 8005E, 8005F, 8005H, 8005I, 8006H, 8006I, 8007C, 8007K, 8008, 8008C, 8008K, 8009K, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8018, 8019, 8021, 8037, 8037A, 8037B, 8037C, 8037E, 8037F, 8037G, 8037H, 8037K, 8037L, 8037O, 8037P, 8037Q, 8037R, 8038B, 8038E, 8039, 8039A, 8039B, 8039C, 8039D, 8039H,	The impacts would be the same intensity as Alternative C for these areas, negligible, however minimized with 18.6 fewer acres impacted due to road closures.

	8039I, 8039J, 8039K, 8039L, 8039M	
Areas: 5, 7, 11, 12, 16, and 17	8000V, 8000W, 8000Y, 8001, 8001A, 8001B, 8001C, 8001D, 8001E, 8001F, 8001G, 8001H, 8001I, 8001J, 8002, 8002B, 8002C, 8002D, 8003, 8004, 8004F, 8006H, 8006I, 8007C, 8007K, 8008, 8008B, 8008C, 8008D, 8008E, 8008F, 8008H, 8008I, 8008K, 8009F, 8011, 8012, 8013, 8013A, 8014, 8014A, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8039C, 8039D, 8039M	Impacts would be the same as Alternative D.
Area 13	8007, 8007E, 8007G	Impacts would be the same as Alternative C.
Area 16	8008, 8008C, 8008K, 8013, 8013A, 8014, 8014A, 8016, 8016D, 8021	Impacts would be the same as those described under Alternative A, just substantially decreased by 25.2 acres of disturbance. Impacts would be negligible.

Impacts on Vegetation Monument Objects from SDNM Livestock Grazing

- Impacts on vegetation Monument objects from SDNM livestock grazing AUM allocations would be the same as those described under Impacts from Implementation Level Decisions on Vegetation Monument Objects (p. 931) from Livestock Grazing, because the actions that address wildlife habitat likewise address vegetation characteristics and impacts from livestock grazing as well.

Impacts on Vegetation Monument Objects from SDNM Target Shooting

Alternative A (No Action)

Alternative A (No Action) SDNM Target Shooting Management Actions

- The entire Monument would remain open to recreational target shooting.

- **Impact Analysis from Alternative A (No Action) SDNM Target Shooting Actions**

- Target shooting primarily occurs within the Creosote Bush–Bursage community and to a lesser extent the Palo Verde-Mixed Cacti community (including the Saguaro Cactus Forests) and the Desert Washes within those communities. The majority of the acres within the Palo Verde-Mixed Cacti community, which includes the largest portion of the saguaro cactus forest, are generally protected within existing wilderness areas and larger tracts of roadless areas due to steeper rocky terrain. Impacts from target shooting would be expected to be minor.

Alternative B

Alternative B SDNM Target Shooting Management Actions

- Under Alternative B, 95,900 acres of the total 486,400 acres of the SDNM would be available for target shooting activities.

Impact Analysis from Alternative B SDNM Target Shooting Actions

● Impacts would be the same as described under Alternative A, except at a lesser extent, as 80.3% of the Monument would be closed to target shooting. Limiting target shooting to designated sites, which primarily occur within the Creosote Bush–Bursage, Desert Grassland and the Desert Washes within those areas, could limit potential direct loss of vegetation and allow for continued vegetative diversity and a functioning desert ecosystem. Areas excluded from shooting include the Sand Tank Mountains, the Palo Verde-Mixed Cacti community (including the Saguaro Cactus Forests) and the majority of the Desert Washes within the Monument. Impacts to vegetation would be expected to decrease as compared to Alternative A. Impacts from target shooting would be expected to range from negligible to minor.
Alternative C
Alternative C SDNM Target Shooting Management Actions
● Only sites (totaling less than 1,134 acres) that have been identified as being compatible with Monument objects and do not pose a safety risk to Monument visitors would remain open to target shooting, while the rest of the Monument would be closed to target shooring.
Impact Analysis from Alternative C SDNM Target Shooting Action
● Impacts would be the same as described under Alternative A and B, except at a much lesser extent, as 99.8% of the Monument would be closed to target shooting. Limiting target shooting to designated sites, which only occurs within the Creosote Bush–Bursage and the Desert Washes within those areas, could limit potential direct loss of vegetation and allow for continued vegetative diversity and a functioning desert ecosystem. Areas excluded from shooting include the Sand Tank Mountains, the Desert Grassland, the Palo Verde-Mixed Cacti community (including the Saguaro Cactus Forests) and the majority of the Desert Washes within the Monument. Impacts to vegetation would be expected to decrease as compared to Alternative A and B. Impacts on vegetation would be expected to be negligible.
Alternative D
Alternative D SDNM Target Shooting Management Actions
● The entire Monument would be closed to target shooting.
Impact Analysis from Alternative D SDNM Target Shooting Action
● Impacts would be negligible, as the SDNM would be closed to target shooting.
Alternative E (Preferred Alternative)
Alternative E (Preferred Alternative) SDNM Target Shooting Management Actions
● The entire Monument would be closed to target shooting.
Impact Analysis from Alternative E (Preferred Alternative) SDNM Target Shooting Actions
● Impacts would be negligible, as the SDNM would be closed to target shooting.

Glossary

ABIOTIC:
The nonliving, material (as opposed to conceptual) components of the environment, such as air, rocks, soil, water, coal, peat, and plant litter. See **BIOTIC (p. 951)**.

ACCELERATED EROSION:
Soil loss above natural levels resulting directly from human activities. Because of the slow rate of soil formation, accelerated erosion can permanently reduce plant productivity.

ACQUIRED PUBLIC LANDS:
Lands in Federal ownership that the Government obtained as a gift or by purchase, exchange, or condemnation. See **PUBLIC LANDS (p. 977)**

ACTIVE MANAGEMENT AREAS:
Five areas in Arizona (i.e. Prescott, Phoenix, Pinal, Santa Cruz, and Tucson) where the Arizona Department of Water Resources regulates groundwater use. Groundwater regulations stem from the 1980 Arizona Groundwater Management Code, which provides the management framework to ensure dependable water supplies for Arizona well into the future. Ensuring dependable supplies, the code places conservation requirements on municipal and agricultural water use and promotes the use of renewable supplies, such as Colorado River water delivered by the Central Arizona Project.

ACTIVE MINING CLAIM:
A parcel of Federal land, valuable for a mineral deposit or deposits. A claim is a parcel for which one has asserted a right of possession. The right is restricted to extracting and developing a mineral deposit. The rights granted by a mining claim are valid against a challenge by the United States and other claimants only after the discovery of a valuable mineral deposit. There are two types of mining claims: lode and placer. Since October 5, 1992, only claimants who have a legal interest in ten or fewer mining claims nationwide and who also meet other requirements, may perform assessment work and file evidence of assessment. All other claimants must pay an annual fee of $125 per claim to BLM or file for a waiver from payment by August 31. Failure to file by August 31 requires BLM to declare the claim or site null and void by operation of law.

ACTIVE USE:
The current authorized use, including livestock grazing and conservation use. Active use may constitute a portion of or all permitted use. Active use does not include temporary nonuse or suspended use of forage within all or a portion of an allotment.

ACTIVITY PLAN:
A detailed and specific plan for managing a single resource program or plan element undertaken as needed to implement the more general resource management plan decisions. An activity plan is prepared for specific areas to reach specific resource management objectives within stated timeframes. (See **STATE IMPLEMENTATION PLAN (SIP) (p. 989)**.) An activity plan usually describes multiple projects and applies best management practices to meet resource-management plan objectives. Examples of activity plans include interdisciplinary management plans, habitat management plans, recreation area management plans, and allotment management plans.

ACTUAL USE:
Describes how many and what kind of livestock graze, as well as where they graze, on an allotment or on a portion or pasture of an allotment.

ADJUDICATION:
Refers to a judicial process whereby water rights are determined or decreed by a court of law.

AGGREGATE (adj.):
Constituting or amounting to the whole and complete Alternative resource prescriptions effects, not just the individual resource effect. The total aggregate effect of an Alternative in the RMP considers every resource prescriptions' effect on an individual resource.

AGGREGATE (n.):
Any combination of sand, gravel, and crushed stone in its natural or processed state.

AIR QUALITY RATING:
See **CLASS I AIR QUALITY RATING (p. 953)** and **CLASS II AIR QUALITY RATING (p. 953)**.

AIRSHED:
An area that shares the same air because of topography, meteorology, and climate; the atmospheric zone potentially influenced by air pollutants from various sources.

ALLOTMENT:
An area of land designated and managed for the grazing of livestock where one or more operators are authorized to graze their livestock. An allotment generally consists of Federal rangelands but may include intermingled parcels of private, State, or Federal lands. The BLM stipulates the number of livestock and season of use for each allotment.

ALLOTMENT MANAGEMENT PLAN (AMP):
A livestock grazing management plan dealing with a specific unit of rangeland and based on multiple use resource management objectives. The AMP considers livestock grazing in relation to other uses of rangelands and in relation to renewable resources-watershed, vegetation, and wildlife. An AMP establishes the seasons of use, the number of livestock to be permitted on rangelands, and the rangeland improvements needed.

ALLUVIAL FAN:
A low, outspread, relatively flat to gently sloping mass of sediment, shaped like an open fan and deposited by a stream where it flows from a narrow mountain valley onto a plain or broad valley.

ALLUVIUM:
Any sediment deposited by flowing water as in a riverbed, floodplain, or delta.

ANALYSIS OF THE MANAGEMENT SITUATION (AMS):
Step 4 in BLM's resource management planning process. An AMS describes a planning area's current public land management and suggests opportunities to better manage this land.

ANIMAL UNIT:
One mature (1,000 pound) cow or the equivalent based upon an average daily forage consumption of 26 pounds of dry matter per day.

ANIMAL UNIT MONTH (AUM):
The amount of forage needed to sustain one cow, five sheep, or five goats for one month.

ANNUAL PLANT:
A plant that completes its life cycle and dies in 1 year or less. Also see **PERENNIAL PLANT (p. 974)**.

APPROPRIATE MANAGEMENT LEVEL (AML):
The number of adult horses or burros (expressed as a range with an upper and lower limit) to be managed within an HMA. Forage for wild horses and burros (AUMs) is allocated based on the AML upper limit. Excess Animals – Wild, free-roaming horses or burros which have been removed or which must be removed from in order to preserve and maintain a thriving natural ecological balance and multiple-use relationship in an area.

AQUATIC HABITATS (COMPONENTS):
Habitats confined to streams, rivers, springs, lakes, ponds, reservoirs, and other water bodies.

AQUIFER:
A water-bearing bed or layer of permeable rock, sand, or gravel capable of yielding large amounts of water.

AQUIFER RECHARGE:
Adding water to an aquifer, a process that occurs naturally from the infiltration of rainfall and from water flowing over earth materials that allow it to infiltrate below the land surface.

ARCHAEOLOGICAL FEATURE:
A nonportable object, not recoverable from its matrix (usually in an archeological site) without destroying its integrity. Examples are rock paintings, hearths, post holes, floors, and walls.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC):
A designated area on public lands where special management attention is required- (1) to protect and prevent irreparable damage to fish and wildlife; (2) to protect important historic, cultural, or scenic values, or other natural systems or processes; or (3) to protect life and safety from natural hazards.

ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION:
Standards and guidelines developed collaboratively by BLM and the Arizona Resource Advisory Council (RAC) to address the minimum requirements of the Department of the Interior's final rule for Grazing Administration, effective Aug. 21, 1995.

AUTHORIZED OFFICER:
Any employee of the BLM who has been delegated the authority to perform duties related to public lands, public purposes, conveyances, hazardous substances, and solid wastes.

AZSITE DATABASE:
A computer database containing cultural site information managed by the State Historic Preservation Office and maintained by Northern Arizona University and Arizona State University.

BACK COUNTRY SETTING:
Areas with undeveloped, primitive, and self-directed visitor experience without provisions for motorized or mechanized access, except for identified routes.

BAJADA:
A broad continuous slope extending along and from the base of a mountain range and formed by coalescing alluvial fans.

BASE FLOW (DISCHARGE):
The portion of stream discharge derived from such natural storage sources as groundwater, large lakes, and swamps but not derived from direct runoff or flow from stream regulation, water diversion, or other human activities.

BASE HERD:
The constant livestock herd size that is continually licensed but may not be the same as the grazing (carrying) capacity. Also see **GRAZING CAPACITY (CARRYING CAPACITY) (p. 963)**.

BASE METAL:
A metal inferior in value to gold and silver; a term generally applied to the commercial metals such as copper and lead.

BASE PROPERTY:
1) Land that has the capability to produce crops or forage that can be used to support authorized livestock for a specified period of the year, or 2) water that is suitable for consumption by livestock and is available and accessible to the authorized livestock when the public lands are used for livestock grazing.

BASIN:
A broad, structural lowland between mountain ranges, commonly elongated and many miles across.

BENEFIT (RECREATION/SOCIETAL):
A benefit is defined as an improved condition or the prevention of a worse condition. Benefits of leisure and recreation engagements can be realized by individuals (e.g., improved physical and psychological well-being), groups of individuals (strengthened bonds among family and friends), communities (economic gain from tourism), society (the cumulative effects of individual and group benefits), and the environment (a result of a stronger environmental ethic among individuals).

BENEFITS-BASED MANAGEMENT (RECREATION/SOCIETAL):
Benefits-based management is an approach to park and recreation management that focuses on the positive outcomes of engaging in recreational experiences.

BIG GAME:
Large species of wildlife that are hunted, such as elk, deer, bighorn sheep, and pronghorn antelope.

BIGHORN SHEEP HABITAT:
Area is open to non-vehicular traffic year around (e.g., hiking, biking, and equestrian). Restrictions vary by location and are listed in RMP. Typically, roads are closed during lambing season (January 1–June 30).

BIOLOGICAL ASSESSMENT:
Information prepared by or under the direction of a Federal agency to determine whether a proposed action is likely to (1) harm threatened or endangered species or designated critical habitat, (2) jeopardize the existence of species that are proposed for listing, or (3) adversely modify proposed critical habitat. Biological assessments must be prepared for major construction activities. The outcome of a biological assessment determines whether formal Section 7 consultation or a conference is needed. Also see **BIOLOGICAL OPINION (p. 951)**.

BIOLOGICAL DIVERSITY (BIODIVERSITY):
The full range of variability within and among living organisms and the ecological complexes in which they occur. Biological diversity encompasses ecosystem or community diversity, species diversity, and genetic diversity.

BIOLOGICAL EVALUATION:
The gathering and evaluation of information on proposed endangered and threatened species and critical and proposed critical habitat for actions that do not require a biological assessment. Also see **BIOLOGICAL ASSESSMENT (p. 951)**.

BIOLOGICAL OPINION:
A document that includes the following- (1) the opinion of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service as to whether a Federal action is likely to jeopardize the existence of a species listed as threatened or endangered or destroy or adversely modify designated critical habitat, (2) a summary of the information on which the opinion is based, and (3) a detailed discussion of the effects of the action on listed species or designated critical habitat.

BIOLOGICAL VEGETATION TREATMENT:
Methods of vegetation treatment that employ living organisms to selectively suppress, inhibit, or control herbaceous and woody vegetation. Examples of such methods include insects; pathogens; and grazing by cattle, sheep, or goats.

BIOMASS:
The total amount of living matter in a given unit of the environment.

BIOTIC:
Pertaining to life or living; the living components of the environment. Also see **ABIOTIC (p. 947)**.

BIRDS OF CONSERVATION CONCERN:
As listed by the U.S. Fish and Wildlife Service, birds (other than threatened or endangered species) that are in greatest need of conservation action and without such action might become listed as threatened or endangered.

BOSQUE:
A woodland dominated by trees more than 15 feet tall.

BRAIDING:
A pattern of an interlacing or tangled network of several branching and reuniting stream channels separated by branch islands or channel bars.

BROOD PARASITISM:
The exploitation by one bird species of the parental behavior of another species. A nest parasite lays eggs in the nest of another bird species to be cared for by a host. The parasite benefits from saving time, energy, and survival prospects, whereas the host may suffer partial or complete loss of its own current reproduction.

BROWSE:
The part of leaf and twig growth of shrubs, woody vines, and trees available for animal consumption.

BUREAU (BLM) SENSITIVE SPECIES:
All species that are under status review, have small or declining populations, live in unique habitats, or need special management to reduce the likelihood and need for future listing under the ESA.

BACK COUNTRY BYWAY:
A component of the national scenic byway system which focuses primarily on corridors along back country roads which have high scenic, historic, archeological, or other public interest values. The road may vary from a single track bike trail to a low speed, paved road that traverses back country areas. (BLM Handbook H-8357-1, B 2)

CANAMEX:
Canada to Mexico highway authorized through the North American Free Trade Agreement of 1994, designed to facilitate trade between Mexico, Canada, and the US.

CANCELLED/CANCELLATION:
A permanent termination of a grazing permit, grazing lease, grazing preference, free-use grazing permit, or other grazing authorization in whole or in part.

CANDIDATE SPECIES:
Species not protected under the Endangered Species Act, but being considered by the U.S. Fish and Wildlife Service for inclusion on the list of federally threatened and endangered species.

CANOPY:
The cover or leaves of branches formed by the tops or crowns of plants as viewed from above the cover measured by the vertical projection downward of the extent of the cover and expressed as a percentage of the ground so covered.

CARRYING CAPACITY (RECREATION):
The amount of recreation use a given resource can sustain before the resource's quality begins to irreversibly deteriorate.

CARRYING CAPACITY (WILDLIFE):
The most animals a specific habitat or area can support without causing deterioration or degradation of that habitat. Also see **GRAZING CAPACITY (CARRYING CAPACITY) (p. 963)**.

CASUAL USE (MINING):
Mining that only negligibly disturbs Federal lands and resources and does not include the use of mechanized earth moving equipment or explosives or motorized equipment in areas closed to off-highway vehicles. Casual use generally includes panning, non-motorized sluicing, and collecting mineral specimens using hand tools.

CASUAL USE (RECREATION):
Non-commercial or non-organized group or individual activities on public land that do the following: Comply with land use decisions and designations (i.e. special area designations), do not award cash prizes; are not publicly advertised; pose minimal risk for damage to public land or related water resources; and generally require no monitoring. If the use goes beyond those conditions, the activity should be treated as any other organized recreational group or competitive activity or event for which BLM would require the event organizer to obtain a special recreation permit (SRP).

CASUAL USE OF MINERAL MATERIALS:
Extracting mineral materials for limited personal (noncommercial) uses.

CATEGORICAL EXCLUSION:
A category of actions (identified in agency guidance) that do not individually or cumulatively have a significant effect on the human environment and for which neither an environmental assessment nor an EIS is required (40 CFR 1508.4).

CATTLE GUARD:
A device placed in a road, usually a grate or series of metal bars placed perpendicular to the flow of traffic, which allows free passage of vehicles but which livestock will not cross.

CHANNEL:
A natural or artificial watercourse with a definite bed and banks to confine and conduct continuously or periodically flowing water.

CHANNELIZATION:
The process of rebuilding the natural course of a stream to make it flow into a restricted path.

CHANNEL MORPHOLOGY:
Relating to the form and structure of channels.

CHARCO (DIRT CHARCO):
A slight depression on the ground that holds water after a rain (from the Spanish word for "puddle"). In general, charcos are smaller than stock tanks or dirt tanks.

CHEMICAL VEGETATION TREATMENTS:
The applying of chemicals to control unwanted vegetation.

CLASS I AIR QUALITY RATING:
Under the Clean Air Act, the rating given areas of the country selected to receive the most stringent degree of air quality protection.

CLASS II AIR QUALITY RATING:
Under the Clean Air Act, the rating given areas of the country selected for somewhat less stringent protection from air pollution damage than Class I areas, except in specified cases.

COLLUVIUM:
Any loose, heterogeneous and incoherent mass of soil and/or rock fragments moved down slope by gravity-driven processes (like creep or sheet wash) and deposited at the base of the slope or hillside.

COMMUNICATION FACILITY:
A building and/or tower, or other physical improvement that is built, installed, or established to house and support authorized communications uses.

COMMUNICATION SITE:
An area of Public Land or National Forest System lands designated for communications use through the land and resource management planning process.

COMMUNITY:
A collective term used to describe an assemblage of organisms living together; an association of living organisms having mutual relationships among themselves and with their environment and thus functioning at least to some degree as an ecological unit.

COMMUNITY INTERFACE:
Community Interface represents public lands bordering or surrounded by communities and their associated urban infrastructure. This setting will also include lands projected to be influenced by the increasing urbanization of the planning area over the next 15 to 20 years. The setting can be natural in appearance, but the landscape is subject to change from intensive recreation activities and other land use authorizations.

COMMUNITY RECREATION-TOURISM MARKET:
A community or communities dependent on public lands recreation and/or related tourism use, growth, and/or development. Major investments in facilities and visitor assistance are authorized within SRMAs where BLM's strategy is to target demonstrated community recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand for specific activity, experience, and benefit opportunities. These opportunities are produced through maintenance of prescribed natural resource and/or community setting character and by structuring and implementing management, marketing, monitoring, and administrative actions accordingly.

COMPETITIVE RACES:
For purposes of this plan, all competitive events that have an element of speed as a component, including, motorcycle enduros, OHV desert racing, and equestrian endurance rides.

COMPOSITION:
The proportions of various plant species in relation to the total on a given area. It may be expressed in terms of cover, density, weight, etc.

CONSERVATION EASEMENT:
An easement to assure the permanent preservation of land in its natural state or in whatever degree of naturalness the land has when the easement is granted.

COOPERATING AGENCY:
Assists the lead Federal agency in developing an EA or EIS. The CEQ regulations implementing NEPA define a cooperating agency as any agency that has jurisdiction by law or special expertise for proposals covered by NEPA (40 CFR 1501.6). Any Federal, state, local government jurisdiction with such qualifications may become a cooperating agency by agreement with the lead agency.

COOPERATIVE MANAGEMENT AGREEMENT:
A document that describes agreements made between BLM and the public on adjusting certain uses. This document also defines the specific adjustments and the schedule of adjustments (usually over a 5-year period).

COOPERATIVE RECREATION MANAGEMENT AREA (CRMA):
An area for which BLM enters into a cooperative management agreement with a local government to manage recreation land.

CORRIDOR:
See **DESIGNATED MULTIUSE UTILITY CORRIDOR (p. 958)**.

COVER:
(1) Plants or plant parts, living or dead, on the surface of the ground; (2) plants or objects used by wild animals for nesting, rearing of young, escape from predators, or protection from harmful environmental conditions.

COW-CALF LIVESTOCK OPERATION:
A livestock operation that maintains a base breeding herd of mother cows and bulls. The cows produce a calf crop each year, and the operation keeps some heifer calves from each calf crop for breeding replacements. Between the ages of 6 and 12 months, the operation sells the rest of the calf crop along with old and non-productive cows and bulls.

CREEPING PLANT:
A plant that spreads over the ground or other surface.

CRETACEOUS:
In geologic history the third and final period of the Mesozoic era, from 144 million to 65 million years ago, during which extensive marine chalk beds formed.

CRITERIA AIR POLLUTANTS:
Air pollutants for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set. Examples of such pollutants are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and PM10 and PM25.

CRITICAL HABITAT, DESIGNATED:
Specific parts of an area (1) that are occupied by a federally listed threatened or endangered plant or animal at the time it is listed and (2) that contain physical or biological features essential to the conservation of the species or that may require special management or protection. Critical habitat may also include specific areas outside an area occupied by a federally listed species if the Secretary of the Interior determines that these areas are essential for conserving the species.

CULTURAL HERITAGE VALUES:
The irreplaceable qualities that are embodied in cultural resources, such as scientific information about prehistory and history, cultural significance to Native Americans and other groups, and the potential to enhance public education and enjoyment of the Nation's rich cultural heritage. Section 1 of the National Historic Preservation Act states that "the preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic and energy benefits will be maintained and enriched for future generations of Americans."

CULTURAL RESOURCE:
A location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources include archaeological and historical sites, structures, buildings, objects, artifacts, works of art, architecture, and natural features that were important in past human events. They may consist of physical remains or areas where significant human events occurred, even though evidence of the events no longer remains. And they may include definite locations of traditional, cultural, or religious importance to specified social or cultural groups.

CULTURAL RESOURCE DATA:
Cultural resource information embodied in material remains such as artifacts, features, organic materials, and other remnants of past activities. An important aspect of data is context, a concept that refers to the relationships among these types of materials and the situations in which they are found.

CULTURAL RESOURCE DATA RECOVERY:
The professional application of scientific techniques of controlled observation, collection, excavation, and/or removal of physical remains, including analysis, interpretation, explanation, and preservation of recovered remains and associated records in an appropriate curatorial facility used as a means of protection. Data recovery may sometimes employ professional collection of such data as oral histories, genealogies, folklore, and related information to portray the social significance of the affected resources. Such data recovery is sometimes used as a measure to mitigate the adverse impacts of a ground-disturbing project or activity.

CULTURAL RESOURCE INTEGRITY:
The condition of a cultural property, its capacity to yield scientific data, and its ability to convey its historical significance. Integrity may reflect the authenticity of a property's historic identity, evidenced by the survival or physical characteristics that existed during its historic or prehistoric period, or its expression of the aesthetic or historic sense of a particular period of time.

CULTURAL RESOURCE INVENTORY (SURVEY):
A descriptive listing and documentation, including photographs and maps of cultural resources. Included in an inventory are the processes of locating, identifying, and recording sites, structures, buildings, objects, and districts through library and archival research, information from persons knowledgeable about cultural resources, and on-the-ground surveys of varying intensity.

- Class I: A professionally prepared study that compiles, analyzes, and synthesizes all available data on an area's cultural resources. Information sources for this study include published and unpublished documents, BLM inventory records, institutional site files, and state and National Register files. Class I inventories may have prehistoric, historic, and ethnological and sociological elements. These inventories are periodically updated to include new data from other studies and Class II and III inventories.

- Class II: A professionally conducted, statistically based sample survey designed to describe the probable density, diversity, and distribution of cultural properties in a large area. This survey is achieved by projecting the results of an intensive survey carried out over limited parts of the target area. Within individual sample units, survey aims, methods, and intensities are the same as those applied in Class III inventories. To improve

statistical reliability, Class II inventories may be conducted in several phases with different sample designs.

- Class III: A professionally conducted intensive survey of an entire target area aimed at locating and recording all visible cultural properties. In a Class III survey, trained observers commonly conduct systematic inspections by walking a series of close-interval parallel transects until they have thoroughly examined an area.

CULTURAL RESOURCE PROJECT PLAN:
For cultural resource projects, a detailed design plan that defines the procedures, budget, and schedule for such activities as structure stabilization, recordation, interpretive development, and construction of facilities such as trails. These plans include estimates on workforce, equipment, and supply needs.

CULTURAL SITE:
A physical location of past human activities or events, more commonly referred to as an archaeological site or a historic property. Such sites vary greatly in size and range from the location of a single cultural resource object to a cluster of cultural resource structures with associated objects and features.

CUMULATIVE IMPACTS:
(40 CFR 1508.8) "...is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

DATA RECOVERY:
See **CULTURAL RESOURCE DATA RECOVERY (p. 956)**.

DECISION RECORD:
A manager's decision on a categorical exclusion review or an environmental assessment. Comparable to the record of decision for an environmental impact statement, the decision record includes- (1) a finding of no significant impact, (2) a decision to prepare an environmental impact statement, or (3) a decision not to proceed with a proposal. Also see **???**.

DEFERRED ROTATION GRAZING:
Moving grazing animals to various parts of a range in succeeding years or seasons to provide for seed production, plant vigor, and seedling growth.

DESERT TORTOISE HABITAT CLASSIFICATIONS:
Three categories of desert tortoise habitat based on population, viability, size, density, and manageability and derived from BLM inventories of desert tortoise habitat throughout the planning areas between 1989 and 1999. The categories are as follows:

Category I. Medium to high tortoise density. Habitat area essential for maintaining large, viable populations.

Category II. Low to moderate tortoise density. Habitat is manageable.

Category III. Isolated patches of good habitat exist but are difficult to manage. Most management conflicts are not resolvable.

DESIGNATED MULTIUSE UTILITY CORRIDOR:
See MULTIUSE UTILITY CORRIDOR (p. 970)

DESIRED FUTURE CONDITION:
A detailed description of the particular resource condition to be achieved sometime in the future. These serve as resource standards which management is intended to achieve. These are analogous to resource objectives.

DESIRED OUTCOMES:
A type of land use plan decision expressed as a goal or objective.

DESIRED PLANT COMMUNITY (DPC):
The plant community that has been determined through a land use or management plan to best meets the plan's objectives for a site. A real, documented plant community that embodies the resource attributes needed for the present or potential use of an area, the desired plant community is consistent with the site's capability to produce the required resource attributes through natural succession, management intervention, or a combination of both.

DESTINATION RECREATION-TOURISM MARKET:
National or regional recreation-tourism visitors and other constituents who value public lands as recreation-tourism destinations. Major investments in facilities and visitor assistance are authorized within SRMAs where BLM's strategy is to target demonstrated destination recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand for specific activity, experience, and benefit opportunities. These opportunities are produced through maintenance of prescribed natural resource setting character and by structuring and implementing management, marketing, monitoring, and administrative actions accordingly.

DEVELOPED RECREATION SITES AND AREAS:
Those sites and areas that contain structures or capital improvements primarily used by the public for recreation purposes. Such sites or areas may include such features as: delineated spaces for parking, camping, or boat launching; sanitary facilities; potable water; grills or fire rings; or controlled access.

DIKE:
(1) An upright or steeply dipping sheet of igneous rock that has solidified in a crack or fissure in the earth's crust; (2) a human-made structure used to control stream flow.

DISPERSED RECREATION:
Recreation that does not require developed sites or facilities.

DISPOSAL:
See **LAND DISPOSAL (p. 967)**.

DRAINAGE AREA:
Area or watershed that drains naturally to a particular point on a river, stream, or creek.

DRAINAGE BASIN:
Drainage system that consists of a surface stream or body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

EASEMENT:
The right to use land in a certain way granted by a landowner to a second party.

ECOLOGICAL CONDITION:
See **ECOLOGICAL SITE RATING (ECOLOGICAL CONDITION/ ECOLOGICAL STATUS) (p. 959)**.

ECOLOGICAL INTEGRITY:
The quality of a natural unmanaged or managed ecosystem in which the natural ecological processes are sustained, with genetic, species, and ecosystem diversity assured for the future.

ECOLOGICAL NICHE:
See **NICHE (p. 972)**.

ECOLOGICAL SITE:
A distinctive kind of land that has specific physical characteristics and that differs from other kinds of land in its ability to produce a characteristic natural plant community.

ECOLOGICAL SITE DESCRIPTIONS:
Descriptions of the following characteristics of an ecological site- soils, physical features, climatic features, associated hydrologic features, plant communities possible on the site, plant community dynamics, annual production estimates and distribution of production throughout the year, associated animal communities, associated and similar sites, and interpretations for management.

ECOLOGICAL SITE INVENTORY:
The basic inventory of present and potential vegetation on BLM rangeland.

ECOLOGICAL SITE RATING (ECOLOGICAL CONDITION/ ECOLOGICAL STATUS):
The present state of vegetation of an ecological site in relation to the potential natural community for the site. Independent of the site's use, the ecological site rating is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a community resemble those of the potential natural community. The four ecological status classes correspond to 0-25 percent, 25-50 percent, 51-75 percent, or 76-100 percent similarity to the potential natural community and are called early-seral, mid-seral, late-seral, and potential natural community, respectively.

ECOSYSTEM:
Organisms, together with their abiotic environment, forming an interacting system and inhabiting an identifiable space.

ECOTOURISM:
Tourism that essentially focuses on natural rather than developed attractions with the goal of enhancing the visitor's understanding and appreciation of nature and natural features. Such tourism often attempts to be environmentally sound and to contribute economically to the local community.

ELIGIBLE RIVER SEGMENT:
Qualification of a river for inclusion in the National Wild and Scenic Rivers System by determining that it is free flowing and, with its adjacent land area, has at least one river-related value considered to be outstandingly remarkable.

EMERGENT VEGETATION:
Aquatic plant species that are rooted in wetlands but extend above the water's surface.

ENDANGERED SPECIES:
Any animal or plant species in danger of extinction throughout all or a significant portion of its range as designated by the U.S. Fish and Wildlife Service under the Endangered Species Act.

ENERGY FLOW:
The intake, conversion, and passage of energy through organisms or through an ecosystem.

ENTRENCHMENT:
The process by which a stream erodes downward (incision) creating vertical, often eroding banks and abandoning its floodplain. Entrenched streams are often referred to as gullies.

ENVIRONMENTAL ASSESSMENT (EA):
(40 CFR 1508.9)

- "(a) Means a concise public document for which a Federal agency is responsible that serves to:

1. Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

2. Aid an agency's compliance with the Act when no environmental impact statement is necessary.

3. Facilitate preparation of a statement when one is necessary.

- (b) Shall include brief discussions of the need for the proposal, of alternatives as required by section 102 (2) (E), of the environmental impacts of the proposed action and Alternatives, and a listing of agencies and persons consulted."

ENVIRONMENTAL IMPACT STATEMENT (EIS):
(40 CFR 1508.11) "means a detailed written statement as required by section 102 (2) (C) of the Act" (referring to the National Environmental Policy Act.)

ENVIRONMENTAL JUSTICE (EJ):
The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socio-economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and Tribal programs and policies (see Executive Order 12898).

EPHEMERAL RANGELAND:
Areas of the hot desert biome (region) that do not consistently produce enough forage to sustain a livestock operation but may briefly produce unusual volumes of forage that may be utilized by livestock.

EPHEMERAL STREAM:
A stream or portion of a stream that (1) flows only in direct response to precipitation, (2) receives little or no water from springs or no long continued supply from snow or other sources, and (3) has a channel that is always above the water table.

EXCAVATION:
The scientific examination of an archaeological site through layer-by-layer removal and study of the contents within prescribed surface units, e.g. square meters.

EXCLOSURE:
An area fenced to exclude animals.

EXISTING PARKING, STAGING, AND CAMPING AREAS AND DISTURBED AREAS:
Sites and areas previously used for overnight stays, parking and staging. Existing sites must have bare mineral earth areas clear of vegetation, other indications include tent pads, camp fire rings, camper and vehicle pullouts, rock alignments and other signs of overnight and long-term use and occupation.

EXOTIC:
An organism or species that is not native to the region in which it is found.

EXTENSIVE RECREATION MANAGEMENT AREA (ERMA):
A public lands unit identified in land use plans containing all acreage not identified as a SRMA. Recreation management actions within an ERMA are limited to only those of a custodial nature.

EXTIRPATED SPECIES:
A locally extinct species; a species that is no longer found in a locality but exists elsewhere.

EXTIRPATION:
See **EXTIRPATED SPECIES (p. 961)**.

FACILITY FOOTPRINT:
The area on the ground defining or delineating the extent of the facility. For a building, it could be the outside edge of the foundation. For a parking lot, staging area, or trail head, it could be a barrier fence or artificial boundary that defines the limits of the particular use.

FEDERAL LAND POLICY AND MANAGEMENT ACT (FLPMA):
The act that (1) set out, for the Bureau of Land Management, standards for managing the public lands including land use planning, sales, withdrawals, acquisitions, and exchanges; (2) authorized the setting up of local advisory councils representing major citizens groups interested in land use planning and management, (3) established criteria for reviewing proposed wilderness areas, and (4) provided guidelines for other aspects of public land management such as grazing.

FEE SIMPLE TITLE:
Unrestricted ownership of real property (i.e. land and whatever is erected or growing on it).

FINDING OF NO SIGNIFICANT IMPACT (FONSI):
A document that is prepared by a federal agency and that briefly explains why an action not otherwise excluded from the requirement to prepare an environmental impact statement (EIS) would not significantly affect the human environment and not require an EIS.

FINE PARTICULATE MATTER ($PM_{2.5}$):
Particulate matter that is less than 2.5 microns in diameter.

FIRE INTENSITY:
The rate of heat release for an entire fire at a specific time.

FIRE MANAGEMENT:
The integration of fire protection, prescribed burning, and fire ecology knowledge into multiple use planning, decision making, and land management.

FIRE MANAGEMENT PLAN:
A plan that defines a program to manage wildland and prescribed fires and documents the fire management program in the approved land use plan.

FIRE SUPPRESSION:
All the work of extinguishing or confining a fire, beginning with its discovery.

FIRE SUPPRESSION RESOURCES:
People, equipment, services, and supplies available or potentially available for assignment to incidents.

FLOODPLAIN:
Nearly level land on either or both sides of a channel that is subject to overflow flooding.

FORAGE:
All browse and herbage that is available and acceptable to grazing animals or that may be harvested for feed.

FORB:
An herbaceous plant that is not a grass, sedge, or rush.

FREE USE PERMIT:
A permit that allows the removal of mineral materials from public lands free of charge to any Federal, State, or territorial agency, unit, or subdivision.

FRONT COUNTRY SETTING:
Front Country offers the main setting and locations for intensive resource-dependent recreation uses and facilities. Motorized and mechanized vehicles must remain on existing or designated routes. The lands are generally natural in appearance and may see minor to moderate alterations over the life of the LUP due to land use authorizations and BLM management actions.

FUEL LOAD (IN FIRE SUPPRESSION):
The ovendry weight of fuel per unit area usually expressed in tons/acre.

FUEL LOADING:
The amount of fuel present expressed by weight of fuel per unit area.

FUEL MOISTURE CONTENT (IN FIRE SUPPRESSION):
The water content of a fuel expressed as a percentage of the fuel's ovendry weight. For dead fuels, which have no living tissue, moisture content is determined almost entirely by relative humidity, precipitation, dry-bulb temperature, and solar radiation. The moisture content of live fuels is physiologically controlled within the living plant.

FUGITIVE DUST:
Dust particles that are introduced into the air through certain actions such as soil cultivation or vehicles crossing open fields or driving on dirt roads or trails.

FUNCTIONING WATERS (WILDLIFE):
A well, catchment, spring, reservoir, or other feature (human made or natural) that provides a reliable source of potable water on a year-long basis. For such a source of water to be considered functional, the quality and quantity of water must be sufficient to sustain native wildlife populations in the local area. For example, a reservoir that fills up during monsoon rains but goes dry in a few weeks is not functional from a wildlife standpoint.

FUNDAMENTALS OF RANGELAND HEALTH:
As Described in 43 CFR 4180, the conditions in which (1) rangelands are in proper functioning physical condition, (2) ecological process are supporting healthy biotic populations and communities, (3) water quality is meeting state standards and BLM objectives, and (4) special status species habitat is being restored or maintained.

GAUGING STATION:
Particular site on a stream, canal, lake, or reservoir where systematic observations of height or discharge are obtained.

GENETIC DIVERSITY:
The variation in genes in a population pool that contributes to the ability of organisms to evolve and adapt to new conditions.

GEOGRAPHIC INFORMATION SYSTEM (GIS):
An information system that integrates, stores, edits, analyzes, shares, and displays geographic information for informing decision making.

GOAL:
The desired state or condition that a resource management policy or program is designed to achieve. Broader and less specific than objectives, goals are usually not measurable and may not have specific dates by which they must be reached. Objectives are developed by first understanding one's goals.

GRADIENT:
Rate of regular or graded ascent or descent.

GRANT:
A document authorizing the use of public or Federal lands for the construction, operation, maintenance, and termination of a project.

GRAZING CAPACITY (CARRYING CAPACITY):
The highest livestock stocking rate possible without damaging vegetation or related resources. Grazing capacity may vary from year to year or in the same area because of fluctuating forage production.

GRAZING CYCLE:
The amount of time required for livestock to rotate completely through all the pastures under an allotment management plan.

GRAZING DISTRICT:
The specific area within which the public lands are administered under section 3 of the Taylor Grazing Act of June 1934, as amended (43 USC 315). Public lands outside grazing district boundaries are administered under section 15 of the Act.

GRAZING PERMIT/LICENSE/LEASE:
A written document authorizing use of the public lands within an established grazing district. Grazing permits specify all authorized use, including livestock grazing, suspended use, and conservation use. Permits also specify the total number of AUMs apportioned, the area authorized for grazing use, or both.

GRAZING PREFERENCE:
A superior or priority position against others for the purpose of receiving a grazing permit or lease. This priority is attached to base property owned or controlled by the permittee or lessee.

GRAZING PRIVILEGES:
The use of public land for livestock grazing under permits or leases.

GRAZING REST:
Any period during which no livestock grazing is allowed within an area.

GRAZING SEASON:
An established period for which grazing permits are issued.

GRAZING SYSTEM:
A systematic sequence of grazing use and non-use of an allotment to meet multiple use goals by improving the quality and amount of vegetation.

GROUND COVER:
See **COVER (p. 955)**.

GROUND LITTER:
See **LITTER (p. 968)**.

GROUNDWATER:
Subsurface water and underground streams that supply wells and springs. Use of groundwater in Arizona does not require a water right, but must only be "reasonable." Groundwater is separated from surface water by the type of alluvium in which the water is found. Water in the younger, floodplain alluvium is considered surface water. Water in the older, basin-fill alluvium is considered groundwater.

GROUNDWATER RECHARGE:
Adding water to an aquifer, a process that occurs naturally from the infiltration of rainfall and from water flowing over earth materials that allow it to infiltrate below the land surface.

GULLIES:
A furrow, channel or miniature valley cut by concentrated runoff, usually with steep sides through which water commonly flows during and immediately after rains or snow melt.

HABITAT:
An area that provides an animal or plant with adequate food, water, shelter, and living space.

HABITAT FRAGMENTATION:
Process by which habitats are increasingly subdivided into smaller units resulting in their increased insularity and losses of total habitat area.

HABITAT MANAGEMENT PLAN:
A site-specific wildlife habitat plan.

HAZARDOUS MATERIALS (HAZMAT):
An all-encompassing term that includes hazardous substances; hazardous waste; hazardous chemical substances; toxic substances; pollutants and contaminants; and imminently hazardous chemical substances and mixtures that can pose an unreasonable risk to human health, safety, and property.

HERBACEOUS:
Of, relating to, or having the characteristics of a vascular plant that does not develop woody tissue.

HERD AREA (HA):
Geographic areas of the public lands identified as habitat used by wild horses and/or wild burros at the time the WFRHBA was enacted (12/15/1971).

HERD MANAGEMENT AREA PLAN (HMAP):
A plan for the management of a geographic area used by wild horses or burros. It outlines details of a burro or horse capture plan, adoption program and long-term management of populations.

HERD MANAGEMENT AREA (HMA):
May be established in those HAs within which wild horses and burros can be managed for the long term. HMAs are designated through the land use planning process for the maintenance of wild horse and burro herds. In delineating each HMA, the authorized officer shall consider the appropriate management level (AML) for the herd, the habitat requirements of the animals, the relationships with other uses of the public and adjacent private lands, and the constraints contained in 43 CFR 4710.4.

HERITAGE TOURISM:
Programs that seek to stimulate economic development by promoting the use of historic properties. Management concerns include ensuring the long-term preservation and sustainable use of properties. Best-management practices also encourage economic partnerships between the BLM and the State, tribal and local tourism programs.

HIGH POTENTIAL HISTORIC SITE:
Those historic sites related to the route of the National Historic Trail, or sites in close proximity thereto, which provide opportunity to interpret the historic significance of the trail during the period of its major use. Criteria for consideration as high potential sites include historic significance, presence of visible historic remnants, scenic quality, and relative freedom from intrusion. (From Section 12 of The National Trails System Act).

HIGH POTENTIAL ROUTE SEGMENT:
Those segments of a trail which would afford high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to

vicariously share the experience of the original users of a historic route. (From Section 12 of The National Trails System Act).

HISTORICAL SITE:
A location that was used or occupied after the arrival of Europeans in North America (ca. A.D. 1492). Such sites may consist of physical remains at archaeological sites or areas where significant human events occurred, even though evidence of the events no longer remains. They may have been used by people of either European or Native American descent.

HOHOKAM:
A group of North American Indians who lived between perhaps 300 BC and AD 1400 in central and southern Arizona, largely along the Gila and Salt Rivers.

HOME RANGE:
The area in which an animal travels in the scope of natural activities.

HYDRIC:
Characterized by, relating to, or requiring an abundance of moisture.

HYDROLOGIC CYCLE:
The circuit of water movement from the atmosphere to the earth and its return to the atmosphere through various stages or processes, such as precipitation, interception, runoff, infiltration, percolation, storage, evaporation, and transpiration.

IGNEOUS ROCK:
Rock, such as granite and basalt, which has solidified from a molten or partially molten state.

IMPLEMENTATION DECISIONS:
Decisions that take action to implement land use plan decisions; generally appealable to IBLA under 43 CFR 4.410.

INDICATORS:
Elements of the human environment affected, or potentially affected, by a change agent. An indicator can be a structural component, a functional process or an index. A key indicator integrates several system elements in such a way as to indicate the general health of that system.

INFILTRATION:
The downward entry of water into the soil or other material.

INFRASTRUCTURE:
The set of systems and facilities that support a region or community's social and economic structures. Examples of such systems include energy, transportation, communication, education, medical service, and fire and police protection.

INHOLDING:
Parcels of land owned or managed by someone other than BLM but surrounded in part or entirely by BLM-administered land.

INTERDISCIPLINARY TEAM:
A team of varied land use and resource specialists formed to provide a coordinated, integrated information base for overall land use planning and management.

INTERESTED PUBLIC:
An individual, group or organization that has submitted a written request to the authorized officer to be provided an opportunity to be involved in the decision-making process for the management of livestock grazing on specific grazing allotments or has submitted written comments to the authorized officer regarding the management of livestock grazing on a specific allotment.

INTERMITTENT STREAM:
A stream which flows only at certain times of the year when it receives water from springs, rainfall or from surface sources such as melting snow.

INVASIVE SPECIES (INVADERS):
Plant species that were either absent or present only in small amounts in undisturbed portions of a specific range site's original vegetation and invade following disturbance or continued overuse.

KEY FORAGE SPECIES:
Forage species whose use serves as an indicator of the degree of use of associated species.

LAND DISPOSAL:
A transaction which leads to the transfer of title to public lands from the Federal Government.

LANDFORM:
A discernible natural landscape that exists as a result of geological activity such as a plateau, plain, basin, or mountain.

LANDS MANAGED TO MAINTAIN WILDERNESS CHARACTERISTICS:
An allocation resulting from a land use plan management decision for the purpose of protecting lands with wilderness characteristics. A wider range of actions and activities may be allowed than can occur in designated wilderness.

LAND TENURE ADJUSTMENT:
The transfer of land or interest in land (e.g., easement) between the United States and private individuals, entities, State or local governments.

LAND USE ALLOCATION:
The identification in a land use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the planning area, based on desired future conditions.

LAND USE AUTHORIZATION (LUA):
BLM's authorizing through leases, permits, and easements of uses of the public land. Land use authorizations may allow occupancy, recreational residences and cabin sites, farming, manufacturing, outdoor recreation concessions, National Guard maneuvers, and many other uses.

LAND USE PLAN:
A set of decisions that establish management direction for land within an administrative area as prescribed under the planning provisions of FLPMA; an assimilation of land-use-plan-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes both Resource Management Plans and Management Framework Plans.

LEASABLE MINERALS:
Minerals whose extraction from federally managed land requires a lease and the payment of royalties. Leasable minerals include coal, oil and gas, oil shale and tar sands, potash, phosphate, sodium, and geothermal steam.

LEASE:
An authorization to possess and use public lands for a fixed period of time.

LEAVE NO TRACE:
A nationwide (and international) program to help visitors with their decisions when they travel and camp on America's public lands. The program strives to educate visitors about the nature of their recreational impacts as well as techniques to prevent and minimize such impacts.

LENTIC:
Standing water riparian-wetland areas such as lakes, ponds, seeps, bogs, and meadows. See also **LOTIC (p. 968)**.

LITTER:
The uppermost layer of organic debris on the soil surface, essentially freshly fallen or slightly decomposed vegetal material.

LIVESTOCK/KIND OF LIVESTOCK:
The species of domestic livestock, ie. cattle, sheep, horses, burros, and goats.

LOAM:
A soil texture class for soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

LOCATABLE MINERALS:
Minerals that may be acquired under the Mining Law of 1872, as amended.

LOCATION:
The act of taking or appropriating a parcel of mineral land, including the posting of notices, the recording thereof when required, and marking the boundaries so they can be readily traced.

LOTIC:
Running water riparian-wetland areas such as rivers, streams and springs. **See also LENTIC (p. 968)**.

LUA AVOIDANCE AREA:
Areas with sensitive resource values where minor linear and non-linear land use authorizations would be strongly discouraged and therefore "avoided."

LUA EXCLUSION AREAS:
Areas with sensitive resource values where minor linear and non-linear land use authorizations would not be authorized.

MAINTENANCE (ROAD):
From BLM 9100 Manual: The work required keeping a facility in such a condition that it may be continuously utilized at its original or designed capacity and efficiency, and for its intended purposes. Road or trail maintenance actions include (a) signage, (b) minor repairs, e.g. correction of drainage, erosion, or vegetation interference problems. Upon performance

of condition assessment, maintenance could also be construed as (c) allowing road or trail to remain in present state for regular and continuous use.

MAJOR LINEAR LAND USE AUTHORIZATION:
Land use authorizations that include transmission lines (consisting of 115kV or higher), water and gas pipelines (greater than 10 inches in diameter), roads (wider than 200 feet), as well as significant canals.

MANAGEMENT ACTIONS/PRACTICES (FROM RANGELAND STANDARDS & GUIDES):
Actions or practices that improve or maintain basic soil and vegetation resources. Rangeland practices typically consist of watershed treatments (planting, seeding, burning, rest, vegetation manipulation, grazing management) in an attempt to establish desired vegetation species or communities.

MANUAL VEGETATION TREATMENTS:
The use of hand-operated power tools and hand tools to cut, clear, or prune herbaceous and woody plants. In manual treatments, workers cut plants above ground level; pull, grub, or dig out plant root systems to prevent later sprouting and regrowth; scalp at ground level or remove competing plants around desired vegetation; or place mulch around desired vegetation to limit the growth of competing vegetation. Manual vegetation treatments cause less ground disturbance and generally remove less vegetation than prescribed fire or mechanical treatments.

MECHANICAL VEGETATION TREATMENTS:
The use of mechanical equipment to suppress, inhibit, or control herbaceous and woody vegetation. BLM uses wheeled tractors, crawler-type tractors, mowers, or specially designed vehicles with attached implements for such treatments.

MESOZOIC ERA:
One of the great eras of geologic time (248 million to 65 million years ago), following the Paleozoic era, preceding the Cenozoic era, and including the Triassic, Jurassic, and Cretaceous periods.

MINERAL ENTRY:
The filing of a claim on public land to obtain the right to any minerals it may contain.

MINERALIZATION:
Evidence of the presence of minerals.

MINERAL MATERIAL DISPOSAL:
The disposal through sale or free use permit of sand, gravel, decorative rock, or other materials defined in 43 CFR 3600.

MINERAL MATERIALS:
Materials such as common varieties of sand, stone, gravel, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws but that can be acquired under the Mineral Materials Act of 1947, as amended.

MINING DISTRICT:
An area, usually designated by name, with described or understood boundaries, where minerals are found and mined under rules prescribed by the miners, consistent with the Mining Law of 1872.

MINING PLAN OF OPERATIONS:
A plan for mineral exploration and development that a mining operator must submit to BLM for approval for all mining, milling, and bulk sampling of more than 1,000 tons and for exploration disturbing more than 5 acres or on special status lands, including wilderness, areas of critical environmental concern, national monuments, national conservation areas, and lands containing proposed or listed threatened or endangered species or their critical habitat. A plan of operations must document in detail all actions that the operator plans to take from exploration through reclamation.

MINOR LINEAR LAND USE AUTHORIZATIONS:
Land use authorizations which consist of transmission lines (consisting of 115kV or less), water and gas pipelines (less than 10 inches in diameter), roads (less than 200 feet wide), and other minor utility systems.

MONITORING:
The periodic observation and orderly collection of information to determine (1) the effects of resource management actions by tracking changing resource trends, needs, and conditions; and (2) the effectiveness of actions in meeting management objectives.

MOSAIC:
A pattern of vegetation in which two or more kinds of communities are interspersed in patches.

MOTORIZED TRAIL:
A designated route which allows the use of small-wheel-based motorized vehicles such as all-terrain vehicles and motorcycles.

MULTIPLE USE:
A combination of balanced and diverse resource uses that considers long-term needs for renewable and nonrenewable resources including recreation, wildlife, rangeland, timber, minerals, and watershed protection, along with scenic, scientific, and cultural values.

MULTIUSE UTILITY CORRIDOR:
BLM's preferred route for placing **MAJOR LINEAR LAND USE AUTHORIZATION (p. 969)** for utilities (i.e. pipelines and power lines) and transportation (i.e. highways and railroads).

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS):
The allowable concentrations of air pollutants in the ambient (public outdoor) air specified in 40 CFR 50. National ambient air quality standards are based on the air quality criteria and divided into primary standards (allowing an adequate margin of safety to protect the public health including the health of "sensitive" populations such as asthmatics, children, and the elderly) and secondary standards (allowing an adequate margin of safety to protect the public welfare). Welfare is defined as including effects on soils, water, crops, vegetation, human-made materials, animals, wildlife, weather, visibility, climate, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA):
The Federal law, effective January 1, 1970, that established a national policy for the environment and requires federal agencies- (1) to become aware of the environmental ramifications of their proposed actions, (2) to fully disclose to the public proposed Federal actions and provide a mechanism for public input to Federal decision-making, and (3) to prepare environmental impact statements for every major action that would significantly affect the quality of the human environment.

NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED (NHPA):
A Federal statute that established a Federal program to further the efforts of private agencies and individuals in preserving the Nation's historic and cultural foundations. The National Historic Preservation Act- (1) authorized the National Register of Historic Places, (2) established the Advisory Council on Historic Preservation and a National Trust Fund to administer grants for historic preservation, and (3) authorized the development of regulations to require Federal agencies to consider the effects of federally assisted activities on properties included on or eligible for the National Register of Historic Places.

NATIONAL HISTORIC TRAIL:
One of the three categories of national trails defined in the National Trails System Act of 1968 that can only be established by act of Congress and are administered by Federal agencies, although part or all of their land base may be owned and managed by others. National historic trails are generally more than 100 miles long and follow as closely as possible and practicable the original trails or routes of travel of national historic significance. Their purpose is identifying and protecting the historic route and its remnants and artifacts for public use and enjoyment.

NATIONAL MONUMENT:
An area designated to protect objects of scientific and historic interest by public proclamation of the President under the Antiquities Act of 1906, or by Congress for historic landmarks, historic and prehistoric structures, or other objects of historic or scientific interest on public lands. Designation also provides for the management of these features and values.

NATIONAL RECREATION TRAIL:
One of the three categories of national trails defined in the National Trails System Act of 1968 that can only be established by act of Congress and are administered by federal agencies, although part or all of their land base may be owned and managed by others. National recreational trails are existing regional and local trails recognized by either the Secretary of Agriculture or the Secretary of the Interior upon application.

NATIONAL REGISTER DISTRICT:
A group of significant archaeological, historical, or architectural sites, within a defined geographic area, that is listed on the National Register of Historic Places.

NATIONAL REGISTER ELIGIBLE PROPERTIES:
Cultural resource properties that meet the National Register criteria and have been determined eligible for nomination to the National Register of Historic Places because of their local, state, or national significance. Eligible properties generally are older than 50 years and have retained their integrity. They meet one or more of four criteria- (a) associated with events that have made a significant contribution to the broad patterns of our history; (b) associated with the lives of persons significant in our past; (c) embody the distinctive characteristics of a type,

period, or method of construction, or that represent the work of a master; and (d) have yielded, or may be likely to yield, information important in prehistory or history.

NATIONAL REGISTER OF HISTORIC PLACES:
The official list, established by the National Historic Preservation Act, of the Nation's cultural resources worthy of preservation. The National Register lists archeological, historic, and architectural properties (i.e. districts, sites, buildings, structures, and objects) nominated for their local, state, or national significance by state and federal agencies and approved by the National Register Staff. The National Park Service maintains the National Register.

NATIONAL WILD AND SCENIC RIVERS SYSTEM:
A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historical, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams- (1) recreation—rivers or sections of rivers that are readily accessible by road or railroad and that may have some development along their shorelines and may have undergone some impoundments or diversion in the past, (2) scenic—rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads, and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails with watersheds or shorelines essentially primitive and waters unpolluted.

NATIVE DIVERSITY:
The diversity of species that have evolved in a given place without human influence.

NATIVE SPECIES:
A species that is part of an area's original flora and fauna.

NEOTROPICAL MIGRATORY BIRDS:
Birds that travel to Central America, South America, the Caribbean, and Mexico during the fall to spend the winter and then return to the United States and Canada during the spring to breed. These birds include almost half of the bird species that breed in the United States and Canada.

NICHE:
The role of an organism in the environment, its activities and relationships to the biotic and abiotic environment.

NITROGEN OXIDES (OXIDES OF NITROGEN, NO_2):
A general term for compounds of nitric oxide (NO), nitrogen dioxide (NO_2), and other oxides of nitrogen. Nitrogen oxides are typically created during combustion and are major contributors to smog formation and acid deposition. NO_2 is a criteria air pollutant and may have many adverse health effects.

NON-ATTAINMENT AREA:
An area in which the level of a criteria air pollutant is higher than the level allowed by the federal standards. A single area may have acceptable levels of one criteria air pollutant but unacceptable levels of one or more other criteria air pollutants. Therefore, an area can be both attainment and nonattainment at the same time.

NON-FUNCTIONAL:
Riparian-wetland areas are considered to be in nonfunctioning condition when they don't provide adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, or other normal characteristics of riparian areas. The absence of certain physical attributes, such as a flood plain where one should be, is indicators of nonfunctioning conditions.

NON-LINEAR LAND USE AUTHORIZATIONS:
LUAs that are not linear in fashion and do not exceed 5 acres of total surface disturbance. These LUAs do not produce or store more than 100MW of power.

NON-POINT SOURCE POLLUTION (WATER):
Pollution sources that are diffuse and do not have a single point of origin or are not introduced into a receiving water body from a specific outlet. These pollutants are generally carried off the land by storm water runoff from such sources as farming, forestry, mining, urban land uses, construction, and land disposal.

NON-REPRODUCING WILD HORSES:
An HMA composed, in whole or in part, of sterilized wild horses (either stallions or mares) to aid in controlling on the range population numbers.

NOXIOUS WEED:
The Federal Noxious Weed Act, 1974 (PL 930629) defines a noxious weed as, "any living stage (including seeds and reproductive parts) of a parasitic or other plant of a kind which is of foreign origin, is new to or not widely prevalent in the U.S., and can directly or indirectly injure crops, other useful plants, livestock, poultry or other interests of agriculture, including irrigation, navigation, fish and wildlife resources, or the public health."

NUTRIENT CYCLE:
The process of use, release and reuse of elements by plants and animals through uptake by incorporation into and decomposition of organisms. Elements involved in nutrient cycling remain in the vicinity of the earth's surface.

OBJECTIVES:
The planned results to be achieved within a stated time period. Objectives are subordinate to goals, more narrow in scope, and shorter in range. Objectives must specify time periods for completion, and products or achievements that are measurable. See also GOAL (p. 963).

OBLIGATE:
Essential, necessary, unable to exist in any other state, mode, or relationship.

OFF-HIGHWAY VEHICLE (OHV):
Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: (1) any nonamphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used for national defense.

OFF-ROAD VEHICLE (ORV):
See **OFF-HIGHWAY VEHICLE (OHV) (p. 973)**.

OUTSTANDING NATURAL AREA (ONA):
ACECswhich contain unusual natural characteristics and are managed primarily for educational and recreational purposes.

PALEONTOLOGICAL RESOURCES:
The remains of plants and animals preserved in soils and sedimentary rock. Paleontological resources are important for understanding past environments, environmental change, and the evolution of life.

PALEOZOIC ERA:
An era of geologic time (600 million to 280 million years ago) between the Late Precambrian and the Mesozoic eras and comprising the Cambrian, Ordovician, Silurian, Devonian, Missippian, Pennsylvanian, and Permian periods.

PARTICULATE MATTER:
Fine liquid or solid particles suspended in the air and consisting of dust, smoke, mist, fumes, and compounds containing sulfur, nitrogen, and metals. **Also see $PM_{2.5}$ PARTICULATES (p. 976)and PM_{10} PARTICULATES (p. 975).**

PASSAGE SETTING:
Passage setting provides a motorized travel corridor traversing the Back Country setting. This corridor is 200 feet wide (100 feet each side), centered on a motorized travel route designated for public use, and is available for management infrastructure in response to resource concerns and visitor demand. The lands are generally natural in appearance and may see minor to moderate alterations over the life of the LUP due to land use authorizations and BLM management actions.

PASTURE:
A grazing area that is separated from other areas by fencing or natural barriers.

PATENT:
The instrument by which the Federal Government conveys title to the public lands.

PAYMENTS IN LIEU OF TAXES (PILT):
Payments made to counties by BLM to mitigate losses because public lands cannot be taxed. BLM calculates the amount of payments using a formula based on population and the amount of Federal land in a particular local jurisdiction. These payments are in addition to Federal revenues transferred to local governments under other programs, such as income generated from timber harvests, mineral receipts, and the use of federal land for livestock grazing.

PEDESTALLING:
The removal of soil from the base of a plant, exposing the roots. Pedestalling is often a result of wind and stream bank erosion.

PERENNIAL PLANT:
A plant that has a life cycle of 3 or more years. **Also see ANNUAL PLANT (p. 949)**.

PERENNIAL STREAM:
A stream that flows from source to mouth throughout the year; a stream that normally has water in its channel at all times.

PERMEABILITY, SOIL:
The ease with which gases, liquids, or plant roots penetrate or pass through a bulk mass of soil or a layer of soil.

PERMIT:
A short-term revocable authorization to use public lands for specified purposes.

PERMITTED USE:
The forage allocated by, or under the guidance of, an applicable resource-management plan for livestock grazing in an allotment under a permit or lease and is expressed in animal unit months (AUMs).

PERMITTEE:
A person or company permitted to graze livestock or conduct commercial recreation on public land.

PERSONAL INCOME:
The sum of wage and salary payments, other labor income, proprietors' income, rental income of persons, personal dividend and interest income, and transfer payments to persons, less personal contributions for social insurance.

PETROGLYPH:
Pictures, symbols, or other art work pecked, carved, or incised on natural rock surfaces.

PILT: :
See **PAYMENTS IN LIEU OF TAXES (PILT) (p. 974)**.

PITHOUSE:
A type of house built partly underground by prehistoric people.

PLACER CLAIM:
A mining claim located on surface or bedded deposits, particularly for gold, located in stream gravels.

PLANNING CRITERIA:
The standards, rules, and other factors developed by managers and interdisciplinary teams for their use in forming judgments about decision making, analysis and data collection during planning. Planning criteria streamline and simplify the resource management planning actions.

PLAN OF OPERATIONS:
See **MINING PLAN OF OPERATIONS (p. 970)**.

PLANT SUCCESSION:
The process of vegetation development by which an area becomes successively occupied by different plant communities of higher ecological order.

PLANT VIGOR:
The relative wellbeing and health of a plant as reflected by its ability to manufacture enough food for growth and maintenance.

PM_{10} PARTICULATES:
A criteria air pollutant consisting of small particles with an aerodynamic diameter of 10 microns or less. Their size allows them to enter the air sacs deep within the lungs where they

may be deposited in have adverse health effects. These particles include dust, soot, and other tiny bits of solid materials in the air.

$PM_{2.5}$ PARTICULATES:
Tiny particles with an aerodynamic diameter of 2.5 microns or less. These particles penetrate most deeply into the lungs.

POPULATION:
A group of interbreeding organisms of the same kind occupying a particular space; a group of individuals of a species living in a certain area.

POTENTIAL NATURAL COMMUNITY (PNC) :
The stable biotic community that would become established on an ecological site if all succession stages were completed without human interference under present environmental conditions. The PNC is the vegetation community best adapted to fully use the resources of an ecological site.

PRESCRIBED FIRE (BURNING):
The planned applying of fire to rangeland vegetation and fuels under specified conditions of fuels, weather, and other variables to allow the fire to remain in a predetermined area to achieve such site-specific objectives as controlling certain plant species; enhancing growth, reproduction, or vigor of plant species; managing fuel loads; and managing vegetation community types.

PRIMARY ROAD:
See **ROAD & ROUTE TYPES (p. 983)**.

PRIME FARMLAND:
As defined by the Farmland Protection Policy Act of 1981, land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. Prime farmland includes land with the above characteristics, but is being used to produce livestock and timber. It does not include land already in or committed to urban development or water storage.

PRIMITIVE RECREATION:
Recreation that provides opportunities for isolation from the evidence of humans, a vastness of scale, feeling a part of the natural environment, having a high degree of challenge and risk, and using outdoor skills. Primitive recreation is characterized by meeting nature on its own terms, without comfort or convenience of facilities.

PRIORITY HABITAT:
Includes fish and wildlife habitats requiring protective measures and/or management guidelines to ensure habitat availability.

PRIORITY WILDLIFE SPECIES:
Includes fish and wildlife species requiring protective measures and/or management guidelines to ensure their perpetuation. Moreover, priority wildlife species includes State Endangered, Threatened, Sensitive, and Candidate species; animal aggregations considered vulnerable; and those species of recreational, commercial, or tribal importance that are vulnerable.

PROPAGULES:
A structure (as a cutting, a seed, or a spore) that propagates a plant.

PROPERLY FUNCTIONING CONDITION:
• Riparian-wetland areas are functioning properly when enough vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize stream banks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is influenced by geomorphic features, soil, water, and vegetation.
• Uplands function properly when the existing vegetation and ground cover maintain soil conditions capable of sustaining natural biotic communities. The functioning condition of uplands is influenced by geographic features, soil, water, and vegetation.

PUBLIC DOMAIN:
Lands that are part of the original public domain and have never left federal ownership and lands in federal ownership that were acquired in exchange for public domain lands or for timber on public domain lands.

PUBLIC LAND ORDER:
An order effecting, modifying, or canceling a withdrawal or reservation. Such an order is issued by the Secretary of the Interior pursuant to powers of the President delegated to the Secretary by Executive Order No. 9146 of April 24, 1943.

PUBLIC LANDS:
Land or interest in land owned by the United States and administered by the Secretary of the Interior through the BLM without regard to how the United States acquired ownership, except lands located on the Outer Continental Shelf, and land held for the benefit of Indians, Aleuts, and Eskimos.

RANGE IMPROVEMENT:
An authorized physical modification or treatment which is designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; restore, protect and improve the condition of rangeland ecosystems to benefit livestock, wild horses and burros, and fish and wildlife. Range improvements may be structural or nonstructural. A structural improvement requires placement or construction to facilitate the management or control the distribution and movement of animals. Such improvements may include fences, wells, troughs, reservoirs, pipelines, and cattle guards. Nonstructural improvements consist of practices or treatments that improve resource conditions. Such improvements include seedings; chemical, mechanical, and biological plant control; prescribed burning; water spreaders; pitting; chiseling; and contour furrowing.

RANGELAND:
A kind of land on which the native vegetation, climax, or natural potential consists predominately of grasses, grass like plants, forbs, or shrubs. Rangeland includes lands revegetated naturally or artificially to provide a plant cover that is managed like native vegetation. Rangelands may consist of natural grasslands, savannas, shrub lands, moist deserts, tundra, alpine communities, coastal marshes, and wet meadows.

RANGELAND STUDIES:
Any study methods accepted by the authorized officer for collecting data on actual use, utilization, climatic conditions, other special events, and trends to determine whether management objectives are being met.

RAPTORS:
Birds of prey.

REACH (CHANNEL):
A relatively homogeneous section of a stream having a repetitious sequence of physical characteristics and habitat types.

RECLAIMING OR RECLAIMED (ROUTE): :
See ROAD & ROUTE TYPES (p. 983)

RECORD OF DECISION:
A document signed by a responsible official recording a decision that was preceded by the preparing of an environmental impact statement.

RECREATIONAL TARGET SHOOTING:
The discharge of any firearm for any lawful, recreational purpose other than the lawful taking of a game animal. Recreational target shooting does not include firearms use employed in accordance with state hunting regulations and policy regarding recreational target shooting does not apply to hunters in pursuit of game with firearms that are being employed in accordance with such regulations.

RECREATION AND PUBLIC PURPOSES ACT of 1926 (44 Stat. 741, as amended; 43 U.S.C. 869 et seq.):
An act of Congress that allows lease or acquisition of public land to be used for recreation or public purposes by local government entities (county or city governments) and nonprofit organizations.

RECREATION EXPERIENCES:
Psychological outcomes realized either by recreation-tourism participants as a direct result of their onsite leisure engagements and recreation-tourism activity participation or by non-participating community residents as a result of their interaction with visitors and guests within their community and/or interaction with the BLM and other public and private recreation-tourism providers and their actions.

RECREATION MANAGEMENT ZONES (RMZs):
Subunits within a SRMA managed for distinctly different recreation products. Recreation products are comprised of recreation opportunities, the natural resource and community settings within which they occur, and the administrative and service environment created by all affecting recreation-tourism providers, within which recreation participation occurs.

RECREATION NICHE:
The place or position within the strategically targeted recreation-tourism market for each SRMA that is most suitable (i.e., capable of producing certain specific kinds of recreation opportunities) and appropriate (i.e., most responsive to identified visitor or resident customers), given available supply and current demand, for the production of specific

recreation opportunities and the sustainable maintenance of accompanying natural resource and/or community setting character.

RECREATION OPPORTUNITIES:
Favorable circumstances enabling visitors' engagement in a leisure activity to realize immediate psychological experiences and attain more lasting, value-added beneficial outcomes.

RECREATION OPPORTUNITY SPECTRUM (ROS):
One of the existing tools for classifying recreation environments (existing and desired) along a continuum ranging from primitive, low-use, and inconspicuous administration to urban, high-use, and a highly visible administrative presence. This continuum recognizes variation among various components of any landscape's physical, social and administrative attributes; and resulting descriptions (of existing conditions) and prescriptions (of desired future conditions) define recreation setting character. Descriptions of settings follow:

Primitive:

- Remoteness: An area designated by a line generally 3 miles from all open roads, railroads, and motorized trails.
- Evidence of Humans: Setting is essentially an unmodified natural environment. Evidence of humans would be unnoticed by an observer wandering through the area.
- Evidence of trails is acceptable but should not exceed standard to carry expected use.
- Structures are extremely rare.
- Social: Usually less than six parties per day encountered on trails and less than three parties visible at campsites.
- Managerial: Onsite regimentation is low with controls primarily offsite.

Semi-primitive Non-motorized:

- Remoteness: An area designated by a line generally 1/2 mile from any road, railroad, or trail open to public motorized use. (The guideline for applying the 1/2 mile criterion is to use 1/2 mile except where topographic or physical features closer than 1/2 miles adequately screen out the sights and sounds of humans and make access more difficult and slower. For example, if a ridge is 1/4 mile from the road, use the ridge instead of the 1/2 mile.)
- Any roads, railroads, or trails within the semi-primitive non-motorized areas will have the following characteristics:
- Closed to public motorized use, and
- Are reclaimed, or in the process of reclaiming (when reclaiming will harmonize with the natural appearing environment). Some examples are old logging roads, old railroad beds, old access routes to abandoned campsites, temporary roads, and gated roads that are used for occasional administrative access.
- Evidence of Humans: Natural setting may have subtle modifications that would be noticed but not draw the attention of an observer wandering through the area.

- Little or no evidence of primitive roads and the motorized use of trails and primitive roads.
- Structures are rare and isolated.
- Social: Usually 6-15 parties per day encountered on trails and six or fewer parties visible from campsite.
- Managerial: Onsite regimentation and controls present but subtle.

Semi-Primitive Motorized:

- Remoteness: An area designed by a line generally 1/2 mile from open better than primitive roads. (The guideline for applying the 1/2 mile criterion is to consistently use 1/2 mile where topographic or physical features closer than 1/2 mile adequately screen out the sights and sounds of humans, e.g. a ridge 1/4 mile from the road).
- Contains open primitive roads that are not maintained for the use of standard passenger-type vehicles, normally OHVs and high-clearance vehicles, e.g. an old pickup with high clearance. These open roads are generally tracks, ruts, or rocky-rough surface and upgraded and not drained. The roadbeds and cuts are mostly vegetated with grass or native material unless they are too rocky for vegetation. The roads harmonize with the natural environment. Examples include old logging roads from before specified road years, old revegetated railroad beds, old access roads to abandoned home-sites, temporary logging roads that are revegetated, and low standard administrative roads (normally used for access to wildlife openings).
- Evidence of Humans: Natural setting may have moderately dominant alterations but would not draw the attention of motorized observers on trails and primitive roads within the area. Any closed improved roads must be managed to revegetate and harmonize with the natural environment.
- Strong evidence of primitive roads and the motorized use of trails and primitive roads.
- Structures are rare and isolated.
- Social: Low to moderate contact frequency.
- Managerial: Onsite regimentation and controls present but subtle.

Roaded Natural:

- Remoteness: No criteria.
- Evidence of Humans: Natural setting may have modifications, which range from being easily noticed to strongly dominant to observers within the area. But from sensitive travel routes and use areas these alterations would remain unnoticed or visually subordinate.
- There is strong evidence of designed roads, highways, or both.
- Structures are generally scattered, remaining visually subordinate or unnoticed to the sensitive travel route observer. Structures may include utility corridors or microwave installations.

- Social: Frequency of contact is- Moderate to High on roads; Low to Moderate on trails and away from roads.
- Managerial: Onsite regimentation and controls are noticeable but harmonize with the natural environment.

Rural:

- Remoteness: No criteria.
- Evidence of Humans: Natural setting is culturally modified to the point that it is dominant to the sensitive travel route observer. This setting may include pastoral, agricultural, intensively managed wild landscapes, or utility corridors. Pedestrian or other slow-moving observers are constantly within view of culturally changed landscape.
- There is strong evidence of designed roads, highways, or both.
- Structures are readily apparent and may range from scattered to small dominant clusters, including utility corridors, farm buildings, microwave installations, and recreation sites.
- Social: Frequency of contact is: Moderate to High developed sites, on roads and trails, and water surfaces; Moderate away from developed sites.
- Managerial: Regimentation and controls obvious and numerous, largely in harmony with the human-made environment.

Urban:

- Remoteness: No criteria.
- Evidence of Humans: Setting is strongly structure dominated. Natural or natural appearing elements may play an important role but be visually subordinate. Pedestrian and other slow moving observers are constantly within view of artificial enclosure of spaces.
- There is strong evidence of designed roads and/or highways and streets.
- Structures and structure complexes are dominant.
- Social: Large numbers of users onsite and in nearby areas.
- Managerial: Regimentation and controls obvious and numerous.

RECREATION-TOURISM MARKET:
Recreation-tourism visitors, affected community residents, affecting local governments and private sector businesses, or other constituents and the communities or other places where these customers originate (local, regional, national, or international). Based on analysis of supply and demand, land use plans strategically identify primary recreation-tourism markets for each SRMA: destination, community, or undeveloped.

RECRUITMENT:
The increase in population caused by natural reproduction or immigration.

REFUGIUM:
An area that has remained unaffected by adverse environmental changes to the surrounding area, allowing a population to survive where others have perished.

RENEWABLE ENERGY:
Energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished).

RESEARCH DESIGN:
A statement of proposed identification, documentation, evaluation, investigation, or other research that identifies the project's goals, methods and techniques, expected results, and the relationship of the expected results to other proposed activities or treatments.

RESILIENT SITES:
Sites with bare mineral earth clear of vegetation, that do not have crust that can be broken through or other characteristics that will cause permanent or long-term changes to the site due to activities.

RESOURCE ADVISORY COUNCIL (RAC):
A citizen-based group of 10 to 15 members chartered under the Federal Advisory Committee Act and appointed by the secretary of the interior to forward advice on public land planning and management issues to the BLM. Council membership reflects a balance of various interests concerned with the management of the public lands and users of the public lands.

RESOURCE CONSERVATION AREA (RCA):
A citizen-based group of 10 to 15 members chartered under the Federal Advisory Committee Act and appointed by the secretary of the interior to forward advice on public land planning and management issues to the BLM. Council membership reflects a balance of various interests concerned with the management of the public lands and users of the public lands.

RESOURCE MANAGEMENT PLAN (RMP):
The Federal Land Policy and Management Act (43 CFR 1601.0-5 (k)) details the form and contents of an RMP. It generally establishes that the document will provide guidance on:

- Land areas for limited, restricted or exclusive use; designation, including ACEC designation; and transfer from Bureau of Land Management Administration;
- Allowable resource uses (either singly or in combination) and related levels of production or use to be maintained;
- Resource condition goals and objectives to be attained;
- Program constraints and general management practices needed to achieve the above items;
- Need for an area to be covered by more detailed and specific plans;
- Support action, including such measures as resource protection, access development, realty action, cadastral survey, etc., as necessary to achieve the above;
- General implementation sequences, where carrying out a planned action is dependent upon prior accomplishment of another planned action; and

- Intervals and standards for monitoring and evaluating the plan to determine the effectiveness of the plan and the need for amendment or revision.
- It is not a final implementation decision on actions which require further specific plans, process steps, or decisions under specific provisions of law and regulations.

REST:
See **GRAZING REST (p. 964)**

RESTORATION (CULTURAL RESOURCE):
The process of accurately reestablishing the form and details of a property or portion of a property together with its setting, as it appeared in a particular period of time. Restoration may involve removing later work that is not in itself significant and replacing missing original work. Also see **STABILIZATION (CULTURAL RESOURCE)**.

REST-ROTATION GRAZING:
A grazing system in which one part of the range is ungrazed for an entire grazing year or longer while other parts are grazed for a portion or all of a growing season.

RIGHT-OF-WAY:
A permit or easement that authorizes the use of lands for certain specified purposes, commonly for pipelines, roads, telephone lines, or power lines.

RILL:
A narrow, very shallow (a few centimeters deep), intermittent water course having steep sides and formed as a result of erosion.

RILL EROSION:
Removal of soil by running water forming shallow channels that can be smoothed out by normal cultivation.

RIPARIAN:
Pertaining to or situated on or along the bank of streams, lakes, and reservoirs.

RIPARIAN AREA:
A form of wetland transition between permanently saturated wetlands and upland areas. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

ROAD & ROUTE TYPES:
From BLM Manual 9100, revised 2008:

- Road: A linear route declared a road by the owner, managed for used by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.
- Primitive Road: A linear route managed for use by four-wheel drive or high-clearance vehicles. Primitive roads do not normally meet any BLM road design standards.
- Trails: See **TRAIL (p. 991)**

Terminology used before BLM Manual 9100 2008 revision:

- Primary Road: A regularly maintained route, paved or unpaved, wide enough for at least two vehicles to pass. Provides access between two major points. Serves a large area with many routes of lesser quality branching from it.
- Secondary Road: Paved or unpaved, a regularly maintained one- to two-lane route with routes of lesser quality branching from it. Connects primary roads and major points.
- Tertiary Road: Generally a two-track route that may or may not be usable by a two-wheel drive vehicle. Does not receive formal maintenance.
- Single-Track Route: A route up to 1/2 meter wide upon which all-terrain vehicles or trucks are not allowed.
- Way: A road-like feature used by vehicles having four or more wheels but not declared a road by the owner. A way receives no maintenance to guarantee regular and continuous use.
- Spur: A route that exists for a specific purpose, such as access to a specific use or feature. Uses can be recreational or commercial. Features include campsites, mines, or range developments. A spur route is connected to another road or route type.
- Motorized Trail: **TRAIL (p. 991)**
- Reclaiming or Reclaimed (route): A route that has had very little or no use, so that there is woody vegetation growing in the route that would be damaged by the passage of a vehicle. Erosion or vegetation may block the route and could damage a vehicle or cause it to get stuck.

ROADSIDE:
A general term denoting the area adjoining the outer edge of the road.

ROCK CRAWLING:
The use of specialized motor vehicles for crossing difficult terrain. Also known as extreme technical trail driving.

ROUTE:
Any motorized, non-motorized, or mechanized transportation corridor. Corridor may either be terrestrial or waterway. “Roads” and “Trails” are considered routes.

RUNOFF:
Precipitation, snow melt or irrigation water that appears in uncontrolled surface streams or rivers.

SAFE YIELD:
The rate at which water can be withdrawn from a groundwater basin (aquifer) without depleting the supply so as to cause undesirable effects.

SALEABLE MINERALS:
Common variety minerals on public lands, such as sand and gravel, which are used mainly for construction and are disposed of by sales or special permits to local governments.

SCIENTIFIC DATA RECOVERY:
See **CULTURAL RESOURCE DATA RECOVERY (p. 956)**

SCOPING:
An early and open process for determining the scope of issues to be addressed in an environmental impact statement and the significant issues related to a proposed action.

SEASONAL GRAZING:
Grazing restricted to a specific season.

SEASON OF USE:
The time period when livestock grazing is permitted on a given range area as specified in the grazing permit.

SECONDARY ROAD:
See **ROAD & ROUTE TYPES (p. 983)**.

SECTION:
640 acres, 1 mile square.

SECTION 2920 PERMIT:
Revocable authorizations, for up to three years to permit land uses that involve either little or no land improvement or construction, or investment which can be amortized within the terms of the permit. A permit conveys no possessory interest. The authorized officer may renew it at his/her discretion or revoke it in accordance with its terms or the provisions of 43 CFR 2920.9-3. There are no limitations on the amount of land that maybe included in a permit; however, the area should be limited to the size justified.

SECTION 404 PERMIT:
A permit required by the Clean Water Act, under specified circumstances, when dredge or fill material is placed in the waters of the United States, including wetlands.

SECTION 7 CONSULTATION:
The requirement of Section 7 of the Endangered Species Act that all federal agencies consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service if a proposed action might affect a federally listed species or its critical habitat.

SEDIMENT:
Solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water. Sediment includes chemical and biochemical precipitates and decomposed organic material such as humus.

SEDIMENTARY ROCKS:
Rocks, such as sandstone, limestone, and shale, that are formed from sediments or transported fragments deposited in water.

SEDIMENTATION:
The process or action of depositing sediment.

SEDIMENT LOAD (SEDIMENT DISCHARGE):
The amount of sediment, measured in dry weight or by volume, which is transported through a stream cross-section in a given time. Sediment load consists of sediment suspended in water and sediment that moves by sliding, rolling, or bounding on or near the streambed.

SEDIMENT TRANSPORT:
The movement of mineral and organic solid materials in a stream.

SEDIMENT YIELD:
The amount of sediment removed from a watershed over a specified period, usually expressed as tons, acre-feet, or cubic yards of sediment per unit of drainage area per year.

SEEPS:
Wet areas, normally not flowing, arising from an underground water source.

SEGREGATION:
The removal for a limited period, subject to valid existing rights, of a specified area of the public lands from the operation of the public land laws, including the mining laws, pursuant to the exercise by the Secretary of the Interior of regulatory authority to allow for the orderly administration of the public lands.

SELF-SUSTAINING:
The ability of reproducing herds of wild horses and burros to maintain themselves in a healthy condition and to produce healthy foals.

SENSITIVE SHEEP HABITAT:
Habitat identified by BLM and AZGFD that provides one or more essential biological elements including: lambing areas, migration routes, mineral licks, water source, and foraging areas.

SHARED USE TRAIL:
A trail shared for a variety of uses such as motorized and non-motorized uses; a combination of non-motorized uses such as hiking, horseback riding, and bicycling; or a combination of motorized uses such as dirt bikes and small and large four-wheel-drive vehicles.

SHOULDER:
The portion of the roadway contiguous to the travel way for accommodation of stopped vehicles.

SIKES ACT OF 1974:
A Federal law that promoted federal-state cooperation in managing wildlife habitats on both BLM and Forest Service lands. The act requires BLM to work with State wildlife agencies to plan the development and maintenance of wildlife habitats and has as its main tool the habitat management plan.

SINGLE TRACK ROUTE:
See **ROAD & ROUTE TYPES (p. 983)**.

SINUOSITY:
The ratio of stream length between two points divided by the valley length between the same two points.

SMALL TRACT LANDS:
Parcels of public lands of 5 acres or less that have been found to be chiefly valuable for sale or lease as home, cabin, camp, recreational, convalescent, or business sites under the Act of June 1, 1938.

SOCIAL TRAIL:
An unplanned random trail made by first visitors and then followed by others.

SOIL ERODIBILITY:
The predisposition of a particular soil to be transported by wind or water if it is disturbed and exposed to the elements.

SOIL INFILTRATION:
The ability of soil to absorb moisture that falls on it as precipitation.

SOIL MOISTURE STORAGE:
The water content stored in a soil.

SOIL PRODUCTIVITY:
The capacity of a soil in its normal environment to produce a specified plant or sequence of plants under a specified system of management.

SOIL STABILITY:
A qualitative term used to describe a soil's resistance to change. Soil stability is determined by intrinsic properties such as aspect, depth, elevation, organic matter content, parent material, slope, structure, texture, and vegetation.

SOIL STRUCTURE:
The physical constitution of soil material as expressed by size, shape, and the degree of development of primary soil particles and voids into naturally or artificially formed structural units.

SPECIAL CULTURAL RESOURCE MANAGEMENT AREA (SCRMA):
An area containing cultural resources that are of special importance for public use, scientific use, traditional use or other uses as defined in BLM Manual 8110.4.

SPECIAL RECREATION MANAGEMENT AREAS (SRMAs):
A public lands unit identified in land use plans to direct recreation funding and personnel to fulfill commitments made to provide specific, structured recreation opportunities (i.e., activity, experience, and benefit opportunities). Both land use plan decisions and subsequent implementing actions for recreation in each SRMA are geared to a strategically identified primary market: destination, community, or are undeveloped.

SPECIAL RECREATION PERMIT (SRP):
An authorization that allows for specific nonexclusive permitted recreational uses of the public lands and related waters. SRPs are issued to control visitor use, protect recreational and natural resources, provide for the health and safety of visitors, and accommodate commercial recreational uses.

SPECIAL RECREATION PERMIT TYPES AND DEFINITIONS:
Commercial Use: . The activity, service, or use is commercial if:

- Any person, group, or organization makes or attempts to make a profit, receive money, amortize equipment, or obtain goods or services, as compensation from participants in recreational activities occurring on public lands led, sponsored, or organized by that person, group, or organization;
- Anyone collects a fee or receives other compensation that is not strictly a sharing of actual expenses, or exceeds actual expenses, incurred for the purposes of the activity, service, or use;
- There is paid public advertising to seek participants; or
- Participants pay for a duty of care or an expectation of safety.

Competitive Use: . Any organized, sanctioned, or structured use, event, or activity on public land in which two or more contestants compete and either or both of the following elements apply:

- Participants register, enter, or complete an application for the event;
- A predetermined course or area is designated;
- Or, one or more individuals contesting an established record such as for speed or endurance.

Organized Group Activity and Event Use: . A structured, ordered, consolidated, or scheduled event on, or occupation of, public lands for the purpose of recreational use that is not commercial or competitive.

Vending: The sale of goods or services, not from a permanent structure, associated with recreation on the public lands or related waters, such as food, beverages, clothing, firewood, souvenirs, filming or photographs (video or still), or equipment repairs.

SPECIAL STATUS SPECIES:
Plant or animal species listed as threatened, endangered, candidate, or sensitive by Federal or State governments. By policy, the BLM has certain responsibilities for all special status species. BLM sensitive species are not covered by any other "safety net" of status designation; therefore, the Arizona BLM Sensitive Species List does not include species that are already Federally listed or State listed.

SPLIT-ESTATE:
Land whose surface rights and mineral rights are owned by different entities.

STABILIZATION (CULTURAL RESOURCE):
Protective techniques usually applied to structures and ruins to keep them in their existing condition, prevent further deterioration, and provide structural safety without significant rebuilding. Capping mud-mortared masonry walls with concrete mortar is an example of a stabilization technique. Also see **RESTORATION (CULTURAL RESOURCE) (p. 983)**.

STABILIZATION (SOIL):
Chemical or mechanical treatment to increase or maintain the stability of a mass of soil or otherwise improve its engineering properties.

STAGING AREA:
An area where participants in an activity gather and make final preparations for the activity.

STANDARDS AND GUIDELINES FOR RANGELAND HEALTH:
See **ARIZONA STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING ADMINISTRATION (p. 949)**.

STATE HISTORIC PRESERVATION OFFICER (SHPO):
The official within and authorized by each state at the request of the Secretary of the Interior to act as liaison for the National Historic Preservation Act. Also see **NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED (NHPA) (p. 971)**.

STATE IMPLEMENTATION PLAN (SIP):
Strategic document, prepared by a state (or other authorized air quality regulatory agency) and approved by the EPA, that thoroughly describes how requirements of the Clean Air Act will be implemented (including standards to be achieved, control measures to be applied, enforcement actions in case of violation, etc.).

STATE TRUST LANDS:
Lands granted to Arizona by the Federal Government at territorial establishment and at statehood. Totaling 9.4 million acres, these lands are managed by the Arizona State Land Department to yield revenue over the long term for the 14 trust beneficiaries. The chief beneficiary consists of the public schools. Whenever Arizona sells or leases these lands and their natural resources, it must pay the beneficiaries. Revenues from land sales are maintained in a permanent fund managed by the State Treasurer, and interest from this fund is paid to the beneficiaries.

STOCKING RATE:
The number of specific kinds and classes of animals grazing or using a unit of land for a specific time period. Stocking rates may be expressed as a ratio, such as of animal units/section, acres/animal unit, or acres/animal unit month.

STOCK TANK (POND):
A water impoundment created by building a dam, digging a depression, or both, to provide water for livestock or wildlife.

STREAMBANK:
The portion of a stream channel that restricts the sideward movement of water at normal water levels. The stream bank's gradient often exceeds 45° and exhibits a distinct break in slope from the stream bottom.

STREAMBANK STABILITY:
A stream bank's relative resistance to erosion, which is measured as a percentage of alteration to stream banks.

STRUCTURAL DIVERSITY:
The diversity of the composition, abundance, spacing, and other attributes of plants in a community.

SUBSTRATE:
(1) Mineral and organic material forming the bottom of a waterway or water body; (2) The base or substance upon which an organism is growing.

SUBSURFACE:
Of or pertaining to rock or mineral deposits which generally are found below the ground surface.

SUCCESSION:
See **PLANT SUCCESSION (p. 975)**.

SUPPLEMENTAL WILDERNESS VALUES:
Resources not required for an area to be designated a wilderness but that are considered in assessing an area's wilderness potential. Such values include ecological, geologic, and other features of scientific, educational, scenic, or historical value.

SURFACE-DISTURBING ACTIVITY:
Surface-disturbing activities are those that normally result in more than negligible disturbance to public lands and accelerate the natural erosive process. Surface disturbance may, but does not always, require reclamation. These activities normally involve use or occupancy of the surface, cause disturbance to soils and vegetation, and are usually caused by motorized or mechanical actions. They include, but are not limited to: the use of mechanized earth-moving equipment; truck-mounted drilling and seismic exploration equipment; off-road vehicle travel in areas designated as limited or closed to off-road vehicle use; vegetation treatments; construction of facilities such as power lines, pipelines, oil and gas wells; recreation sites, improvements for range and wildlife; new road construction; and use of pyrotechnics and explosives. Surface disturbance is not normally caused by casual-use activities. Activities that are not considered surface-disturbing include, but are not limited to: livestock grazing, crosscountry hiking, minimum impact filming, and vehicular travel on designated routes.

SUSPENSION:
The temporary withholding from active use through a decision issued by the authorized officer or by agreement of part or all of the permitted use in a grazing permit or lease.

SUSTAINED YIELD:
Achieving and maintaining a permanently high level, annual or regular period production of renewable land resources without impairing the productivity of the land and its environmental values.

TAILINGS:
The waste matter from ore after the extraction of economically recoverable metals and minerals.

TAKE:
As defined by the Endangered Species Act, "to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or attempt to engage in any such conduct."

TARGET SPECIES:
Plant species to be reduced or eliminated by a vegetation treatment.

TEMPORARY NONUSE:
The authorized withholding, on an annual basis, of all or a portion of permitted livestock use in response to a request of the permittee or lessee.

TERMS AND CONDITIONS:
Stipulations contained in livestock grazing permits and leases as determined by the authorized officer to be appropriate to achieve management and resource condition objectives for the public lands and other lands administered by BLM and to achieve standards for rangeland health and ensure conformance with guidelines for grazing administration.

TERTIARY PERIOD:
The earlier (65 million to 1.8 million years ago) of the two geologic periods in the Cenozoic era of geologic time.

TERTIARY ROAD:
See **ROAD & ROUTE TYPES (p. 983)**.

THREATENED SPECIES:
Any plant or animal species likely to become endangered within the foreseeable future throughout all or a part of its range and designated by the U.S. Fish and Wildlife Service under the Endangered Species Act. **Also see ENDANGERED SPECIES (p. 960)**.

THRIVING NATURAL ECOLOGICAL BALANCE (TNEB):
Wild horses and burros are managed in a manner that assures significant progress is made toward achieving the Land Health Standards for upland vegetation and riparian plant communities, watershed function, and habitat quality for animal populations, as well as other site-specific or landscape-level objectives, including those necessary to protect and manage Threatened, Endangered, and Sensitive Species.

TINAJA:
A small pool in a rocky hollow, usually along an ephemeral water course where it runs through exposed bedrock, that holds water into the dry season.

TRAIL:
(Interagency definition) Linear route managed for human powered, stock, or off highway vehicle forms of recreation or for historic or heritage values. Trails are not generally managed for use by four wheel drive or high clearance vehicles.

TRAIL DEFINITIONS:
Interagency definition for public lands outside the Sonoran Desert National Monument: Linear route managed for human powered, stock, or off highway vehicle forms of recreation or for historic or heritage values. Trails are not generally managed for use by four wheel drive or high clearance vehicles.

Sonoran Desert National Monument: Linear route managed for human powered, stock, non-motorized and non-mechanized transportation and travel modes.

Designated wilderness areas: Linear route managed for travel by foot, horseback and pack stock. Mechanized forms of travel (e.g. mountain bikes, wheeled game carriers, handcarts, and hang gliders) are prohibited in wilderness areas.

TRAILHEAD:
The terminus of a hiking, horse, or bicycle trail accessible by motor vehicle and sometimes having parking, signs, a visitor register, and camping and sanitary facilities.

TRANSFER PAYMENT:
A government grant to an individual of money that represents a gift without anything being received or required in return. Examples of transfer payments include student scholarship grants, welfare checks, and social security benefits.

TRANSITIONAL PATHWAYS:
The processes that cause a shift from one vegetation state to another.

TRAVEL MANAGEMENT AREAS:
Polygons or delineated areas where a rational approach has been taken to classify areas open, closed, or limited, and have identified and/or designated network of roads, trails, ways, and other routes that provide for public access and travel across the planning area. All designated travel routes within travel management areas should have a clearly identified need and purpose as well as clearly defined activity types, modes of travel, and seasons or timeframes for allowable access or other limitations.

TREAD LIGHTLY!™:
A not-for-profit organization whose mission is to increase awareness of ways to enjoy the great outdoors while minimizing human impacts.

TREND:
The direction of change, over time, either toward or away from desired management objectives.

TURBIDITY:
Cloudiness of water measured by how deeply light can penetrate it from the surface. Highly turbid water is often called "muddy" although all kinds of suspended particles/sediment contribute to turbidity.

UNAUTHORIZED USE:
Any use of the public lands not authorized or permitted.

UNDERSTORY:
Plants growing under the canopy of other plants. Understory usually refers to grasses, forbs, and low shrubs under a tree or brush canopy.

UNDEVELOPED RECREATION-TOURISM MARKET:
National, regional, and/or local recreation-tourism visitors, communities, or other constituents who value public lands for the distinctive kinds of dispersed recreation produced by the vast size and largely open, undeveloped character of their recreation settings. Major investments in facilities are excluded within SRMAs where BLM's strategy is to target demonstrated undeveloped recreation-tourism market demand. Here, recreation management actions are geared toward meeting primary recreation-tourism market demand to sustain distinctive recreation setting characteristics; however, major investments in visitor services are authorized both to sustain those distinctive setting characteristics and to maintain visitor freedom to choose where to go and what to do—all in response to demonstrated demand for undeveloped recreation.

UPLANDS:
Lands at higher elevations than the alluvial plain or low stream terrace; all lands outside the riparian-wetland and aquatic zones.

URBAN INTERFACE (WILDLAND-URBAN INTERFACE):
The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation. This interface creates conflicts and complicates fighting wildfires and conducting prescribed burns, as well as all other natural resource management activities.

USABLE FORAGE:
That portion of the forage that can be grazed without damage to the basic resources; may vary with season of use, species, and associated species.

UTILITY CORRIDOR:
BLM's preferred route for placing land use authorizations for major linear utilities (i.e. pipelines and power lines). **See also DESIGNATED MULTIUSE UTILITY CORRIDOR (p. 958).**

UTILITY-SCALE RENEWABLE ENERGY DEVELOPMENT:
Utility-scale renewable energy facilities (managed as a land use authorization), where the proponent has signed a purchase power agreement with a utility company to sell power. These facilities typically produce more than 100MW of power.

UTILIZATION (FORAGE):
The proportion of the current year's forage consumed or destroyed by grazing animals. Utilization is usually expressed as a percentage.

VALID EXISTING RIGHTS:
Locatable mineral development rights or land use authorizations that existed when the Federal Land Policy and Management Act (FLPMA) was enacted on October 21, 1976. Some areas are segregated from entry and location under the Mining Law to protect certain values or allow certain uses. Mining claims that existed as of the effective date of the segregation may still be valid if they can meet the test of discovery of a valuable mineral required under the Mining Law. Determining the validity of mining claims located on segregated lands requires BLM to conduct a valid existing rights determination.

VANDALISM (CULTURAL RESOURCE):
Malicious damage or the unauthorized collecting, excavating, or defacing of cultural resources. Section 6 of the Archaeological Resources Protection Act states that "no person may excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands or Indian lands…unless such activity is pursuant to a permit issued under section 4 of this Act."

VEGETATION STRUCTURE:
The composition of an area's vegetation--plant species, growth forms, abundance, vegetation types, and spatial arrangement.

VEGETATION TREATMENTS:
Treatments that improve vegetation condition or production. Such treatments may include seedings; prescribed burning; or chemical, mechanical, and biological plant control.

VEGETATION TYPE:
A plant community with distinguishable characteristics.

VIABILITY:
The capability of living, developing, growing, or germinating under favorable conditions.

VIEWSHED:
The entire area visible from a viewpoint.

VISITOR DAY:
12 visitor hours, which may be aggregated continuously, intermittently, or simultaneously by one or more people.

VISUAL ASPECT:
The visual first impression of vegetation at a particular time or seen from a specific point.

VISUAL RESOURCE MANAGEMENT (VRM):
The planning, design, and implementing of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

VISUAL RESOURCE MANAGEMENT (VRM) CLASSES:
Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective which prescribes the amount of change allowed in the characteristic landscape.

- **Class I: .** (Preservation) provides for natural, ecological changes only. This class includes wilderness areas, some natural areas, some wild and scenic rivers, and other similar sites where landscape modification should be restricted.

- **Class II: .** (Retention of the landscape character) includes areas where changes in any of the basic elements (form, line, color, or texture) caused by management activities should not be evident in the characteristic landscape.

- **Class III:** (Partial retention of the landscape character) includes areas where changes in the basic elements caused by management activities may be evident in the characteristic landscape. But the changes should remain subordinate to the existing landscape character.

- **Class IV:** (Modification of the landscape character) includes areas where changes may subordinate the original composition and character. But the changes should reflect what could be a natural occurrence in the characteristic landscape.

VOLATILE ORGANIC MATERIALS:
Carbon-containing compounds that with few exceptions evaporate into the air. Often having odors, they contribute to the forming of smog and may be toxic. Some examples are gasoline, alcohol, and solvents used in paints.

WATER DEVELOPMENTS:
Construction of artificial, or modification of natural water sources to provide reliable, accessible water for livestock, wildlife, or people.

WATER QUALITY:
Term used to describe the chemical, physical, and biological characteristics of water in respect to its suitability for a particular purpose.

WATER RIGHT:
The right to use a specific quantity of water occurring in a water supply, on a specific time schedule, at a specific place and putting it to a specific beneficial use.

WATERSHED (CATCHMENT):
A topographically delineated area that is drained by a stream system, that is, the total land area above some point on a stream or river that drains water past that point. The watershed is a hydrologic unit often used as a physical-biological unit and a socioeconomic-political unit for planning and managing natural resources.

WATERSHED CONDITION (WATERSHED HEALTH):
The comparison of watershed processes to normal or expected measurements of properties such as soil cover, erosion rate, runoff rate, and groundwater table elevation; an assessment or categorization of an area by erosion conditions, erosion hazards, and the soil moisture/temperature regime.

WATERSHED FUNCTION:
The combination of processes attributed to watersheds as part of the hydrologic cycle, including interception of rain by plants, rocks, and litter; surface storage by the soil; groundwater storage; stream channel storage; soil evaporation; plant transpiration; and runoff. These processes affect the following properties of the watershed: runoff rate, water infiltration rate, soil building rate, soil erosion rate, groundwater recharge rate, groundwater discharge rate, water table elevation, and surface water discharge. These properties in turn affect plant communities through soil attributes, including soil parent material, soil moisture, and nutrients; stream and rivers through flooding duration and magnitude, as well as sediment load, which structures the dimension, pattern, and profile of channels; and lakes and reservoirs through sedimentation and nutrient input.

WAY:
See **ROAD & ROUTE TYPES (p. 983)**.

WEED:
Any plant that interferes with management objectives. A weed may be native or non-native, invasive or passive, or non-noxious.

WETLANDS:
An area that is inundated or saturated by surface or ground water often and long enough to support and that under normal circumstances supports a prevalence of vegetation typically adapted for life in saturated soil. Wetlands include marshes, shallows, swamps, lake shores, bogs, muskegs, wet meadows, estuaries, cienegas, and riparian areas.

WIDTH/DEPTH RATIO:
Bank-to-bank, full-stream width divided by average depth.

WILD AND SCENIC RIVER CORRIDOR:
See **NATIONAL WILD AND SCENIC RIVERS SYSTEM (p. 972)**.

WILDCAT ROAD:
A non-permitted road on federally managed land.

WILDERNESS CHARACTERISTICS:
Attributes defined in Section 2(c) of the Wilderness Act, including the area's size, its apparent naturalness, and its outstanding opportunities for solitude or a primitive and unconfined type of recreation. Wilderness characteristics may also include supplemental values such as ecological, geological, or other features of scientific, educational, scenic, or historical value that may be present but are not required.

- **Naturalness:** The degree to which an area generally appears to have been affected primarily by the forces of nature with the imprint of people's work substantially unnoticeable.
- **Solitude:** The state of being alone or remote from others; isolation. A lonely or secluded place.
- **Primitive and Unconfined Recreation:** Non-motorized, non-mechanized (except as provided by law), and undeveloped types of recreation activities.

WILDFIRE:
Any wildland fire that is not meeting management objectives and therefore requires a suppression response.

WILD FREE-ROAMING HORSES AND BURROS:
Wild horses and burros are managed in a manner that assures significant progress is made toward achieving the Land Health Standards for upland vegetation and riparian plant communities, watershed function, and habitat quality for animal populations, as well as other site-specific or landscape-level objectives, including those necessary to protect and manage Threatened, Endangered, and Sensitive Species.

WILDLAND FIRE:
Any non-structure fire, other than prescribed fire, that occurs in the wildland.

WILDLAND-URBAN INTERFACE (WUI):
Areas where human structures and natural fuels interface or intermix with each other. This interface occurs mainly within 66 to 200 feet of houses, where fire most directly threatens houses and where a defensible zone can be developed.

WILDLIFE:
A broad term that includes birds, reptiles, amphibians, and non-domesticated mammals.

WILDLIFE HABITAT AREAS (WHAs):
An area that offers feeding, roosting, breeding, nesting, and refuge areas for a variety of wildlife species native to an area. Referred to as Wildlife Management Areas in prior plans.

WITHDRAWAL:
Withholding an area of federal land from settlement, sale, location, or entry under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of federal land, other than property governed by the Federal Property and Administrative Services Act, from one department, bureau, or agency to another department, bureau, or agency. See also **SEGREGATION (p. 986)**.

XERORIPARIAN:

An area in a drainage that supports plant species more characteristic of uplands than wetlands, but that is more densely vegetated than areas removed from the drainage. Any flows in these channels are characteristically ephemeral but water may also be subsurface and the drainage may not flow.

Appendix A. Sonoran Desert National Monument Presidential Proclamation

Sonoran Desert National Monument Proclamation
Proclamation 7397 of January 17, 2001
ESTABLISHMENT OF THE SONORAN DESERT NATIONAL MONUMENT
By the President of the United States of America.

A Proclamation

The Sonoran Desert National Monument is a magnificent example of untrammeled Sonoran desert landscape. The area encompasses a functioning desert ecosystem with an extraordinary array of biological, scientific, and historic resources. The most biologically diverse of the North American deserts, the Monument consists of distinct mountain ranges separated by wide valleys, and includes large saguaro cactus forest communities that provide excellent habitat for a wide range of wildlife species.

The Monument's biological resources include a spectacular diversity of plant and animal species. The higher peaks include unique woodland assemblages, while the lower elevation lands offer one of the most structurally complex examples of palo verde/mixed cacti association in the Sonoran Desert. The dense stands of leguminous trees and cacti are dominated by saguaros, palo verde trees, ironwood, prickly pear, and cholla. Important natural water holes, known as tinajas, exist throughout the Monument. The endangered acuna pineapple cactus is also found in the Monument.

The most striking aspect of the plant communities within the Monument are the abundant saguaro cactus forests. The saguaro is a signature plant of the Sonoran Desert. Individual saguaro plants are indeed magnificent, but a forest of these plants, together with the wide variety of trees, shrubs, and herbaceous plants that make up the forest community, is an impressive site to behold. The saguaro cactus forests within the Monument are a national treasure, rivaling those within the Saguaro National Park.

The rich diversity, density, and distribution of plants in the Sand Tank Mountains area of the Monument is especially striking and can be attributed to the management regime in place since the area was withdrawn for military purposes in 1941. In particular, while some public access to the area is allowed, no livestock grazing has occurred for nearly 50 years. To extend the extraordinary diversity and overall ecological health of the Sand Tank Mountains area, land adjacent and with biological resources similar to the area withdrawn for military purposes should be subject to a similar management regime to the fullest extent possible.

The Monument contains an abundance of packrat middens, allowing for scientific analysis of plant species and climates in past eras. Scientific analysis of the midden shows that the area received far more precipitation 20,000 years ago, and slowly became more arid. Vegetation for the area changed from juniper oak pinion pine woodland to the vegetation found today in the Sonoran Desert, although a few plants from the more mesic period, including the Kola Mountain barberry, Arizona rosewood, and junipers, remain on higher elevations of north facing slopes.

The lower elevations and flatter areas of the Monument contain the creosote bursage plant community. This plant community thrives in the open expanses between the mountain ranges, and connects the other plant communities together. Rare patches of desert grassland can also be

found throughout the Monument, especially in the Sand Tank Mountains. The washes in the area support a much denser vegetation community than the surrounding desert, including mesquite, ironwood, paloverde, desert honeysuckle, chuperosa, and desert willow, as well as a variety of herbaceous plants. This vegetation offers the dense cover bird species need for successful nesting, foraging, and escape, and birds heavily use the washes during migration.

The diverse plant communities present in the Monument support a wide variety of wildlife, including the endangered Sonoran pronghorn, a robust population of desert bighorn sheep, especially in the Maricopa Mountains area, and other mammalian species such as mule deer, javelina, mountain lion, gray fox, and bobcat. Bat species within the Monument include the endangered lesser long nosed bat, the California leaf nosed bat, and the cave myotis. Over 200 species of birds are found in the Monument, including 59 species known to nest in the Vekol Valley area. Numerous species of raptors and owls inhabit the Monument, including the elf owl and the western screech owl. The Monument also supports a diverse array of reptiles and amphibians, including the Sonoran desert tortoise and the red backed whiptail. The Bureau of Land Management has designated approximately 25,000 acres of land in the Maricopa Mountains area as critical habitat for the desert tortoise. The Vekol Valley and Sand Tank Mountains contain especially diverse and robust populations of amphibians. During summer rainfall events, thousands of Sonoran green toads in the Vekol Valley can be heard moving around and calling out.

The Monument also contains many significant archaeological and historic sites, including rock art sites, lithic quarries, and scattered artifacts. Vekol Wash is believed to have been an important prehistoric travel and trade corridor between the Hohokam and tribes located in what is now Mexico. Signs of large villages and permanent habitat sites occur throughout the area, and particularly along the bajadas of the Table Top Mountains. Occupants of these villages were the ancestors of today's O'odham, Quechan, Cocopah, Maricopa, and other tribes. The Monument also contains a much used trail corridor 23 miles long in which are found remnants of several important historic trails, including the Juan Bautista de Anza National Historic Trail, the Mormon Battalion Trail, and the Butterfield Overland Stage Route.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national Monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

WHEREAS, it appears that it would be in the public interest to reserve such lands as a national Monument to be known as the Sonoran Desert National Monument.

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Sonoran Desert National Monument, for the purpose of protecting the objects identified above, all lands and interest in lands owned or controlled by the United States within the boundaries of the area described on the map entitled "Sonoran Desert National Monument" attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 486,149 acres, which is the smallest area compatible with the proper care and management of the objects to be protected.

For the purpose of protecting the objects identified above, all motorized and mechanized vehicle use off road will be prohibited, except for emergency or authorized administrative purposes.

Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Arizona with respect to fish and wildlife management.

The establishment of this Monument is subject to valid existing rights.

All Federal lands and interests in lands within the boundaries of this Monument are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the Monument. Lands and interests in lands within the Monument not owned by the United States shall be reserved as a part of the Monument upon acquisition of title thereto by the United States.

This proclamation does not reserve water as a matter of Federal law nor relinquish any water rights held by the Federal Government existing on this date. The Federal land management agencies shall work with appropriate State authorities to ensure that water resources needed for Monument purposes are available.

The Secretary of the Interior shall manage the Monument through the Bureau of Land Management, pursuant to applicable legal authorities, to implement the purposes of this proclamation. That portion identified as Area A on the map, however, shall be managed under the management arrangement established by section 3 of Public Law No. 99 606, 100 Stat. 3460 61, until November 6, 2001, at which time, pursuant to section 5(a) of Public Law No. 99 606, 100 Stat. 3462 63, the military withdrawal terminates. At that time, the Secretary of the Interior shall assume management responsibility for Area A through the Bureau of Land Management.

The Secretary of the Interior shall prepare a management plan that addresses the actions, including road closures or travel restrictions, necessary to protect the objects identified in this proclamation. Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the Monument; provided, however, that grazing permits on Federal lands within the Monument south of Interstate Highway 8 shall not be renewed at the end of their current term; and provided further, that grazing on Federal lands north of Interstate 8 shall be allowed to continue only to the extent that the Bureau of Land Management determines that grazing is compatible with the paramount purpose of protecting the objects identified in this proclamation.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national Monument shall be the dominant reservation.

Nothing in this proclamation shall preclude low level overflights of military aircraft, the designation of new units of special use airspace, or the use or establishment of military flight training routes over the lands included in this proclamation.

In order to protect the public during operations at the adjacent Barry M. Goldwater Range, and to continue management practices that have resulted in an exceptionally well preserved natural resource, the current procedures for public access to the portion of the Monument depicted as Area A on the attached map shall remain in full force and effect, except to the extent that the United States Air Force agrees to different procedures which the Bureau of Land Management determines are compatible with the protection of the objects identified in this proclamation.

Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this Monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this seventeenth day of January, in the year of our Lord two thousand one, and of the Independence of the United States of America the two hundred and twenty fifth.

WILLIAM J. CLINTON

Appendix B. Applicable Laws, Regulations, and Policies

The BLM must comply with the mandate and intent of many laws, executive orders (EOs), regulations, policies and court cases that apply to BLM-administered public land and resources in the Planning Area. The Lower Sonoran Field Office (LSFO) manages public lands in the Lower Sonoran and Sonoran Desert National Monument Decision Areas according to applicable regulations found at Title 43 of the Code of Federal Regulations and according to applicable U.S. Department of the Interior (USDOI) and BLM manuals, handbooks, and instruction memoranda (IMs).

General planning criteria that guide and direct the plan and determine how the planning team approaches the development of alternatives, and ultimately the selection of a preferred alternative, are detailed in Chapter 1, *Purpose & Need for the RMP* (p. 1).

B.1. General Laws, Regulations & Policies

B.1.1. Archaeological Resource Protection Act (ARPA) of 1979

The Archaeological Resource Protection Act (ARPA) (16 USC 470) protects archaeological resources on public and Indian lands. It provides felony-level penalties for unauthorized excavation, removal, damage, alteration, or defacement of any archaeological resource, which is defined as material remains of past human life or activities that at least 100 years old. Before archaeological resources are excavated or removed from public lands, the Federal land manager must issue a permit detailing the time, scope, location, and specific purpose of the proposed work. ARPA also fosters the exchange of information about archaeological resources between governmental agencies, the professional archaeological community, and private individuals. ARPA is implemented by regulations found in 43 CFR Part 7.

B.1.2. BLM Land Use Planning Handbook

The BLM Land Use Planning Handbook (H-1601-1) provides detailed instructions on how to carry out policy and direction described in the manual sections (MS). Handbooks are considered part of the BLM Manual. They have the same force of authority as the MS. The Land Use Planning Handbook outlines specific techniques, procedures, practices, and processes used to create and organize resource-management plans (RMPs) and their component sections.

B.1.3. BLM Manual

The BLM Manual contains BLM policy and program direction. It provides policy, procedures, and instructions to manage programs. Each handbook is controlled by a manual section (MS), which sets out the basic authority for performing tasks, and states who is responsible for seeing that these tasks are accomplished.

B.1.4. Clean Air Act (CAA) of 1970 & Amendments of 1977 and 1990

The Clean Air Act (CAA) of 1970 , as amended 1977 & 1990 (42 USC 7401 et seq.) recognizes that air pollution endangers public health and welfare. To protect and enhance the quality of the nation's air resources, the CAA authorizes the Environmental Protection Agency (EPA) to set six national ambient air quality standards (NAAQSs) that regulate carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter pollution emissions. The CAA seeks to reduce or eliminate the creation of pollutants at their source and designates this responsibility to State and local governments. States are directed to utilize financial and technical assistance as well as leadership from the Federal government to develop implementation plans to achieve NAAQS. Geographic areas are officially designated by the EPA as attainment or nonattainment areas based on their compliance with NAAQS. Geographic regions established for air quality planning purposes are designated as air quality control regions (AQCR). Pollutant concentration levels are measured at designated monitoring stations within the AQCR. An area is designated as unclassifiable where insufficient monitoring data exists. Section 309 of the CAA authorizes the EPA to review and comment on impact statements prepared by other agencies.

An agency should consider what effect an action may have on NAAQS due to short-term increases in air pollution, i.e. during project construction, as well as long-term increases, i.e. those resulting from changes in traffic patterns. For actions in attainment areas, a Federal agency may also be subject to the EPA's prevention of significant deterioration (PSD) regulations. These regulations apply to major new stationary sources and modifications to such sources. Although few agency facilities will actually emit pollutants, increases in pollution can result from changes in traffic patterns or volume. Section 118 of the CAA waives Federal immunity from complying with the CAA and states that all Federal agencies will comply with Federal and State requirements.

B.1.5. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Superfund Amendments and Reauthorization Act (SARA) of 1986

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 authorizes the EPA to respond to spills and other releases of hazardous substances to the environment and authorizes the National Oil and Hazardous Substances Pollution Contingency Plan. CERCLA also provides a Federal “Superfund” to respond to emergencies immediately. Although the “Superfund” provides funds for cleanup of sites where potentially responsible parties (PRPs) cannot be identified, the EPA is authorized to recover funds through damages collected from responsible parties. This funding process places the economic burden for cleanup on polluters. The Superfund Amendments and Reauthorization Act (SARA) of 1986 mandates strong cleanup standards and authorizes the EPA to use a variety of incentives to encourage settlements. Title III of SARA authorizes the Emergency Planning and Community Right to Know Act (EPCRA), which requires facility operators with “hazardous substances” or “extremely hazardous substances” to prepare comprehensive emergency plans and to report accidental releases. EO 12856, “Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements,” requires Federal agencies to comply with the provisions EPCRA. If a Federal agency acquires a contaminated site, it can be held liable for cleanup as the property owner/operator. A Federal agency also can incur liability if it leases a property, as the courts have found lessees liable as

"owners." However, if the agency exercises due diligence by conducting a phase I environmental site assessment, it may claim the "innocent purchaser" defense under CERCLA. To use this defense, , the current owner/operator must show that it undertook "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" before buying the property, according to Title 42 United States Code (USC) 9601(35).

B.1.6. Endangered Species Act (ESA) of 1973

The Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.) establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with using their authority to conserve threatened and endangered species. All Federal agencies must ensure that no action they authorize, fund, or carry out is likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The secretary of the interior, using the best available scientific data, determines which species are officially endangered or threatened, and the U.S. Fish and Wildlife Service (FWS) maintains the list. A list of endangered species may be obtained from the Endangered Species Division, U.S. Fish and Wildlife Service (703-358-2171). States may also have their own lists of threatened and endangered species, which may be obtained by calling the appropriate State fish and wildlife office. Some species, such as the bald eagle, also have laws specifically for their protection (e.g., Bald Eagle Protection Act).

B.1.7. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898, February 11, 1994)

EO 12898 directs Federal agencies to make achieving environmental justice part of their mission. Agencies must identify and address adverse human health and environmental effects their activities have on minority and low-income populations and develop agency-wide environmental justice strategies. The strategy must list "programs, policies, planning, and public participation processes, enforcement, and rulemakings related to human health or the environment that should be revised to promote enforcement of all health and environmental statutes in areas with minority populations and low-income populations, ensure greater public participation, improve research and data collection relating to the health and environment of minority populations and low-income populations, and identify differential patterns of consumption of natural resources among minority populations and low-income populations." A copy of the strategy and progress reports must be provided to the Federal Working Group on Environmental Justice. Responsibility for compliance with this EO lies with each Federal agency.

B.1.8. Federal Land Policy and Management Act (FLPMA) of 1976

The Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1701) and the regulations contained in 43 CFR Part 1600 govern the BLM planning process. Land-use plans ensure that public lands are managed in accordance with the intent of Congress, as stated in FLPMA, under the principles of multiple use and sustained yield. As required by FLPMA, the public lands must be managed in a manner that protects the quality of scientific, scenic,

historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; preserves and protects, where appropriate, certain public lands in their natural condition and provides food and habitat for fish and wildlife and domestic animals; and provides for outdoor recreation and human occupancy and use by encouraging collaboration and public participation throughout the planning process. In addition, the public lands must be managed in a manner that recognizes the nation's need for domestic sources of minerals, food, timber, and fiber from the public lands.

B.1.9. National Historic Preservation Act (NHPA) of 1966

The National Historic Preservation Act (NHPA) sets national policy to identify and preserve properties of State, local, and national significance. The act establishes the Advisory Council on Historic Preservation (Council), state historic preservation offices, and the National Register of Historic Places (NRHP). The Council advises the President, Congress and Federal agencies on historic preservation issues. Section 106 of the act directs Federal agencies to take into account effects of their undertakings (actions and authorizations) on properties included in or eligible for NRHP. Section 110 sets inventory, nomination, protection and preservation responsibilities for Federally owned cultural properties. Section 106 of the act is implemented by regulations of the Council, 36 CFR Part 800. The BLM in Arizona complies with Section 106 according to a national programmatic agreement dated March 26, 1997, supplemented by a protocol between the BLM Arizona state director and the Arizona state historic preservation officer.

The agency should coordinate studies and documents prepared under Section 106 with the National Environmental Policy Act (NEPA) of 1972 where appropriate. However, NEPA and NHPA are separate statutes, and compliance with one does not constitute compliance with the other. For example, actions that qualify for a categorical exclusion under NEPA, may still require Section 106 review under NHPA. It is the responsibility of the agency official to identify properties in the area of potential effects and decide whether they are included or eligible for inclusion in the NRHP. Section 110 of the NHPA requires Federal agencies to identify, evaluate, and nominate historic property under agency control to the NRHP.

B.1.10. Sikes Act of 1960

The Sikes Act (16 USC 670 et seq.) authorizes the USDOI, in cooperation with State agencies responsible for administering fish and game laws, to plan, develop, maintain, and coordinate programs for conserving and rehabilitating wildlife, fish, and game on public lands within its jurisdiction. The plans must conform to overall land-use and management plans for the lands involved. The plans could include habitat improvement projects and related activities and adequate protection for species of fish, wildlife, and plants considered endangered or threatened. The BLM also must coordinate with suitable State agencies in managing State-listed plant and animal species when the State has formally made such designations.

B.1.11. Taylor Grazing Act of 1934, as amended and supplemented

The Taylor Grazing Act (43 USC 315 et seq.) was the Federal government's first effort to regulate grazing on Federal public land. The act established grazing districts of vacant, unappropriated, and unreserved land from the public domain, excluding Alaska, which were not national forests, parks, or monuments, Indian reservations, railroad grant lands, revested Coos Bay Wagon Road

grant lands, or land that was valuable chiefly for grazing and raising forage crops. Residents and stock owners pay an annual fee to obtain a grazing permit, which is used to manage livestock grazing in established districts. Grazing administration regulations (43 CFR 4100) provide for the development of state standards for rangeland health (Standards) and guidelines for grazing management (Guidelines). The Standards and Guidelines are approved through the BLM planning and NEPA processes.

B.1.12. Wild and Scenic Rivers Act (WSRA) of 1968

By recognizing the remarkable values of specific rivers of the Nation, the Wild & Scenic Rivers Act (WSRA) of 1968 (16 USC 1271-1287) provides for a wild and scenic river system. These selected rivers and their immediate environment are preserved in a free-flowing condition, without dams or other construction. The policy not only protects the water quality of the selected rivers but also provides for the enjoyment of present and future generations. Any river in a free-flowing condition is eligible for inclusion, and can be authorized as such by an Act of Congress, an act of State legislature, or by the Secretary of Interior upon the recommendation of the Governor of the State(s) through which the river flows.

B.2. Program-Specific Laws, Regulations & Policies

B.2.1. Resources

Air Quality Management

The objective of the air resource program is to maintain or improve air quality as established by the NAAQS, achieve State Implementation Plan (SIP) goals for nonattainment areas, and reduce emissions from point and non-point sources. Proposed decisions within the influence zone of the planning project that may affect nonattainment areas, including the Maricopa County nonattainment areas for particulate matter of 10 microns (PM_{10}) and particulate matter less than 2.5 microns ($PM_{2.5}$), will be assessed for conformance with air quality standards.

Under the CAA, the BLM administered lands were given a class II air-quality classification unless reclassified by the State. Wilderness areas and national monuments must be classified as class I or class II. This classification allows moderate deterioration associated with moderate, well-controlled industrial and population growth.

Cave Resources

- Cave and Karst Resources Management (Manual Section [MS]-8380)
- Federal Cave Resource Protection Act of 1988 (16 USC 4301-4310)

Climate Change

- Climate Change and the Department of the Interior (Secretarial Order [SO] 3226, January 16, 2009)

Cultural and Heritage Resource Management

Cultural resources will be managed to maintain or enhance significant scientific, educational, cultural heritage, and other public values. Cultural resources will be conserved and protected for future generations. Cultural sites that meet NRHP criteria will be protected and nominated for inclusion on the register.

- American Indian Religious Freedom Act (AIRFA) of 1978 (42 USC 1996
- Antiquities Act of 1906 (16 USC 431-433)
- Archaeological and Historic Preservation Act of 1974 (16 USC 469)
- Archaeological Resources Protection Act of 1979 (16 USC 469)
- BLM Manual 8100 – The Foundation for Managing Cultural Resources (MS-8100)
- BLM Manual 8110 – Identifying and Evaluating Cultural Resources (MS-8110)
- BLM Manual 8120 – Tribal Consultation Under Cultural Resources (MS-8120)
- BLM Manual 8130 – Planning for Use of Cultural Resources (MS-8130)
- BLM Manual 8140 – Protecting Cultural Resources (MS-8140)
- BLM Manual 8150 – Permitting Uses of Cultural Resources (MS-8150)
- BLM Manual 8170 – Interpreting Cultural Resources for the Public (MS-8170)
- Historic Sites Act of 1935 (16 USC 461)
- Identifying and Evaluating Cultural Resources (MS-8110)
- Indian Sacred Sites (EO 13007, May 24, 1996)
- National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.)
- National Trails System Act of 1968 (16 USC 1241-1249)
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC 3001)
- Preserve America (EO 13287, March 3, 2003)
- Protection and Accommodation of Access to Indian Sacred Sites (EO 13007, May 24, 1996)
- Protection and Enhancement of the Cultural Environment (EO 11593, May 13, 1971)
- Reservoir Salvage Act of 1960
- The Foundation for Managing Cultural Resources (MS-8100)

Geological Resources

- None

Paleontological Resources

- General Procedural Guidance for Paleontological Resource Management (H-8270-1)

- Issuance of Archaeological and Paleontological Permits (Secretarial Order [SO] 3104, September 28, 1984)
- Paleontological Resource Management Manual (MS-8270)
- Paleontological Resources Preservation Act — Title VI, Subtitle D of the Omnibus Public Land Management Act of 2009 (PL 111–11)

Priority Wildlife Habitat & Species

Management decisions will be designed to enhance and maintain habitat for threatened and endangered species. Management actions authorized, funded, or implemented by the BLM will not jeopardize the continued existence of Federally listed threatened or endangered plant or animal species or result in the destruction or adverse modification of critical habitat. Species proposed for Federal listing and proposed critical habitat will be given the same consideration as listed species. BLM candidate and special-status species and Arizona species of greatest conservation need will be managed so as not to contribute to the need to list as threatened or endangered. The intent is to recover listed species and maintain healthy populations of all other species, therefore avoiding the need for further listing of any species as threatened or endangered. Terms and conditions and conservation measures from the biological opinion will be incorporated into the plans.

Relevant Laws, Policies & Regulations

- Animal Damage Control Act (7 USC 426)
- Bald and Golden Eagle Protection Act of 1940 (16 USC 668)
- BLM Manual 6840 – Special Status Species Management (MS-6840)
- Conservation of Migratory Birds (EO 13186, January 10, 2001)
- Exotic Organisms (EO 11987, May 24, 1977)
- Fish and Wildlife Conservation Act (16 USC 2901-2911)
- Fish and Wildlife Coordination Act (16 USC 661-667)
- Introduction, Transplant, Augmentation and Reestablishment of Fish, Wildlife, and Plants (MS-1745)
- Migratory Bird Treaty Act of 1918, as amended in 1936, 1960, 1968, 1969, 1974, 1978, 1986, and 1989 (16 USC 703-712)
- Migratory Bird Conservation Act of 1929, as amended (16 USC 715)
- Neotropical Migratory Bird Conservation Act (PL 106-247)
- Public Rangelands Improvement Act of 1978 (43 USC 1901)
- Recreational Fisheries (EO 12962, June 7, 1995)
- Responsibilities of Federal Agencies to Protect Migratory Birds (EO 13186, January 10, 2001)
- Special Status Species Management (MS-6840)

Soil Resource Management

Proposed decisions will be measured against the Arizona Standard for Rangeland Health Standard 1; upland soils will exhibit infiltration, permeability and erosion rates that are appropriate to soil type, climate, and land form (ecological site) to ensure long-term soil productivity. Best management practices will be incorporated into programs to minimize soil erosion and compaction resulting from management actions.

Relevant Laws, Policies & Regulations

- Soil and Water Conservation Act of 1977 (16 USC 2001-2009)
- Soil Conservation and Domestic Allotment Act of 1935 (16 USC 590)
- Soil Resource Management (MS-7100)
- Soil, Water, and Air Management (MS-7000)

Visual Resources Management

A visual resource management (VRM) classification will be conducted to address the public's concerns about open space and natural vistas. Some areas may be subject to special measures to protect resources or reduce conflicts among uses.

The monument will be managed to protect the viewshed and other visual resources that are compatible with the purposes for which the monument was established.

- Transportation Equity Act for the 21st Century (PL 105-178)
- 43 USC 1701, Section 102 (a) (8)
- Public Rangelands Improvement Act of 43 USC 4321, Section 101 (b)
- Visual Resource Inventory Handbook (H-8410-1)

Vegetation Resource Management

Vegetation and Habitat Management

Proposed decisions will be measured against the Arizona Standard for Rangeland Health for desired plant communities that provide for biodiversity and protection and restoration of native species. Vegetation will be managed to achieve desired plant communities (considering the ecological site potential) that provide for biodiversity as well as protection and restoration of native species. The plant communities will be managed to protect, improve, and restore communities to provide wildlife habitat and non-consumptive uses including plant protection, visual quality, watershed protection and stability, and water quality. Provisions may be made for hazardous fuels reduction and habitat restoration.

In SDNM, desired plant community descriptions will be developed that emphasize the protection of the diversity natural communities specified in the Proclamation. Monument plan decisions will prioritize achieving or maintaining these desired plant communities.

Invasive Species and Noxious Weed Control

The BLM will work with county, State, Tribal, and Federal agencies, individuals, and Weed Management Areas to monitor, manage, and control noxious weeds and invasive species. Invasive species and noxious weed control will be considered in the plans in accordance with the integrated weed management guidelines and design features identified in National, State, and local BLM programs and policies. Invasive species and noxious weed infestations will be prevented, contained, or reduced on BLM-administered public land using an integrated pest management approach. Proposed decisions will be assessed to determine whether or not they would contribute to the introduction or spread of noxious weeds or invasive species in accordance with the Federal Noxious Weed Act and Executive Order 13112. Management practices that prevent and control invasive species will be emphasized.

Riparian Areas, Floodplains, and Wetlands

Proposed decisions will be measured against the Arizona Standard for Rangeland Health for riparian areas, floodplains, and wetlands that provide for biodiversity and protection and restoration of native species. Riparian areas, floodplains, and wetlands will be managed to protect, improve, and restore their natural functions to benefit water storage, groundwater recharge, water quality, and fish and wildlife values. All management practices will be designed to maintain or improve the integrity of these high-priority values, in accordance with the Clean Water Act and Arizona's Standards for Rangeland Health. Management activities in floodplains will be consistent with Executive Order 11988 and management activities for wetlands and riparian areas will be consistent with Executive Order 11990.

Relevant Laws, Regulations & Policies

- Range Management Grazing Administration Regulations (43 CFR 4100)
- Arizona Native Plant Law of 1993 (Arizona Revised Statutes [ARS] 3-901 et seq.)
- Arizona Standards as developed from Standards and Guidelines for Grazing Administration (43 CFR 4180.2)
- Chemical Pest Control (MS-9011)
- Federal Advisory Committee Act
- Federal Noxious Weed Act of 1974 (7 USC 2801 et seq.)
- Floodplain Management (EO 11988, May 24, 1977)
- Invasive Species Control (EO 13112, February 3, 1999)
- Noxious Plant Control Act (43 USC 1241-43)
- Protection of Wetlands (EO 11990, May 24, 1977)
- Public Rangelands Improvement Act of 1978
- Rangeland Health Standards (MS-4180)
- Renewable Resource Improvements and Treatments (MS-1740)
- Special Status Species Management (MS-6840)

- Wildlife and Fisheries Management (MS-6500)
- Biological Soil Crusts: Ecology and Management, TR-1730-2, Interagency, 2001
- Interpreting Indicators for Rangeland Health, Version 4, TR 1734-6, Interagency, 2005
- Inventory and Monitoring, Ecological Site Inventory, TR-1737-7, BLM, 2001
- Measuring and Monitoring Plant Populations, TR-1730-1, 1998
- National Range Handbook, Handbook, H-4410-01, 1990
- Rangeland Monitoring and Evaluation, TR-4400-1, BLM 1988
- Rangeland Monitoring and Evaluation Handbook, BLM Handbook H-4400-01, 1990
- Rangeland Monitoring: Actual Use Studies, TR-4400-2, BLM, 1984)
- Rangeland Inventory and Monitoring: Supplemental Studies, TR-4400-5, BLM, 1992
- Rangeland Monitoring: Analysis, Interpretation, and Evaluation, TR-4400-7, BLM, 1984
- Riparian Area Management, Process for Assessing Proper Functioning Condition, TR-1737-9, Interagency, 1990
- Riparian Area Management, Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas, TR-1737-11, Interagency, 1990
- Sampling Vegetation Attributes, TR-1734-4, 1996
- Utilization Studies and Residual Measurements, TR-1734-3, Interagency, 1996

Water Resources Management

Water Quality

Section 319 of the CAA obligates Federal agencies to be consistent with State non-point source management program plans and relevant water-quality standards. Section 313 requires compliance with State Water Quality Standards. The BLM will coordinate with ADEQ regarding their Total Maximum Daily Load (TMDL) program and other relevant water quality programs. The BLM will incorporate applicable best management practices or other conservation measures for specific programs and activities into the RMP. Water quality will be maintained or improved in accordance with State and Federal standards. Proposed decisions within the Planning Area will be in compliance with the Clean Water Act, Federal and State water quality standards, and BLM/ADEQ agreements.

Water Rights

Where the need for water rights is identified on the public lands, the BLM will file for water rights in accordance with State Law and in accordance with the SDNM Proclamation. The BLM will continue to quantify and notify the State of its Federal reserved water rights in the designated wilderness areas, in accordance with the Arizona Desert Wilderness Act of 1990.

Relevant Laws, Policies & Regulations

- Arizona Revised Statutes (ARS) Title 45, Waters and Title 49, The Environment
- Colorado River Basin Project Act (43 USC 1501-1556)
- Colorado River Basin Salinity Control Act (43 USC 1571-1599)
- Colorado River Floodway Protection Act (100 Stat. 1129)
- Colorado River Storage Project Act (43 USC 620)
- Federal Water Pollution Control Act (33 USC 1251 et seq.)
- Flood Control Act (16 USC 460 et seq.)
- Floodplain Management (EO 11988, May 24, 1977)
- Safe Drinking Water Act (42 USC 300h)
- Soil, Water, and Air Management (MS-7000)
- Water Quality Act (PL 100-4)
- Water Resources Planning Act (42 USC 1962)
- Water Rights Act (43 USC 666)
- Fundamentals of Rangeland Health (43 CFR 4180.1)

Wild Horses and Burros Management

In 1971, Congress passed The Wild Free-Roaming Horses and Burros Act (WFRHBA, or "The Act," Public Law 92-195). The Act gave BLM the honor and the responsibility to manage wild horse and burro populations on BLM-administered lands and facilities. The Painted Rock Herd Area (PRHA) is the only location in the Planning Area that has is an established wild horse and burro herd area or herd management area.

Applicable Laws, Regulations & Policies

- The Act of September 8, 1959 (18 U.S.C. 47), commonly known as the Wild Horse Annie Act
- The Wild Free-Roaming Horses and Burros Act of 1971 (16 U.S.C. 1331-1340), as amended.
- Title 43 Code of Federal Regulations 4700.
- Wild Free-Roaming Horses and Burros Management, 2010 (BLM Manual 4700-1, Rel 4-111).
- Wild Horses and Burros Management Handbook, 2010 (BLM Handbook – 66 – Rel. 4-116)
- Conducting Compliance Checks for BLM's Wild Horse and Burro Adoptions (BLM Handbook 4760-1)
- Adoption of Wild Horses and Burros Handbook (BLM Handbook 4750-2)

Wildland Fire and Management

Fire decisions made in the Arizona Statewide LUP Amendment for Fire, Fuels, and Air Quality EA, initiated in 2003, will be incorporated into the Lower Sonoran and SDNM plans. Adjustments to the fire decisions, if required, will be consistent with the Federal Wildland Fire Policy, the National Fire Plan, and all other BLM policy, including current Zone Fire Management Plans.

Fire suppression will be accomplished with the least amount of surface disturbance and to protect significant cultural or paleontological values. Public lands and resources affected by fire will be rehabilitated in accordance with the objectives identified for the affected area, subject to BLM policies and available funding.

Relevant Laws, Regulations & Policies

- BLM Burned Area Emergency Stabilization and Rehabilitation Handbook (H-1742-1)
- BLM Fire Business Management Manual (MS-1111)
- BLM Prescribed Fire Management Handbook (H-9214-1)
- Timber Protection Act (16 USC 594)

B.2.2. Resource Uses

Lands and Realty Management

Land Tenure Adjustment and Withdrawal

Public lands will be retained in public ownership unless determined that disposal of a particular parcel(s) will serve the public interest. Decisions to acquire lands will be based on public benefits, management considerations, and public access needs. Land tenure adjustments are made through both acquisitions and disposals. Land tenure adjustments may include only the surface, only the mineral estate, or both. Acquisitions may occur by land purchase, donation, exchange, or transfer of jurisdiction from another Federal agency. Disposals occur by sale, exchange, transfer of jurisdiction to another Federal agency, or by infrequent sales or transfers under legal authorities. All land tenure adjustments will consider the effect on the mineral estate.

Conditions will be identified that warrant the removal or withdrawal of certain public lands from multiple use, such as for public safety or protection of special uses and resources. Withdrawals designate public lands for a particular project, purpose or use. Normally, the land is closed to entry under all or some of the public land laws including the mining law. Criteria for identifying lands available or not available for land entry, including under the Desert Land Entry Act, will be developed.

In SDNM, all lands and interest in lands within the monument will be retained in public ownership. The RMP will evaluate the opportunity for acquiring non-Federal lands within or adjacent to the monument that could protect or enhance management of monument resources. Acquired lands and interests within the monument boundary will be added to the monument. The Proclamation withdrew the monument from all form of entry, location, selection, sale, or leasing or other disposition under public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument.

Corridors, Communications Sites, and Renewable Energy Sites

Existing corridors and communication sites from previous plans may be modified, removed, or carried forward. Additional corridors and communication sites, and new renewable energy sites, including wind and solar energy, will be considered based on established criteria, procedures, and policy, in association with industry demand and resource protection objectives. New locations for corridors, communication sites, and renewable energy sites will also consider environmental quality, economic efficiency, security, safety, and good engineering and technological practices. Decisions will consider preferred locations and exclusion areas to protect significant resource values.

In SDNM, existing and proposed corridors, communication sites, and renewable energy sites will be evaluated for compatibility with protecting the monument resources. Additional corridors and communication sites, and new renewable energy sites, including wind and solar energy, will be considered based on consideration of monument resource protection, along with established criteria, procedures, and policy, and in association with industry demand and resource protection objectives.

Applicable Laws, Regulations & Policies

- Airport and Airway Improvement Act (49 USC 2215)
- BLM Acquisition Handbook (H-2100-1)
- BLM Land Exchange Handbook (H-2200-1)
- BLM Preacquisition Environmental Site Assessment Handbook (H-2101-4
- BLM Recreation and Public Purposes Handbook (H-2740-1)
- BLM Manual 9310 – Appraisals of Real Property (MS-9310)
- BLM Manual 2200 – Land Exchanges (MS-2200)
- BLM Manual 2880 – Oil and Natural Gas Pipelines (MS-2880)
- BLM Manual 379 – Payment in Lieu of Taxes (MS-379)
- Desert Land Entry Act (43 USC 321 et seq.)
- Energy Policy Act (42 USC 15801)
- Exchanges of Public Land for Non-Federal Land (43 USC 1716)
- Federal Highway Acts (23 USC 17 & 317)
- Federal Land Exchange Facilitation Act of 1988 (43 USC 1716)
- Federal Land Transfer Facilitation Act of 2000 (PL 106-248)
- Federal Property and Administrative Services Act (40 USC 472)
- Indian General Allotment Act (24 Stat. 388)
- Recreation and Public Purposes Act of 1926, as amended (43 USC 869 et seq.)
- Telecommunications Act of 1996 (PL 104-104)

Livestock Grazing Management

The BLM will manage grazing through existing laws, regulations, and policies, including the *Arizona Standards for Rangeland Health and Guidelines for Grazing Administration*. The BLM will provide for livestock management in an environmentally sensitive manner consistent with resource management objectives, including achieving desired plant communities, and land use conditions. Proposed decisions will determine if allotments are open or closed to grazing in accordance with the Taylor Grazing Act and, if open, in what manner. Decisions will include a strategy for ensuring that proper grazing practices are followed while preserving habitats for sensitive plant and wildlife species. Appropriate best management practices will be followed to protect rangeland resources and, where necessary, to mitigate any conflicts with other uses and values. Administrative actions to assure compliance with existing permit/lease requirements, to modify permits and leases, to monitor and supervise grazing use, and to remedy unauthorized grazing use will continue.

In SDNM, consistent with the monument Proclamation, grazing permits on Federal lands within the monument south of I-8 shall not be renewed at the end of their current term and grazing on Federal lands north of I-8 shall be allowed to continue only to the extent that the BLM determines that grazing is compatible with the paramount purpose of protecting the objects identified in the Proclamation. A priority will be placed on protecting the monument resources, including the diversity of plant communities identified in the Presidential Proclamation.

Applicable Laws, Regulations & Policies

- BLM Rangeland Health Standards Handbook (H-4180)
- BLM Manual 4180 – Rangeland Health Standards (MS-4180)
- Grazing Administration – Exclusive of Alaska (43 CFR 4100)Public Rangelands Improvement Act of 1978 (43 USC 1901)
- Process for Setting Priorities for Issuing Grazing Permits and Leases (WO-IM-2009-018)

Minerals Management

Identify exploration and development opportunities and areas for lease, including geothermal resources, saleable, and locatable minerals. Minerals management will be consistent with FLPMA and existing policy and regulation including the Mining and Minerals Policy Act of 1970, Section 102(a)(12) of FLPMA, the National Materials and Minerals Policy, Research and Development Act of 1980, and current BLM mineral resources policy. Withdrawals from the mining laws may be considered to achieve resource management objectives. Where the plan identifies lands as open to mineral leasing, it also will define any constraints to surface use.

In SDNM, public lands are closed to mineral development (subject to valid existing rights) by the Proclamation.

Applicable Laws, Regulations & Policies

- Actions to Expedite Energy-Related Projects (EO 13212, May 18, 2001)
- Building Stone Placer Act of 1892 (30 USC 161)

- Bureau of Land Management — Energy and Materials Policy (Aug. 26, 2008)
- Combined Hydrocarbon Leasing Act of 1981 (43 USC 1701 et seq.)
- Domestic Minerals Program Extension Act of 1953 (50 USC 2181)
- Energy Policy Act of 2005 (PL 109-58)
- Energy Independence and Security Act of 2007 (PL 110-140)
- Energy and Mineral Resource Assessment (MS-3031)
- Energy Policy Act of 1992 (42 USC 13201)
- Federal Coal Leasing Amendments Act of 1976 (30 USC 201)
- Federal Land Policy and Management Act of 1976 (PL 94-579)
- Federal Mining and Minerals Policy Act of 1970 (30 USC 21a)
- General Mining Law of 1872, as amended (30 USC 21)
- Geothermal Steam Act of 1970 (30 USC 1001-1027)
- Materials Sale Act of 1947 (30 USC 601-604)
- Mineral Leasing Act of 1920 (30 USC 181 et seq.)
- Mineral Leasing Act for Acquired Lands of 1947 (30 USC 351 et seq., PL 382)
- Mineral Materials Act (30 USC 601 et seq.)
- Mineral materials rules (42 CFR 3600)
- Mineral Reports – Preparation and Review (MS-3060)
- Mining & Minerals Policy Act of 1970 (30 USC21)
- Mining Claims Rights Restoration Act of 1955 (69 USC 681, PL 359)
- Mining in the Parks Act (16 USC 1901 et seq.)
- Multiple Mineral Development Act of 1954 (68 USC 708, PL 585)
- Multiple Surface Use Act of 1955, with Petrified Wood Amendment (69 USC 367, PL 167)
- National Materials and Minerals Policy, Research and Development Act of 1980 (30 USC 28)
- Oil and Gas Leasing (43 CFR 3100-3800)
- Outer Continental Shelf Lands Act of 1953 (67 USC 462)
- Placer Act of 1870 (16 Stat. 217)
- Placer Claim Millsite Act of 1960 (74 USC 7)
- Solid materials leasing rules (43 CFR 3500)

- Stock Raising Homestead Act (43 USC 291-299)
- Surface Mining Control & Reclamation Act (30 USC 1201 et seq.)

Recreation Management

A range of landscape settings and associated recreation opportunities will be provided that contribute to meeting projected recreation demand within the Planning Area. Recreation management objectives will be defined based on recreational opportunities and compatibility with other resource management objectives, including Arizona Standards for Rangeland Health.

Public lands will be identified as being within either special recreation management areas or extensive recreation management areas.

A range of developed and dispersed recreation experiences, including both motorized and non-motorized recreation opportunities, will be provided.

In SDNM, a range of landscape settings and associated recreation opportunities will be provided that contribute to meeting projected recreation demands in the SDNM Planning Area, while meeting the overriding purpose of protecting monument resources and the Arizona Standards for Rangeland Health.

Consistent with the Proclamation, in order to protect the public during operations at the adjacent Barry M. Goldwater Range, and to continue management practices that have resulted in an exceptionally well preserved natural resource, the current procedures for public access to the Sand Tank portion of the national monument (formerly Area A), shall remain in effect, except to the extent that the Air Force agrees to different procedures which the BLM determines are compatible with protection of monument resources.

Applicable Laws, Regulations & Policies

- BLM National Mountain Bicycling Strategic Action Plan (2002)
- BLM Recreation Permit Administration Handbook (H-2930-1)
- Land and Water Conservation Act of 1965, as amended (USC 4601-1 et seq.)
- Recreational Fisheries (EO 12962)

Travel Management

The plan will include transportation and access needs for motorized and non-motorized uses. Based upon Executive Order 11644 and subsequent regulations in 43 CFR 8340, all public lands will be designated as open, limited, or closed to motorized vehicles. The plans may designate a network of vehicle routes. Public safety, resource protection, current and future user access needs and conflict resolution will be considered in making these decisions. The BLM route inventory will provide a basis for considering route management.

In SDNM, consistent with the Proclamation, all motorized and mechanized vehicle use off-road will be prohibited, except for emergency or authorized administrative purposes. The plan will designate a network of routes for motorized and mechanized vehicle use. Protection of the monument resources, public safety, current and future user access needs, and conflict resolution will be considered in making these decisions.

Relevant Laws, Policies & Regulations

- Arizona Off-Highway Vehicle Law (ARS 28-1171.4)
- Off-Road Vehicles (43 CFR 8340-8344)
- Clarification of Cultural Resource Considerations for Off-Highway Vehicle (OHV) Designation and Travel Management (WO-IM-2007-030)
- Clarification of Guidance and Integration of Comprehensive Travel and Transportation Management Planning into the Land Use Planning (WO-IM-2008-014)
- Implementation of Roads and Trails Terminology Report – Classification of Primitive Roads; DD: 07/31/2009 (WO-IM 2009-132)
- Use of Off-Road Vehicles on Public Lands (EO 11644, February 8, 1972; EO 11989, May 24, 1977)
- Transportation Equity Act for the 21st Century (PL 105-178)

B.2.3. Special Designation Management

The BLM will review, through this planning process, lands within the Planning Area that may possess remote or primitive characteristics. Consistent with BLM policy, the secretary of the interior letter to Sen. Robert Bennett (dated April 11, 2003), and the settlement in the case of *Utah v. Norton* (dated April 14, 2003), the BLM has the authority to discuss and incorporate wilderness values into the land use plan, in accordance with the public process incorporated in all land use planning efforts. Thus, the BLM is committed to listening to public input through the land use planning process and, where appropriate, managing specified areas of land for wilderness values. However, the BLM has no authority to establish new wilderness study areas (WSAs) or to report such areas to Congress. The BLM can protect areas in their natural state using a wide range of land use tools other than the WSA designation process.

Current congressionally designated wilderness areas will be managed according to the 1990 Arizona Desert Wilderness Act, the Wilderness Act regulations for wilderness management at 43 CFR 6300, interim management plans for wildlife and fire management in wilderness, and applicable wilderness management plans. The RMPs will not address reducing or eliminating existing wilderness areas, nor will the RMPs address changing existing boundaries or allowing mechanized or motorized access in any area within them.

Special areas on public lands include wildernesses, WSAs, areas of critical environmental concern (ACECs), national trails, wild and scenic rivers, national conservation areas, and backcountry byways. Special areas that may be considered in this plan include ACECs, national trails, national conservation areas, and backcountry byways as consistent with federal law as well as policies and procedures. Management requirements for designated special areas will be identified in the plan.

<u>Congressional Designations</u>

National Byways

- BLM Byways Handbook (H-8357-1)

- Intermodal Surface Transportation Efficiency Act of 1991 (23 USC 101)
- Transportation Equity Act for the 21st Century (PL 105-178)

National Historic Trails

- National Trails System Act (PL 90-543, as amended through PL 109-418)
- BLM National Scenic and Historic Trails Strategy (2006)

Wilderness Areas

- Arizona Desert Wilderness Act (PL 101-628)
- BLM Management of Designated Wilderness Areas Handbook (H-8560)
- BLM Interim Management Policy & Guidelines for Lands Under Wilderness Review Handbook (H-8550-1)
- Wilderness Act (16 USC 1131 et seq.)
- Wilderness Management (43 CFR 6300 & 8560)

Administrative Designations

Areas of Critical Environmental Concern ACECs

- Designation of Areas of Critical Environmental Concern (43 CFR 1610.7-2)

Resource Conservation Area

- Reserving Public Lands in Connection with Gila River Waterfowl Area Project (Public Land Order [PLO] 1015, October 5, 1954)
- Classification of Public Lands for Multiple Use Management in 1967 (32 Federal Register [FR] 8536).
- Designation of Fred J. Weiler "Green Belt" Resource Conservation Area in 1970 (35 FR 13532)

B.2.4. Tribal Interests, Public Safety & Social and Economic Conditions

Hazardous Materials and Public Safety Management

The plan will develop a framework to protect public health and safety, including addressing hazardous sites and activities; incorporating requirements to meet the CAA, CWA, and other environmental laws and regulations; and considering other potential hazards.

The Air Force and BLM are developing a Memorandum of Understanding to address safe disposal of any unexploded ordnance discovered on lands relinquished from the Barry M. Goldwater Range (i.e., Sentinel Plain and property in the vicinity of the Ajo Airport).

In SDNM, in order to protect the public during operations at the adjacent Barry M. Goldwater Range, and to continue management practices that have resulted in an exceptionally well preserved natural resource, the current procedures for public access to the portion of the monument depicted as Area A will remain in full force and effect, except to the extent that the Air Force agrees to different procedures that the BLM determines are compatible with the protection of resources and uses identified in the Presidential Proclamation.

- Action to Expedite Energy Related Projects (EO 13212, May 18, 2001)
- Atomic Energy Act of 1954, as amended (PL 83-703)
- BLM Abandoned Mine Land Program Policy Handbook (H-3720-1)
- BLM CERCLA Handbook (H-1703-1)
- BLM Military Munitions & Explosives of Concern Handbook (H-1703-2)
- BLM National Environmental Policy Act Handbook (H-1790-1)
- BLM Safety and Health for Field Operations Handbook (H-1112-2)
- BLM Safety and Health Management Handbook (H-1112-1)
- Innocent Landowners, Standards for Conducting All Appropriate Inquiries (40 CFR 312)
- Reporting Hazardous Substance Activity When Selling or Transferring Federal Real Property (43 CFR 373)
- Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 (40 CFR 350-372)
- Energy Supply, Distribution, or Use (EO 13211, May 18, 2001)
- Environmental Management Systems (515 DM 4)
- Environmental Stewardship & Transportation Infrastructure Project Reviews (EO 13274, September 18, 2002)
- Federal Aid Highways Act (23 USC 317)
- Federal Compliance with Pollution Control Standards (EO 12088, October 13, 1978) as amended (EO 12580, January 23, 1987)
- Federal Compliance with Right to Know Laws and Pollution Prevention Requirements (EO 12856, August 3, 1993)
- Federal Environmental Pesticide Control Act of 1972, as amended (7 USC 136)
- Federal Facilities Compliance Act of 1992 (PL 102-386)
- Federal Insecticide, Fungicide and Rodenticide Act of 1975, as amended (7 USC 136)
- Land Acquisition, Exchange and Disposal, Real Property Pre-Acquisition Environmental Site Assessments (602 DM 2)

- National Oil & Hazardous Substances Pollution Contingency Plan (40 CFR 300)
- Nuclear Waste Policy Act of 1982 (42 USC 10101)
- Pollution Prevention Act (PPA) of 1990 (42 USC 13101 et seq.)
- Resource Conservation & Recovery Act (RCRA) of 1976, as amended (42 USC 6901 et seq.)
- Safe Drinking Water Act (SDWA) of 1974 (42 USC 300)
- Solid Waste Disposal Act (42 USC 6901 et seq.)
- Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423, January 24, 2007)
- Superfund Implementation (EO 12580, January 23, 1987) as amended (EO 13016, August 28, 1996)
- Toxic Substance Control Act (TSCA) of 1976 (15 USC 2601 et seq.)
- Uranium Mill Tailings Radiation Control Act of 1978, as amended (88 USC 7901)

Socioeconomic Management

- Federal Action to Address Environmental Justice in Minority Populations & Low-Income Populations (EO 12898, February 11, 1994)
- Protection & Enhancement of Environmental Quality (EO 11514, March 5, 1970)

Appendix C. State, County, Local and Other Related Agency Plans

C.1. State

Arizona Department of Water Resources. 1999. *Phoenix Active Management Area 3rd Management Plan*.

_____. 1999. *Pinal Active Management Area 3rd Management Plan*.

Arizona Game and Fish Department. 2006. Wildlife 2012 - *The Arizona Game and Fish Department's Strategic Plan for the Years 2007-2012*. (Arizona Game and Fish Department, 2006)

_____. 2003. *Arizona Shooting Ranges, a Strategic Plan for the Development of Arizona Shooting Ranges*. (Arizona Game and Fish Department, 2003)

_____. 2006. *Arizona's State Wildlife Action Plan*. (Arizona Game and Fish Department, 2006)

Arizona Interagency Desert Tortoise Team and Arizona Game and Fish Department. 1996. *Management Plan for the Sonoran Desert Population of the Desert Tortoise in Arizona*.

Arizona Public Service. 2009. *Arizona Public Service Company 2009-2018 Ten-Year Plan*. (Arizona Public Service Company, 2009)

Arizona State Land Department. 2003. *Conceptual Plan for Gila Bend*.

Arizona State Parks. 2009. A*rizona Trails 2010: A State Motorized and Non-Motorized Trails Plan*. (Arizona State Parks, 2009)

_____. 2008. *Statewide Comprehensive Outdoor Recreation Plan*. (Arizona State Parks, 2008)

Arizona Wildlife Linkages Workgroup. 2006. *Arizona's Wildlife Linkages Assessment*.

C.2. County

Gila County. 2003. *Draft Gila County 2012 Comprehensive Plan*.

Maricopa Association of Governments. 2000. *Desert Spaces Plan*.

_____. 2004. *San Tan Mountains Regional Park Master Plan Environmental Assessment. Maricopa County.* 1991. Maricopa County LUP Mobile Planning Area. https://maricopa.gov/Planning/Resources/Plans/docs/pdf/mobileplan.pdf

_____. 1992. *Grand Avenue Corridor Area LUP*.

_____. 1992. *Maricopa County LUP Queen Creek Planning Area.* http://www.maricopa.gov/planning/Resources/Plans/docs/pdf/queen.pdf

_____. 2008. *Maricopa County 2020, Eye to the Future Comprehensive Plan.* http://www.maricopa.gov/planning/Resources/Plans/docs/pdf/Carefree%20Highway%20Scenic%20Corridor.pdf

_____. 2000. *Tonopah/Arlington Area Plan.* http://www.maricopa.gov/planning/Resources/Plans/docs/pdf/tonapah_6-21-2007.pdf

_____. 2003. *Rainbow Valley Area Plan.* http://www.maricopa.gov/planning/Resources/Plans/AreaLandUsePlan/rainbowValleyAreaPlan.aspx

_____. 2003. *SR 85 Corridor Area Plan.* http://www.maricopa.gov/planning/Resources/Plans/docs/pdf/State_Route_85.pdf

_____. 2000. *White Tanks Grand Avenue Area Plan.* http://www.maricopa.gov/planning/Resources/Plans/docs/pdf/whitetanks_6-21-07.pdf

Pima County. 2003. *Pima County Comprehensive Plan.* http://www.pimaxpress.com/Planning/ComprehensivePlan/LUI_legend2003.htm

_____. 2005. *Conservation Lands System Regional Lands System.* http://www.pimaxpress.com/Planning/Conservation/PlanAmendCLS.htm

_____. 2004. *Sonoran Desert Conservation Plan.* http://www.co.pima.az.us/cmo/sdcp/index.html

Yuma County. 2001. *Yuma County 2010 Comprehensive Plan.*

C.3. City

City of Apache Junction. 2010. PRELIMINARY DRAFT 2010 *General Plan*. (City of Apache Junction, 2010)

City of Goodyear. 2008. *City of Goodyear Parks Master Plan Update.* (City of Goodyear, 2008)
_____. 2003. Goodyear General Plan Update 2003-2013.

City of Phoenix. 2001. *City of Phoenix General Plan*.

_____. 2003. *Facility Plan, City of Phoenix SR 85 Landfill, Buckeye, Arizona.*

Tucson Electric Power. 2010. *Tucson Electric Power Company Ten-Year Plan for Years 2010-2019.* http://www.cc.state.az.us/Divisions/Utilities/Electric/Biennial/10%20year%20plans/TenYearPlanTEP2010-Final.pdf

C.4. Other Federal

Federal Aviation Administration. 2008. *National Plan of Integrated Airport Systems (2009-2013).* http://www.faa.gov/airports/planning_capacity/npias/reports/

National Park Service. 1996. *Juan Bautista de Anza National Historic Trail Comprehensive Management and Use Plan Final EIS.* http://www.nps.gov/juba/parkmgmt/juba-cmp.htm

_____. 1998. *Organ Pipe Cactus National Monument Final General Management Plan Development Concept Plans EIS.* http://www.nps.gov/orpi/parkmgmt/upload/fingmp.pdf

National Plan of Integrated Airport Systems (2001-2005).

U.S. Department of Transportation, Federal Aviation Administration. 2007. *Final Regional Transportation Plan.* Maricopa Association of Governments, 2007. http://www.mag.maricopa.gov/pdf/cms.resource/RTP_2007-Update_07July.pdf

U.S. Fish and Wildlife Service. 1995. *Lesser Long-Nosed Bat Recovery Plan.* http://www.fws.gov/southwest/es/Documents/R2ES/LesserLongNoseBat.pdf

_____. 1998. *Final Revised Sonoran Pronghorn Recovery Plan.* http://www.fws.gov/southwest/es/arizona/Sonoran_Pronghorn_RP.htm

_____. 2006.*Cabeza Prieta National Wildlife Refuge Comprehensive Conservation Plan Wilderness Stewardship Plan and Environmental Impact Statement.* http://www.fws.gov/southwest/refuges/plan/PDFs%202007/Final%20EIS%20text.pdf (United States Fish and Wildlife Service, 2006)

U.S. Air Force. 1996. *Final Characterization Plan for the Munitions Residue Burial Site on the Barry M. Goldwater Range, Arizona.*

U.S. Department of Agriculture, USFS. 1985. *Tonto National Forest Plan*. http://www.fs.fed.us/r3/tonto/plan-revision/index.shtml

U.S. Departments of the Air Force, Navy, and Interior (Lead Agency) and AGFD. 2003. *DEIS for a Proposed Integrated Natural Resources Management Plan for the Barry M. Goldwater Range.*

Appendix D. Wild and Scenic River Eligibility Assessment

D.1. Wild and Scenic River Eligibility Assessment

Reason for Consideration

Public comments submitted on Scoping Process for the Lower Sonoran Field Office and the Sonoran Desert National Monument Resource Management Plan.

Segment Description

Table D.1. Observations on Gila River Segments Assessed for WSR Eligibility

Segment Description	Within BLM Jurisdiction		Comments
	Segment Length	Segment Acreage	
Segment A: 19.3 miles from Hayden Dam to the Gila River Indian Community Reservation (east boundary)	0.31 miles	50	Urban area, trash, salt cedar, effluent from sewage plants, roads, bridges, transient camps, occupation, stone and gravel extraction.
Segment B: 67.7 miles within the Gila River Indian Community Reservation	0 miles	0	Gila River Community Reservation and Interstate 10.
Segment C: 37.6 miles from the Gila River Indian Community Reservation (north boundary) to Gillespie Dam.	13 miles	2,080	Phoenix, Goodyear, and Buckeye metro area with farming, residential development, trash, salt cedar trees, effluent from sewage plants, transient camps, OHV use areas, farm runoff and DDT contamination, non-native fishes, roads, bridges, golf courses, and race tracks. Dirt roads cross bed of river when dry. Fred J. Weiler Green Belt and AGFD and USFWS wildlife conservation areas.
Segment D: 40.8 miles from Gillespie Dam to Painted Rock Dam	23.6 miles	3,776	Contaminated fish, DDT contamination, salt cedar infestations, trash, dump debris, roads, and farming run-off. Dirt roads cross bed of river when dry. Fred J. Weiler Green Belt. AGFD has relinquished wildlife management area in flood reservoir of Painted Rocks Dam. Fred J. Weiler impoundment area.
Segment E: 127.1 miles from Painted Rock Dam to the Colorado River	54.4 miles	8.704	Contaminated fish, DDT, salt cedar infestations, trash, and farming run-off. Dirt and paved roads cross bed of river when dry
TOTAL	91.31	14,610	River length from Hayden Dam to the Colorado River: 292.5 miles.

Free-Flowing Requirement Analysis

For a river or river-segment to be eligible for inclusion in the NWSRS, it must be free-flowing. The Wild and Scenic River Act (WSRA) defines a “free-flowing” river as having:

- Existence in a natural condition,
- Flow in a natural condition,
- Few impoundments,
- Few diversions,
- No straightening,
- No rip-rapping.

In-stream impoundments or structures will not automatically preclude a river segment from being considered for inclusion in the NWSRS. The intent of Congress and Federal regulations is that rivers must be generally free flowing, but not completely without human modification.

Table D.2. Flow of Gila River Segments Considered for WSR Eligibility

Segment	Flow regime	Free-flowingStatus	Comments
Segment A: Hayden Dam to Gila River Indian Community Reservation (east boundary)	Ephemeral or underground.	No. Existence and Flow not in a Natural Condition. Impoundments. Water flow diverted by Hayden Dam diversion and Coolidge Dam.	Impoundments and upstream dams essentially de-water river below Hayden Dam and Salt River confluence. Salt cedar infestations.
Segment B: Gila River Indian Community Reservation	Ephemeral or underground.	No. Existence and Flow not in a Natural Condition. Impoundments. Water diverted by Hayden Dam diversion and Coolidge Dam.	Impoundments and upstream dams essentially de-water river below Hayden Dam and Salt River confluence. Salt cedar infestations.
Segment C: Gila River Indian Community Reservation (north boundary) to Gillespie Dam	Ephemeral – effluent from 91st sewage treatment plan creates permanent flow in areas. Seasonal or permanent ponding and marsh in some areas. Underground flow in some areas.	No. Water flow Existence and Flow is not considered a natural regime. Water flows are a product of farm water run off, treated sewage effluent from the 91st Avenue Sewage Treatment Plant, and occasional surfacing of subterranean flows. Significant effect from upstream impoundments and diversions of the Salt, Verde and Gila Rivers. Straightening and bank Rip-Rapping near urban communities.	Salt River contributes little water due to dams, impoundments and diversions. Hassayampa River and Salt River flows are ephemeral and contribute to some subterranean flow. Some marsh and wetland areas intermixed with salt cedar infestations and cottonwood trees.

Segment	Flow regime	Free-flowingStatus	Comments
Segment D: Gillespie Dam to Painted Rock Dam	Ephemeral – little surface flow. There is underground and surface flow in some areas due to farm water recharge and sewage effluent.	No. Water flow considered only marginal and not natural per its existence and flow regime. Flows are a product of farm run off, and treated sewage effluent from the 91st Avenue Sewage Treatment Plant. The lower ten-miles east of Painted Rock Dam is an impoundment area full of dead and living salt cedar trees and subject to fires.	Upper half of segment is surrounded by farms, and crossed by roads and utilities. Lower part of segment is a toxic (DDT and other materials) and dead salt cedar forest clogged with dead trees, deposited with refuse and contamination from the 1993 and 2005 Painted Rock Dam flood impoundments, and fire scars. Gillespie Dam breached in 1993 and no longer impounds water or silt.
Segment E: Painted Rock Dam to Colorado River	Ephemeral, surface flow occasionally in some areas, underground flows, seasonal ponding in some areas below Painted Rock Dam. Marshy areas near ponding areas.	No. Painted Rocks Dam is a major impediment to all natural flow events and impounds all surface water flowing down the Verde, Gila and Salt systems. Surface water below Painted Rock Dam flows and surfaces to some extent due to lack of additional impoundments. However, the current Existence and Flow regimes are not considered natural. Occasional surfacing water flows do not resemble or mimic an unencumbered river's natural ebb and flow existence nor the desert river's natural water flow. River flows are mainly a product of farm run off, release of flood waters from Painted Rock Dam, and occasional surfacing of some re-charged subterranean flows. This segment does offer more connected riparian habitat and cover than the other four segments.	Most natural appearing segment along lower Gila River due to remoteness and less human infrastructure. There are some marsh areas, cottonwood trees, along with salt cedar infestations.

Section C: Outstandingly Remarkable Values (ORV) Analysis

A river must have one or more Outstandingly Remarkable Values (ORVs) to be eligible for inclusion in the NWSRS. Each value must be directly river-related (defined as occurring within a quarter-mile of the river's high-water mark), exhibit rare or exemplary values within the geographic region, and be determined to be regionally or nationally significant. BLM IM 2004-196 indicates that judgment should be used to determine whether the ORV meets the criteria: Each ORV "should be located in the river or on its immediate shore lands, contribute substantially to the functioning of the river ecosystem, and/or owe [its] location or existence to the presence of the river".

Potential ORVs are:

- Scenic: diversity of view, special features, seasonal variations, cultural modifications;

- Fish: habitat quality, diversity of species, value of species, abundance of fish, natural reproduction, size and vigor of fish, cultural and historic importance, recreational importance, and access;
- Recreation, water-oriented and general: length of season, flow, diversity of use, experience quality, scenery and naturalness, access, level of use, associated opportunities, attraction, sites and facilities
- Wildlife: habitat quality, diversity of species, abundance of species, natural reproduction, size and vigor of species, cultural and historic importance recreational importance, and access;
- Geologic: feature abundance, diversity of features, educational and scientific;
- Historic: significance, education and interpretation, listing and eligibility, site integrity;
- Cultural: significance, current uses, number of cultures, site integrity, education and interpretation, listing and eligibility;
- Ecological: species diversity, ecological function, rare communities, educational and scientific.

The size of a river is not a criterion of eligibility. To be eligible, rivers do not have to have outstanding white-water or even boatable segments. Flow must be sufficient to sustain the ORV that makes a river or river segment eligible for consideration. The ORVs present on the segments of the Gila River assessed for WSR eligibility are shown in Table 3 below.

Table D.3. Presence and Extent of Scenic, Recreational, Geological, Fish and Wildlife, Historical, Cultural or Other Values in Gila River Segments

Segment	Scenic	Recre-ational	Geological	Fish and Wildlife	Historical	Cultural	Other Similar Values
Segment A: Hayden Dam to Gila River Indian Community Reservation	Not Present.	Not Present.	Not Present. – Flat desert plain below Hayden Dam	None identified except pygmy owl (currently in the process of potential delisting by the USFWS).	Not Present.	Not Present.	None identi-fied.
Segment B: Gila River Indian Community Reservation	Not Present.	Not Present.	Not Present. – Flat desert plain below Hayden Dam	Not Present, except where Tribe has artificially restored riparian habitat.	Long history of uses and importance to the Gila River Indian Community.	Cultural and spir-itual im-portance to Gila River Indian Commu-nity.	None identi-fied.

Segment	Scenic	Recre-ational	Geological	Fish and Wildlife	Historical	Cultural	Other Similar Values
Segment C: Gila River Indian Community Reservation to Gillespie Dam	Views of the Gila River. Some areas are scenic and form a "greenbelt" through parts of this segment.	Bird hunting, bird watching.	None identified.	Base and Meridian Wildlife Area Robbins Butte Wildlife Area Fred J. Weiler Green Belt. Federally endangered Yuma clapper rail, and the Western yellow-billed cuckoo, a Federally listed candidate species. Potential habitat for the Southwestern willow flycatcher.	Long history of use and importance to the Gila River Indian Community.	Long association of use and cultural importance to the Gila River Indian Community	None identified.
Segment D: Gillespie Dam to Painted Rock Dam	In areas where the river flows by the Gila Bend Mountains and Painted Rock Dam area due to mountain views to east and north. These views are outside of river corridor. Class C Scenery per VRM. River corridor itself is disturbed and impacted by farms, roads, pipelines, impoundments (Painted	Not Present. Little public land and limited public access. Dense salt cedar thickets in Painted Rocks impoundment impede public access.	None identified.	Fred J. Weiler Green Belt. AGFD has relinquished control of the Painted Rock Dam wildlife Federally endangered Yuma clapper rail, and the western yellow-billed cuckoo, a Federally listed candidate species in area. Appropriate habitat exists for the endangered Southwestern Willow Flycatcher, although	Anza National Historic Trail Butterfield Stage Trail Gila Overland Trail Mormon Battalion	None identified, but probably cultural affiliation and importance to Gila River Indian Community and Tohono O'odham Nation.	None identified.

Segment	Scenic	Recre-ational	Geological	Fish and Wildlife	Historical	Cultural	Other Similar Values
	Rock) and bridges.			nesting not documented.			
Segment E: Painted Rock Dam to Colorado River	Middle areas - Wellton to Aqua Caliente - is not noted for scenic views, but some areas where the river cuts through the Sentinel Plain lava flows and Muggins Mountains have scenic character due to rugged volcanic geology. These views. The best views are greater than ¼ mile away. Roads and farms along river banks in many areas.	Bird watching and bird hunting good at Painted Rocks Lake below dam and, to a lesser extent along the Gila River to the Colorado River.	River cuts deeply through Sentinel Plain Lave Flow, one of the youngest and thickest shield volcano lava flows in Arizona.	Fred J. Weiler Green Belt. River corridor has good habitat and cover for large mammals, aquatic life, birds and raptors, and stretches of riparian habitat. Federally endangered Yuma clapper rail and the western yellow-billed cuckoo, a Federally listed candidate species in area. Appropriate habitat exists for the endangered Southwestern Willow Flycatcher.	Anza NHT. Butterfield Stage Overland Trail, Gila Overland Trail Sears Point Cultural ACEC Concentration of pre-historic cultural sites on both sides of river, especially petroglyphs and pathways Historic site of Oatman family "massacre"	Long association of uses and importance to lower Colorado River Indian Tribes and communities, and the Tohono O'Odham Nation. Concentration of pre-historic cultural sites on both sides of river, especially petroglyphs and pathways.	None identified.

Eligibility Findings

Free-Flowing Requirements: Segments A, B, C, D and E are not free-flowing. The lower Gila River is not eligible for consideration as a Wild and Scenic River.

Outstandingly Remarkable Values Analysis: The lower Gila River does have important recreational, wildlife, riparian habitats, or cultural and historical resources. Appendix 1: Resource Values of the Lower Gila River summarizes the condition and presence of resource values observed on the river.

Rationale for Decision

Most of the Gila River's natural and available surface flow ends abruptly at Coolidge Dam. The dams and diversions of the Verde River, the Salt River, and the upper Gila River have staunched water flow and contributed to the elimination, reduction, or alteration of riparian habitats on the

lower Gila River. The flows of the Salt River and the Hassayampa River, the lower Gila's major tributaries, rarely reach the river except during major winter rain and flooding events. The Salt River is the core tributary, and it is impounded by a series of dams.

None of the five river segments identified are free-flowing in the context of Federal guidelines defining existence in a natural condition or flow in a natural condition. Painted Rock Dam, the Hayden Diversion Dam, Coolidge Dam, and the Salt River dam systems all bequeath major impediments to the free flow of water to the lower Gila River. Much of the surface water flowing in the lower Gila is a result of human actions, including farm runoff and agricultural returns, treated sewage effluent, and flood and street water drainage. There also are subterranean water flows that add to the human-provided waters contributed by the Hassayampa and Salt River.

The five identified river segments maintain little semblance of functioning riparian values except in isolated areas. Pollution and adjacent development, including urban, farming, road, utility, and residential uses, create a large succession of fragmented and unnatural river segments under numerous private, state, Federal and local owners. This fragmented jurisdictional state of affairs exists along the entire lower Gila River, curtailing cogent planning or restoration efforts. It must be noted, however, that the aforementioned watered areas, while separated and disparate, provide highly productive riparian habitat zones for birds and raptors, as well as small mammals and some aquatic species both native and non-native. Recreational opportunities for wildlife sightseeing and bird hunting are also good on these watered riparian segments.

Common plants in the river corridor are salt cedar, cottonwood, and mesquite. Salt cedar is non-native. From the 1880 to the 1940s, proliferation of upstream dams and diversions decreased the amount of water in the Gila River. Water loss led to the death of most of the healthy cottonwood and willow trees and galleries along the lower Gila River. These trees need a lot of water to thrive and reproduce. Droughts accelerated the loss of riparian habitats, and riparian and mesquite forests were also cleared to grow crops, build roads, and enhance grazing. Today, much of the original cottonwood and willow trees have been replaced with invasive and widespread salt cedar. The upper flood plain, once a healthy mesquite forest, also contains mostly salt cedar.

Grazing and de-watering continue to alter the lower reaches of the Gila River. Native plants, while present, have been supplanted many areas by large swaths of dense, near-impenetrable salt cedar thickets. These thickets are subject to high-intensity wildfires during the spring and summer. Native cottonwood galleries and mesquite bosques have been greatly reduced or eliminated due to dewatering, grazing, and agricultural practices.

Agriculture remains the biggest user of the river's water. Wells and diversions also pump water out of the lower reaches of the river. Increasing water demands from the communities of Buckeye and Goodyear, smaller towns poised to expand into large communities, portend greater amounts of ground water pumping to supply residential needs. There is little hope that much water will, or could ever, be allocated to re-establish natural flow regimes in the lower Gila River.

The lower stretches of the Gila River contain many illegal dump sites for litter, trash, tires, appliances, chemicals, cars and appliances, causing various types of water pollution and soil contamination. The 1993 and 2005 winter flood events filled the Painted Rocks Dam Flood Impoundment area. Trash dumps and landfills upstream of Gillespie Dam were breached in the Phoenix metropolitan and other areas. This resulted in polluted landfill debris, soils, and noxious materials flowing to the Colorado and contaminating all downstream segments of the lower Gila River with unsightly litter and toxic brews.

Pesticide contamination affects most of the lower Gila River, especially between its confluences with the Salt and the Colorado rivers. DDT was used to control cotton pests in Avondale and Buckeye. Reports in the late 1970s considered the Salt River confluence to the Painted Rock stretch of the Gila River the most DDT-laden stream sampled in the West. Anglers are warned not to eat fish caught in the Gila River, near Painted Rock Dam, or from the dam's various impoundments and borrow areas. Due to the 1993 and 2005 floods, contaminants have flushed downstream to the Colorado River. These two floods impounded high levels of water behind the dam, which eventually were released, taking DDT compounds and pollution with them. No clean-up plans are in the works due to high costs and a low threat to human activities.

The Gila River flows continually and consistently near Goodyear, Arizona. The water comes from the 91st Avenue Sewage Treatment Plant. This permanent water source has allowed riparian areas to self-restore and re-establish habitat for birds, aquatic species, and water-dependent plants like cottonwood, salt cedar and willows, along with cottontails and sedges. However, these riverbed riparian areas are not natural and will not return to a natural functioning condition. Larger animal species will never be able to re-populate the riparian areas as these animals are permanently displaced or cut off by urban and agricultural development. Native fish survival also is problematic due to intense competition with non-native fishes that eat the natives or usurp their nesting and feeding habitat.

Current Management Areas – Lower Gila River Corridor

The lower Gila River's best riparian and wildlife habitats and most noted cultural resources are managed through a series of special management areas. These areas encompass and effectively manage the best remaining fragments of natural and cultural resource values associated with this beleaguered and over-used river. Segments A and B have no notable special management areas associated with conservation of riparian and river-related values, but Segments C, D and E have several special management areas. These areas include the Baseline Meridian, Robbins Butte, Powers Butte, Arlington and Quigley Wildlife Management Areas, the Fred J. Weiler Green Belt, the Sears Point ACEC and the Gila Trail Special Recreation Management Area. These areas are described in greater detail in Attachment 1 – Resource Values of the Lower Gila River.

Urban communities along Segment C of the Gila River have proposed plans for "river greenbelts" and recreation sites along the river. These include the Tres Rios Master Plan and the El Rio Master Plan (along a portion of the Gila River). These areas would be intensely managed recreation sites with trails, ponds, lakes, sports areas and other urban recreation uses. All the plans are under consideration at this time.

D.2. ATTACHMENT 1: Resource Values of the Lower Gila River

Fred J. Weiler Green Belt Special Management Area

Segments C, D and part of E of the lower Gila River contain BLM-administered public lands encompassed within the Fred. J. Weiler Green Belt Management Area. Virtually all riparian habitat along the lower Gila River channel is salt-cedar and mesquite thickets and salt-bush flats. Cottonwoods and willows are limited. The Fred J. Weiler Green Belt, managed by the BLM and the Arizona Game & Fish Department (AGFD), consists of approximately 63,000 acres in the southwest region of Maricopa County. The green belt extends along the Gila River from the Sierra Estrella Regional Park to a point 12 miles west of Dateland, Arizona. The U.S. Department of the Interior determined in 1968 that the green belt would be retained under the

Classification for Multiple Use Act of 1964, then designated the area the Fred J. Weiler Green Belt Special Recreation Area in 1970. Both classifications were established to enable management of wildlife habitat, flood and erosion control, and recreation opportunities The green belt contains habitat for the Federally endangered Yuma clapper rail and the Western yellow-billed cuckoo, a Federally listed candidate species.

Segment A - Hayden Dam to the Gila River Indian Community Reservation (East Boundary)

No resource values identified.

Segment B – Gila River Indian Community Reservation

No resource values identified.

Segment C - Gila River Indian Community Reservation (North Boundary) to Gillespie Dam.

Base and Meridian Wildlife Area (B&M)): The AGFD manage 200 acres of river and adjacent riparian habitat at the confluence of the Salt River and Gila River just west of the Phoenix metropolitan area. B&M contains riparian vegetation assemblages of cottonwood, willow, salt cedar, seep willow and desert broom and mesquite.

The goal for management of the B&M area is to optimize the habitat for wildlife and wildlife-oriented recreation. The area is fully devoted to waterfowl and riparian management.

Wetland and riparian habitats within B&M area provide critical nesting, cover and food resources for many avian species, including sensitive species. The riparian habitat common to the Gila River is recognized as the highest quality nesting habitat for white-winged dove in Arizona. The property is equally valuable for mourning dove nesting. Other species of significant value are Gambel's quail, coots and other shorebirds. A host of bird, mammal, and reptile species use the area because of its proximity to the river. Wildlife may include: Common yellowthroat, great blue heron, belted kingfisher, and Western screech-owl.

Special Status Species occurring on the B&M includes the Federally endangered Yuma clapper rail and the Western yellow-billed cuckoo, a Federally listed candidate species. Potential habitat for the following special status species may also occur near the area: Lowland leopard frog, Ferruginous hawk, Great egret, Loggerhead shrike, Osprey, American peregrine falcon, Southwestern willow flycatcher, California leaf-nosed bat, Greater Western mastiff bat, and Sonoran desert tortoise.

Robbins Butte Wildlife Area: The Robbins Butte Wildlife Area (RBWA) is located approximately seven miles southwest of Buckeye, Arizona, comprising approximately 1,681 acres. RBWA is one of two areas along the Gila River with the greatest potential for waterfowl habitat enhancement. Vegetative cover is a diverse mixture including dense salt cedar thickets, willows and cattail in the river bottom; mature mesquite on the river terrace; saltbush and shrub-sized mesquite upland areas.

The primary management emphasis at RBWA is to provide food crops and nesting habitat for upland game birds. Secondary management emphasis includes enhancing riparian habitat and the riparian-desert upland ecotone. A combination of wildlife food crops, natural foods and nesting habitat attracts many breeding white-winged and mourning doves. Amphibians and reptiles also are common; a minimum of 19 reptile species reside at RBWA.

RBWA is the center of the annual Gila River Christmas Bird Count, and over 115 species of winter-resident birds have been observed in the vicinity. In addition, many raptors winter in and near RBWA, including the White-tailed Kite. The summer avian community has not been counted, but species numbers probably exceed those of winter.

Special Status Species occurring on or near the Robbins Butte Wildlife Area includes the Federally endangered Yuma clapper rail, and the Western yellow-billed cuckoo, a Federally listed candidate species. Those special status species that potentially occur on the RBWA include Great egret, Snowy egret, and Western yellow bat.

Powers Butte Wildlife Area: The Powers Butte Wildlife Area (PBWA) encompasses 1,120 acres. The area is managed for the enhancement of its riparian and aquatic habitats.

Mourning doves, white-winged doves, Gambel's quail, and cottontail rabbits inhabit the area. Particularly abundant during migration and in the winter, various birds, including a wide assortment of hawks and other birds of prey, find food and shelter within the bounds of this wildlife area as well.

The 91st Avenue Wastewater Treatment Plant, local agriculture, intermittent tributary flows, and groundwater all feed the Gila River through the wildlife area, creating dense stands of salt cedar, and marsh and wetland habitats. Powers Butte, a steep knoll formed by volcanic boulder, provides an overlook to the surrounding valley and river.

Riparian habitats are the most noticeable plant life on the area. The most common plants are salt cedar and mesquite. Salt cedar was introduced to Arizona many years ago and does not naturally occur here. Most of the original cottonwood and willow trees have been replaced with salt cedar. The upper flood plain, which once was a mesquite forest, also contains a lot of salt cedar.

This area is highly valued for its protection of sensitive species and habitats in Arizona. With appropriate enhancement, the amount and quality of riparian and wetland habitats can be increased, and diversified to support more species that depend on such areas. The salt cedar, which has replaced most of the native riparian trees in the area, provides good nesting places for doves.

Arlington Wildlife Area: The Arlington Wildlife Area (AWA) is located along the west bank of the Gila River and is approximately 1,500 acres. The AWA is managed to optimize the habitat potential of the property for wildlife and for present and future generations of the public to enjoy wildlife-oriented recreation

The wildlife area has an extensive stand of salt cedar and about 4 miles of river channel, including running water, cattails and other emergent vegetation, sand and gravel bars, and riparian trees such as cottonwood, willow and salt cedar. The AWA is particularly favorable as a location for limited-mobility hunters to gain access for duck hunting. This area also has a very high value for its dove-nesting habitat. The Federally endangered Yuma clapper rail also is a regular nesting species in the ponds and along the river.

The water ponds attract numerous waterfowl and shorebirds. The Yuma clapper rails nest on site. The salt-cedar *bosque* provides nesting habitat for red-winged blackbirds, doves, and other riparian bird species. The salt-cedar *bosque* also provides cover for various mammals, amphibians and reptiles. Special-status species occurring on or near the AWA include the Federally endangered Yuma clapper rail and the western yellow-billed cuckoo, a Federally listed candidate species.

Urban communities on Segment C, including Buckeye and Goodyear, have proposed master plans for "river greenbelts" and recreation sites along the river. Plans include the Tres Rios Master Plan and the El Rio Master Plan along a portion of the Gila River. These areas would be intensely managed recreation sites with trails, ponds, lakes, sports areas, and other urban recreation uses. All the plans are under consideration at this time.

Segment D - Gillespie Dam to Painted Rock Dam

Public land ownership within the river bed is quite limited within Segment D. Public lands within the river bed channel are part of the Fred. J. Weiler Green Belt and managed for riparian and wildlife values. The area above Painted Rocks Dam has limited value for wildlife.

Anza National Historic Trail (NHT): The NHT enters this segment north of Gila Bend and extends down the river corridor to the Colorado River and Yuma, Arizona. The BLM is mandated to maintain and protect the historic and cultural resources within the NHT corridor as defined by Federal law.

Gila Trail Special Recreation Management Area: This management area enters Segment D north of Gila Bend and extends down the river corridor to the Maricopa County/Yuma County line. The area includes lands surrounding the Gila Trail, the Butterfield Overland Stage Route, the Anza National Historic Trail, the Southern Overland Trail, the Mormon Battalion Trail, the Oatman Massacre Site, and the Painted Rock Mountains and associated cultural and recreational features.

Segment E - Painted Rock Dam to the Colorado River

This river segment has the most BLM-administered public land. Many of the public lands are encompassed by the Fred J. Weiler Green Belt. The segment's most noted cultural and riparian values are enclosed within the following areas:

Quigley Wildlife Management Area (QWMA): The QWMA contains approximately 622 acres consisting of two major open-water areas, idle farmland, large stands of salt cedar and open-water areas characterized by emergent vegetation such as cattail. The area is managed to restore, enhance, and manage wetland habitat, including open water and marsh, riparian and associated upland wildlife habitats; and to provide public opportunities for wildlife viewing, education, research, hunting and fishing.

Wetland and riparian habitats within the QWMA provide critical nesting, cover and food resources for many avian species. The low water depths and emergent vegetation such as cattail and bulrush make excellent nesting substrate for a large number of waterfowl species. Other wildlife species supported by the wetlands at QWMA include shorebirds, game and nongame fish, game and nongame birds, and amphibians. The marsh habitat at QWMA has in the past supported four to six pairs of the endangered Yuma clapper rail, and appropriate habitat exists for the endangered southwestern willow flycatcher, although nesting has not been documented.

The upland habitats currently provides significant nesting habitat for white-winged and mourning doves.

Special-status species occurring on or near the QWMA include the American bittern, great egret, loggerhead shrike, osprey, snowy egret, southwestern willow flycatcher, western least bittern, and white-faced ibis.

Sear's Point Area of Critical Environmental Concern (ACEC): The BLM manages all cultural resources in the river channel under the Antiquities Act of 1906. The Painted Rocks area and Sears Point Cultural ACECprotect significant rock art and cultural areas of importance to local and regional Indian nations and tribes.

Gila Trail Special Recreation Management Area: This management area includes lands surrounding the Gila Trail, the Butterfield Overland Stage Route, the Anza National Historic Trail, the Southern Overland Trail, the Mormon Battalion Trail, the Oatman Massacre Site, and the Painted Rock Mountains and associated cultural and recreational features.

Anza National Historic Trail (NHT): The NHT enters this segment north of Gila Bend and extends down the river corridor to the Colorado River and Yuma, Arizona. The BLM is mandated to maintain and protect the historic and cultural resources within the NHT corridor as defined by Federal law.

Appendix E. Draft Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument

E.1. Background

Under the authority of the Antiquities Act of 1906 (16 USC 431-433), President Clinton designated the Sonoran Desert National Monument (SDNM) by Presidential Proclamation 7397 on January 17, 2001 (Appendix A, *Sonoran Desert National Monument Presidential Proclamation* (p.)). The Monument comprises approximately 486,400 acres of public lands administered by the Bureau of Land Management (BLM), and is generally located 60 miles southwest of Phoenix, Arizona. Among other provisions, and with respect specifically to the practice of livestock grazing on these public lands, the President directed:

Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument; provided, however, that grazing permits on Federal lands within the monument south of Interstate Highway 8 shall not be renewed at the end of their current term; and provided further, that grazing on Federal lands north of Interstate 8 shall be allowed to continue only to the extent that the Bureau of Land Management determines that grazing is compatible with the paramount purpose of protecting the objects identified in this proclamation [emphasis added].

Livestock grazing ceased in 2008-2009 on allotments located south of Interstate 8 (I-8) in the SDNM. From this time forward, the public lands south of I-8 (155,900 acres) will remain unavailable for livestock use and the grazing preferences (7,884 AUMs) attached to the base properties for permitted use on the allotments will be cancelled. Forage previously allocated for livestock grazing will be available for other resource uses such as wildlife habitat, watershed values, recreation, etc. In addition, 78,000 acres were closed to grazing in 1941 in Area A for a total of 233,900 acres on the Monument (48 percent of the total) that are currently and will remain unavailable for livestock grazing. This document describes the BLM's analysis of livestock grazing on 252,500 acres of public lands that are currently available for livestock grazing north of I-8 within SDNM (52 percent of the total). The following analysis will be used to determine whether livestock grazing is compatible with the paramount purpose of the Monument, which is to protect the objects identified in the proclamation.

E.1.1. A Brief History of Grazing on Public Lands

During the era of homesteading, western public rangelands were often overgrazed because of policies designed to promote the settlement of the West and a lack of understanding of arid ecosystems. In response to requests from western ranchers, Congress passed the Taylor Grazing Act of 1934, which led to the creation of grazing districts in which grazing use was apportioned and regulated. Under the Taylor Grazing Act, the first grazing district to be established was Wyoming Grazing District Number 1 on March 23, 1935. Secretary of the Interior Harold Ickes created a Division of Grazing within the Department of Interior to administer the grazing districts; this division later became the U.S. Grazing Service and was headquartered in Salt Lake City.

In 1946, as a result of government reorganization by the Truman Administration, the Grazing Service was merged with the General Land Office to become the Bureau of Land Management.

The unregulated grazing that took place before enactment of the Taylor Grazing Act caused damage to soil, plants, streams, and springs in some places. As a result, grazing management after enactment was initially designed to increase productivity and reduce soil erosion by controlling grazing through fencing and water projects and by conducting forage surveys to balance forage demands with the land's productivity ("carrying capacity").

These initial improvements in livestock management, which arrested the degradation of public rangelands while improving watersheds, were appropriate for the times. However, by the 1960s and 1970s, public appreciation for public lands and expectations for their management rose to a new level, as made clear by passage of the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and the Federal Land Policy and Management Act of 1976. Consequently, the BLM moved from managing grazing in general to better manage and protect specific rangeland resources and other multiple-use resources, such as riparian areas, threatened and endangered species, sensitive plant species, and cultural and historical objects. Consistent with this enhanced role, the Bureau developed or modified the terms and conditions of grazing permits and leases and implemented new range projects to address these specific resource issues or promote continued improvement of public rangeland conditions.

E.1.2. Historic Use of Gila Bend, Arizona, and Surrounding Areas

Livestock grazing in Gila Bend and surrounding areas began in the late 1700s in Indian rancherias along the Gila River. At that time, livestock largely were confined to the flood plains of the Gila River, which was the only reliable water source able to support livestock year-round. It also is likely that the mountains and bajadas adjacent to the river would have received some use by livestock, particularly during wetter periods when temporary waters would have been available in potholes or from the few springs in the area. Livestock use prior to this time occurred from movement along the route taken by the Spanish immigrants in the 18th century along what is now the Juan Bautista de Anza National Historic Trail (NHT). Records indicate that 240 people on horseback or mule moved from towns in Sonora and Sinaloa to a new settlement in the San Francisco area along with 1,000 head of livestock.

Starting in the 1860s, settlers began to move into the area along the Gila to start farming operations. Livestock associated with these farms also were likely confined to the river floodplain and adjacent bajadas. More widespread livestock use of the drier valleys and mountains did not occur in the area until dirt stock tanks were developed and wells were dug in the early 1900s. The first of these was a dirt stock tank developed around 1900 in the Little Rainbow Valley just north of the current Monument boundary. The first wells in the area were drilled in Rainbow Valley between 1910 and 1912. One of these wells was dug north of Mobile, which would have provided some livestock access to what is now the SDNM. The only waters in the Vekol Valley area at that time consisted of a couple of dirt waterholes, or "charcos," that provided temporary water for cattle belonging to the Tohono O'odham people. The Vekol Valley within the current SDNM boundaries was not developed for additional livestock use until the 1920s and 1930s.

Larger scale ranching operations did not begin in the Sand Tank Mountain area until 1917. The first water sources for livestock included two hand-dug wells, Lost Horse Tank (earthen), and the development of two natural water sources at Sand Tank and Mesquite Tank (Robinett 1997).

After the development of necessary water sources, ranching in the area consisted of year round cow-calf operations with herds that the operator would adjust based on weather conditions and available forage. The practice of moving large numbers of steers to utilize the ephemeral forage brought by a wet winter or spring did not occur until during and after World War II in the middle of the 20th century (Robinett 1997).

E.1.3. Current Land Health Standards and Guidelines for Grazing Management on Public Lands

Today, the BLM manages livestock grazing to achieve and maintain public land health. To achieve desired conditions, the agency uses rangeland health standards and guidelines, which the BLM developed in the 1990s with input from the citizen-based Resource Advisory Councils across the West. Standards describe specific conditions needed for public land health, such as the presence of stream bank vegetation and adequate canopy and ground cover. Guidelines are the management techniques designed to achieve or maintain healthy public lands, as defined by the standards.

E.1.4. Current Livestock Grazing Management on the SDNM

Portions of six livestock grazing allotments are located within SDNM north of I-8, encompassing a total of 252,500 acres (Map E-2). The allotments, their classifications, size, and amount of permitted use are listed in Table E.1, "Acres of Public Lands and Permitted Use within SDNM Grazing Allotments" (p. 1041). Permitted use is expressed in animal unit months (AUMs) which means the amount of forage necessary for the sustenance of one cow, or its equivalent, for a period of one month. Facilities constructed to manage livestock grazing within these allotments include: 16 ephemeral reservoirs, 9 wells, 8 corrals, and approximately 46 miles of allotment boundary and pasture barbed-wire fences.

Table E.1. Acres of Public Lands and Permitted Use within SDNM Grazing Allotments

Allotment	Rangeland Classification	Allotment Number	Public Land Acres	% of Public Land Acres	Current Permitted Use AUMs
Big Horn	Perennial-Ephemeral	03009	92,204	95%	2,812**
Beloat	Perennial-Ephemeral	03007	33,600	26%	776
Conley	Perennial-Ephemeral	03018	77,708	88%	3,403
Hazen	Perennial-Ephemeral	03042	31,926	75%	886
Lower Vekol	Perennial-Ephemeral	03053	15,409	71%	826
Arnold	Ephemeral	03004	1,609	7%	0
Totals			252,456	n/a	8,703

* The acres and AUM percentages were prorated by using inventory data and base water properties instead of percentage of public land acreage.

** This figure represents the prorated remaining portion of the Big Horn allotment after 53,144 acres south of I-8 were made unavailable in 2008.

The six allotments within the SDNM north of I-8 received their classifications between 1973 and 1976. Five of the allotments were classified as perennial-ephemeral. "Perennial" refers to the grazing preference authorized on the permit. "Ephemeral" applies to additional annual

forage that occurs in years with above average precipitation. Livestock operators on these five allotments are offered 10-year permits from the BLM that state the number and kind of livestock as well as the period of use for each allotment. Ephemeral forage is utilized through ephemeral use-authorizations in accordance with land health standards and the Arizona grazing guidelines (Guidelines) discussed in the Lower Sonoran LS/SDNM Resource Management Plan (RMP). (See Appendix L in the LS/SDNM DRMP/EIS). The sixth allotment (Arnold Allotment) is authorized for ephemeral grazing only.

E.1.5. Legal Mandates Relating to Public Lands Grazing

Laws that apply to the BLM's management of public lands grazing include the Taylor Grazing Act of 1934, the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, the Federal Land Policy and Management Act (FLPMA) of 1976, and the Public Rangelands Improvement Act of 1978. The Federal regulations that govern livestock management are found at 43 CFR 4100.

E.2. Compatibility Analysis & Determination Process

As directed by the proclamation that established the SDNM, authorized grazing use and associated management practices within the SDNM can continue only to the extent that livestock grazing is determined to be compatible with the paramount purpose of protecting the biological, ecological, scientific, and historic and archaeological objects of the Monument.

The BLM utilizes a Land Health Evaluation (LHE) process to ascertain whether the Arizona Rangeland Health Standards (land health standards) are met. When standards are not being met, a draft determination is made to identify causal factors of non-achievement. Causal factors can include current grazing practices, historical livestock use, drought, fire, OHV use, general recreation, etc. Technical recommendations from the LHE identify appropriate actions needed in order to make significant progress toward achieving the standards where they are not being achieved.

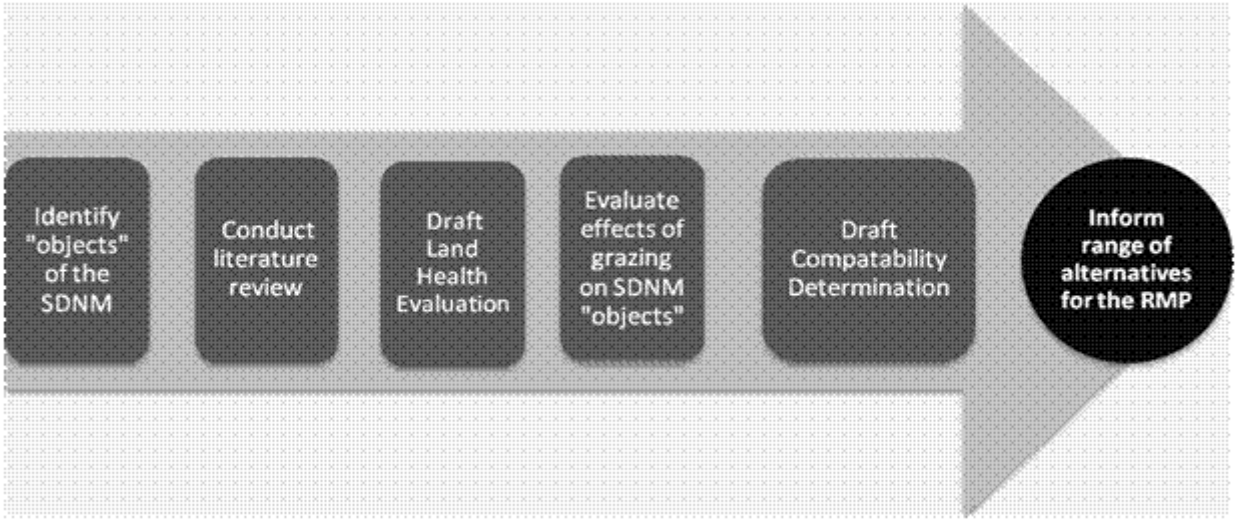
The land health standards, specifically Standard 1 and Standard 3, directly address and measure indicators associated with the biological, ecological and cultural resources, or "objects" identified for protection in the Monument's proclamation. In the case of the SDNM, the LHE analyzed the Monument's desert ecosystems for proper functioning condition; considered the anticipated diversity of plant species; examined the long-term recruitment and maintenance of saguaro cactus forests; addressed the effect of grazing on wildlife and associated habitat; and evaluated the functioning, health, diversity and sustainability of key vegetation communities.

For the purposes of this assessment, livestock grazing will be considered incompatible with the SDNM Proclamation when Monument objects are impaired due to present livestock grazing practices.

The following process comprises the draft compatibility analysis and determination:

- Identify the "Monument objects" specific to the SDNM,
- Conduct a literature review,
- Conduct an LHE addressing the effects of livestock grazing on Monument objects,

- Perform an analysis of the effects of livestock grazing on archaeological and historical Monument objects,
- Present draft compatibility analysis findings and determination,
- Set parameters to develop a full range of livestock grazing management alternatives for analysis in the DRMP.



E.2.1. Step 1: Identify the Monument Objects Specific to the SDNM

The first eight paragraphs of Presidential Proclamation 7397 outline the reasons why President Clinton chose to designate the SDNM and, as such, provide the most direct expression of the Monument objects to be conserved, protected, and restored for the benefit of current and future generations. The identified objects are described in Table E.2, “Monument Objects Specific to the SDNM” (p. 1044). The subsequent analysis of impacts of livestock grazing on these objects assists in the determination of grazing compatibility. It also informs the range of alternatives developed and analyzed in the Lower Sonoran-SDNM Draft RMP.

Because the objects in the proclamation are identified at the landscape level, biological “indicators” for the objects were identified that can be measured at the site-specific level. For each Monument object, corresponding "indicators" are identified. See Table E.2, “Monument Objects Specific to the SDNM” (p. 1044).

Table E.2. Monument Objects Specific to the SDNM

Monument Object	Paragraph from Presidential Proclamation 7397	Indicator
Functioning desert ecosystem	1. "The Sonoran Desert National Monument is a magnificent example of untrammeled Sonoran desert landscape. The area encompasses a functioning desert ecosystem with an extraordinary array of biological, scientific, and historic resources. The most biologically diverse of the North American deserts, the Monument consists of distinct mountain ranges separated by wide valleys, and includes large saguaro cactus forest communities that provide excellent habitat for a wide range of wildlife species."	Diversity, density, and distribution of saguaro cactus forest, habitat for a wide range of wildlife species
Diversity of plant and animal species	2. "The Monument's biological resources include a spectacular diversity of plant and animal species. The higher peaks include unique woodland assemblages, while the lower elevation lands offer one of the most structurally complex examples of palo verde/mixed cacti association in the Sonoran Desert. The dense stands of leguminous trees and cacti are dominated by saguaros, palo verde trees, ironwood, prickly pear, and cholla. Important natural water holes, known as tinajas, exist throughout the Monument. The endangered acuña pineapple cactus is also found in the Monument."	Health, density, and distribution of saguaro cactus and nurse plants
	3. "The most striking aspect of the plant communities within the Monument are [sic] the abundant saguaro cactus forests. The saguaro is a signature plant of the Sonoran Desert. Individual saguaro plants are indeed magnificent, but a forest of these plants, together with the wide variety of trees, shrubs, and herbaceous plants that make up the forest community, is an impressive site [sic] to behold. The saguaro cactus forests within the Monument are a national treasure, rivaling those within the Saguaro National Park."	Health, density, and distribution of saguaro cactus and nurse plants

Saguaro cactus forests	4. "The rich diversity, density, and distribution of plants in the Sand Tank Mountains area of the Monument is especially striking and can be attributed to the management regime in place since the area was withdrawn for military purposes in 1941. In particular, while some public access to the area is allowed, no livestock grazing has occurred for nearly 50 years. To extend the extraordinary diversity and overall ecological health of the Sand Tanks [sic] Mountains area, land adjacent and with biological resources similar to the area withdrawn for military purposes should be subject to a similar management regime to the fullest extent possible."	Diversity, density, and distribution of plants (palo verde-mixed cacti vegetation community)
Sand Tank Mountains	5. "The Monument contains an abundance of packrat middens, allowing for scientific analysis of plant species and climates in past eras. Scientific analysis of the midden [sic] shows that the area received far more precipitation 20,000 years ago, and slowly became more arid. Vegetation for the area changed from juniper-oak-pinion pine woodland to the vegetation found today in the Sonoran Desert, although a few plants from the more mesic period, including the Kofa Mountain barberry, Arizona rosewood, and junipers, remain on higher elevations of north-facing slopes."	Preservation, health, and distribution of packrat middens, Kofa Mountain barberry, Arizona rosewood, junipers
Vegetation communities: creosote-bursage, desert grassland, and washes	6. "The lower elevations and flatter areas of the Monument contain the creosote-bursage plant community. This plant community thrives in the open expanses between the mountain ranges, and connects the other plant communities together. Rare patches of desert grassland can also be found throughout the Monument, especially in the Sand Tank Mountains area. The washes in the area support a much denser vegetation community than the surrounding desert, including mesquite, ironwood, palo verde, desert honeysuckle, chuperosa, and desert willow, as well as a variety of herbaceous plants. This vegetation offers the dense cover bird species need for successful nesting, foraging,	Health, diversity, and distribution of creosote bush-bursage vegetation community, desert grassland, washes

	and escape, and birds heavily use the washes during migration."	
Wildlife	7. "The diverse plant communities present in the Monument support a wide variety of wildlife, including the endangered Sonoran pronghorn, a robust population of desert bighorn sheep, especially in the Maricopa Mountains area, and other mammalian species such as mule deer, javelina, mountain lion, gray fox, and bobcat. Bat species within the Monument include the endangered lesser long-nosed bat, the California leaf-nosed bat, and the cave myotis. Over 200 species of [song] birds are found in the Monument, including 59 species known to nest in the Vekol Valley area. Numerous species of raptors and owls inhabit the Monument, including the elf owl and the western screech owl. The Monument also supports a diverse array of reptiles and amphibians, including the Sonoran desert tortoise and the red-backed whiptail. The Bureau of Land Management has designated approximately 25,000 acres of land in the Maricopa Mountains area as critical habitat for the desert tortoise. The Vekol Valley and Sand Tank Mountain areas contain especially diverse and robust populations of amphibians. During summer rainfall events, thousands of Sonoran green toads in the Vekol Valley can be heard moving around and calling out."	Distribution and health of Sonoran desert tortoise, desert bighorn sheep, red-backed whiptail lizard, raptors, owls (including elf owl and western screech owl), mule deer, Sonoran pronghorn, javelina, mountain lion, gray fox, bobcat, lesser long-nosed bat (see above), California leaf-nosed bat, cave myotis bat, Sonoran green toads.
Archaeological and historic sites	8. "The Monument also contains many significant archaeological and historic sites, including rock art sites, lithic quarries, and scattered artifacts. Vekol Wash is believed to have been an important prehistoric travel and trade corridor between the Hohokam and tribes located in what is now Mexico. Signs of large villages and permanent habitat sites occur throughout the area, and particularly along the bajadas of the Table Top Mountains. Occupants of these villages were the ancestors of today's O'odham, Quechan, Cocopah, Maricopa, and other tribes. The Monument also contains a much used trail corridor 17 miles long in which are found remnants of several	Preservation of rock art sites, lithic quarries, scattered artifacts, Vekol Wash, Table Top Mountain bajadas, Juan Batista de Anza NHT, Mormon Battalion Trail, and Butterfield Overland Stage Route.

	important historic trails, including the Juan Bautista de Anza NHT, the Mormon Battalion Trail, and the Butterfield Overland Stage Route."	

E.2.2. Step 2: Conduct a Literature Review

In order to determine possible effects of livestock grazing on resources and objects in the Monument, the BLM conducted a thorough review of pertinent scientific literature specific to livestock grazing in the Sonoran Desert. The literature addressing the potential effects of livestock grazing in the arid West is voluminous; however, limited literature addresses the Sonoran Desert specifically. Thus, this review is limited to documents that have a close relationship to Monument objects. Literature reviewed included materials submitted by interested parties, groups, and individuals outside the BLM. A list of references reviewed and an evaluation of the body of literature for its relevance to the assessment of grazing compatibility in SDNM is compiled into a separate document and is available from the BLM on request.

The following literature review is organized by Monument object type. Results of some studies refer to more than one object type but are classified below to the most likely type for the purposes of organization.

E.2.2.1. Functioning Desert Ecosystem

The zone of effect around a livestock watering source has been termed the "piosphere" (Andrew, 1988). Particularly in arid environments, the distribution of impacts resulting from concentrations of large herbivores is patterned, ranging from impacts many times higher than the overall average at the watering point to many times lower than the average along a gradient until the foraging range of the animal is exceeded. Such concentrated impacts include the accumulation of livestock feces, increased soil nutrients near water and depletion further away from it, livestock trails, soil compaction, reduced cryptogamic crust cover, increased bare soil, decreased herbage biomass, and increased herbage defoliation. Similar, albeit more subtle, patterns of impact may occur around shade, campsites, and salt licks (Andrew 1988).

Bahre (1991) summarized previous studies in assessing the effects of human use on arroyo cutting and gully erosion in the arid Southwest. While overgrazing by livestock is often cited as an initiating factor, woodcutting, agricultural clearing, road and railroad construction, and construction of water diversions such as canals and levees, combined with changing rainfall patterns, are also cited as important contributing factors. An alternate view, stimulated by the observation that arroyo cutting and filling also occurred in prehistoric times, postulates that downward movement of soils leads to cumulatively steeper gradients of outwash plains until a tipping point is reached (i.e., when increased runoff velocity causes a soil cutting process that continues until slopes and runoff velocities are again in equilibrium). This view suggests that because only natural mechanical processes are involved in gully erosion, no human intervention is required to address it (Cooke and Reeves 1976).

Hovorka (1996) studied the relationship between livestock grazing and Sonoran Desert vegetation, insects, and insectivorous bats at sites in the Rincon, Tucson, and Silver Bell Mountains. He found that the influence of grazing history on plant community composition of the Sonoran Desert was significantly weaker than that of both moisture availability and elevation; however, small perennials and saguaro were more abundant on ungrazed study plots than on grazed study plots.

The study also showed that grazing history did not have a significant influence on insect or bat abundance.

E.2.2.2. Saguaro Cactus Forests

Studies of saguaro cactus (Carnegia gigantea) at Saguaro National Park suggest that livestock grazing has an adverse effect on the recruitment of young saguaro, which germinate and grow during the first decade under the shade and protection of shrubs and trees known as "nurse" plants. Abouhaidar (1992) found significantly fewer saguaros aged 11-20 years on a grazed area of Saguaro National Park relative to an ungrazed area, and observed that saguaro recruitment following cessation of livestock grazing appeared to experience a lag of approximately 10 years, after which saguaro germination and growth markedly increased as the density of protective cover increased. This pattern of delayed recruitment was also documented by Holden et al. (2000) in a re-survey of saguaro monitoring plots at Saguaro National Park, although these writers noted that inability of earlier researchers to locate tiny saguaro seedlings and several subsequent years of above average rainfall may have contributed to this effect.

Available literature is conclusive that saguaro populations are strongly influenced by forces that alter the density of shade producing perennial plants under which saguaro germinate and grow early in life, and also suggests that saguaro tend to establish in cohorts when climatic conditions are favorable (see Niering et al. 1963; Steenbergh and Lowe 1977; Turner et al. 1966). In general, favorable seasonal rainfall increases the likelihood of saguaro germination and contributes to increased cover of nurse plants. Livestock can crush nurse plants or trample seedlings as they rest in the shade of larger trees, or directly feed on nurse plants, which would reduce protective cover for young saguaro and adversely affect saguaro germination and establishment. Such effects generally occur where livestock congregate, such as near watering areas or washes with large trees. However; Bowers and Turner (2002) also speculated that livestock grazing "may have indirectly benefited palo verde populations by reducing small mammal populations via competition for forage."

E.2.2.3. Vegetation Communities

The few peer-reviewed scientific studies that attempt to measure or infer the direct and indirect effects of livestock grazing on specific elements of the Sonoran Desert ecosystem focus on annual and perennial vegetation, saguaro cactus, insects and insectivorous bats, lizards, rodents, and bighorn sheep.

Several studies examining changes in Sonoran Desert vegetation have been conducted at a site near Tucson called Tumamoc Hill that has been fenced and protected from livestock grazing since 1907 (Blydenstein et al. 1957; Goldberg and Turner 1986; Shreve 1929; and Shreve and Hinckley 1937). These studies are not conclusive in determining whether the presence or absence of livestock grazing significantly affects plant density and species composition. Blydenstein et al. (1957) found that plant density, particularly with regard to the presence of perennial grasses and white ratany (Krameria grayi), was notably greater on the protected study site than at an adjacent area that was not protected from "occasional light" livestock grazing; however, no significant difference in plant species composition between the two areas was observed. In a subsequent study, Goldberg and Turner (1986) also documented increased plant density over time but observed that, while increased plant density might be related to protection from livestock grazing, the recruitment of new plants occurs very slowly and is critically dependent

upon suitable climatic conditions. Goldberg and Turner (1986) also found that the number of plant species increased in all study plots. Because the study plots were located in areas that were believed to have historically received differing levels of use by livestock, these writers concluded that there were no consistent directional changes in the vegetation composition of the study area, despite having been protected from livestock grazing for nearly 70 years, and that the observed changes in cover and density appeared to be responses to sequences of either exceptionally wet years or exceptionally dry years (Goldberg and Turner 1986).

A two-year study of grazed and ungrazed plots adjacent to the northern boundary of the Organ Pipe Cactus National Monument found that the composition of annual plant species declined with recent grazing by livestock (Waser and Price 1981). This reduction of plant diversity was not caused by turnover in common species but by the disappearance of rarely encountered, inconsistently distributed species. Within each study year, an overall reduction of plant diversity following recent grazing was determined to be significant; however, the relationship between livestock grazing and species composition between the two years was less clear due to variance in annual precipitation. Even considering that varying precipitation levels tend to obscure grazing affects on specie composition on a year-to-year basis, Waser and Price (1981) speculated that the effects of livestock grazing and winter precipitation on plant species diversity are cumulative and that recovery of plant species diversity would occur more rapidly in the absence of continued livestock grazing.

During a study of the effects of livestock grazing on jojoba shrubs (Simmondsia chinensis), Roundy and Ruyle (1989) found that plant species density and composition inside an area near Roosevelt Lake that was protected from livestock grazing for 48 years was similar to the area outside of the exclosure that had been continuously grazed during the same period. Although the density of jojoba was similar in the two areas, the plants were smaller and the canopy cover was less outside than inside the exclosure. Jojoba grazed by livestock had greater twig growth than ungrazed shrubs, but grazed shrubs had lower male and female flower densities than ungrazed shrubs. The researchers observed that heavy grazing, such as near a stock water pond, resulted in much smaller branches and canopies, leading to lower overall forage production in comparison to moderately grazed shrubs. Based on their findings, they recommended rest from grazing from March to May when warm temperatures and available water in the soil would allow maximum re-growth and seed production.

E.2.2.4. Wildlife

Jones (1981) studied the effects of livestock grazing on lizard abundance and diversity at three locations on the BLM Phoenix District. Fourteen sample sites, comprised of seven sites located in areas characterized as “heavily” grazed and seven sites as “lightly grazed,” were established in chaparral, desert grassland, mixed riparian scrub, cottonwood-willow riparian, and Sonoran desert scrub vegetative communities. All the lightly grazed sites had greater lizard abundance and species diversity than the heavily grazed sites except in Sonoran desert scrub communities where no differences were detected. Jones (1981) concluded that livestock grazing reduced overall lizard abundance and species diversity when associated with changes in structural composition of a given vegetative community. In Sonoran desert scrub, cattle did not reduce the amount of abundant, non-palatable shrubs; thus, little change in low-height perennial structure occurred, and lizard populations appeared to be unaffected.

The effect of livestock grazing on rodents is ambiguous but appears to depend on habitat preference for dense cover. Species that prefer open habitats such as Arizona pocket mouse

(*Perognathus amplus*), silky pocket mouse (*P. flavus*), hispid pocket mouse (*P. hispidus*), and Merriam's kangaroo rat (*Dipodomys merriami*) may thrive where livestock grazing reduces vegetative cover without substantially reducing seed production. In contrast, species that prefer heavy cover such as Price pocket mouse (*P. penicillatus*) and Bailey pocket mouse (*P. baileyi*) may be negatively affected (Fagerstone and Ramey 1996). Steenbergh and Lowe (1977) discussed the possible interrelationship between livestock grazing, rodent populations, and recruitment of young saguaro. While their review suggested that rodents consume saguaro seedlings and young plants, these writers did not find sufficient evidence to show a relationship between livestock grazing and effects to vegetative composition and cover such that increased rodent populations, and a resulting decrease in numbers of young saguaro, ultimately occurred.

In a study of livestock grazing influence on desert bighorn sheep (*Ovis canadensis mexicana*), Dodd and Brady (1986) examined differences between Sonoran Desert bighorn sheep habitat that had not been grazed for 26 years and recently grazed habitat. The main differences are that bighorn sheep preferred steep slopes while livestock predominantly used level terrain, and bighorn sheep primarily ate shrubs and cacti whereas cattle predominantly ate perennial grasses. The percentage of dietary overlap between bighorn sheep and cattle averaged only 35 percent, and no significant differences between grazed and ungrazed shrub and cacti cover were noted at any slope. On level slopes, annual grass and forb cover was significantly greater on the ungrazed area relative to the grazed areas. Dodd and Brady (1986) concluded that competition between bighorn sheep and cattle was low due to a dissimilarity in diets and distinct spatial segregation based on slope steepness. Krausman et al. (1996) also observed that ranges used by livestock and desert bighorn sheep usually do not overlap spatially; however, these writers described numerous instances of "social intolerance" in desert bighorn sheep: as livestock moved into core areas of habitat, bighorn sheep moved away. Due to this tendency to avoid contact with livestock, Krausman et al. (1996) suggested that even seasonal livestock grazing may fragment desert bighorn sheep habitat, effectively resulting in the exclusion of sheep from what is otherwise acceptable habitat.

With the exception of possible social intolerance of livestock by bighorn sheep, potential effects of livestock grazing on Sonoran Desert fauna is closely related to the affects of livestock grazing on Sonoran Desert vegetation. What is known about such effects is summarized below:

The very limited number of studies does not allow for strong conclusions to be drawn. Plant diversity appears to decline with grazing, although overall changes in species composition are relatively small. Grazing does not appear to have large effects on the major woody components, but impacts the less abundant and smaller species. Regeneration of saguaro cacti in areas of the Sonoran Desert can be negatively impacted. Recovery of a perennial herbaceous understory may be site dependent, and it is not clear whether the difference in recovery is due to site potential to support an herbaceous understory or due to the intensity of historic grazing (Milchunas 2006).

E.2.2.5. Archaeological and Historic Sites

Archaeological Resources

There are few published empirical studies of effects on cultural resources from livestock grazing. However, unpublished literature and published archaeological reports from the American Southwest describe incidents of damage associated with grazing. Reported effects of trampling include artifact breakage; vertical and horizontal displacement of artifacts; physical disturbance of archaeological features, such as collapse of walls; contamination of organic materials; and accelerated erosion that can disturb cultural deposits and obscure the visibility of artifacts, trails,

and other features. There have also been reports of cattle damaging rock art panels by rubbing against them.

Such disturbances affect the quality that archaeologists refer to as "integrity." A site with good archaeological integrity has archaeological deposits that are relatively intact and complete. These deposits retain the spatial patterning of surface and subsurface artifacts and features, as well as qualities of "context" that can yield critical information for scientific studies. Aspects of integrity, used to evaluate the eligibility of historic properties for nomination to the National Register of Historic Places, also include "setting" and "feeling." Setting is "the physical environment of a historic property … elements such as topographic features, open space, viewshed, landscape, vegetation" (Little et al. 2000). Feeling is "a property's expression of the aesthetic or historic sense of a particular period of time" (Little et al. 2000). Intact qualities of setting and feeling enhance opportunities to interpret sites for public visitation and education. Disturbances to these qualities, from grazing impacts or other sources, can limit opportunities for research and interpretation.

In some cases, it is difficult to determine whether adverse impacts to archaeological sites have been caused by grazing, recreational activities such as camping, or a combination of factors. A small number of controlled studies have examined grazing impacts by mapping the locations and condition of artifacts in clearly defined plots, before and after grazing use (Osborn and Hartley 1991, Osborn et al. 1987, Roney 1977, Van Vuren 1982). Alan Osborn and his colleagues examined the effects of domestic livestock grazing on archaeological resources of Capitol Reef National Park in southern Utah. The study included reconnaissance and observations at recorded sites, and the creation of experimental and control plots containing several types of newly manufactured lithic and ceramic artifacts. Several study plots were located close to water sources. The artifacts were made, measured, weighed, placed, and mapped. Following 6 months of grazing use, they were again mapped, weighed, and examined. Osborn found that 93 percent of the artifacts remained intact, and 84 percent remained visible. Pottery shards were more prone to breakage. Mapping revealed that 23 percent of artifacts were displaced, but about 75 percent of the displaced artifacts had moved less than 15 centimeters. The results varied by the location of the plot. The impacts were greatest in plots close to water sources, which received a higher degree of grazing use. Osborn and Hartley (1991) concluded, "the degree of effect is a direct reflection of grazing intensity and dependence on limited water sources in this cold desert environment."

In summary, these studies indicate that impacts are a concern in areas of concentrated livestock use, such as water sources and corrals, more so than in areas of dispersed use. This conclusion is reflected in a study that examined lithic artifact breakage in areas of variable livestock use along the Central Arizona Project aqueduct in the western Arizona desert (Brown and Stone 1982). Collections of lithic artifacts from six archaeological sites located along different segments of the aqueduct route exhibited breakage rates ranging from 13 to 17 percent. These rates of breakage may be related to multiple factors, including grazing and off-highway vehicle use. In contrast, 52 percent of the artifacts from a seventh site located near a reservoir used by cattle were broken.

Historical Resources

As identified in Table 2, the Monument contains the Juan Bautista de Anza Trail (Anza trail) corridor, a National Historic Trail. Approximately 17 miles in length, the corridor also contains remnants of other later traveled historic trails: the Mormon Battalion and the Butterfield Overland Stage Route. Although no visible physical remnants remain of the Anza trail, the historic corridor, as defined by the National Park Service, varies in width depending on the information

found in the user diaries. The historic setting is an area 3 miles wide, or up to the visual horizon, whichever is less. The Mormon Battalion and the Butterfield Overland Stage Route both contain characteristics that would make them eligible for the National Register of Historic Places. Like the Anza Trail, the Mormon Battalion trail contains physical features and attributes documented by diariesm, however, portions along the Butterfield route contain actual visible remnants from the stagecoaches. Four livestock water developments lie within the historic corridor: Gap Tank, Conley Tank, North Tank and North Tank Well.

E.2.2.6. Summary of the Literature Review

There are few studies of livestock grazing effects within the Sonoran Desert and none conducted within the SDNM. Most of the livestock-grazing management studies in the Sonoran desert in this literature review appear to compare effects on fauna, flora, and soil from an unknown and unquantified, amount of livestock grazing to no grazing. The lack of quantification of the intensity, frequency, and timing of livestock grazing makes it difficult to ascertain the levels of livestock grazing that are causing the effects. Despite these problems, the body of literature does provide some general potential effects of livestock grazing within the Sonoran desert that can be extrapolated to the SDNM and to some biological and cultural objects on the SDNM.

Potential negative effects of livestock grazing to annual and perennial vegetation, saguaro cactus, insects, insectivorous bats, lizards, rodents, and bighorn sheep were found from the literature review, and these potential effects can be related to the diversity of the plant species biological object, the saguaro cactus forest biological object, and the wildlife biological object.

Livestock grazing in the Sonoran Desert can potentially reduce plant species diversity and the presence of young saguaros in localized areas. Livestock grazing had no significant effects on insectivorous bats such as the lesser long-nosed bat, the California leaf-nosed bat, or the cave myotis bat. Livestock grazing had little to no effect on lizard abundance in Sonoran desert scrub plant communities, which are the habitat of the red-backed whiptail lizard (a noted wildlife object); therefore, livestock grazing is predicted to have little to no effect on the red-backed whiptail lizard. Livestock have the potential to cause social intolerance in desert bighorn sheep. This manifests itself in desert bighorn sheep moving away from areas when livestock are in the vicinity.

There are descriptions in the published record of damage to archaeological resources associated with livestock grazing. Reported adverse effects to site integrity include artifact breakage by trampling, displacement of artifacts, and the physical disturbance of archaeological features. Accelerated erosion can disturb cultural deposits and obscure the visibility of artifacts, trails, and other features. Studies indicate that breakage impacts are more of a concern in areas of concentrated livestock use, such as water sources and corrals, than in areas of dispersed use. Impacts on cultural resources by camping, off-road vehicles and other human activities can have the same effects as described above.

E.2.3. Step 3: Conduct a Land Health Evaluation

A draft land health evaluation (LHE) was completed in 2011 for this compatibility analysis. The purpose of the SDNM LHE is to gauge whether the Arizona Standards for Rangeland Health are being met on the Monument. If the LHE documents that standards are not met in the assessment area, the authorized officer must determine significant causal factors for non-achievement.

Further, if existing grazing management practices or levels of grazing use on public land are significant causal factors for the non-achievement of standards, then BLM has determined that such grazing is not compatible with the protection of the objects of the Monument.

Rangeland Health Standards (now referred to as Land Health Standards) are measurable and attainable goals for the desired condition of biological resources and physical components/characteristics of desert ecosystems found within the Monument that were identified as Monument objects by Presidential Proclamation 7397. BLM typically evaluates indicators of land health by ascertaining the effects of livestock grazing on natural resources on landscape units called ecological sites. The BLM does not have site-specific data for every ecological site within the Sonoran Desert but does try to collect data on prevalent ecological sites within pastures or allotments. Comprehensive data on the Sonoran Desert do not exist from other sources. The BLM typically monitors change on ecological sites in response to management or weather but makes livestock-grazing management changes on a management unit of pastures or allotments rather than ecological sites because ecological sites are typically too small in size to manage separately for livestock grazing. Prevalent ecological sites within pastures or allotments are typically monitored through use of key areas or critical areas. Response to management or weather on these key areas or critical areas is used as a basis for judging whether livestock-grazing management is in need of change within pastures or allotments.

As part of the LHE process, desired plant community (DPC) objectives were established for the biological objects of the Monument. The DPC objectives were used as an indicator of ecosystem function and land health. This was accomplished by identifying indicators for the biological objects, which are identified in Table 2. If standards are being achieved then ecosystem functionality is not at risk. If standards are not achieved, then ecosystem functionality may be at risk on the Monument.

The Arizona Rangeland Health Standards are defined below:

- Standard 1 - Upland Sites: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site). To achieve Standard 1, rangelands cannot show signs of accelerated soil erosion by wind or water. If achieved, the health of the rangelands is determined to not be at risk. If the standard is not achieved, the health of the ecological site is at risk due to clear evidence of soil loss and hydrologic function.

- Standard 2 - Riparian-Wetland Sites: Riparian-wetland areas are in proper functioning condition (not applicable).

- Standard 3 - Desired Resource Conditions: Productive and diverse upland and riparian-wetland communities of native species exist and are maintained. To achieve Standard 3, the ecological site must be producing desirable forage, cover and soil protection. For wildlife, including desert tortoise, this means “healthy” rangeland is more likely to provide the necessary food and cover to sustain the species. If achieved, ecological sites are determined to contain productive and diverse communities of native species resulting in proper ecosystem function. If the standard is not achieved, the soil conditions and ecosystem function described in Standard 1 are at risk of losing soil, and not providing forage and habitat for wildlife and livestock.

Standard 1 and Standard 3 apply to public lands within the SDNM. There are no riparian areas located within the Monument; therefore, land health Standard 2 is not applicable and was not evaluated. The Barry M. Goldwater Range (BGR) and Area A (Sand Tank Mountains area) were

used as comparison areas to set conservative resource condition objectives. The area has not been open to livestock grazing since the 1940s.

As part of the LHE process, a draft of the evaluation was sent out for a technical peer review. Contributors to the technical peer review are four rangeland ecologists who each have an extensive publications record and are recognized experts in Sonoran Desert ecosystem functions. These included an Assistant Professor of Natural Resources, University of Arizona, and Extension Specialist in Range Management, University of Arizona, a professor Emeritus, University of Arizona, Tucson and a Professor Emeritus, New Mexico State University, Las Cruces. The peer reviewers were asked the following questions:

1. Are the conclusions supported by analysis of the data?
2. Are the data collected sufficient to permit the BLM to draw the conclusions made?
3. If data are not deemed sufficient, what improvements could be made to existing data, what new types of data could be collected, and what methods could be used to obtain the data to improve BLM's ability to generate conclusions?

Recommendations received from the peer review were considered before completing the draft LHE. In addition, future study design recommendations from the peer reviewers will be considered in any monitoring plan for the SDNM. Comments submitted by stakeholders and interested publics will be considered for the final LHE and final compatibility analysis.

E.2.3.1. Data Collection and Analysis

Direct measurements of the resource conditions on the Monument began with a BLM rangeland soil and vegetation inventory, which was completed for SDNM allotments in 1981 as part of the planning effort for the Lower Gila South RMP/EIS. Ecological sites were mapped for each allotment within the Monument. Data were collected for the rangeland survey from 1979 to 1981. The BLM's rangeland inventory production data and the Soil Conservation Service (now NRCS) range site guides were used to determine range condition (ecological status) and apparent trend.

In 2002, the Pacific Biodiversity Institute (PBI), which was a subcontractor of The Nature Conservancy through an assistance agreement with the BLM, collected estimates of vegetative canopy cover to assess the ecological condition of SDNM. This was designed to be used as a baseline for changes and trends in the condition of the natural communities within the Monument. Data were also collected by PBI in the BGR and the southern portion of Area A. Historical records indicate that livestock use in this area has been absent or relatively light since the 1940s. Data from the 48 PBI study sites were used as part of the analysis.

In 2008, a BLM interdisciplinary team collected data at 35 key areas within the SDNM allotments for the purpose of conducting an LHE. Key areas were selected based on their location, distance to water, livestock and wildlife habitat values, and included representations of all major ecological sites. Key areas were not placed within small, localized disturbance areas around wildlife and livestock watering facilities, as they are not representative of the overall range conditions.

Vegetative attribute data collected includes ground cover, frequency, relative production, structure, composition, and canopy cover (Interagency Technical Team 1996a). Utilization data were also collected at several key areas, and use-pattern mapping was conducted during a year of average livestock use for each of the allotments (Interagency Technical Team 1996b). Detailed

methodology for each of these data collection techniques is provided in Appendix F, *Arizona Land Health Evaluation for the Sonoran Desert National Monument* (p. 1081), Arizona Land Health Evaluation for the Sonoran Desert National Monument.

The plant communities found on an ecological site are naturally variable. Composition and production vary with yearly conditions, location, aspect, and the natural variability of the soils. The "historical climax plant community" represents the natural potential plant communities found on relic or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as fire, grazing, or drought (NRCS 2010). Given this natural variability, rather than using the absolute value to determine achievement of the objective, the site was considered achieving the objective if the vegetative attributes measured were within 80 percent of the attribute value.

For the ecological site within an allotment to be considered achieving land health Standard 3, a majority of the key areas and PBI plots (more than 50 percent) representing an ecological site had to meet all the desired plant community objectives. This represents a preponderance of evidence approach to ascertain whether land health Standard 3 was met.

The departure from achievement of a standard may be negligible, minor, moderate or major. Level and intensity of use is the indicator used of whether or not an activity is a significant causal factor for not achieving a land health standard. The percent of the vegetative community/object affected by livestock use are also summarized by cumulative acres and miles.

E.2.3.2. Analysis, Interpretation & Evaluation of Effects of Livestock Grazing on Monument Objects

The following analysis and interpretation summarizes the results of the LHE (Appendix F, *Arizona Land Health Evaluation for the Sonoran Desert National Monument* (p. 1081)). It is based on the cumulative acres of ecological sites found within the vegetative community Monument object. The results of the LHE indicate that Standard 1 is being achieved throughout the Monument. Qualitative assessments of the soil-related indicators (rills, flow patterns, pedestals, bare ground, gullies, litter movement, and soil compaction etc.) did not indicate any signs of accelerated erosion at any site. Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate for the ecological sites. Quantitative cover data indicates that vegetative and microbiotic crust cover levels are appropriate across the majority of the ecological sites assessed, and are comparable to the BGR/Area A areas that have not been grazed in 60 years. Because Standard 1 is being achieved throughout the Monument, it is not analyzed further. However, Standard 3 is not achieved in all areas.

Utilization data is analyzed in conjunction with vegetation cover and composition, livestock-use levels (AUMs), and precipitation to determine causal factors for non-achievement of standards and to determine whether changes in current management practices are necessary. Proper utilization levels are needed to provide for plant maintenance and watershed health values.

The analysis below includes a determination as to whether or not livestock grazing is the causal factor when Standard 3 is not achieved. The SDNM is comprised primarily of shrubs. Shrub utilization exceeding 40 percent of current year's growth can impede shrub viability (i.e. vigor, reproductive capacity, etc.) (Holechek, et al. 1999). Therefore, current livestock grazing is determined to be a significant causal factor for non-achievement of standards in those areas where

patterns of livestock use are greater than 40 percent utilization. If livestock grazing is determined not to be the causal factor, other factors may be contributing to non-achievement of Standard 3.

Effects of grazing were analyzed by vegetative community and by permitted allotment.

Analysis of the Biological Objects by Vegetative Community

Creosote Bush-Bursage Vegetation Community

This community consists of the limy fan, limy upland deep and Sandy Loam deep ecological sites and provides habitat for wildlife objects (identified in Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060). It comprises 151,643 acres within the Monument. Standard 3 is being achieved on 45,633 acres within this community. Standard 3 is not being achieved on 106,010 acres within this community, due in large part to a minor departures from the reference state of vegetation canopy cover and composition (See Table E.3, "Creosote Bush-Bursage Land Health Standard Achievement Status" (p. 1056)). Utilization data indicate that existing grazing-management practices are causal factors in failing to achieve Standard 3 on 7,980 acres (5 percent) of the creosote bush-bursage community. The remaining 98,030 acres of the vegetation community not achieving Standard 3 could not be attributed to current livestock-grazing practices. Long-term trend data are not available to ascertain whether progress is or is not being made toward achievement of Standard 3 (May also refer to Map F-5 in the LHE Appendix F).

Table E.3. Creosote Bush-Bursage Land Health Standard Achievement Status

	Standard 1	Standard 3
1. Acres achieving land health standards	151,643	45,633
2. Acres not achieving land health standards	0	106,010
a. Due to current livestock grazing	0	7,980
b. Due to other causes*	0	98,030
3. Acres not achieving land health standards but making significant progress	0	0
Total acres in the SDNM	**151,643**	
*May include historic livestock grazing, livestock use patterns, fire, drought, OHV use, etc.		

Palo Verde-Mixed Cacti Vegetation Community and Saguaro Cactus Forest

This community (see Map E-1) consists of the limy upland and granitic hills ecological sites and provides habitat for wildlife objects (identified in Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060)). It comprises 87,366 acres within the Monument. Standard 3 is being achieved on 65,827 acres within the Monument. Standard 3 is not being achieved on 21,539 acres within this community, due in large part to a minor departure from the reference state of vegetation canopy cover or composition (see Table E.4, "Palo-Verde Mixed Cactus Land Health Standard Achievement Status" (p. 1057)). Utilization data indicate that existing grazing-management practices are factors in failing to achieve Standard 3 on 511 acres (approximately 1 percent of the community). The remaining 21,028 acres of the vegetation community not achieving Standard 3 could not be attributed to current livestock-grazing practices.

The results of the PBI Saguaro Study indicate that recruitment of saguaros is occurring within the grazed portion of SDNM north of I-8 at appropriate rates compared to Area A and BGR.

Table E.4. Palo-Verde Mixed Cactus Land Health Standard Achievement Status

	Standard 1	Standard 3
1. Acres achieving land health standards	87,366	65,827
2. Acres not achieving land health standards	0	21,539
a. Due to current livestock grazing	0	511
b. Due to other causes*	0	21,028
3. Acres not achieving land health standards but making significant progress	0	0
Total acres	**87,366**	
*May include historic livestock grazing, livestock use patterns, fire, drought, OHV use, etc.		

Desert Wash Community

This community consists of the sandy wash and loamy swale ecological sites and provides habitat for wildlife objects (identified in Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060)). The community covers 490.5 miles within the Monument. (See Table E.5, "Desert Wash Community Land Health Standard Achievement Status" (p. 1057).) Standard 3 is being met on 196.5 miles within the Monument. Standard 3 is not being met on 294 miles within this community, due in large part to a minor departure from the reference state of vegetation canopy cover or composition. Utilization data indicate that existing grazing management practices are factors in failing to achieve Standard 3 on 12 miles (approximately 2 percent) of the community. The remaining 282 miles of the vegetation community not achieving Standard 3 could not be attributed to current livestock-grazing practices.

Table E.5. Desert Wash Community Land Health Standard Achievement Status

	Standard 1	Standard 3
1. Miles achieving land health standards	490.5	196.5
2. Miles not achieving land health standards	0	294.0
a. Due to current livestock grazing	0	12.0
b. Due to other causes*	0	282.0
Total Miles	**490.5**	
*May include historic livestock grazing, livestock use patterns, fire, drought, OHV use, etc.		

Analysis of the Diversity of Plant Species Biological Object

Plant species diversity is most simply defined as the number of plant species occurring in a given plant community or landscape. Plant diversity is a vegetation attribute based on other attributes such as presence, cover or biomass -- it is a calculated or synthesized value, not a directly observable attribute of vegetation. Cover was used as a diversity attribute in this analysis. This use is an accepted methodology and was employed by Waser and Price (1981).

The plant diversity found within any vegetation community can be highly variable and is affected by factors such as slope, aspect, local climate and the natural variability of the soils. In addition, drought, fire, herbivory, and other factors have an effect on the diversity of a community. As mentioned earlier, the plant communities within the SDNM are shrub-dominated communities, typical of the Sonoran Desert scrub vegetative communities.

The analysis was based on cover data from PBI plots. Data collected on the Monument north of I-8 was compared to the average number of perennial species per plot on BGR and Area A lands

within similar ecological sites. The BGR and Area A are considered reference areas for plant species diversity for the SDNM. The results are summarized in Table E.6, "Average Number of Perennial Species Per Plot (Diversity)" (p. 1058).

Table E.6. Average Number of Perennial Species Per Plot (Diversity)

Plant Community (ecological site)	BGR/ Area A	Big Horn	Conley	Beloat	Hazen	Lower Vekol
Creosote-bursage (limy fan)	2	3	2.6	2.7	5.5	**
Palo verde-mixed cacti (granitic hills)	9*	14	12.5	18.8	16	19
Creosote-bursage (limy upland deep)	4.6	4.3	**	**	**	**
Desert wash (sandy wash)	12	17.7	6	**	10	**
*Only one plot in this ecological site in BGR						
**No data collected						

Based on the results summarized in the table, the average number of species per plot for all allotments are similar to BGR/Area A average species with the exception of the Conley allotment sandy wash ecological site. This would indicate that the diversity of perennial species is relatively similar to that of the comparison area, which has not been grazed in more than 50 years.

Analysis of the Biological Monument Objects by Allotment

Big Horn (92,204 Acres)

The palo verde-mixed cacti vegetation community and saguaro cactus forest Monument objects (limy upland and granitic hills ecological sites) represent 28,836 acres within the allotment. Both ecological sites within this community are achieving Standard 1 and Standard 3.

The creosote bush-bursage vegetation community Monument object (limy fan, limy upland deep, and Sandy Loam deep ecological sites) represents 59,240 acres within the allotment. The limy fan and sandy loam deep ecological sites (29,856 acres) are meeting Standard 1 and Standard 3. The limy upland deep ecological site is meeting Standard 1 but not Standard 3 (29,384 acres). Utilization data indicate that existing grazing-management practices are factors in failing to meet Standard 3 on 2,974 acres (5 percent) of the creosote bush-bursage community. The failure of the remaining acres of the limy upland deep ecological site to meet Standard 3 could not be attributed to current livestock grazing.

The desert wash Monument object (sandy wash and loamy swale ecological sites cover 192 miles within the allotment (see Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060)). Both ecological sites within this community are meeting Standard 1 and Standard 3.

Beloat (33,600 Acres)

The palo verde-mixed cacti vegetation community and saguaro cactus forest objects (limy upland and granitic hills ecological sites) cover 12,113 acres within the allotment. Both ecological sites within this community are achieving Standard 1 and Standard 3.

The creosote bush-bursage vegetation community Monument object (limy fan and limy upland deep ecological sites) represents 21,487 acres of the allotment. Both ecological sites within this community are achieving Standard 1, but the limy fan ecological site (17,906 acres) is not

achieving Standard 3. Because the livestock utilization was less than 40 percent, grazing is determined not to be a causal factor for failing to achieve Standard 3.

The desert wash Monument object (sandy wash and loamy swale ecological sites) covers 64 miles within the allotment. The loamy swale ecological site (1 mile) is achieving Standard 1 and Standard 3. The sandy wash ecological site is achieving Standard 1 but not Standard 3 (63 miles). Grazing management practices are not factors in failing to achieve Standard 3, as livestock use levels were negligible (0-5 percent) and slight (6 to 20 percent) levels.

Conley (77,708 Acres)

The palo verde-mixed cacti vegetation community and saguaro cactus forest Monument objects (limy upland and granitic hills ecological sites) cover 20,963 acres within the allotment. The limy upland and granitic hills ecological sites are achieving Standard 1 but not Standard 3. Utilization data indicate it is more likely than not that existing grazing management practices or levels of grazing use are factors in failing to achieve the Standard 3 on 511 acres (2 percent) of the palo verde-mixed cacti vegetation community. The failure of the remaining acres of the community to meet Standard 3 could not be attributed to current livestock grazing.

The creosote bush-bursage vegetation community Monument object (limy fan and limy upland deep ecological sites) covers 52,315 acres of the allotment. The limy fan and limy upland deep ecological sites are achieving Standard 1 but not Standard 3 (52,315 acres). Utilization data indicate it is more likely than not that existing grazing management practices or levels of grazing use are factors in failing to achieve Standard 3 on 5,006 acres (10 percent) of the creosote bush-bursage community. The failure of the remaining acres of the vegetation community to meet Standard 3 could not be attributed to current livestock grazing.

The desert wash Monument object (sandy wash and loamy swale ecological sites) covers 155 miles of the allotment. The loamy swale ecological site (1 mile) is achieving Standard 1 and Standard 3. The sandy wash ecological site (154 miles) is achieving Standard 1 but not Standard 3. Utilization data indicate it is more likely than not that existing grazing-management practices and levels of grazing use are factors in failing to achieve Standard 3 on 10 miles (6 percent) of the desert wash community.

Hazen (31,926 Acres)

The palo verde-mixed cacti vegetation community and saguaro cactus forest Monument objects (limy upland and granitic hills ecological sites), which provide habitat for wildlife objects, cover 17,713 acres of the allotment. The ecological sites within this community are achieving Standard 1 and Standard 3. The creosote bush-bursage vegetation community Monument object (limy fan and limy upland deep ecological sites) covers 14,213 acres of the allotment. The limy upland deep ecological site (8,514 acres) is achieving Standard 1 and Standard 3. The limy fan ecological site is achieving Standard 1 but not Standard 3 (5,699 acres). It is more likely than not that the failure of this site to meet Standard 3 is not due to existing grazing-management practices or levels of grazing use, as livestock use levels were at negligible (0 to 5 percent) and slight (6 to 20 percent) levels.

The desert wash Monument object (sandy wash ecological site) covers 59 miles of the allotment (see Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060). The ecological site is achieving Standard 1 but not Standard 3. It is more likely than not that the failure of this site to meet Standard 3 is not due to existing grazing

management practices or levels of grazing use, as livestock use levels were at negligible (0 to 5 percent) and slight (6 to 20 percent) levels.

Lower Vekol (15,409 Acres)

The palo verde-mixed cacti vegetation community and saguaro cactus forest Monument objects (limy upland and granitic hills ecological sites covers 6,838 acres of the allotment (see Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060)). The granitic hills ecological site (6,262 acres) is achieving Standard 1 and Standard 3. The limy upland ecological site (576 acres) is achieving Standard 1 but not Standard 3. It is more likely than not that the failure of these sites to meet Standard 3 are not due to existing grazing management practices or levels of grazing use, as livestock use levels were at slight (6 to 20 percent) and light (21 to 40 percent) levels.

The creosote bush-bursage vegetation community Monument object (limy fan and limy upland deep ecological sites covers 3,682 acres of the allotment. See Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060). Both ecological sites within this community are achieving Standard 1 and Standard 3.

The desert wash Monument object (sandy wash and loamy swale ecological sites) covers 18.5 miles of the allotment. The loamy swale ecological site (0.5 miles) is achieving Standard 1 and Standard 3. The sandy wash ecological site is achieving Standard 1 but not Standard 3 (18 miles). Utilization data indicate it is more likely than not that existing grazing management practices or levels of grazing use are factors in failing to achieve Standard 3 on 2 miles (11 percent) of the desert wash community.

Arnold (1,609 Acres)

The creosote bush-bursage vegetation community Monument object (limy fan ecological site) covers 706 acres of the allotment. The ecological site is meeting Standard 1 but not Standard 3. It is more likely than not that the failure of these sites to meet Standard 3 are not due to existing grazing management practices or levels of grazing use, as livestock use levels were at slight (6 to 20 percent) levels. Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060) identifies which land health objectives apply to each biological indicator of the Monument objects. Because the objects in the proclamation are identified at the landscape level, biological "indicators" for the objects were identified that can be measured at the site-specific level. These were identified in Table E.2, "Monument Objects Specific to the SDNM" (p. 1044). For each Monument object, corresponding "indicators" are identified.

Table E.7. Results of the Land Health Evaluation (LHE Objectives by Monument Object)

Biological Indicator	Applicable Standards	Evaluation Results
Monument Object: Functioning Desert Ecosystem		
See Monument object: saguaro cactus forest		
See Monument object: vegetation communities		
Habitat for a wide range of wildlife species (See Monument object: wildlife)		
Monument Object: Diversity of Plant and Animal Species		
Woodland assemblages	Do not occur north of I-8. Occur in the higher peaks of the Table Top and Sand Tank Mountains.	

Biological Indicator	Applicable Standards	Evaluation Results
Palo verde-mixed cacti vegetation community	**Land Health Standard 1:** Assessments of soil/site stability and hydrologic function on granitic hills and limy upland ecological sites. **Land Health Standard 3**: Vegetative canopy cover objective for the limy upland and granitic hills ecological sites. palatable shrub composition objective for the limy upland ecological sites	**Big Horn:** Achieves Standard 1, Achieves Standard 3 for the limy upland and granitic hills ecological sites
		Beloat: Achieves Standard 1, Achieves Standard 3 for the limy upland and granitic hills ecological sites
		Conley: Achieves Standard 1 Does not achieve Standard 3 for the limy upland and granitic hills ecological sites
		Hazen: Achieves Standard 1, Achieves Standard 3 for the granitic hills ecological site
		Lower Vekol: Achieves Standard 1, Achieves Standard 3 for the granitic hills ecological site, Does not achieve Standard 3 for the limy upland ecological site. Does not achieve the palatable shrub composition DPC objective.
Monument Object: Saguaro Cactus Forests		
Saguaro cactus and nurse plants	**Land Health Standard 1**: Assessments of soil/site stability and hydrologic function on granitic hills and limy upland ecological sites - provides suitable soil and hydrologic conditions for saguaros and nurse plants. **Land Health Standard 3:** Vegetative canopy cover objectives for the limy upland and granitic hills ecological sites - provides vegetative cover of nurse plants. **Land Health Standard 3:** Saguaro recruitment objectives for the limy	**All SDNM:** PBI recruitment of saguaros is occurring within the grazed portion of the SDNM at appropriate rates compared to ungrazed portions of the SDNM and BGR Area A. See Map E-3.
		Big Horn: Achieves Standard 1, Achieves Standard 3 for the limy upland and granitic hills ecological sites
		Beloat: Achieves Standard 1

Biological Indicator	Applicable Standards	Evaluation Results
	upland and granitic hills ecological sites	Achieves Standard 3 for the limy upland and granitic hills ecological sites
		Conley: Achieves Standard 1 Does not achieve Standard 3 for the limy upland and granitic hills ecological sites
		Hazen: Achieves Standard 1, Achieves Standard 3 for the granitic hills ecological site.
		Lower Vekol: Achieves Standard 1, Achieves Standard 3 for the granitic hills ecological site Does not achieve Standard 3 for the limy upland ecological site; however, does achieve the canopy cover objective for nurse plants.
Monument Object: Sand Tank Mountains		
Sand Tank Mountains	Mountain range not in analysis area (located south of I-8)	
Monument Object: Scientific Analysis of Plant Species and Climates in Past Eras		
Packrat middens	Ancient middens occur in dry caves and rock shelters where they are protected from moisture. Livestock do not generally utilize areas with dry caves and rock shelters due to steep, rocky, and rough terrain.	
Kofa Mountain barberry	Does not occur north of I-8.	
Arizona rosewood	Does not occur north of I-8.	
Juniper	Does not occur north of I-8.	
Monument Object: Vegetation Communities: Creosote-Bursage, Desert Grassland, and Desert Washes		
Creosote-bursage vegetation community	**Land Health Standard 1:** Assessments of soil/site stability and hydrologic function on limy fan, limy upland deep, and/or sandy loam deep ecological sites **Land Health Standard 3:** Vegetative canopy cover objectives and composition objectives for the limy fan, limy upland deep, and sandy loam deep ecological sites	**Big Horn:** Achieves Standard 1, Achieves Standard 3 for the limy fan ecological site, Achieves Standard 3 for the sandy loam deep ecological site, Does not achieve Standard 3 for the limy upland deep ecological site. Several sites do not meet canopy cover objectives.
		Beloat: Achieves Standard 1, Does not achieve Standard 3 for the limy fan ecological site.

Biological Indicator	Applicable Standards	Evaluation Results
		Conley: Achieves Standard 1, Does not achieve Standard 3 for the limy fan ecological site. Species composition objectives were not met at multiple sites, Does not achieve Standard 3 for the limy upland deep ecological site.
		Hazen: Achieves Standard 1, Achieves Standard 3 for the limy upland deep ecological site, Does not achieve Standard 3 for the limy fan ecological site.
		Lower Vekol: Achieves Standard 1, Achieves Standard 3 for the limy upland deep ecological site.
		Arnold: Achieves Standard 1, Does not achieve Standard 3 for the limy fan ecological site.
Desert washes	**Land Health Standard 1:** Assessments of soil/site stability and hydrologic function on sandy wash and loamy swale ecological sites. **Land Health Standard 3:** Vegetative canopy cover and palatable shrub composition objectives for the sandy wash ecological site, and vegetative canopy cover and perennial grass composition objectives for the loamy swale ecological site.	**Big Horn:** Achieves Standard 1, Achieves Standard 3 for the sandy wash and loamy swale ecological sites.
		Beloat: Achieves Standard 1, Does not achieve Standard 3 for the sandy wash ecological site, Achieves Standard 3 for the loamy swale ecological site.
		Conley: Achieves Standard 1, Does not achieve Standard 3 for the sandy wash ecological site, Achieves Standard 3 for the loamy swale ecological site.
		Hazen:

Biological Indicator	Applicable Standards	Evaluation Results
		Achieves Standard 1, Does not achieve Standard 3 for the sandy wash ecological site.
		Lower Vekol: Achieves Standard 1, Does not achieve Standard 3 for the sandy wash ecological site, Achieves Standard 3 for the loamy swale ecological site.
Desert Grassland	Does not occur north of I-8	
Monument Object: Wildlife*		
Sonoran desert tortoise, Desert bighorn sheep, Red-backed whiptail lizard, Elf owl, Western screech owl, Mule deer.	**Land Health Standard 1:** Assessments of soil/site stability and hydrologic function on granitic hills and limy upland ecological sites (palo verde-mixed cacti vegetation community). **Land Health Standard 3:** Vegetative canopy cover objectives for the limy upland and granitic hills ecological sites. **Land Health Standard 3:** palatable shrub plant species composition objective for the limy upland ecological site.	**Big Horn:** Achieves Standard 1, Achieves Standard 3 for the limy upland and granitic hills ecological sites.
		Beloat: Achieves Standard 1, Achieves Standard 3 for the limy upland and granitic hills ecological sites.
		Conley: Achieves Standard 1, Does not achieve Standard 3 for the limy upland and granitic hills ecological sites.
		Hazen: Achieves Standard 1, Achieves Standard 3 for the granitic hills ecological site.
		Lower Vekol: Achieves Standard 1, Achieves Standard 3 for the granitic hills ecological site, Does not achieve Standard 3 for the limy upland ecological site.

Biological Indicator	Applicable Standards	Evaluation Results
Mule deer, Elf owl, Western screech owl, Cactus ferruginous pygmy-owl (not identified in the proclamation).	**Land Health Standard 1:** Assessments of soil/site stability and hydrologic function on sandy wash ecological site **Land Health Standard 3:** Vegetative canopy cover and palatable shrub composition objectives for the sandy wash ecological site, and vegetative canopy cover and perennial grass composition objectives for the loamy swale ecological site, and for potential cactus ferruginous pygmy-owl (CFPO) habitat in the sandy wash ecological site	**Big Horn:** Achieves Standard 1, Achieves Standard 3 for the sandy wash and loamy swale ecological sites, Achieves CFPO canopy cover objective.
		Beloat: Achieves Standard 1, Does not achieve Standard 3 for the sandy wash ecological site, Achieves Standard 3 for the loamy swale ecological site, Achieves CFPO canopy cover objective.
		Conley: Achieves Standard 1, Does not achieve Standard 3 for the sandy wash ecological site, Achieves Standard 3 for the loamy swale ecological site, No identified potential cactus ferruginous pygmy-owl (CFPO) habitat.
		Hazen: Achieves Standard 1, Does not achieve Standard 3 for the sandy wash ecological site, Achieves CFPO canopy cover objective.
		Lower Vekol: Achieves Standard 1, Does not achieve Standard 3 for the sandy wash ecological site, Achieves Standard 3 for the loamy swale ecological site, No identified potential cactus ferruginous pygmy-owl (CFPO) Habitat.
Sonoran pronghorn	Does not occur in the Monument.	
Javelina	Occurrence of this species north of I-8 in the SDNM is unconfirmed.	

Biological Indicator	Applicable Standards	Evaluation Results
Mountain lion	Evaluation of palo verde-mixed cacti and washes communities (granitic hills, limy upland and sandy wash ecological sites) addresses suitable habitat for prey species (i.e. mule deer, bighorn sheep, rodents, etc.).	
Gray fox	Evaluation of all vegetative communities addresses suitable habitat for prey species (i.e. quail, birds, rodents, lizards, etc.).	
Bobcat	Evaluation of all vegetative communities addresses suitable habitat for prey species (i.e. quail, birds, rodents, lizards, etc.).	
Lesser long-nosed bat (see above)	Evaluation of saguaro cactus forests conditions and applicable ecological sites evaluates habitat needs within the SDNM north of I-8 for this species.	
California leaf-nosed bat	Evaluation of all vegetative communities addresses suitable forage habitat. No known roost sites on the SDNM (Arizona Bat Resource Group, 2003). Forage (insects) area could occur within the Monument.	
Cave myotis bat	Evaluation of all vegetative communities addresses suitable forage habitat. No known roost sites on the SDNM (Arizona Bat Resource Group, 2003). Forage (insects) area could occur in the Monument.	
Elf owl (see above)	Evaluation of palo verde-mixed cacti and washes communities (granitic hills, limy upland and sandy wash ecological sites) addresses suitable forage habitat.	
Western screech owl (see above)	Evaluation of palo verde-mixed cacti and washes vegetation communities (granitic hills, limy upland and sandy wash ecological sites) addresses suitable forage habitat (i.e. small birds, rodents, lizards, insects etc.).	
Red-backed whiptail lizard (see above)	Evaluation of palo verde-mixed cacti vegetation community (granitic hills and limy upland ecological sites) addresses the habitat needs for this species.	
Sonoran green toad	Located in Vekol Valley spreader dikes and stock tanks outside the SDNM north of I-8.	
* Under Standard 3, when DPC objectives for wildlife habitat are being achieved, the site is producing desirable forage, cover, and soil protection. For wildlife, including the desert tortoise, this means "healthy" rangeland is more likely to provide the necessary food and cover to sustain the species that live there.		

E.2.3.3. Summary of Land Health Evaluation Findings by Monument Object

Where livestock grazing was determined to be a significant causal factor for of the failure to meet land health standards, it was determined that livestock grazing is not compatible with the protection of the Monument objects (see Map E-2 and Map E-3). Current livestock grazing was determined to be a significant causal factor for non-achievement of standards in those areas where unacceptable patterns of livestock use (greater than 40 percent utilization levels) occurred.

Functioning Desert Ecosystem

The functioning desert ecosystem in the SDNM including saguaro cactus forests, various vegetation communities, and habitat for a wide range of wildlife species is generally unaffected by grazing. Livestock grazing north of I-8 is not having an adverse effect on the ecosystem function of 99 percent of the palo verde-mixed cacti community, 99 percent of the saguaro cactus forest community, 95 percent of the creosote bush-bursage community, and 98 percent of the desert wash vegetation community or associated wildlife identified in Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060) and discussion below. In these locales, current livestock-grazing practices are compatible with protection of Monument objects.

Palo Verde-Mixed Cacti Vegetation Community, Saguaro Cactus Forests, Diversity of Plant and Animal Species, Wildlife

Studies (Abouhaidar 1992, Holden, et al. 2000) have shown that saguaro cactus forest communities are strongly influenced by forces that alter density of shade-producing perennials ("nurse" plants). Evidence from the SDNM suggests that current grazing practices are compatible with the maintenance of nurse plants. Analysis of 87,366 acres of palo verde-mixed cactus and the saguaro cactus forest communities in the SDNM indicate that Standard 3 is being achieved on 65,827 acres. (See Table E.9, "Land Health Standard Status & Determination by Vegetation Community" (p. 1070)) Standard 3 is not being met on the Conley or Lower Vekol allotments. (See Table E.9, "Land Health Standard Status & Determination by Vegetation Community" (p. 1070).) Use-pattern mapping and utilization data indicate that failure to achieve Standard 3 on the Lower Vekol allotment is not attributable to grazing. However, on 511 acres (more than 1 percent) of the Conley Allotment, conditions do not meet Standard 3, a situation that likely is attributable to grazing. The BLM has determined that current grazing practices are not compatible with the protection of the palo verde-mixed cacti vegetation or saguaro cactus forest communities on 511 acres of the Conley Allotment within the SDNM.

The failure of 21,539 acres (24.7 percent) of the SDNM to meet Standard 3, is due to a small difference in canopy cover or composition from the reference state. These are important criteria for recruitment in saguaro forests and recovery in both these communities. Failure to achieve Standard 3 is likely due to plant mortality associated with recent periods of drought (in particular the 2002 drought) and local site characteristics.

The results of the PBI Saguaro Study indicate that recruitment of saguaros is occurring within the grazed portion of SDNM north of I-8 at appropriate rates for this community.

Based on the results summarized in Table E.6, "Average Number of Perennial Species Per Plot (Diversity)" (p. 1058), species diversity within the palo verde-mixed cacti and saguaro cactus forest vegetation communities within the SDNM north of I-8 is not reduced from what is found in the BGR and Area A.

Scientific Analysis of Plant Species & Climates in Past Eras

Packrat middens

Current livestock grazing is compatible with the Scientific Analysis of Plant Species and Climates biological object. Use-pattern mapping indicates that livestock do not utilize areas with dry caves or rock shelters where ancient packrat middens, used for ancient climate studies, occur due to steep, rocky and rough terrain. Other indicators of scientific analysis of plant species, identified in Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060), occur south of I-8.

Creosote Bush-Bursage and Wildlife Within This Community

Elf Owl, Western Screech Owl, Mule Deer, Mountain Lion, Gray Fox, Bobcat, California Leaf-Nosed Bat, Cave Myotis Bat

Analysis of the 151,643 acres of creosote bush-bursage vegetation community in the SDNM indicates that Standard 3 is being achieved on 45,633 acres. (See Table E.9, "Land Health Standard Status & Determination by Vegetation Community" (p. 1070).) The acreage where Standard 3 is not being met (106,010) is mostly attributable to drought and subsequent plant mortality (98,030 acres). Utilization data indicate that grazing is contributing to the failure to achieve Standard 3 on 7,980 acres of the SDNM. The BLM has determined that current livestock-grazing practices are

not compatible with the protection of the creosote-bursage vegetation community on 2,974 acres of the Big Horn allotment and 5,006 acres of the Conley allotment within the SDNM.

Desert Washes and Wildlife Within This Community

Elf Owl, Western Screech Owl, Mule Deer, Mountain Lion, Gray Fox, Bobcat, California Leaf-Nosed Bat, Cave Myotis Bat

Desert washes are particularly important and provide habitat for numerous wildlife species. There are 490.5 miles (approximately 1,717 acres) of desert washes within the SDNM. Of these, 294 miles (1,029 acres) (see Table E.9, "Land Health Standard Status & Determination by Vegetation Community" (p. 1070)) are not achieving Standard 3 due to differences in vegetation canopy or composition from the reference state. Utilization data indicate that grazing management practices or levels of use are contributing to non-achievement on 12 miles (42 acres) of desert wash. Ten of these miles are on the Conley allotment and two on the Lower Vekol allotment. The BLM has determined that current livestock-grazing practices are not compatible with protection of 10 miles (35 acres) of desert washes on the Conley allotment and 2 miles (7 acres) of the Lower Vekol allotment within the SDNM.

Table E.8. Land Health Standard Status & Causal Factor Determination by Allotment/Ecological Site

Ecological site	Total (acres)	Achieving LH standards (acres)	Not achieving LH Standards (acres)	Acres where livestock use is a causal factor	% of total where livestock use is a causal factor
Big Horn					
Limy fan	28,390	28,390	0	0	0%
Limy upland deep	29,384	0	29,384	2,974	10%
Sandy loam deep	1,466	1,466	0	0	0%
Creosote bush-bursage total	**59,240**	**29,856**	**29,384**	**2,974**	**5%**
Limy upland	6,898	6,898	0	0	0%
Granitic hills	21,938	21,938	0	0	0%
Palo verde-mixed cacti total	**28,836**	**28,836**	**0**	**0**	**0%**
Misc. ecological sites*	4,128	4,128	0	0	0%
Total acres	**92,204**	**62,820**	**29,384**	**2,974**	**3%**
Loamy swale	2 miles	2 miles	0 miles	0	0%
Sandy wash	190 miles	190 miles	0 miles	0	0%
Beloat					
Limy fan	17,906	0	17,906	0	0%
Limy upland deep	3,521*	3,521*	0	0	0%
Creosote bush-bursage total	**21,487**	**3,581**	**17,906**	**0**	**0%**
Limy upland	5,403	5,403	0	0	0%
Granitic hills	6,710	6,710	0	0	0%
Palo verde-mixed cacti total	**12,113**	**12,113**	**0**	**0**	**0%**
Total acres	**33,600**	**15,694**	**17,906**	**0**	**0%**
Loamy swale	1 mile	1 mile	0 miles	0	0%
Sandy wash	63 miles	0 miles	63 miles	0	0%
Conley					

Ecological site	Total (acres)	Achieving LH standards (acres)	Not achieving LH Standards (acres)	Acres where livestock use is a causal factor	% of total where livestock use is a causal factor
Limy fan	38,537	0	38,537	5,006	0
Limy upland deep	13,778	0	13,778	0	0%
Sandy loam deep	0	0	0	0	0%
Creosote bush-bursage total	**52,315**	**0**	**52,315**	**4,971**	**10%**
Limy upland	5,053	0	5,053	320	0.6%
Granitic hills	15,910	0	15,910	191	0.01%
Palo verde-mixed cacti total	**20,963**	**0**	**20,963**	**511**	**0.02%**
Misc. ecological sites*	4,430	0	0	0	0%
Total acres	**77,708**	**0**	**73,278**	**5,517**	**7%**
Loamy swale	1 mile	0	0 miles	0	0%
Sandy wash	154 miles	0	154 miles	10 miles; (35 acres)**	6%
Hazen					
Limy fan	5,699	0	5,699	0	0%
Limy upland deep	8,514	8,514	0	0	0%
Creosote bush-bursage total	**14,213**	**8,514**	**5,699**	**0**	**0%**
Limy upland	4,831*	4,831*	0	0	0%
Granitic hills	12,882	12,882	0	0	0%
Palo verde-mixed cacti total	**17,713**	**17,713**	**0**	**0**	**0%**
Total acres	**31,926**	**26,227**	**5,699**	**0**	**0%**
Loamy swale	1 mile	1 mile	0 miles	0	0%
Sandy wash	63 miles	0 miles	63 miles	0 miles	0%
Lower Vekol					
Limy fan	118*	118*	0	0	0%
Limy upland deep	3,564	3,564	0	0	0%
Creosote bush-bursage total	**3,682**	**3,682**	**0**	**0**	**0%**
Limy upland	576	0	576	0	0%
Granitic hills	6,262	6,262	0	0	0%
Palo verde-mixed cacti total	**6,838**	**6,262**	**576**	**0**	**0%**
Misc. ecological sites*	4,889	4,889	0	0	0%
Total acres	**15,409**	**14,833**	**576**	**0**	**0%**
Loamy swale	0.5 miles	0.5 miles	0 miles	0	0%
Sandy wash	18 miles	0 miles	18 miles	2 miles; (7 acres)	1%
Arnold					
Limy fan	706	0	706	0	0%
Creosote bush-bursage total	**706**	**0**	**706**	**0**	**0%**
Limy upland	360*	360*	0	0	0%

Ecological site	Total (acres)	Achieving LH standards (acres)	Not achieving LH Standards (acres)	Acres where livestock use is a causal factor	% of total where livestock use is a causal factor
Granitic hills	543*	543	0	0	0%
Palo verde-mixed cacti total	**903**	**903**	**0**	**0**	**0%**
Total acres	**1,609**	**903**	**706**	**0**	**0%**
Sandy wash	2 miles	2 miles	0 miles	0	0%
Total acres unavailable to grazing: 8,498**					
* Generally consists of small patchy inclusions of ecological site polygons within the allotment that do not represent larger stratum for management purposes and do not meet the key area concept or are inaccessible to livestock and were not evaluated. However, the majority of these areas were mapped for livestock use patterns. ** The sandy wash acres for the Conley allotment are included in the creosote bush-bursage vegetation community acreage and not included in the grand total acres to avoid acreage duplication					

Table E.9. Land Health Standard Status & Determination by Vegetation Community

Creosote Bush-Bursage							
	Big Horn	Beloat	Conley	Hazen	Lower Vekol	Arnold	Total
1. Acres achieving land health standards	29,856	3,581	0	8,514	3,682	0	45,633
2. Acres not achieving land health standards	29,384	17,906	52,315	5,699	0	706	106,010
a. Due to livestock grazing	2,974	0	5,006	0	0	0	7,980
b. Due to other causes*	26,410	17,906	47,309	5,699	0	706	98,030
Total acres: 151,643							
Palo Verde-Mixed Cacti & Saguaro Cactus Forest							
	Big Horn	Beloat	Conley	Hazen	Lower Vekol	Arnold	Total
1. Acres achieving land health standards	28,835	12,113	0	17,713	6,262	903	65,826
2. Acres not achieving land health standards	0	0	20,963	0	576	0	21,539
a. Due to livestock grazing	0	0	511	0	0	0	511
b. Due to other causes*	0	0	20,452	0	576	0	21,028
Total acres: 87,366							
Desert Wash							
	Big Horn	Beloat	Conley	Hazen	Lower Vekol	Arnold	Total
1. Miles (acres) achieving land health standards	190 (665)	1 (3.5)	1 (3.5)	0	.5 (1.7)	2 (7)	(6.2); (680.7 acres)
2. Miles (acres) not achieving land health standards	0	63 (220.5)	154 (539)	59(206.5)	18 (63)	0	0; (1,029 acres)
a. Due to livestock grazing	0	0	10 (35)**	0	2 (7)	0	0; (42 acres)
b. Due to other causes*	0	63 (220.5)	144 (504)	59 (206.5)	16 (56)	0	0; (987 acres)

Total miles (acres): 490.5 miles (1716.75 acres)
*May include historic livestock grazing, livestock use patterns, fire, drought, OHV use, etc. ** The sandy wash acres for the Conley allotment are included in the creosote bush-bursage vegetation community acreage and not included in the total acres to avoid acreage duplication

Where livestock grazing was determined to be a significant causal factor for non-achievement of land health standards, it was determined that livestock grazing is not compatible with the protection of the Monument objects. Current livestock grazing was determined to be a significant causal factor for non-achievement of standards in areas where unacceptable patterns of livestock use (greater than 40 percent utilization levels) occurred. In addition to identifying livestock-related effects on the SDNM's biological objects, this compatibility study also evaluated livestock-related effects on archaeological and historic objects, as identified in the Monument proclamation. A class 1 literature search was completed in 2010 for the LHE, as per BLM manual section 8110.2.A.2. This review identified previous surveys and known archeological sites or traditional cultural places within the allotment boundaries. The results on the archaeological/historical evaluation are identified in Table E.10, "Results of the Cultural Evaluation by Monument Object" (p. 1071).

E.2.4. Step 4: Analysis of the Effects of Livestock Grazing on Archaeological & Historic Objects

E.2.4.1. Indicators to Evaluate the Condition of Monument Cultural Objects

Based on the above discussion, indicators of grazing-related damage could include the following:

- Breakage or displacement of artifacts or features that is clearly associated with livestock-grazing use.
- Evidence of trampling that has disturbed archaeological deposits or accelerated processes of erosion at archaeological sites.
- Trampling, loss of vegetation, defecation, or other observable effects that impair qualities of setting, feeling, and other aspects of integrity.

Table E.10. Results of the Cultural Evaluation by Monument Object

Indicator	Evaluation Results
Monument Object: Archaeological and Historic Sites	
Rock art sites	Three rock art sites are known to exist on the grazing allotments within the SDNM north of I-8. These sites are all in rocky, upland settings and are not situated in areas of concentrated livestock use. These sites do not exhibit evidence of damage from livestock, livestock-management activities, or range improvements, because the petroglyphs and associated artifacts are on large, boulder-strewn hillsides and knolls that it would be extremely unlikely for livestock to access.
Lithic quarries	All sites identified in existing information are located south of I-8 and are no longer subject to grazing activities.

Indicator	Evaluation Results
Monument Object: Archaeological and Historic Sites	
Scattered artifacts	A total of 22 of the 41 sites located north of I – 8 on the SDNM are listed as artifact scatters. Of these 22 artifact scatters, 19 sites have characteristics that would make them eligible for the National Register of Historic Places (NRHP). None of these known artifact scatters are located within areas of concentrated livestock use. Of the 19 artifact scatters that have the characteristics that would make them eligible for the NRHP, five sites have been documented by the recording archaeologist as having been affected by grazing. On three of these sites, the documentation merely mentions grazing generally as an effect, usually among other effects, with no further information tied to indicators of disturbance to that site. There is no documentation as to whether any artifacts or features had been disturbed by grazing. Two sites were documented with specific indicators of the type and level of disturbance. One site was documented as having "moderate trampling and denudation of vegetation." This was cited as a factor that leads to gradual erosion. However, the photographs of the site in this documentation do not show that this is the case. The photograph shows Sonoran Desert vegetation with typical densities. This photo shows that the ground surface is stable and is not subject to erosion. The other site was documented as being disturbed because of "three well-defined livestock trails that cut across a potential ancient trail near the northwest end of the site, and general grazing impacts and gradual erosion." The line of sight can follow the line of travel and the profile of the probable prehistoric trail in several places. Artifacts and features have not been disturbed by the livestock trails. The livestock trails are distinct and visible in this area due to their distance to a water development (Bosque Well). This well is roughly 0.75 mile away from the site. Livestock trails have disturbed roughly 0.4 percent of the ground surface of this site.
Vekol Wash	Located south of I-8.
Table Top Mountain bajadas	Located south of I-8.
Juan Bautista de Anza NHT	While no visible physical remnants remain of this historic trail, later trails utilized the same corridor used by Anza. The historic trail corridor, as identified by the National Park Service, varies in width depending on the information found in the diaries. The historic setting of this trail is an area 3 miles wide, or up to the visual horizon, whichever is less. The livestock water developments in the area -- Gap Tank, Conley Tank, North Tank, and North Tank Well -- all lie within this historic setting. The line of sight for a trail user is undisturbed as one can see where the trail corridor continues ahead. This trail is 1,200 miles long -- from the border with modern Mexico to the San Francisco Bay area -- with roughly 17 miles within the SDNM. Of the four water developments on the SDNM where livestock usage is concentrated, the area at North Tank is the only one where effects from grazing activities disturbs the setting. The area where livestock use has reduced the vegetation is about 10 acres in size, amounting to 1,300 linear feet of the trail corridor. The Anza NHT story involves driving 1,000 head of livestock and 300 people mounted on horseback along this trail when it was originally used. Thus, livestock may be viewed as compatible with authentic Anza NHT setting.
Mormon Battalion Trail	The Mormon Battalion Trail is an historic route with well documented physical features and attributes. It has the characteristics that would make it eligible for the NRHP. This trail experiences direct disturbance from the congregation of livestock at North Tank. The area of direct impact amounts to about 800 linear feet of trail signature from trampling the trail ruts, berms, and vegetation that grows along the berms. The Mormon Battalion Trail is about 1,850 miles long, 17 miles of which are within the SDNM boundaries. The area at North Tank where direct effects from grazing activities disturbs the setting is about 10 acres in size.

Indicator	Evaluation Results
Monument Object: Archaeological and Historic Sites	
Butterfield Overland Stage Route	The Butterfield Overland Stage Route, like the Mormon Battalion Trail, is a historic route with well documented physical features and attributes. It has the characteristics that would make it eligible for the NRHP. Several other historic sites are associated with this historic route within the SDNM. This trail experiences direct disturbance from the congregation of livestock at North Tank. The area of direct disturbance amounts to approximately 800 linear feet of trail signature from trampling the trail ruts, berms, and vegetation that grows along the berms. The Butterfield Overland Stage Route is about 2,800 miles long, 17 miles of which is located within the SDNM boundaries. The area at North Tank where direct impacts from grazing activities disturbs the setting is about 10 acres in size.
Other archaeological & historic sites	A total of 14 out of the 41 sites recorded on the SDNM north of I-8 can be categorized as "other archaeological and historic sites." These include nine historic sites related to railroad, ranching, or travel routes. The only sites documented to have impacts related to grazing are along the Butterfield Overland Stage Route and the Mormon Battalion Trail immediately next to North Tank. These sites are entirely located within the 15 acres that were identified above as having been used by livestock historically, diminishing the vegetation. A protective fence installed in 1995 has been helpful in reducing disturbances from grazing and human activities on this site. Human activities have been so intense in this area that the causal factor for the level of disturbance in this area cannot be blamed on one activity alone. Unauthorized collection of artifacts, for instance, has been occurring over the years.

E.2.4.2. Summary of Grazing Effects on Cultural Monument Objects

The rock art sites are all situated in rough, rocky areas it is extremely unlikely for livestock to access. None of the rock art (petroglyph) site information suggests any disturbance from livestock. Lithic quarries sites are situated south of I-8 and are not subject to grazing activities.

The artifact scatter sites are a very common site type in this region. A close look at the documentation shows that only one site out of 22 artifact scatters shows physical disturbance due to grazing activities. The amount of disturbance to the site is calculated to be approximately 0.4 percent of the surface area of this one site.

The Juan Bautista de Anza NHT setting is being affected by historically concentrated use around one livestock water source. The nature of this disturbance is trampling of the local vegetation. When one considers the length of the Anza Trail (1,200 miles long, 17 miles of which is located within the SDNM boundaries) and the area of direct impact of 10 acres, amounting to about 1,300 linear feet of trail corridor, this disturbance area is at a very small scale. Driving livestock and people along this trail historically is the action that blazed the original trail. In historic and recent times, vegetation was not permanently removed from this area. The diminishment of the volume of vegetation in one small area along the trail corridor does not affect the characteristics that make this trail important in history.

In terms of the Butterfield Overland Stage Route and the Mormon Battalion Trails, they share the same 17 miles of physical trail tread in the SDNM. Therefore, they both have experienced historic disturbances from the congregation of livestock at North Tank. The area of direct disturbance amounts to a loss of about 800 linear feet of trail signature due to livestock trampling of the historic trail ruts, berms, and vegetation that grows along the berms. The area at North Tank where direct disturbance from grazing activities diminishes the setting is about 10 acres in

size [Note: in total acreage calculations, these acres are included in the creosote bush-bursage figures to avoid duplications]. Trail users can see the trail continue beyond this open area. The diminishment of the volume of vegetation in one small area along the trail corridor does not affect the characteristics that make this trail important in history. The essential characteristics that make these two trails important in history are still present and visible.

E.2.5. Step 5: Compatibility Analysis Findings and Determination

The Proclamation for the Sonoran Desert National Monument requires that BLM determine the compatibility of grazing "with the paramount purpose of protecting objects identified in this proclamation." The results of this determination will be used in the Lower Sonoran and Sonoran Desert National Monument Resource Management Plan to inform a range of alternatives with respect to livestock grazing.

Methodologies employed in the compatibility analysis included a rigorous land health evaluation process, a thorough literature review, technical reports and guidance, and a comprehensive evaluation of the effects of grazing on Monument objects and their indicators within the SDNM. This analysis has been a complex undertaking due to the inherent challenges of balancing human use and the needs of interrelated desert ecosystems.

E.2.5.1. Findings

In some locations, current conditions on the six allotments within the SDNM are not achieving Standard 3 (See Map E-2). Monument lands not achieving Standard 3 total 127,550 acres, representing 50.5 percent of all Monument lands north of I-8. Livestock use pattern mapping and monitoring data indicate that non-achievement of Standard 3 cannot be attributed to current livestock-grazing practices on 96.6 percent of Monument lands located north of I-8. There may be several contributing factors to non-achievement of Standard 3 aside from livestock grazing.

The results of the analysis indicate that livestock grazing is a causal factor for non-achievement of Standard 3 on 8,498 acres (Map E-2). This represents 3.4 percent of the 252,500 acres of the Monument north of I-8, and 6.76 percent of the 127,550 acres not achieving Standard 3.

Areas where livestock grazing was determined to be the causal factor for not achieving Standard 3 include portions of the following Monument objects or indicators: palo verde-mixed cacti (1 percent of plant community), the saguaro cactus forest (1 percent of plant community), creosote bush-bursage (5 percent of plant community) or desert wash (2 percent, or 12 miles of the plant community) and its associated wildlife objects (identified in Table E.7, "Results of the Land Health Evaluation (LHE Objectives by Monument Object)" (p. 1060)) and a small portion (1.4 percent, or 10-acres) of the Anza NHT.

Currently, the grazing preference for perennial forage is not supported by monitoring and inventory data. Field observations and use compliance checks indicate that operators graze the majority of their permitted AUMs during the early winter and spring months, which are periods of high levels of ephemeral forage.

Concentrated livestock use around North Tank (10 acres) is not consistent with past use during historic time periods, and it negatively affects the protection of the archaeological and historic site within the SDNM. Elsewhere, known rock art sites in the SDNM are not near areas of grazing

concentration and have not been impacted by grazing. Artifact scatters have not yielded any definitive evidence of grazing impacts that would affect site setting or integrity.

E.2.5.2. Determination

A limited amount of livestock grazing is compatible with the protection of Monument objects, based on the draft SDNM LHE and this draft compatibility analysis. The evaluation, literature review and professional opinions of BLM staff identify presently undesirable interactions between current livestock-grazing practices and individual Monument objects, as well as the underlying biological/ecological processes.

Livestock-grazing practices negatively affect 3.4 percent (8,498 acres) of the Monument north of I-8. Current livestock grazing is determined to be incompatible on 3.4 percent of the Monument. Recommended livestock-grazing adjustments and technical recommendations presented in the draft SDNM LHE ensure that 49.5 percent of Monument north of I-8 will continue to meet Standard 3. Future permitted use should be changed to ensure the Monument objects are managed properly. To ensure that future management practices remain compatible with the Monument objects, perennial permitted use should be reduced.

The level of use should be adjusted to primarily fall-winter-spring with reduced use levels during the summer months as follows: 65 percent of permitted use would occur from Oct. 1 to April 30 and 35 percent of permitted use from May 1 to Sept. 30. This will reduce potential competition with special status wildlife and other wildlife species during the critical summer months.

Ephemeral grazing is compatible with Monument objects when the Ephemeral Guidelines for Livestock Grazing Management (Appendix L, *Guidelines for Grazing Administration* (p. 1253)) are followed.

Current livestock grazing at one 10-acre site around North Tank along the Anza NHT and the Butterfield Overland Stage Route is not compatible with protecting these archaeological and historic Monument objects [Note: this acreage figure is included in the creosote bush-bursage biological objects calculations to avoid duplication]. Overall, however, this compatibility analysis finds that livestock-grazing activities on the SDNM are compatible with the paramount purpose of protecting archaeological and historic objects identified in the Monument proclamation.

E.2.6. Step 6: Develop Full Range of Livestock Grazing Management Alternatives in the Draft Lower Sonoran & SDNM RMP

The BLM must develop a full range of livestock management RMP alternatives in order to: 1) meet land health standards, and 2) satisfy the paramount purpose to protect Monument objects as directed by the presidential proclamation.

The findings and determinations presented in Step 5 guided development of the range of action alternatives presented and analyzed in the RMP. The draft RMP will evaluate the environmental consequences of implementing a range of alternatives.

One RMP alternative (the No Action Alternative) should establish a baseline and emphasize maintaining current grazing authorizations, terms, conditions and practices. Other alternative(s)

should address Step 5 findings and determinations through emphasizing that some or all SDNM acreage will be unavailable for grazing, as recommended by the draft SDNM LHE. Alternative(s) should address Step 5 findings through emphasizing modified grazing use authorizations, as recommended by the draft SDNM Land Health Evaluation.

E.2.6.1. Manager Recommendation

The foregoing compatibility analysis and determination considers the SDNM's place in the NLCS, the unique character of the Sonoran Desert, as well as the historic role and current practices of livestock grazing management in the area. This analysis concludes that current livestock-grazing practices negatively affect 3.4% (8,498 acres) of the Monument north of I-8 and grazing is therefore incompatible with protection of monument objects in that area. This 8,498 acre figure includes the one 10 acre site determined to not be compatible with protecting archeological and historic monument objects. In accordance with the proclamation's direction, those areas will be unavailable for livestock grazing. With that limited exception, I find that modified and limited livestock-grazing authorizations on the public lands of the SDNM north of I-8 is compatible with the paramount purpose of protecting the objects the objects identified in Presidential Proclamation 7397 and for which the SDNM was designated.

_____ (Manager, SDNM) _____ (Date)

E.3. References

Abouhaidar, F. 1992. Influence of livestock grazing on saguaro seedling establishment, pp. 57-61, in: Proceedings of the Symposium on Research in Saguaro National Monument. 23-24 January 1991 Tucson, Arizona. National Park Service, Rincon Institute and Southwest Parks and Monuments Association.

Andrew, M.H. 1988. Grazing impact in relation to livestock watering points. Trends in Ecology and Evolution 3(12):336-339.

Bahre, C.J. 1991. A legacy of change: historic human impact on vegetation of the Arizona borderlands. The University of Arizona Press, Tucson. pp. 231

Blydenstein, J.C., R. Hungerford, G.I. Day, and R.R. Humphrey. 1957. Effect of domestic livestock exclusion on vegetation in the Sonoran Desert. Ecology 38(3):522-526.

Bowers, J.E., and R.M. Turner. 2002. The influence of climatic variability on local population dynamics of Cercidium microphyllum (foothill palo verde). Oecologia 130:105-113.

Brown, P.E., and C.L. Stone. 1982. Granite Reef: A study in desert archaeology. Anthropological Research Papers No. 28, Arizona State University, Tempe.

Cooke, R.U., and R.W. Reeves. 1976. Arroyos and environmental change in the American South-west. Clarendon Press, Oxford.

Dodd, N.L., and W.W. Brady. 1986. Cattle grazing influences on vegetation of a sympatric desert bighorn range in Arizona. Desert Bighorn Council Transactions 30:8-13.

Fagerstone, K.A., and C.A. Ramey. 1996. Rodents and lagomorphs, pp. 83-132 in: Rangeland Wildlife, Paul R. Krausman, ed. The Society for Range Management, Denver, Colorado.

Goldberg, D.E., and R.M. Turner. 1986. Vegetation change and plant demography in permanent plots in the Sonoran Desert. Ecology 67(3):695-712.

Hall, J.A., S. Weinstein, and C.L. McIntyre. 2005. The impacts of livestock grazing in the Sonoran Desert: a literature review and synthesis for the Bureau of Land Management, Phoenix District Office. The Nature Conservancy in Arizona, Tucson.

Holden, M., P. Anning, and M. Weesner. 2000. 10-year re-survey of saguaro cactus (Carnegia gigantea) populations at Saguaro NP. Lay Report to Southwest Parks and Monuments Association, SPMA Project 00-08.

Holechek, J.L., R.D. Pieper, and C.H. Herbel. 1998. Range management: principles and practices. 3rd ed. Prentice Hall. Upper Saddle River, NJ.

Holechek, J.L., M. Thomas, F. Molinar, and D. Galt. 1999. Stocking desert rangelands: what we've learned. Rangelands 21(6):8-12.

Holechek, J.L., and D. Galt. 2000. Grazing intensity guidelines. Rangelands 22(3):11-14.

Holechek, J.L., T.T. "Red" Baker, and J.C. Boren. 2005. Impacts of controlled grazing versus grazing exclusion on rangeland ecosystems: what we have learned. Range Improvement Task

Force Report No. 57. Agricultural Experiment Station, Cooperative Extension Service, College of Agriculture and Home Economics, New Mexico State University, Las Cruces, NM.

Hovorka, M.D. 1996. The impacts of livestock grazing on Sonoran desert scrub vegetation, insect, and insectivorous bat communities. M.S. Thesis, Graduate Programme in Biology, York University, North York, Ontario.

Interagency Technical Team. 1996a (revised 1997, 1999). Sampling vegetation attributes. Interagency Technical Reference 1734-4. Cooperative Extension Service; U.S. Department of Agriculture, Forest Service; U.S. Department of Agriculture, Natural Resources Conservation Service, Grazing Land Technology Institute; U.S. Department of the Interior, Bureau of Land Management. 172 p.

Interagency Technical Team. 1996b (revised 1997, 1999). Utilization studies and residual measurements. Interagency Technical Reference 1734-3. Cooperative Extension Service; U.S. Department of Agriculture, Forest Service; U.S. Department of Agriculture, Natural Resources Conservation Service, Grazing Land Technology Institute; U.S. Department of the Interior, Bureau of Land Management. 176 p.

Jones, K.B. 1981. Effects of grazing on lizard abundance and diversity in western Arizona. The Southwestern Naturalist 26(2):107-115.

Krausman, P.R., R. Valdez, and J.A. Bissonette. 1996. Bighorn sheep and livestock, pp. 237-243, in: Rangeland wildlife. Paul R. Krausman, ed. The Society for Range Management, Denver, Colorado.

Little, B., E.M. Seibert, J. Townsend, J.H. Sprinkle Jr., and J. Knoerl. 2000. National Register Bulletin: Guidelines for evaluating and registering archaeological properties. U.S. Dept. of the Interior, National Park Service, Washington, D.C.

Martin, S.C., and R.M. Turner. 1977. Vegetation change in the Sonoran Desert region, Arizona and Sonora. Journal of the Arizona Academy of Science 12:59-69.

Milchunas, D.G. 2006. Responses of plant communities to grazing in the southwestern United States. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-169.

Niering, W.A, R.H. Whittaker, and C.H. Lowe. 1963. The saguaro: a population in relation to environment. Science 142(3588):15-23.

Osborn, A.J., and R.J. Hartley. 1991. Adverse effects of domestic livestock grazing on the archaeological resources of Capitol Reef National Park, Utah, p. 136-153 in: Proceedings of the first biennial conference of research in Colorado Plateau National Parks. U.S. Geological Survey, Washington, D.C.

Osborn, A.J., S. Vetter, R.J. Hartley, L. Walsh, and J. Brown. 1987. Impacts of domestic livestock grazing on archaeological resources of Capitol Reef National Park, Utah. Occasional Studies in Anthropology No. 20. U.S. Dept. of the Interior, National Park Service, Midwest Archaeological Center.

Pellant, M., P. Shaver, D.A. Pyke, and J.E. Herrick. 2000. Interpreting indicators of rangeland health-version 3. Technical Reference 1734-6. U.S. Department of the Interior, Bureau of

Land Management; U.S. Department of the Interior, U.S. Geological Survey; U.S. Department of Agriculture, Natural Resources Conservation Service; U.S. Department of Agriculture, Agricultural Research Service. 130 p.

Robinett, D. 1992. Drought and recovery in the upper Sonoran Desert. Rangelands 14(4):219-222.

Robinett, D.G. 1997. Rangeland, p. 97-100, in: Soil survey of Gila Bend-Ajo area, Arizona, parts of Maricopa and Pima Counties. U.S. Department of Agriculture, Natural Resources Conservation Service.

Roney, J. 1977. Livestock and lithics: the effects of trampling. Unpublished manuscript on file, U.S. Department of the Interior, Bureau of Land Management, Phoenix District.

Roundy, B.A., and G.B. Ruyle. 1989. Effects of herbivory on twig dynamics of a Sonoran Desert shrub, Simmondsia chinensis (Link) Schn. The Journal of Applied Ecology 26(2):701-710.

Shreve, F. 1929. Changes in desert vegetation. Ecology 10(4):364-373.

Shreve, F., and A.L. Hinckley. 1937. Thirty years of change in desert vegetation. Ecology 18(4):463-478.

Smith, L., G. Ruyle, J. Maynard, S. Barker, W. Meyer, D. Stewart, B. Coulloudon, S. Williams, and J. Dyess. 2007. Principles of obtaining and interpreting utilization data on rangelands. The University of Arizona, College of Agriculture and Life Sciences, Arizona Cooperative Extension, AZ1375, 14 p.

Steenbergh, W.F., and C.H. Lowe. 1977. Ecology of the saguaro: II. reproduction, germination, establishment, growth, and survival of the young plant. U.S. Department of the Interior, National Park Service, Scientific Monograph Series, Number 8.

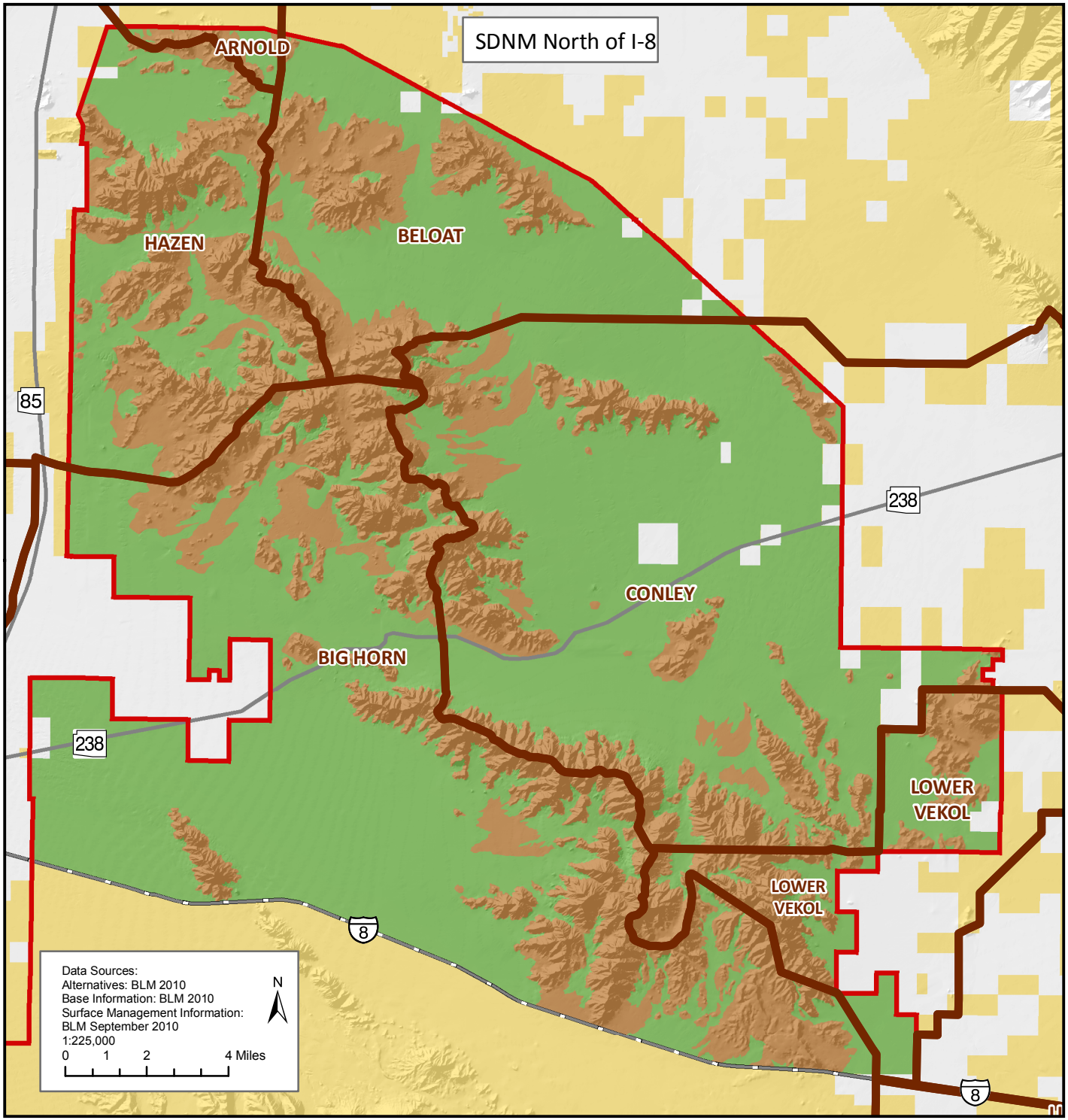
Turner, R.M. 1990. Long-term vegetation change at a fully protected Sonoran Desert site. Ecology 71(2):464-477.

Turner, R.M., S.M. Alcorn, G. Olin, and J.A. Booth. 1966. The Influence of shade, soil, and water on saguaro seedling establishment. Botanical Gazette 127(2/3):95-102.

University of Arizona. 1982. Big Horn Allotment cattle diet study.

Van Vuren, D. 1982. Effects of feral sheep on the spatial distribution of artifacts on Santa Cruz Island. Bulletin of the Southern California Academy of Science 81(3):148-151.

Waser, N.M., and M.V. Price. 1981. Effects of grazing on diversity of annual plants in the Sonoran Desert. Oecologia 50:407-411.



Appendix E - Map 1 (Compatibility Analysis)

SDNM Grazing Allotments & Vegetation Communities From Land Health Evaluation

Lower Sonoran and Sonoran Desert National Monument Draft RMP/EIS

- Allotment Boundaries
- Palo Verde Mixed Cactus and Saguaro Cactus Forest
- Creosote Bush-Bursage

Surface Management

- Bureau of Land Management

General Reference

- Sonoran Desert National Monument
- County Boundary
- Interstate
- State Route

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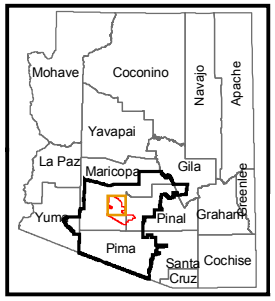
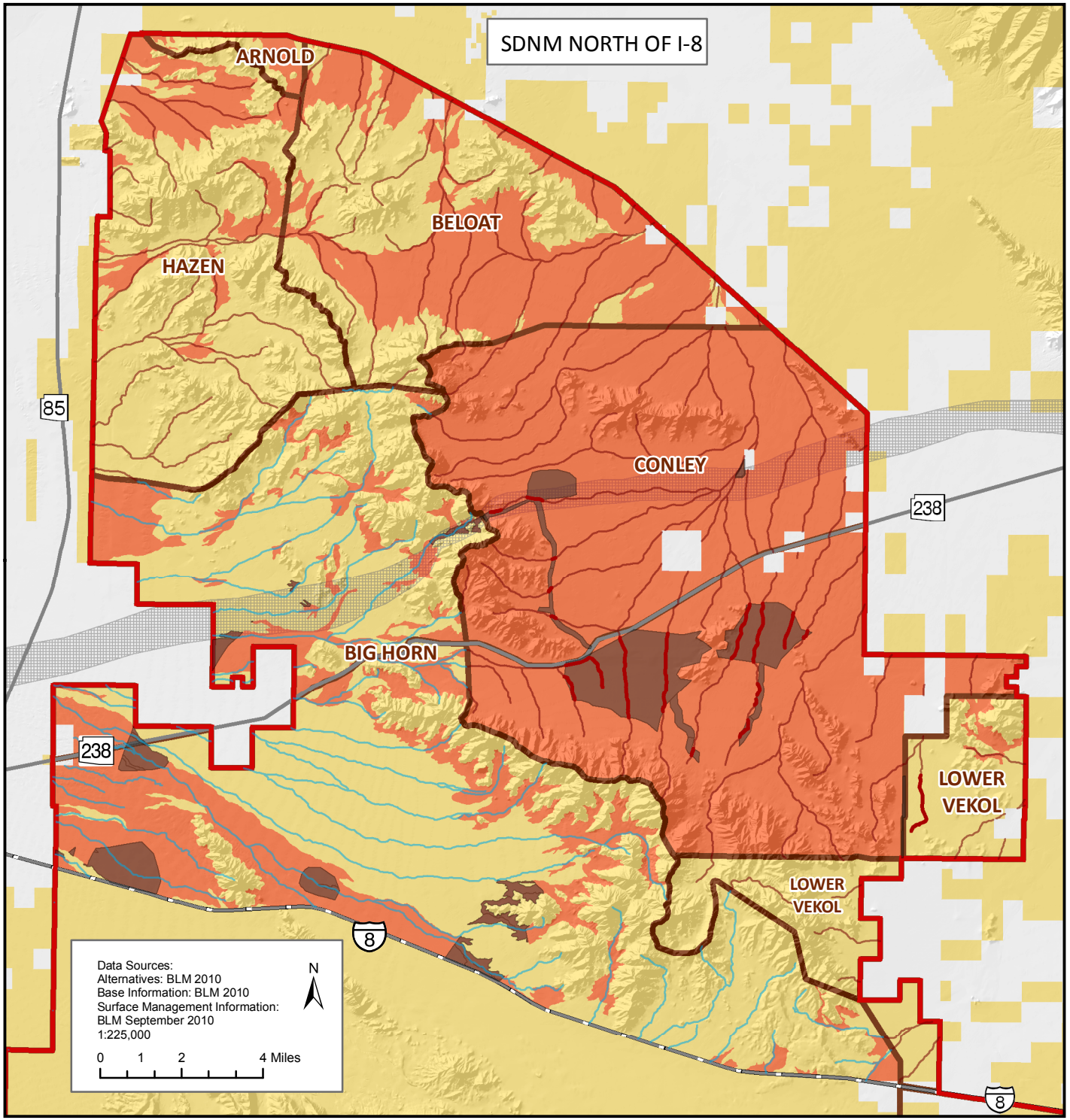


Gila and Salt River Meridian
Universal Transverse Mercator
Zone 12, Units Meters
GRS 1980 Spheroid
NAD83 Datum

Bureau of Land Management
Lower Sonoran Field Office

Map Last Revised: Jan. 2010



Appendix E - Map 2
Compatibility Analysis

SDNM Grazing Standard 3 Findings from Land Health Evaluation

Lower Sonoran and Sonoran Desert National Monument Draft RMP/EIS

- Allotment Boundaries
- Uplands Not Achieving Standard 3
  Livestock is the Causal Factor
- Uplands Not Achieving Standard 3
  Other Causal Factor - Drought, Fire, etc.
- Desert Washes Not Achieving Standard 3
  Livestock Causal Factor
- Desert Washes Not Achieving Standard 3
- Desert Washes Achieiving Standard 3
- Anza National Historic Trail

Surface Management

- Bureau of Land Management

General Reference

- Sonoran Desert National Monument
- County Boundary
- Interstate
- State Route

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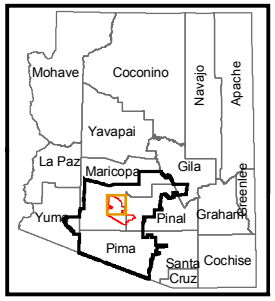

Gila and Salt River Meridian
Universal Transverse Mercator
Zone 12, Units Meters
GRS 1980 Spheroid
NAD83 Datum

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Lower Sonoran Field Office

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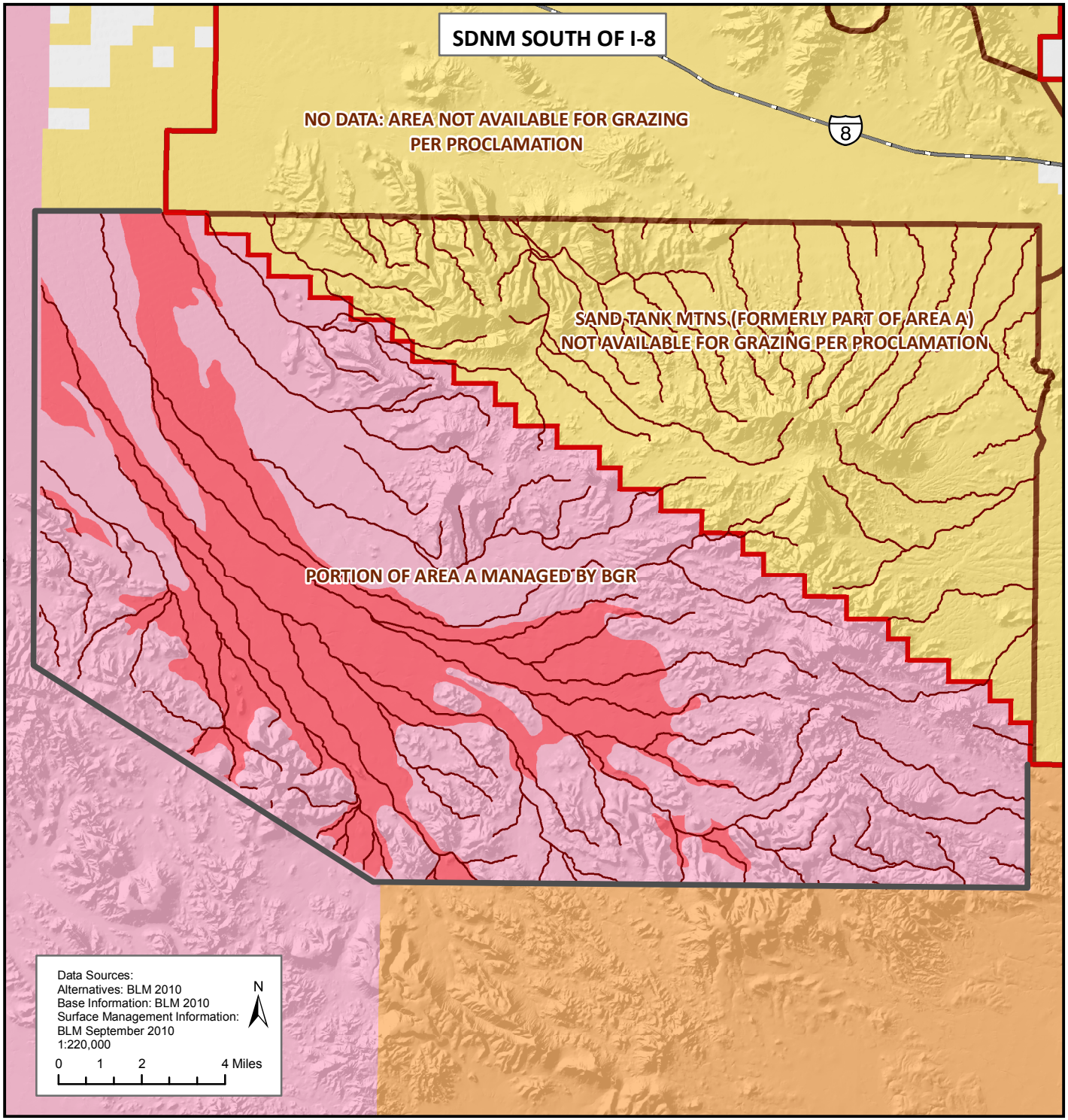

Appendix E - Map 3
Compatibility Analysis

SDNM - BGR (Area A) Non-Grazed Lands Standard 3 Findings from Land Health Evaluation

Lower Sonoran and Sonoran Desert National Monument Draft RMP/EIS

- Allotment Boundaries
- Uplands Not Achieving Standard 3
  Other Causal Factor - Drought, Fire, etc.
- Desert Washes Not Achieving Standard 3

Surface Management

- Bureau of Land Management
- BGR Military Range
- Tohono O'odham Reservation

General Reference

- Sonoran Desert National Monument
- County Boundary
- Interstate

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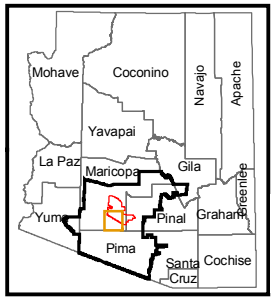


Gila and Salt River Meridian
Universal Transverse Mercator
Zone 12, Units Meters
GRS 1980 Spheroid
NAD83 Datum

Bureau of Land Management
Lower Sonoran Field Office

Map Last Revised: Jan. 2010

Appendix F. Arizona Land Health Evaluation for the Sonoran Desert National Monument

F.1. Introduction

The purpose of this draft land health evaluation (LHE) is to gauge whether the Arizona Standards for Rangeland Health (Standards) are being achieved on the Sonoran Desert National Monument (SDNM) and, where they are not, to determine whether livestock grazing is the causal factor. An evaluation is not a decision document but a standalone report that clearly records the analysis and interpretation of the available inventory and monitoring data. As part of the land health-assessment process desired plant community (DPC) objectives were established for the biological objects of the Monument, i.e., special-status species habitat. The DPC objectives will assure that soil conditions and ecosystem function described in Standards 1 and 3 are met — or will make significant progress toward meeting Standards 1 and 3.

The Secretary of the Interior approved the "Arizona Standards for Rangeland Health and Guidelines for Grazing Administration" (Standards and Guidelines) in April 1997. The decision record, signed by the BLM Arizona State Director in April 1997, provides for full implementation of the Standards and Guides in BLM resource-management plans (RMPs) in Arizona. These Standards and Guidelines are now referred to as Land Health Standards. (See Arizona Rangeland Health Standards and Guidelines for Grazing Administration (p.) in this document.)

Land health standards are measurable and attainable goals for the desired condition of the biological resources and physical components and characteristics of desert ecosystems found within the Monument.

The evaluation:

- Ascertains whether standards are being achieved, not achieved, and whether significant progress is being made towards achievement of the land health;
- Determines whether livestock grazing is a significant factor causing non-achievement where it is ascertained that land health standards are not being achieved.

F.2. Monument Profile

F.2.1. Monument Description

The SDNM was established by proclamation in 2001 by the President of The United States under authority of section 2 of the Antiquities Act of June 8, 1906 (34 Stat. 225, 16 USC 431). (See SDNM Presidential Proclamation (p.).) The purpose of establishing the Monument was to protect the biological and cultural objects of the Monument. The Monument is located south of the city of Buckeye, Arizona, and east of the town of Gila Bend, Arizona, in Maricopa and Pinal counties. It covers approximately 486,400 acres and is part of the National Landscape Conservation System managed by the Bureau. The proclamation required three allotments (Santa Rosa, South Vekol and Vekol) and portions of two other allotments (Big Horn and Table Top) south of Interstate 8

(I-8) be closed to livestock use upon expiration of their permits. This resulted in 155,900 acres being closed to livestock grazing south of I-8 by 2009. In 1941, 78,000 acres (formerly known as Area "A") were withdrawn for the Barry M. Goldwater Range (BGR) for military purposes. It was later returned to the BLM and was not reopened to grazing use. Currently, 233,900 acres are unavailable to livestock use within the Monument. The portions of the six allotments north of I-8 currently open to livestock use are the focus of this evaluation (see Map F-4).

The SDNM Proclamation requires the BLM to determine whether livestock grazing is compatible with protecting the objects of the SDNM on the 252,500 acres currently open to livestock use north of I-8, with protecting the objects of the SDNM. The proclamation specifically states: "[G]razing on Federal lands north of I-8 shall be allowed to continue only to the extent that the Bureau of Land Management determines that grazing is compatible with the paramount purpose of protecting the Monument objects identified in this proclamation." This LHE will be part of a larger document that will analyze the compatibility of grazing on the Monument. A draft resource management plan (RMP) and environmental impact statement (EIS) addresses the full array of rangeland management alternatives for livestock grazing.

F.2.2. Physical Description of the SDNM

F.2.2.1. Grazing Allotments within the SDNM

The following is a general description of the size and location of the allotments within the Monument north of I-8. See Table 1 for land status and allotment acreages and Map F-1 for the location of the allotments within the SDNM.

Big Horn

The Big Horn allotment (92,204 acres) is in the western portion of the Monument and lies east of Gila Bend. The northern boundary of the allotment is the North Maricopa Mountains, and the southern boundary is I-8. The western boundary of the allotment is State Highway 85 (SR 85), and the eastern boundary is 2 miles west of the Vekol Valley interchange. The Big Horn allotment contains the most acreage of the six allotments being evaluated. It ranges in elevation from 780 ft. to 3,182 ft.

Beloat

The Beloat allotment (33,600 acres) is located in the Rainbow Valley area. Approximately one quarter of the allotment lies within the boundary of the Monument. The allotment's northern boundary is the El Paso natural gas pipeline. The North Maricopa Mountains are the southern boundary. It ranges in elevation from just over 1,100 ft. near the El Paso gas line to 2,493 ft. on Sheep Mountain.

Conley

The Conley allotment (77,708 acres) is located at the southern end of Rainbow and Mobile valleys. It lies south of the Beloat allotment, with the Maricopa Mountains on the west and the Palo Verde Mountains on the east. The southern boundary is the South Maricopa Mountains. Approximately 60 percent of the entire allotment lies within the Monument boundary. It ranges in elevation from 1,260 ft. near Waterman Wash to 3,182 ft. in the North Maricopa Mountains..

Hazen

The Hazen allotment (31,926 acres) lies on the northwest side of the Monument. The Gila River is the western boundary, while the eastern boundary runs through the middle of the North Maricopa Mountains. The northern boundary is the gas pipeline, and the southern boundary is the fence along the northern boundary of the Big Horn allotment. Approximately 50 percent of the entire allotment lies within the Monument boundary. It ranges in elevation from 800 ft. on the Gila River to 2,493 ft. on Sheep Mountain.

Lower Vekol

The Lower Vekol allotment (15,409 acres) comprises only a small portion of the Monument on the east side. It stretches from I-8 on the south to the Haley and Booth Hills on the north. The western portion, which lies mainly in the Monument, is in the South Maricopa Mountains. It ranges in elevation from around 1,600 ft. near Vekol Wash to 2,600 ft. in the Maricopa Mountains.

Arnold

The Arnold Allotment (1,609 acres) has only a small portion within the north end of the SDNM. The northern boundary of the allotment in the SDNM is the gas pipeline, and the southern and western boundaries are the Hazen allotment. The allotment is bordered by the Beloat allotment on the east.

Table F.1. SDNM Grazing Allotments, Acreage of Public Lands and Permitted Use North of Interstate 8

Allotment	Rangeland Classification	Allotment Number	Public Land Acres	% of Public Land Acres*	Permitted Use (AUMs*)
Big Horn	Perennial-Ephemeral	03009	92,204	95%	2,812**
Beloat	Perennial-Ephemeral	03007	33,600	26%	776
Conley	Perennial-Ephemeral	03018	77,708	88%	3,403
Hazen	Perennial-Ephemeral	03042	31,926	75%	886
Lower Vekol	Perennial-Ephemeral	03053	15,409	71%	826
Arnold	Ephemeral	03004	1,609	7%	0
Totals				N/A	

*The acres and AUM percentages were prorated by using inventory data and base water properties instead of percentage of public land acreage

** This figure represents the prorated remaining portion of the Big Horn allotment after 5,144 acres south of I-8 were made unavailable in 2008.

F.2.2.2. Climate

Precipitation

Precipitation data was collected from the National Oceanic and Atmospheric Administration (NOAA) from two stations: Gila Bend and Maricopa. The 20-year average annual precipitation for the Gila Bend area is approximately 6.28 inches. The 20-year average for the Maricopa area is 7.63 inches.

Temperature

Winter temperatures are mild, with the few recorded freezing days lasting for short periods of time only. Summertime temperatures are hot, with many days in June and July exceeding 105 degrees Fahrenheit. Frost-free days range from 280 days in major river valleys with cold air drainage to 320-350 days in uplands.

F.2.2.3. Soils

Winter temperatures are mild, with the few recorded freezing days lasting for short periods of time only. Summertime temperatures are hot, with many days in June and July exceeding 105 degrees Fahrenheit. Frost-free days range from 280 days in major river valleys with cold air drainage to 320-350 days in uplands.

The Gunsight-Rillito-Denure Map Unit (map unit s399 in Map F-2) occurs on the fan terraces and is deep, somewhat excessively drained, and nearly level to moderately steep loamy soils. These soils are deeply dissected by drainages. The ecological sites associated with these soils are limy fan, limy upland deep, and sandy wash.

The Quilotosa-Rock Outcrop-Momoli Map Unit (map unit s293 in Map F-2) occurs on upper fan terraces, hills, and mountains. They are shallow to deep, excessively drained, nearly level to steep, very gravelly loamy soils and rock outcrops. It is mostly granitic mountains and hills. Ecological sites associated with these soils are limy upland and granitic hills.

The Mohall-Dateland Map Unit (map unit s283 in Map F-2) occurs on fan terraces and basin floors. They are deep, well drained, nearly level, loamy soils dissected by drainageways. Ecological sites associated with these soils are limy fan, limy upland deep, sandy wash, and Loamy Swale.

The Gunsight-Chuckawalla Unit (map unit s288 in Map F-2) is only a small portion of the Monument near Gila Bend. It occurs on fan terraces dissected by drainageways. They are deep, well drained, loamy soils. The Chuckawalla soil is characterized by desert pavement on fan terrace summits between drainages. The ecological sites associated with these soils are limy fan, limy upland deep, and sandy wash.

F.2.2.4. Watersheds

The SDNM lies within portions of the Santa Cruz River and the Lower Gila River Watersheds. Sub watersheds include the Vekol Valley, Rainbow Valley, and the Gila Bend units.

F.2.2.5. Water Quality

There are no Section 303d Water Quality Limited Stream Segments within the Monument.

F.2.3. Biological Resources

F.2.3.1. Vegetation

The vegetation existing on any given area of land is a product of two kinds of site factors. One is the combination of soil, topography, and climate that determines the moisture, temperature, and nutrient relationships of the site. The other is the natural and land-use history of the location over time. These factors may include a combination of plant invasions, climatic changes, fire, disease, animal influences (including grazing animals and predators, as well as insects, soil organisms, and birds), and human impacts (including livestock grazing, clearing, reseeding, burning, wood cutting, seed harvest, or other influences, not only since European settlement but extending back to the beginnings of human occupation).

Changes in vegetation due to environmental factors or management practices may result in various stable states of vegetation that may not have the potential to return to the "original" condition. Thus, the vegetation has entered a different relatively stable state. This is called the state and transition concept (Westoby et al. 1989). In some cases, changes may not be reversible by removing grazing, or the removal of grazing may lead to a buildup of fine fuels from ephemeral years that could result in catastrophic fires in plant communities that are not fire-adapted.

The SDNM has three major plant communities: the creosote- bursage desert scrub, the palo verde-mixed cactus, and the ephemeral wash plant communities. Each of these communities is described below along with the Natural Resources Conservation Service's (NRCS) associated ecological sites.

An ecological site is a distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community.

Creosote- Bursage Desert Scrub (Limy Fan and Limy Upland Deep Ecological Sites):

This community is generally in the lower elevations of the Monument on desert flats and valley bottoms. Primarily creosote (*Larrea tridentata*) in the flats with minor amounts of shrubs such as triangle-leaf bursage (*Ambrosia deltoidea*) and white or range ratany (*Krameria grayi or erecta*) and scattered trees such as little-leaf Palo verde (*Parkinsonia microphylla*) and ironwood (*Olneya tesota*). This community is associated with the limy fan and limy upland deep 7- to 10 inch precipitation zone (p.z.) ecological sites. It comprises approximately 36 percent of the area covered by the Monument. During periods of above average precipitation these ecological sites can produce up to several thousands of pounds per acre of ephemeral forage in the form of annual grasses and forbs.

Palo Verde-Mixed Cactus (Granitic Hills and Limy Upland Ecological Sites):

This vegetative community generally occupies the mountain slopes and upper bajadas. It is a mix of palo verde, ironwood, and varied shrub species such as triangle-leaf bursage, white bursage (*Ambrosia dumosa*), range ratany and white ratany, and a mixed variety of cactus including cholla species (*Cylindropuntia spp.*), Engelmann's hedgehog (*Echinocereus engelmannii*), and barrel cactus (*Ferocactus spp*.). Ocotillos (*Fouquieria splendens*) also occur in this community. This community is associated with granitic hills and limy upland 7- to 10-inch precipitation zone ecological sites. It comprises approximately 42 percent of the Monument with the majority from the granitic hills.

The highest densities of saguaros (*Carnegiea gigantea*), referred to as the "saguaro forest," are found primarily within these ecological sites.

Ephemeral Wash (Sandy Wash Ecological Site):

This site occurs in larger drainageways that dissect bajadas and desert flats throughout the Monument. In some cases, the drainage is braided and covers a large surface area. It is a multi-layered community that contains trees, large shrubs, small shrubs, and forbs. Trees include blue palo verde (*Parkinsonia florida*), ironwood, and desert willow (*Chilopsis linearis*). Common shrubs include wolfberry (*Lycium spp*.), desert lavender (*Hyptis emoryi*), burrobush (*Hymenoclea salsola*), and bricklebush (*Brickellia coulteri*). This community is associated with the sandy wash ecological sites. It comprises approximately 16 percent of the Monument. During periods of

above average precipitation, these ecological sites can produce several thousands of pounds of ephemeral forage per acre.

F.2.3.2. Major Land Resource Areas

The Monument lies within two different major land resource areas (MLRA): The 40-4 MLRA Lower Sonoran Desert Shrub and the 40-2 MLRA Middle Sonoran Desert Shrub. An MLRA is a broad geographic area that is characterized by a particular pattern of soils, climate, water resources, vegetation, and land use. Each MLRA is further divided into ecological sites. The ecological sites in the Monument are identified in the plant community descriptions above.

F.2.3.3. Wildlife Resources

F.2.3.3.1. Threatened and Endangered Species

Lesser Long-Nosed Bat

The lesser long-nosed bat was listed as endangered in September 1988 without critical habitat (USFWS 1988). The lesser long-nosed bat consumes high energy nectar, pollen, and fruit produced by a variety of columnar cacti including saguaro and agaves. The migratory nature of the lesser long-nosed bat allows it to take advantage of the seasonal availability of these cacti and agave species. Cactus flowers and fruit are available during the spring and early summer; agave flowers are available from July through October (BLM unpublished documentation on file).

Lesser long-nosed bats are efficient fliers and are known to fly considerable distances from roost sites to foraging sites. Foraging areas are areas with sufficient food resources within 40 miles of a roost site. (See Map F-3). Using this criterion, approximately 57,170 acres in the South Maricopa Mountains Wilderness and the Booth Hills contain suitable foraging habitat.

The terms and conditions of the biological opinion (BO) for the Lower Gila South RMP (BLM 1998) require that the BLM “maintain current levels of food plants for the bat” and that “grazing levels will not be increased until it is known that sufficient food plants exist and are being sustained.”

F.2.3.4. Special Status and Sensitive Species:

Cactus Ferruginous Pygmy-Owl

The cactus ferruginous pygmy owl (CFPO) was listed as endangered under the Endangered Species Act (ESA) on March 10, 1997. Critical habitat was designated in 1999 but did not include lands within the SDNM. Following a number of lawsuits, the CFPO was de-listed in 2006 (FR 73 (106) 31418-31424). In 2008, the US Fish and Wildlife Service (USFWS) received a petition to again list the CFPO under the ESA based on additional information. The USFWS is actively considering the petition. Currently, the BLM considers the CFPO a special status species.

The cactus ferruginous pygmy-owl has not been documented on the Monument, but potential and suitable habitat does occur in several locations throughout the Monument, primarily in the bajadas, the larger drainages, and several larger livestock waters (dirt tanks). These livestock waters are also important for other wildlife species.

The vegetation around four of the larger livestock waters on Conley and Beloat allotments were identified as potential CFPO habitat. Other livestock waters found on the Big Horn, Lower Vekol, and other allotments were assessed for CFPO habitat and did not meet the requirements. A few of the larger livestock waters surrounded by dense vegetation, such as mesquite (*Prosopis velutina*), may also be considered suitable habitat. Suitable habitat for this species lies within uplands and washes of the Arizona upland subdivision below the 4,000 foot elevation (USFWS 1997). Suitable habitat patches are areas greater than 3 acres in size and consist of braided wash systems and other densely vegetated areas. Suitable habitat consists of dense thickets of vegetation such as palo verde, ironwood, mesquite, acacia (*Acacia spp.*), and saguaro. It contains a diversity of species and structures of shrubs, cacti, and trees instead of single or very scattered individuals and contains trees greater than 6 inches in diameter, and saguaro cacti with cavities. The structural height of vegetation is usually evenly divided in volume or density between herbaceous ground cover and low shrubs, medium-sized shrubs, and trees. Unsurveyed areas are considered to be suitable cactus ferruginous pygmy-owl habitat when they include the attributes described above. Surveys were conducted throughout the SDNM in 2001 and south of I-8 in 2004, following the protocol developed by the Arizona Game and Fish Department (AGFD 2000). No pygmy-owls were detected during those survey efforts.

Sonoran Desert Tortoise

The Sonoran Desert tortoise was listed by the USFWS as a candidate species in November 2010. It has 152,743 acres of Category I, 22,756 acres of Category II and 4,058 acres of Category III habitat within the Monument north of Interstate-8. (See Map F-3) Tortoise habitat is associated with the upper bajadas and ridges (limy upland ecological sites) and rocky slopes (granitic hills ecological sites). Tortoises will also use caliche caves in washes associated with the upper bajadas for burrows as well as using the washes as travel ways.

Tucson Shovel-Nosed Snake

The Tucson shovel-nosed snake (Stebbins 1985, Crother 2000) was recently petitioned for listing as an endangered species by the Center for Biological Diversity. The Tucson shovel-nosed subspecies is considered regionally vulnerable by The Nature Conservancy (TNC 2004) because much of its formerly occupied habitat has been altered and appears to be no longer inhabited. It has a restricted distribution, known only from a small area in Arizona in portions of Pinal, Maricopa, and Pima counties. This taxon is considered regionally vulnerable because much of its lowland, valley floor habitat within its restricted range has been cleared or severely impacted by agricultural and urban development. The greatest abundance of the Tucson shovel-nosed snake in its entire range is thought to be west of Mobile on the SDNM (P. Rosen, personal comm.).

The shovel-nosed snake is found in areas with soft sandy loams; loose soil; fine, wind-blown sands (such as in washes); and occasionally on rocky hillsides with pockets of sand among rocks (Stebbins 1985, Pima County 2001, TNC 2004). The snake requires these deep valley fill soils for burrowing and nesting. The western shovel-nosed snake utilizes the soil substrate around creosote bush as foraging habitat (Pima County 2001). Creosote bush also serves as escape habitat (Stebbins 1985, Pima County 2001).

According to information collected by TNC (2004) the Tucson shovel-nosed snake was found at sites with soils that had a high percentage (ranging from 49 to 85 percent) of fine sand, silt, and clay (classified as sandy loams, loamy sands, gravelly-sandy loams, and silty-sandy loams; P. Rosen, personal comm.). The Tucson shovel-nosed snake was found in areas on the SDNM

that correspond to creosote bush-bursage desert scrub and xeroriparian scrub (ephemeral wash) natural communities.

Desert Bighorn Sheep

This BLM and state sensitive species has approximately 177,000 acres of habitat within the Monument north of I-8. (See Map F-3.) Desert bighorn have been documented from all the mountain ranges on the SDNM. Important features of desert bighorn habitat are cliffs, rocky outcrops, and talus slopes which are used as escape terrain. Desert bighorn are closely associated with palo verde-mixed cacti-mixed scrub vegetation communities on rocky slopes, mountain uplands, and rock outcrops (granitic hills ecological site). However, desert bighorn sheep move seasonally between the uplands and bajadas and travel across desert valleys between mountain ranges.

Desert bighorn forage on green and dried, grasses and forbs, as well as on shoots and flowers of prickly pear (*Opuntia polyacantha*), cholla cactus, and succulents (for example, barrel cactus, agaves). Grasses, including big galleta (*Pleuraphis rigida*), are important in the northern and eastern part of their range and are favored when available. Browse becomes more important in the fall and winter and in the southern and western part of bighorn's range. Other important browse species include acacia, palo verde, ironwood, mesquite, fairy duster (*Calliandra eriophylla*), Mormon tea (*Ephedra spp.*), and desert mistletoe (*Phoradendron californicum*).

Population estimates for the Sand Tank Mountains and the North and South Maricopa Mountains have been low due to drought conditions from the mid 1990s.

F.2.3.5. General Wildlife:

Wildlife species that populate the various vegetative communities within the SDNM allotments include, mule deer, coyote, javelina, mountain lion, bobcat, gray fox, kit fox, badger, chuckwalla, rosy boa, western diamondback, mourning doves, white-winged doves, Gambel's quail, and various other reptile, bat, and non-game species.

F.2.4. Special Management Areas

Wilderness

Two wilderness areas occur within the evaluation area. (See Map F-1) The North Maricopa Wilderness area lies on the north end of the SDNM. It is approximately 63,200 acres in size. The South Maricopa Wilderness area lies just north of I-8 in the central portion of the SDNM and is approximately 60,100 acres in size. Both of these wilderness areas provide good to outstanding opportunities for primitive recreation but are easily accessed via roads and trails.

Juan Bautista de Anza National Historic Trail (NHT)

The Juan Bautista de Anza NHT, designated in 1990, is a 1,200-mile historic trail corridor extending from Mexico to California. The NHT commemorates the 1775–1776 land route that Spanish commander Juan Bautista de Anza took in an effort to establish a mission and presidio near San Francisco Bay. Within the SDNM, this one-mile wide trail corridor is located north of I-8 and runs east-west through the entire Monument. Although this trail has no known surviving trail signature on the ground, certain segments of the trail that traverse the SDNM are considered to be

among the best-preserved corridor segments and most representative of the historic trail corridor conditions. A total of 17 miles traverse the Conley and Big Horn allotments. (See Map F-1)

F.2.5. Recreational Resources

The SDNM provides opportunities for both motorized and non-motorized recreation. Off-highway vehicle use is restricted to the existing road and trail system. There are several developed recreation sites within the Monument boundaries. Unauthorized OHV use does occur off-road, mostly in the larger ephemeral washes and congregation areas. The extent of the impacts this use has on the vegetative community and wildlife habitat has been steadily increasing in recent years.

F.2.6. Visual Resources

The BLM manages public lands to protect scenic values. The agency developed the visual resource management (VRM) program to assess and maintain these values. The VRM process is used to evaluate the scenic quality and lessen the effects of development on the land. The Monument contains VRM Classes I through IV. Class I areas are afforded the highest protection of visual resources, whereas Class IV areas are afforded the least.

F.2.7. Cultural Resources

A class 1 literature search was completed, as per BLM manual section 8110.2.A.2. This review identified previous surveys and known archeological sites or traditional cultural places within the allotment boundaries.

There are no known archeological sites or traditional cultural properties within areas of concentrated physical impacts from domestic livestock. There are no known sites that have been identified as properties of traditional importance by Native American tribes or other related groups. As a result of the aforementioned information, no mitigation measures have been required or recommended as a term or condition of the grazing permits north of I-8. This does not preclude any protective measures deemed necessary to protect future cultural resource discoveries within an allotment.

F.3. Grazing Management

F.3.1. Grazing History

Livestock grazing in Gila Bend and the surrounding areas began to occur in the late 1700s with a few Indian rancherias where livestock were confined to the flood plains of the Gila River. At the time, the river was the only available reliable water source that could support livestock. Livestock use of the drier valleys and mountains did not occur in the area until the drilling of wells and development of dirt stock tanks in the early 1900s. The first of these was a dirt stock tank developed around 1900 in the Little Rainbow Valley just north of the Monument boundary. The first wells in the area were drilled in Rainbow Valley around 1910 to 1912, one of which was north of Mobile and provided some livestock access to water within what is now the Monument boundary. At this time, the only waters in the Vekol Valley consisted of a couple of dirt charcos that provided temporary water for cattle from the Tohono O'odham people. Ranching operations

began in the Sand Tank Mountains area in 1917. The first water sources for livestock there included two hand-dug wells, Lost Horse Tank (earthen) and the development of natural water sources in Sand Tank Mountains at Sand Tanks and Mesquite Tanks.

The Vekol Valley was not developed for additional livestock use until the 1920s and 1930s. (Robinett 1997).

F.3.2. Current Management

From 1973 to 1976, the allotments in the SDNM were classified as perennial/ephemeral rangelands with the exception of the Arnold Allotment, which was classified as ephemeral only. Perennial-ephemeral range produces perennial forage each year and periodically provides additional ephemeral vegetation. In a year of abundant moisture and favorable climatic conditions, annual forbs and grasses add materially to the total grazing capacity.

The permitted use for the allotments is identified in Table F.1, "SDNM Grazing Allotments, Acreage of Public Lands and Permitted Use North of Interstate 8" (p. 1083). Permitted use is defined in animal unit months (AUMs) which means the amount of forage necessary for the sustenance of one cow, or its equivalent, for a period of one month. Ephemeral use may be authorized in accordance with policy established by Arizona BLM Instruction Memorandum (IM) AZ-94-018 and the Ephemeral Guidelines for Livestock Grazing Management. (See Appendix L, *Guidelines for Grazing Administration* (p. 1253)) Ephemeral ranges lie within the general southwest desert region extending primarily into southern Arizona, southern California, and southern Nevada, and include portions of the Mojave, Sonoran, and Chihuahuan deserts. Ephemeral range does not consistently produce forage but periodically provides annual vegetation suitable for livestock grazing. In years of abundant moisture and other favorable climatic conditions, a large amount of forage may be produced (from 400 to 2,000 lbs. per acre air dry weight). Favorable years are highly unpredictable, and the season is usually short-lived. Operators adjust livestock numbers voluntarily or as requested by the BLM when faced with drought, fire, etc. Active preference AUMs are adjusted throughout the grazing year (March 1 to February 28) in response to drier periods or to take advantage of ephemeral forage during wetter periods.

F.3.3. Terms and Conditions of the Current Permits

All of the allotments grazing permits contain the standard terms and conditions listed below in accordance with provisions of the grazing regulations.

- Grazing permits or lease terms and conditions and the fees charged for grazing use are established in accordance with all the provisions of the grazing regulations now or hereafter approved by the Secretary of the Interior.
- They are subject to cancellation, in whole or in part, at any time because of:
    - Noncompliance by the permittee/lessee with rules and regulations,
    - Loss of control by the permittee/lessee of all or a part of the property upon which it is based,
    - A transfer of grazing preference by the permittee/lessee to another party,
    - A decrease in the lands administered by the BLM within the allotments described,

  - Repeated, willful unauthorized grazing use.

- They are subject to the terms and conditions of allotment management plans if such plans have been prepared. Allotment management plans must be incorporated in permits or leases when completed.

- Those holding permits or leases must own or control and be responsible for the management of livestock authorized to graze.

- The permittee's/lessee's case file is available for public inspection as required by the Freedom of Information Act.

- Grazing permits or leases are subject to the nondiscrimination clauses set forth in Executive Order 11246 of September 24, 1964, as amended. A copy of this order may be obtained from the authorized officer.

- Grazing permits or leases are subject to the nondiscrimination clauses set forth in Executive Order 11246 of September 24, 1964, as amended. A copy of this order may be obtained from the authorized officer.

- Livestock use that is different from that authorized by a permit or lease must be applied for prior to the grazing period and must be filed with and approved by the authorized officer before grazing use can be made.

- Billing notices are issued which specify fees due. Billing notices, when paid, become a part of the grazing permit or lease. Grazing use cannot be authorized during any period of delinquency in the payment of amounts due, including settlement for unauthorized use.

- Grazing fee payments are due on the date specified on the billing notice and must be paid in full within 15 days of the due date, except as otherwise provided in the grazing permit or lease. If payment is not made within that time frame, a late fee (the greater of $25 or 10 percent of the amount owed but not more than $250) will be assessed.

- No member of or delegate to Congress or the Resident Commissioner after his election or appointment, either before or after he has qualified, or during his continuance in office or officer, agent, or employer of the Department of the Interior, other than members of advisory committees appointed in accordance with the Federal Advisory Committee Act (5 USC App. 1) and Sections 309 of the Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.) shall be admitted to any share or part in a permit or lease or derive any benefit to arise therefrom; and the provisions of Section 3741 Revised Statutes (41 USC 22; 18 USC Section 431-433, and 43 CFR Part 7), enter into and form a part of a grazing permit or lease, so far as the same may be applicable.

Other terms and conditions:

- When forage conditions warrant, livestock grazing may be authorized upon application to utilize an ephemeral forage crop pursuant to federal grazing regulations, special management requirements, and other guidance.

F.4. Planning and Environmental Documents

The following documents provide resource condition objectives for public lands within the SDNM allotments. (See Key Area Data (p.).) These objectives were used in the development of the desired resource conditions and DPC objectives for the Monument.

- Lower Gila South Resource Management Plan (RMP) and Environmental Impact Statement (EIS) (1988)
- Resource objectives from the Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona (TP), 1990.

F.5. Rangeland Management Programs Objectives

F.5.1. BLM Objectives

The BLM's objectives for rangeland management are to carry out the intent of the Taylor Grazing Act of 1934, as amended and supplemented, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. This is: 1) to periodically and systematically inventory public lands and their resources and their present and future use projected through land use planning processes; 2) to manage public lands on the basis of multiple use and sustained yield; 3) to manage public lands in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; 4) where appropriate, to preserve and protect certain public lands in their natural condition; 5) to provide food and habitat for fish and wildlife and domestic animals; 6) to provide for outdoor recreation and human occupancy and use; and 7) to manage, maintain and improve the condition of the public rangelands so that they become as productive as feasible for all rangeland values in accordance with management objectives and the land use planning process.

Title 43 Code of Federal Regulations (CFR) Part 4100 regulations govern grazing administration for public rangelands. Among other things, the regulations in CFR Part 4180 require the implementation of land health standards and guidelines for livestock grazing management to achieve the fundamentals of land health. The regulations at 43 CFR 4100 require that permits and leases include terms and conditions that ensure conformance with subpart 4180, Fundamentals of Rangeland Health.

The Taylor Grazing Act of 1934 (TGA) provides for two types of authorized use (1) A grazing permit that is a document that authorizes use of the public lands within an established grazing district. A grazing district defines the specific area within which the public lands are administered in accordance with Section 3 of the TGA; (2) A grazing lease is a document authorizing use of the public lands outside an established grazing district. Public lands outside grazing-district boundaries are administered in accordance with Section 15 of the TGA.

A permit or lease will include:

- The number and kind of livestock;
- The period(s) of use;
- The allotment(s) to be used; and

- The amount of use, in animal unit months (AUMs).

The Special Ephemeral Rule, published December 7, 1968 allows a variance to the mandatory stipulations above. An ephemeral permit or lease does not specify number and kind of livestock, period of use, or the amount of use in AUMs. The rule establishes that on applicable grazing lands, livestock grazing is feasible when certain climatic conditions create favorable conditions for grazing, primarily on annual vegetation. When these conditions occur, and the permittee or lessee applies for grazing use, the BLM determines the amount and period of authorized use. Such use is authorized when forage is available and there is a high probability that the forage will continue to be available through the period applied for and authorized.

Other terms and conditions may be specified in grazing permits or leases, which will assist in achieving management objectives, provide for proper range management or assist in the orderly administration of the public rangelands. These terms and conditions, which are not all inclusive, are contained at 43 CFR 4130.3.

Terms and conditions for grazing permits and leases must be in conformance with resource management objectives and program constraints, as identified in land use plans.

BLM allotments in Arizona are classified as perennial, ephemeral, or perennial-ephemeral. These classifications correspond to the following types of designated rangelands:

- Perennial - rangeland which consistently produces perennial forage to support a year round livestock operation.

- Ephemeral - rangelands that do not consistently produce enough forage to sustain a year round livestock operation but may briefly produce unusual volumes of forage to accommodate livestock grazing. There is a special rule for ephemeral range.

- Perennial-Ephemeral – rangelands that produce perennial forage every year and periodically provide additional ephemeral vegetation. In a year of abundant moisture and favorable climatic conditions, annual forbs and grasses add materially to the total grazing capacity.

F.5.2. SDNM Desired Future Conditions

Manage livestock grazing to provide forage for multiple uses while maintaining healthy ecosystems and protecting the Monument's biological and cultural resources.

F.5.3. SDNM Land Health Objectives by Ecological Site

The land health standards are evaluated by polygons that represent ecological sites. The "health" of different kinds of rangeland must be judged by standards specific to the potential of the ecological site. (See Tables 6-12: Land Health Objectives by Ecological Site, which are listed separately for each allotment below.)

The land health standards and subsequent objectives were quantified to address the objects of the Monument. See Table F.2, "Land Health Objectives by Monument Object" (p. 1094). The Monument objects are defined at the landscape level, while biological indicators for the objects were identified at the site-specific level.

Ecological sites within the BGR and Area A were used as comparison areas to help AB quantify the resource-condition objectives because the areas have not been open to livestock grazing since the 1940s and meet the desired resource conditions for wildlife habitat and other resource values at the landscape level. Only the data that could be correlated to ecological sites present in both the BGR/Area A and the allotments north of I-8 were used as comparison data.

Table F.2. Land Health Objectives by Monument Object

Biological Indicator	Applicable Standards
Monument Object: Functioning Desert Ecosystem	
See Monument Object: Saguaro Cactus Forest	
See Monument Object: Vegetation Communities	
Habitat for a wide range of wildlife species (See Monument Object: Wildlife)	
Monument Object: Diversity of Plant and Animal Species	
Woodland assemblages	Does not occur north of I-8. Occurs in the higher peaks of Table Top and Sand Tank Mountains.
Palo Verde-Mixed Cacti Vegetation Community	**Land Health Standard 1:** Assessments of Soil/Site Stability and Hydrologic Function on Granitic Hills and Limy Upland Ecological Sites.
	Land Health Standard 3: Vegetative Canopy Cover Objective for the Limy Upland and Granitic Hills Ecological Sites. Palatable Shrub Composition Objective for the Limy Upland Ecological Sites.
Monument Object: Saguaro Cactus Forests	
Saguaro cactus and nurse plants	*Land Health Standard 1*: Assessments of Soil/Site Stability and Hydrologic Function on Granitic Hills and Limy Upland Ecological Sites - provides suitable soil and hydrologic conditions for saguaros and nurse plants.
	Land Health Standard 3: Vegetative Canopy Cover Objectives for the Limy Upland and Granitic Hills Ecological Sites - provides vegetative cover of nurse plants.
	Land Health Standard 3: Saguaro Recruitment Objectives for the Limy Upland and Granitic Hills Ecological Sites.
Monument Object: Sand Tank Mountains	
Sand Tank Mountains	Mountain range not in analysis area (located south of I-8)
Monument Object: Scientific Analysis of Plant Species and Climates in Past Eras	
Packrat middens	Ancient middens occur in dry caves and rock shelters where they are protected from moisture. Livestock do not generally utilize areas with dry caves and rock shelters due to steep, rocky and rough terrain.
Kofa Mountain barberry	Does not occur north of I-8
Arizona Rosewood	Does not occur north of I-8
Junipers	Does not occur north of I-8
Monument Object: Vegetation Communities: Creosote-Bursage, Desert Grassland, and Desert Washes	
Creosote-Bursage Vegetation Community (Map F-2)	**Land Health Standard 1:** Assessments of Soil/Site Stability and Hydrologic Function on Limy Fan, Limy Upland Deep, and/or Sandy loam deep Ecological Sites.
	Land Health Standard 3: Vegetative Canopy Cover Objectives and Composition Objectives for the Limy Fan, Limy Upland Deep, and/or Sandy loam deep Ecological Sites.
Desert Washes (???)	**Land Health Standard 1:** Assessments of Soil/Site Stability and Hydrologic Function on Sandy wash and Loamy swale Ecological Site
	Land Health Standard 3: Vegetative Canopy Cover and Palatable Shrub Composition Objectives for the Sandy Wash ecological site, and Vegetative Canopy Cover and Perennial Grass Composition Objectives for the Loamy Swale ecological site.
Desert Grassland	Does not occur north of I-8
Monument Object: Wildlife*	

Biological Indicator	Applicable Standards
Sonoran Desert Tortoise, Desert Bighorn Sheep, Red-Backed Whiptail Lizard, Elf Owl, Western Screech Owl, Mule Deer	**Land Health Standard 3:** Assessments of Soil/Site Stability and Hydrologic Function on Granitic Hills and Limy Upland Ecological Sites (Paloverde-Mixed Cacti Vegetation Community).
	Land Health Standard 3: Vegetative Canopy Cover Objectives for the Limy Upland and Granitic Hills Ecological Sites.
	Land Health Standard 3: Palatable Shrub Plant Species Composition Objective for the Limy Upland Ecological Site.
Mule Deer, Elf Owl, Western Screech Owl, Cactus Ferruginous Pygmy Owl (*not identified in the proclamation*)	**Land Health Standard 1:** Assessments of Soil/Site Stability and Hydrologic Function on Sandy Wash Ecological Site.
	Land Health Standard 3: Vegetative Canopy Cover and Palatable Shrub Composition Objectives for the Sandy Wash ecological site, and Vegetative Canopy Cover and Perennial Grass Composition Objectives for the Loamy Swale ecological site, and for Potential Cactus Ferruginous Pygmy Owl (CFPO) Habitat in the Sandy Wash Ecological Site.
Sonoran Pronghorn	Does not occur in the Monument.
Javelina	Occurrence of this species north of I-8 in SDNM is unconfirmed.
Mountain Lion	Evaluation of Paloverde-Mixed Cacti Vegetation and Washes Communities (Granitic Hills, Limy upland and Sandy wash ecological sites) addresses suitable habitat for prey species (i.e. mule deer, Bighorn sheep, rodents, etc.).
Gray Fox	Evaluation of all vegetative communities addresses suitable habitat for prey species (i.e. quail, birds, rodents, lizards, etc.).
Bobcat	Evaluation of all vegetative communities addresses suitable habitat for prey species (i.e. quail, birds, rodents, lizards, etc.).
Lesser Long-Nosed Bat (see above)	Evaluation of saguaro cactus forests conditions and applicable ecological sites evaluates habitat needs within SDNM, north of I-8, for this species.
California Leaf-Nosed Bat	Evaluation of all vegetative communities addresses suitable forage habitat. No known roost sites on SDNM (Hinman and Snow, eds.). Forage (insects) area could occur in the Monument.
Cave Myotis Bat	Evaluation of all vegetative communities addresses suitable forage habitat. No known roost sites on SDNM (Hinman and Snow, eds.). Forage (insects) area could occur in the Monument.
Elf Owl (see above)	Evaluation of Paloverde-Mixed Cacti Vegetation and Washes Communities (Granitic Hills, Limy upland and Sandy wash ecological sites) addresses suitable forage habitat.
Western Screech Owl (see above)	Evaluation of Paloverde-Mixed Cacti Vegetation and Washes Communities (Granitic Hills, Limy upland and Sandy wash ecological sites) addresses suitable forage habitat (i.e. small birds, rodents, lizards, insects etc.).
Red-Backed Whiptail Lizard (see above)	Evaluation of Paloverde-Mixed Cacti Vegetation Community (Granitic Hills and Limy upland ecological sites) addresses the habitat needs for this species.
Sonoran Green Toads	Located in Vekol valley spreader dikes and stock tanks outside SDNM north of I-8.
Monument Object: Archaeological and Historic Sites	

Biological Indicator	Applicable Standards
Rock art sites	Three rock art sites are known to exist on the grazing allotments within the SDNM north of I-8. These sites are all in rocky, upland settings and are not situated in areas of concentrated livestock use. These sites do not exhibit evidence of damage from livestock, livestock-management activities, or range improvements, because the petroglyphs and associated artifacts are on large, boulder-strewn hillsides and knolls that it would be extremely unlikely for livestock to access.
Lithic quarries	All sites identified in existing information are located south of I-8 and are no longer subject to grazing activities.
Scattered Artifacts	A total of 22 of the 41 sites located north of I – 8 on the SDNM are listed as artifact scatters. Of these 22 artifact scatters, 19 sites have characteristics that would make them eligible for the National Register of Historic Places (NRHP). None of these known artifact scatters are located within areas of concentrated livestock use. Of the 19 artifact scatters that have the characteristics that would make them eligible for the NRHP, five sites have been documented by the recording archaeologist as having been affected by grazing. On three of these sites, the documentation merely mentions grazing generally as an effect, usually among other effects, with no further information tied to indicators of disturbance to that site. There is no documentation as to whether any artifacts or features had been disturbed by grazing. Two sites were documented with specific indicators of the type and level of disturbance. One site was documented as having "moderate trampling and denudation of vegetation." This was cited as a factor that leads to gradual erosion. However, the photographs of the site in this documentation do not show that this is the case. The photograph shows Sonoran Desert vegetation with typical densities. This photo shows that the ground surface is stable and is not subject to erosion. The other site was documented as being disturbed because of "three well-defined livestock trails that cut across a potential ancient trail near the northwest end of the site, and general grazing impacts and gradual erosion." The line of sight can follow the line of travel and the profile of the probable prehistoric trail in several places. Artifacts and features have not been disturbed by the livestock trails. The livestock trails are distinct and visible in this area due to their distance to a water development (Bosque Well). This well is roughly 0.75 mile away from the site. Livestock trails have disturbed roughly 0.4 percent of the ground surface of this site.
Vekol Wash	Located south of I-8.
Table Top Mountain bajadas	Located south of I-8.
Juan Bautista de Anza NHT	While no visible physical remnants remain of this historic trail, later trails utilized the same corridor used by Anza. The historic trail corridor, as identified by the National Park Service, varies in width depending on the information found in the diaries. The historic setting of this trail is an area 3 miles wide, or up to the visual horizon, whichever is less. The livestock water developments in the area -- Gap Tank, Conley Tank, North Tank, and North Tank Well -- all lie within this historic setting. The line of sight for a trail user is undisturbed as one can see where the trail corridor continues ahead. This trail is 1,200 miles long -- from the border with modern Mexico to the San Francisco Bay area -- with roughly 17 miles within the SDNM. Of the four water developments on the SDNM where livestock usage is concentrated, the area at North Tank is the only one where effects from grazing activities disturbs the setting. The area where livestock use has reduced the vegetation is about 10 acres in size, amounting to 1,300 linear feet of the trail corridor.

Biological Indicator	Applicable Standards
	The Anza NHT story involves driving 1,000 head of livestock and 300 people mounted on horseback along this trail when it was originally used. Thus, livestock may be viewed as compatible with authentic Anza NHT setting.
Mormon Battalion Trail	The Mormon Battalion Trail is an historic route with well documented physical features and attributes. It has the characteristics that would make it eligible for the NRHP. This trail experiences direct disturbance from the congregation of livestock at North Tank. The area of direct impact amounts to about 800 linear feet of trail signature from trampling the trail ruts, berms, and vegetation that grows along the berms. The Mormon Battalion Trail is about 1,850 miles long, 17 miles of which are within the SDNM boundaries. The area at North Tank where direct effects from grazing activities disturbs the setting is about 10 acres in size.
Butterfield Overland Stage Route	The Butterfield Overland Stage Route, like the Mormon Battalion Trail, is a historic route with well documented physical features and attributes. It has the characteristics that would make it eligible for the NRHP. Several other historic sites are associated with this historic route within the SDNM. This trail experiences direct disturbance from the congregation of livestock at North Tank. The area of direct disturbance amounts to approximately 800 linear feet of trail signature from trampling the trail ruts, berms, and vegetation that grows along the berms. The Butterfield Overland Stage Route is about 2,800 miles long, 17 miles of which is located within the SDNM boundaries. The area at North Tank where direct impacts from grazing activities disturbs the setting is about 10 acres in size.
Other Archaeological & Historic sites	A total of 14 out of the 41 sites recorded on the SDNM north of I-8 can be categorized as “other archaeological and historic sites.” These include nine historic sites related to railroad, ranching, or travel routes. The only sites documented to have impacts related to grazing are along the Butterfield Overland Stage Route and the Mormon Battalion Trail immediately next to North Tank. These sites are entirely located within the 15 acres that were identified above as having been used by livestock historically, diminishing the vegetation. A protective fence installed in 1995 has been helpful in reducing disturbances from grazing and human activities on this site. Human activities have been so intense in this area that the causal factor for the level of disturbance in this area cannot be blamed on one activity alone. Unauthorized collection of artifacts, for instance, has been occurring over the years.

F.5.3.1. Land Health Standard 1 — Upland Sites

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Objective:

- Signs of accelerated erosion are minimal and are appropriate for the site as indicated by ground cover (litter, rock, vegetative [canopy] cover, etc.) and signs of erosion. This objective applies to all ecological sites. A departure from the ecological site description or reference sheet of moderate or greater would not be achieving the standard. A departure of none to slight or slight to moderate is considered achieving the standard.

- Achievement of Standard 1 (appropriate erosion and vegetative cover levels) will ensure properly functioning watersheds and ecological processes in order to sustain healthy biotic populations and communities (biological objects of the Monument).

F.5.3.2. Land Health Standard 2 — Riparian — Wetland Site

Riparian-wetland areas are in proper functioning condition.

There are no riparian areas located within the Monument; therefore, this land health standard was not applicable and was not evaluated.

F.5.3.3. Land Health Standard 3 — Desired Resource Conditions

Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

Productive and diverse uplands are paramount to the Monument's biological resource goals and objectives. The desired resource conditions will address the land health indicators for the Monument's biological objects and, when achieved, will ensure that the ecosystem is in functioning condition. Desired resource conditions are not identified by several stages. They identify the vegetation attributes, such as composition, structure, and cover, which are desired within the Monument. These include establishing vegetative characteristics necessary for soil protection and providing forage and habitat for both wildlife and livestock. Site potentials (soil, climate, topography) of the ecological sites establish the natural limits on what can be produced in terms of vegetation and related resource values like forage, wildlife habitat, and watershed characteristics.

The criterion for meeting desired resource conditions is achievement of or conditions leading to the DPC objectives.

- The DPC objectives are specific to each ecological site and based on comparison area data collected from the Barry M. Goldwater Range (BGR) and Area "A" by Pacific Biodiversity Institute (PBI) and the BLM.
- These data were analyzed along with information from the National Resources Conservation Service (NRCS) Ecological Site Descriptions and reference sheets to estimate the potential or capability of the site to produce different kinds and amounts of vegetation so that the DPC objectives are realistic in terms of what is possible to achieve. Due to the variability within an ecological site the average value for each attribute tied to the indicators for land health were used to quantify the DPC objectives.
- All key areas will be measured against the ecological site DPC objectives (see Conclusions). The objectives will be used to determine whether standards for land health are being achieved or not achieved, and if not achieved, is significant progress being made toward achievement.

F.5.3.4. Ecological Site-Level Desired Plant Community Objectives

F.5.3.4.1. Sandy Wash Ecological Sites

- Maintain vegetative canopy cover at 34 percent

- Maintain composition of palatable browse species at 14 percent

Rationale:

Based on the site potential, canopy cover at 34 percent should provide sufficient cover to support wildlife and bird species (elf owl, western screech owl, mule deer, quail, etc.) and prevent accelerated erosion of the site. Maintaining composition of palatable species (see Key Management Species List (p.)) at 14 percent should provide adequate habitat and forage for wildlife and livestock. No more than 7 percent composition of the 14 percent composition will be allowed for wolfberry species (wolfberry species provide only limited seasonal forage for both livestock and some wildlife species).

F.5.3.4.2. Potential Cactus Ferruginous Pygmy-Owl Habitat (Sandy Wash Ecological Site)

- Maintain composition of palatable browse at 14 percent
- Maintain vegetative canopy cover at 40 percent with a multi-layered structure present. Multi-layered structure as represented by:
  - Trees - ironwood, blue palo verde, mesquite (tree form)
  - Tall shrubs – catclaw, wolfberry, burrobush, big bursage (*Ambrosia ambrosioides*)
  - Low shrubs, forbs, annuals, i.e., white ratany, desert globemallow (*Sphaeralcea ambigua*)

Rationale:

Maintaining vegetative canopy cover at 40 percent and a multi-layered structure will provide sufficient cover and structure to support cactus ferruginous pygmy-owl. Total vegetative canopy cover of 40 percent is identified in the sandy wash 7- to 10-inch precipitation zone ecological site description as potential for the site.

Maintaining composition of palatable browse (See Key Management Species List (p.)) at 14 percent will maintain habitat and forage for wildlife. No more than 7 percent composition of the 14 percent 6 composition will be allowed for wolfberry species (wolfberry species provide only limited seasonal forage for both livestock and wildlife).

Ecological site data collected from BGR/Area A comparison areas indicated no perennial grass component in the sandy wash ecological site. (See Pacific Biodiversity Institute Study Plots (p.).) It was determined that setting a DPC objective for perennial grass could not be quantified.

F.5.3.4.3. Loamy Swale Ecological Site:

- Maintain perennial grasses at 10 percent composition,
- Maintain vegetative canopy cover at 20 percent.

Rationale:

Maintaining composition of perennial grasses at 10 percent or more will provide forage for wildlife and livestock. Appropriate canopy cover levels will prevent accelerated erosion and provide cover for wildlife.

F.5.3.4.4. Limy Fan Ecological Site:

- Maintain vegetative canopy cover at 7 percent.
- Maintain ratany-bursage shrub group at 9 percent of total composition.

Rationale:

Maintaining the ratany-bursage functional group, which consists of range ratany, white ratany, white bursage, and triangle-leaf bursage, on this site provides habitat for wildlife and forage for livestock. Appropriate vegetative cover levels will prevent accelerated erosion and provide cover for wildlife.

F.5.3.4.5. Limy Upland Deep Ecological Site:

- Maintain vegetative canopy cover at 10 percent.
- Maintain the ratany-bursage functional group at 12 percent of total composition.

Rationale:

Maintaining the ratany-bursage functional group, which consists of range ratany, white ratany, white bursage and triangle leaf bursage, on this site provides habitat for wildlife and forage for livestock. Appropriate vegetative cover levels will prevent accelerated erosion and provide cover for wildlife.

F.5.3.4.6. Limy Upland Ecological Site:

- Maintain total vegetative canopy cover at 12 percent,
- Maintain composition of palatable browse at 5 percent,
- Maintain recruitment of saguaros at the current rate of 0.96 young saguaros per 12.5 meter radius plot.

Rationale:

Maintaining palatable browse (See Key Management Species List (p.)) will ensure perennial forage for livestock and wildlife. This community provides habitat for bighorn sheep, desert tortoise, mule deer, red-backed whiptail lizard, elf owl, western screech owl and other bird and wildlife species. Appropriate vegetative cover levels will prevent accelerated erosion of ecological sites (See NRCS ecological reference worksheets) and provide for wildlife habitat.

Maintaining the current recruitment rate for saguaros of 0.96 young saguaros per 12.5 meter radius plot (see Pacific Biodiversity Institute Saguaro Study (p.)) is appropriate for this ecological site north of I-8. Recruitment of saguaros is necessary to maintain CFPO and other owl

nesting sites and lesser long-nose bat feeding areas. The potential saguaro population varies by elevation, aspect, precipitation, and soil type.

The highest densities of saguaros, referred to as the "saguaro forest" in the Monument Proclamation, are found primarily within the limy upland and granitic hills ecological sites. Maintaining vegetative canopy cover on the site will provide nurse plants for saguaros. The limy upland ecological site is where livestock use in the "saguaro forest" is most likely to occur.

F.5.3.4.7. Granitic Hills Ecological Site:

- Maintain vegetative canopy cover at 16 percent,
- Maintain recruitment of saguaros at the current rate of .83 young saguaros per 12.5 meter radius plot.

Rationale:

This community provides habitat for bighorn sheep, desert tortoise, mule deer, red-backed whiptail lizards, and other wildlife species. Based on slope, terrain, and other limiting factors, livestock do not utilize the majority of this ecological site, particularly during the warmer months. Appropriate vegetative cover levels will prevent accelerated erosion, provide cover for wildlife, and provide nurse plants for saguaros. Maintaining the current recruitment rate for saguaros of 0.83 young saguaros per 12.5 meter radius plot (see Pacific Biodiversity Institute Saguaro Study (p.)) is appropriate for this ecological site located north of I-8. The BGR/Area A saguaro study, which had a recruitment rate of 1.26 young saguaros per plot, conducted by PBI, was located primarily in the volcanic hills 7- to 10-inch and 10- 13-inch precipitation zone ecological sites, with the data being combined from both sites. The saguaro stem count values in the BGR/Area A plots could potentially be greater due to the difference in the ecological sites and increased precipitation. Recruitment of saguaros is necessary to maintain CFPO nesting sites and lesser long-nose bat feeding areas. The potential saguaro population varies by elevation, aspect, precipitation, and soil type. Comparison area data and the ecological site guide indicate this site has low potential for agave species.

F.5.3.4.8. Sandy Loam Deep Ecological Site:

- Maintain total vegetative canopy cover at 15 percent,
- Maintain composition of palatable browse at 16 percent.

Rationale:

Maintaining palatable browse (see Key Management Species List (p.)) will ensure perennial forage for livestock and wildlife. This community provides habitat for bighorn sheep, desert tortoise, mule deer, and other wildlife species. Appropriate vegetative cover levels will prevent accelerated erosion of ecological sites (See NRCS ecological reference worksheets). This site only occurs as a minor inclusion within the Monument; however, it is within the service use area of the Big Horn station livestock water on the Big Horn allotment.

F.5.4. Utilization Guidelines

Monument utilization guidelines were quantified for the purposes of addressing future management actions. Utilization, along with other monitoring data, is a useful indicator to ascertain whether or not current livestock grazing is a significant causal factor for not achieving a land health standard. For example, consistently high levels of utilization over a period of years may indicate that livestock-grazing management practices or levels of use may need to be adjusted.

Utilization guidelines for the SDNM are as follows:

- Manage for slight use (20 percent or less) of current year's growth on key perennial forage species in wilderness areas,
- Manage for moderate use (40 percent or less) of current year's growth on key perennial browse species outside of wilderness areas,
- Manage for moderate use (45 percent or less) of current year's growth on key perennial grass species outside of wilderness areas.

The utilization guidelines addressed are intended to indicate a level of use or desired stocking rate to be achieved over a period of years. "Desert forage plants can sustain about 40 percent use of annual herbage production" (Holechek et al. 1999). Levels of utilization exceeding 40 percent on shrubs may exceed the threshold for maintenance or improvement in the growth and reproduction of the key forage species and have a long-term effect on vegetation canopy cover and composition.

These guidelines are intended to be met over the long term and not on a year-to-year basis. These measurements, when properly timed and conducted using appropriate methods and sampling procedures, can be used as an aid in:

- Analyzing distribution of animal use on a management unit,
- Interpreting cause-and-effect relationships for observed changes in resource attributes such as soil cover, species composition, residual cover, etc.,
- Adjusting stocking rates or timing of grazing when used in conjunction with other monitoring information.

Utilization and residue measurements are not terms and conditions or desired resource condition objectives. They are monitoring and assessment tools used with other information in evaluating whether desired resource conditions are being achieved.

F.6. Inventory and Monitoring Methodology

F.6.1. Rangeland Survey

A rangeland soil and vegetation survey was completed for all allotments within what is now the SDNM in 1981 as part of the planning effort for the Lower Gila South RMP/EIS. Data were collected for the survey from 1979 to 1981. The BLM's rangeland inventory method and the Soil Conservation Service's (NRCS) methods were used for determining range condition and apparent trend. For the purposes of this evaluation, the rangeland survey production data from several locations was applied to the current ecological site descriptions to determine a similarity index.

F.6.2. Key Areas

Key areas were established by an interdisciplinary team on the SDNM allotments beginning in 2004. (See Map F-4,) A key area is a relatively small portion of an allotment selected because of its location, proximity to water, livestock and wildlife habitat values, and value as a long-term monitoring point. They are located in each of the major pastures and are selected in locations that represent where livestock grazing pressure is occurring across the management area and include representations of all major ecological sites. Data collected from 36 key areas were used for this evaluation.

For collecting monitoring data, a 40- by 40 square cm frame with a point in the center was used to collect between 100 and 200 quadrats of data for various attributes at each key area. The dry-weight-rank technique was used to collect production and relative composition. Cover data were collected by using the point-cover technique with the frame-center point. Species composition was calculated using the production data. These monitoring methods are described in BLM Technical Reference-1734-4, "Sampling Vegetation Attributes" (U.S. Department of the Interior, 1996).

Land Health

The upland health of several key areas was evaluated using the BLM Rangeland Health Evaluation Site Documentation Worksheet. (For detailed results, see Attachment 3 – Key Area Data.)

This assessment is a qualitative and quantitative approach to look at how the ecological processes on a site are functioning. The product of the qualitative assessment is not a single rating of land health, but an assessment of three components called attributes. The attributes are:

- Soil/site stability,
- Hydrologic function,
- Biotic integrity.

These observed attributes are placed into one of five categories depending on the degree of departure from the ecological site description or reference area. Summing all of the attributes makes a final upland health determination. The five categories are:

1. Extreme,
2. Moderate to extreme,
3. Moderate,
4. Slight to moderate,
5. None to slight.

Soil/site stability is the capacity of the site to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water. Hydrologic function is the capacity of the site to capture, store, and safely release water from rainfall, runoff, and snowmelt and to resist reduction in this capacity and recover from disturbance. Biotic integrity is the capacity of the site to support characteristic functional and structural vegetation communities and to resist loss due to disturbance and recover following disturbance. Functional groups are species of similar

importance. Methods for the LHE are described in BLM Technical Reference 1734-6, Version 3, "Interpreting Indicators of Rangeland Health" (2000).

The Indicators of Rangeland Health Assessment is a qualitative approach to examine how the ecological processes on a site are functioning. The product of the qualitative assessment is not a single rating of rangeland health, but an assessment of three components called attributes. Seventeen interrelated indicators are used in the assessment. The rating for each indicator in the evaluation area is based on that indicator's degree of departure from the Reference Sheet of each Ecological Site (i.e. none to slight, slight to moderate, moderate, moderate to extreme, and extreme). Refer to Table F.3, "Rangeland Health Attributes" (p. 1104) for the Indicators of Rangeland Health assessment.

Table F.3. Rangeland Health Attributes

Soil/Site Stability	The capacity of the site to limit redistribution and loss of soil resources (including nutrients and organic matter) by wind and water. Indicators are ground cover and signs of erosion.
Hydrologic Function	The capacity of the site to capture, store and safely release water from rainfall, runoff and snowmelt, to resist reduction in this capacity and recover from disturbance.
Biotic Integrity	The capacity of the site to support characteristic functional and structural vegetation communities and to resist loss due to disturbance and recover following disturbance. Indicators are vegetation composition, structure, and distribution.
Source: Technical Reference 1734-6	

Utilization studies

Utilization data were collected in the Conley and Big Horn allotments at several of the key areas in 2008 and 2009 using the Key Species Method found in BLM Technical Reference 1734-3, "Utilization Studies and Residual Measurements" (1996). See Table F.7, "Utilization Estimates on Key Areas Within the Big Horn and Conley Allotments" (p. 1106). The landscape appearance method found in this technical reference was used to map out zones of utilization for use-pattern mapping throughout the Monument. This method is used to identify use patterns in order to plan for range improvements and identify necessary changes in grazing management to improve distribution. When interpreting these data, the amount of utilization observed at each location was less important than the overall use patterns across the allotment.

F.6.3. Pacific Biodiversity Institute Site Data

In 2002 Pacific Biodiversity Institute (PBI) was subcontracted by The Nature Conservancy through an assistance agreement with the BLM to collect data within the Monument. Estimates of vegetative canopy cover by species were collected on 12.5 meter radius plots (approximately 0.12 acres). This was designed to be used as baseline information to help assess changes and trends in the condition of the natural communities. Analysis of the applicable vegetative community data for 48 study sites (interchangeably referred to as plots) is included in this evaluation. The study design was a linear transect extending out from a disturbance site (livestock waters, etc.). The first plot was located within the disturbance, the second 50 meters from the disturbance; the third 100 meters, and the fourth 500 meters. Several additional plots were located at further 500 meter intervals from the disturbance. For the purposes of this evaluation, only plots located at 1,000 meters (.62 miles) or more from the disturbance sites were used. PBI study sites that were located close to livestock waters were not used because these areas are not representative of what is occurring within the larger area. In addition, some study sites that crossed multiple ecological

sites were not used. Depending on the location and position on the landscape, PBI study sites were analyzed to address vegetation attributes specific to wildlife habitat (bighorn sheep) values. In some instances, these sites were located in areas that receive no livestock use or negligible livestock use. Data were also collected by PBI in the Barry M. Goldwater Range (BGR) and the southern portion of Area A. (See Map F-4). Historical records indicate that livestock use in this area has been recently absent or relatively light.

F.7. Management Evaluation and Summary of Studies Data

F.7.1. Actual Use

Actual livestock use data were ascertained from past permitted use. The 10-year average livestock use has varied from year to year due to annual fluctuations in forage conditions and ephemeral operations. Operators have voluntarily removed livestock as requested by the BLM during drier periods. In some cases, the operators have applied for non-use and reactivated use in the same grazing year as conditions improved. The data in Table F.4, "Grazing Allotment Use, Permitted and 10 Year Average" (p. 1105) below is presented allotment-wide on Public Lands within the Planning Area as actual use data is not available by Decision Area.

Table F.4. Grazing Allotment Use, Permitted and 10 Year Average

Allotment #	Allotment name	Type	Permitted Use (AUMs)	10-Year Average Permitted Use*
3009	Big Horn	cattle	6,104	5,659
3007	Beloat	cattle	2,988	2,262
3018	Conley	cattle	4,158	3,821
3053	Lower Vekol	cattle	1,164	528
3042	Hazen	cattle	1,181	1,066
3004	Arnold	cattle	0	N/A**

* Average use based on paid grazing bills, 1998-2007

**The Arnold allotment is ephemeral use only

F.7.2. Precipitation

Precipitation data for the Monument were acquired from the Western Regional Climate Center monitoring sites located in Gila Bend and Maricopa. The 20-year average annual precipitation for the Gila Bend area is approximately 6.28 inches. The precipitation by month for the period of 1999 to 2008 is shown in Table F.5, "Average Precipitation (in Inches) for Gila Bend, Arizona, 1999 to 2008" (p. 1105). The average for this period was 6.16 inches. Extremes in precipitation include a low of 2.90 inches in 2002 and a high of 10.61 inches in 2003. The 20-year average precipitation for the Maricopa area is 7.63 inches. The precipitation by month for the period of 1999 to 2008 is shown in Table F.6, "Average Precipitation (in Inches) for Maricopa, Arizona, 1999 to 2008" (p. 1106). The average for this period was 6.57 inches. Extremes in precipitation include a low of 3.07 inches in 2002 and a high of 8.07 inches in 2005.

Table F.5. Average Precipitation (in Inches) for Gila Bend, Arizona, 1999 to 2008

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN.
1999	0.20	0.11	0.04	1.15	0.01	0.15	2.45	2.04	0.10	0.00	0.00	0.00	6.25
2000	0.08	0.12	1.85	0.00	0.00	0.20	0.02	0.84	0.00	2.22	0.80	0.00	6.13
2001	1.57	0.76	0.55	0.08	0.02	0.00	0.13	1.33	0.00	0.06	0.08	0.50	5.08

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN.
2002	0.05	0.00	0.03	0.00	0.00	0.00	0.13	0.00	0.21	0.30	1.79	0.39	2.90
2003	1.37	2.06	0.90	0.56	0.00	0.00	0.62	0.85	2.46	0.00	1.29	0.50	10.61
2004	0.60	0.86	0.29	1.10	0.00	0.00	1.27	0.51	0.00	1.30	0.66	1.54	8.13
2005	1.28	2.46	0.50	0.17	0.00	0.00	0.33	1.14	0.11	0.32	0.00	0.00	6.31
2006	0.00	0.00	1.02	0.00	0.00	0.00	0.65	0.57	0.58	0.05	0.00	0.31	3.18
2007	0.01	0.08	0.64	0.14	0.00	0.00	1.22	0.64	0.21	0.00	0.80	1.30	5.04
2008	1.57	0.90	0.00	0.00	2.20	0.00	0.82	1.45	0.15	0.00	0.12	0.76	7.97
Yearly Avg.	0.67	0.74	0.58	0.32	0.22	0.04	0.76	0.94	0.38	0.43	0.55	0.53	6.16

Table F.6. Average Precipitation (in Inches) for Maricopa, Arizona, 1999 to 2008

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN.
1999	0.02	0.34	0.50	1.05	0.00	0.02	2.45	0.54	1.90	0.00	0.00	0.00	6.82
2000	0.00	0.01	2.24	0.00	0.00	1.21	0.25	1.49	0.02	2.22	0.57	0.00	8.01
2001	2.04	0.40	0.97	1.19	0.00	0.08	0.63	0.37	0.00	0.68	0.25	0.78	7.39
2002	0.10	0.00	0.04	0.00	0.00	0.00	0.18	0.09	1.71	0.04	0.54	0.37	3.07
2003	0.50	1.34	0.22	0.09	0.00	0.00	0.52	1.03	0.47	0.04	0.63	0.26	5.10
2004	1.28	0.92	0.57	0.62	0.00	0.00	0.63	0.30	0.71	0.67	0.70	1.65	8.05
2005	2.08	3.55	1.02	0.14	0.00	0.00	0.31	0.86	0.00	0.10	0.00	0.01	8.07
2006	0.00	0.00	2.62	0.00	0.00	0.21	1.21	0.82	0.71	0.31	0.00	0.34	6.22
2007	0.58	0.23	1.23	0.12	0.33	0.00	0.69	1.56	0.40	0.00	0.81	0.00	5.95
2008	1.13	0.55	0.00	0.00	1.71	0.00	0.67	1.26	0.30	0.00	0.34	1.05	7.01
Yearly Avg.	0.77	0.73	0.94	0.32	0.2	0.15	0.75	0.83	0.62	0.41	0.38	0.45	6.57

F.7.3. Key Area Data

See Key Area Data (p.) and Pacific Biodiversity Institute Study Plots (p.).

F.7.4. Utilization and Use Pattern Mapping

See Map F-5.

The majority of livestock use occurred during the 2008 winter/spring season, which is typical of most years. Additional years of utilization data needs to be collected; however, 2008 does reflect patterns of use during a year with slightly above to average winter/spring precipitation levels and moderate ephemeral production. Ephemeral forage production per acre was approximately 400 to 500 lbs. air dry weight per acre. In years of above average moisture, these sites are capable of producing up to 2,000 lbs. air dry weight per acre.

Use-pattern mapping data were not collected on the Hazen allotment for livestock use as livestock have not been on the allotment for several years. The use-pattern mapping was collected for wildlife use around two wildlife waters located within the allotment.

Table F.7. Utilization Estimates on Key Areas Within the Big Horn and Conley Allotments

Big Horn Key Area Utilization – 2008			
Key Area	Key Species	% Use	Utilization Class
BH 2	White ratany	19%	Slight
BH 3	White ratany	24%	Light
	Burrobrush	13%	Slight
BH 5(W)*	White ratany	39%	Light

BH 6(W)*	Big galleta	26%	Light	
	Burrobrush	42%	Moderate	
	White bursage	27%	Light	
Conley Key Area Utilization -- 2008				
Key Area	Key Species	% Use	Utilization Class	
C 5	White bursage	14%	Slight	
	Burrobrush	29%	Light	
C 7 (W)*	Burrobrush	13%	Slight	
C 9	White ratany	31%	Light	
	White bursage	9%	Slight	
Conley Allotment Utilization Study Sites				
Site	Key Species	% Use	Utilization Class	Year
CU 2	White ratany	14%	Slight	2009
	White bursage	12%	Slight	2009
CU 3	White ratany	12%	Slight	2009
CU 4	White ratany	49%	Moderate	2009
CU 5	Burrobrush	18%	Slight	2008
	Globemallow	24%	Light	2008
CU 6	White ratany	34%	Light	2008
CU7	White ratany	40%	Light	2008
CU8 (W)*	White ratany	23%	Light	2008
	Burrobrush	35%	Light	2008
CU10	White ratany	43%	Moderate	2008
	White bursage	26%	Light	2008
*W - signifies wilderness area location				

F.8. Conclusions

Conclusions are supported by the analysis of key area and PBI data, and information portrayed within the evaluation to show whether land health standards are being achieved or not achieved and whether significant progress towards achievement is being made. Conclusions are presented only for Arizona Standards 1 and 3. For Standard 1, conclusions are summarized to the allotment level for each allotment across all ecological sites. For Standard 3, conclusions are first summarized to each ecological site within each allotment, and then summarized to the allotment level for each allotment. Refer to ??? for the various management objectives for each ecological site. Referring to the raw data in Key Area Data (p.) and Pacific Biodiversity Institute Study Plots (p.) will aid in interpreting and verifying the conclusions presented.

Achievement of Standard 3 considers the inherent variability within ecological site potential.

Data variability was considered when making the final determination whether or not a site is achieving Standard 3 objectives. Rather than using the absolute value to determine achievement of the objective, the site was considered achieving the objective if the canopy cover or the composition vegetative attributes measured were within 80 percent of the attribute value.

The final determination of whether or not an ecological site is achieving Standard 3 was based on a preponderance of evidence approach. More than 50 percent of the key areas and PBI plots representing an ecological site had to be achieving all of the DPC objectives for the ecological site within an allotment to be considered achieving Standard 3. This approach was used because a statistical approach was not feasible, as the number of key areas and PBI plots on each ecological site were not adequate to statistically analyze each ecological site.

F.9. Barry M. Goldwater Range/Area A Reference Site

In 1941, 78,000 acres (formerly known as Area "A") were withdrawn for the BGR for military purposes. It was later returned to the BLM and was not reopened to grazing use. Ecological sites within the BGR/Area A were used as comparison areas to help quantify the resource-condition objectives because, being closed to livestock grazing since the 1940s, they meet the desired resource conditions for wildlife habitat and other resource values at the landscape level. Only the data that could be correlated to ecological sites present in both the BGR/Area A and the allotments north of I-8 were used as comparison data.

Table F.8. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – BGR/Area A

Meets St. 3*	Ecological site	Key area/ PBI site	Canopy cover objective	Actual canopy cover	Composi-tion objective	Actual composition	Achieved canopy cover**	Achieved composi-tion**
N	Sandy wash	233	34%	38%	14%	7%	Y	N
		252	34%	47.5%	14%	8%	Y	N
		262	34%	23.5%	14%	17%	N	Y
		271	34%	26%	14%	16%	N	Y
		BHPP3S	34%	50%	14%	10%	Y	N
N	Limy Fan	236	7%	6.5%	9%	0%	Y	N
		237	7%	8%	9%	0%	Y	N
		240	7%	8%	9%	12%	Y	Y
		BHPP2S	7%	13%	9%	28%	Y	Y
Y	Limy Upland deep	269	10%	18%	12%	12%	Y	Y
		272	10%	17%	12%	0%	Y	N
		234	10%	8%	12%	37%	Y	Y
		BHPP1S	10%	10%	12%	45%	Y	Y
Y	Granitic Hills	232	16%	16.0%	N/A	N/A	Y	N/A

*More than 50% of the key areas and PBI plots representing an ecological site had to be achieving all of the desired plant community objectives, for the ecological site within an allotment to be considered achieving land health standard 3. This represents a preponderance of evidence approach to ascertain whether land health standard 3 was achieved. This approach was used because a statistical approach was not feasible as the number of key areas and PBI plots on each ecological site were not adequate to statistically analyze each ecological site.

** Ecological site variability was considered when making the final determination of whether or not a site is achieving LH Standard 3 objectives. Rather than using the absolute value to determine achievement of the objective, if the canopy cover and/or the composition vegetative attributes measured were within 80% of the attribute value, the site was considered achieving the objective.

F.10. Big Horn Allotment

F.10.1. Land Health Standard 1 — Upland Sites

Conclusion:

Upland sites within the Big Horn allotment meet Standard 1.

Objective: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Rationale:

The findings are based upon the preponderance of evidence of all indicators used to determine attainment of Standard 1.

The results of the upland assessment indicate a slight departure from the ecological site descriptions, with only one site in the slight to moderate category (see soil/site stability and hydrologic function attributes for Big Horn allotment in Table F.17, "Departure from Ecological Site Description" (p. 1159)). The majority of the key areas and PBI plots (23 of 28) had vegetative cover levels that are appropriate for the site (see Table F.9, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Big Horn Allotment" (p. 1113)) and the qualitative assessments of the soil-related indicators (rills, flow patterns, pedestals, bare ground, gullies, litter movement, and soil compaction etc.) did not indicate any signs of accelerated erosion at any site. PBI cover data indicates that microbiotic crusts are at appropriate levels in relation to the BGR/Area A comparison area (see microbiotic crust cover data in Table F.19, "Average Cover of Microbiotic Crusts (% by Plot)" (p. 1161)).

F.10.2. Land Health Standard 3 — Desired Resources Conditions

Objective:

Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

F.10.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites

F.10.2.1.1. Sandy Wash Ecological Site

Conclusion:

Based upon the preponderance of evidence, the sandy wash ecological site is achieving Standard 3. All seven sites achieve the canopy cover objectives and the palatable browse objective. The results of use-pattern mapping was light to moderate use and do not indicate that current livestock management is the causal factor on the sites that are not achieving the objectives.

Objectives:

- Maintain sandy washes at 34 percent canopy cover. (applies to six sites: Key Areas BH-1 and BH-4 and PBI sites 190 192, 202 and 203),
- Maintain canopy cover at 40 percent for the potential CFPO sandy wash sites (applies to Key Area BH-8),
- Maintain sandy washes at 14 percent composition of palatable browse (all seven sites).

Discussion:

The canopy cover objective is being achieved or exceeded on all seven sites (see Table 8: Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Big Horn Allotment). All of the vegetative components that form a multi-layered structure are present for potential CFPO and other wildlife habitat. The tree layer is represented by blue palo verde and ironwood, the tall shrub layer is represented by catclaw acacia, desert hackberry, and wolfberry, and the low shrub layer is represented by big bursage, triangle-leaf bursage, and bricklebush. There were no signs of accelerated erosion at any site (see Table F.17, "Departure from Ecological Site Description" (p. 1159)).

All seven sites achieve or exceed the palatable browse composition objective (see Table 8).

F.10.2.1.2. Loamy Swale Ecological Site:

Conclusion:

Standard 3 is being met for the loamy swale ecological site.

Objectives:

- Maintain perennial grasses at 10 percent composition,
- Maintain total vegetative canopy cover at 20 percent.

Discussion:

Data from the loamy swale key area (BH-7) shows that the objectives are being achieved with perennial grasses at 13 percent composition and vegetative cover at 36 percent (Table 8).

F.10.2.1.3. Limy Fan Ecological Site:

Conclusion:

Based upon the preponderance of evidence, the limy fan ecological site is meeting Standard 3. Two sites are achieving both objectives and one site is not achieving the objectives. Utilization levels on key species at Key Area BH-2 were slight to light (less than 40 percent) in 2008, and use-pattern mapping was at moderate use. This does not indicate that current livestock management is the causal factor on the sites that are not achieving the objectives.

Objectives:

- Maintain vegetative canopy cover at 7 percent,
- Maintain ratany-bursage shrub group at 9 percent of total composition.

Discussion:

Data from Key Area BH-3 (11 percent) and PBI study site 58 (8 percent) indicate that both achieve the canopy cover objective. Key area BH-2 is close to achieving the objective at 5 percent canopy cover. Key area BH-3 and PBI study site 58 achieve the objective of 9 percent composition for the ratany-bursage shrub group. BH-2 does not achieve the objective at 6 percent (see Table F.9, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Big Horn Allotment" (p. 1113)).

F.10.2.1.4. Limy Upland Deep Ecological Site:

Conclusion:

Based upon the preponderance of evidence, *the limy upland deep ecological site is not achieving Standard 3*. Only two of the five sites are achieving both objectives, and three sites are achieving only one of two objectives. Long-term trend data are not available to ascertain whether significant progress towards achievement is being made. Use-pattern mapping indicates 0-5 percent use on key species at PBI sites 59 and 60 (see Map F-5) and *indicate that current livestock management is not the causal factor* on the sites that are not achieving the objectives.

Objectives:

- Maintain vegetative canopy cover at 10 percent,
- Maintain ratany-bursage shrub group at 12 percent of total composition.

Discussion:

Key area BH-5 and PBI study site 61 achieve the canopy cover objective. Key areas BH-13 and PBI sites 59 and 60 do not achieve the canopy cover objective. There were no indications of accelerated erosion at any of the sites.

Key areas BH-5 and BH-13 and all three PBI study plots achieve the objective of 12 percent composition in the ratany-bursage shrub group (see Table 8).

F.10.2.1.5. Limy Upland Ecological Site:

Conclusion:

Based upon the preponderance of evidence, *the limy upland ecological site is achieving Standard 3*. Both sites achieve all three objectives. Use-pattern mapping indicates negligible livestock utilization.

Objectives:

- Maintain total vegetative canopy cover at 12 percent,
- Maintain composition of palatable browse species at 5 percent,
- Maintain recruitment of saguaros at the current rate of 0.96 young saguaros per 12.5 meter radius plot.

Discussion:

Key areas BH-9 and BH-12 are achieving the canopy cover objective at 12 percent and 14 percent.

Both key areas achieve the palatable browse composition objective at 5 percent and 4 percent.

Results of the PBI saguaro study indicate recruitment of young saguaros is occurring at 0.96 stems per plot which achieves the objective (see Pacific Biodiversity Institute Saguaro Study (p.)). Young saguaros are defined as less than 1 meter tall and are referred to as short stems in Attachment 5.

F.10.2.1.6. Sandy Loam Deep Ecological Site:

Conclusion:

Standard 3 is being achieved for the sandy loam deep ecological site. The key area achieves both objectives. Use-pattern mapping indicates light utilization and key area utilization was at light use for two key species and moderate (42 percent) use for one key species.

Objectives:

- Maintain total vegetative canopy cover at 15 percent,
- Maintain composition of palatable browse at 16 percent.

Discussion:

Data from the sandy loam deep (BH-6) key area shows that the site is meeting the objective for palatable browse at 16 percent composition and achieves the canopy cover objective at 13 percent (see Table F.9, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Big Horn Allotment" (p. 1113)). Utilization levels in 2008 on key species at Key Area BH-6 were light on big galleta (26 percent) and white bursage (27 percent) and moderate on burrobrush (42 percent). The wilderness area objective of 20 percent was exceeded (see Table F.7, "Utilization Estimates on Key Areas Within the Big Horn and Conley Allotments" (p. 1106).).

F.10.2.1.7. Granitic Hills Ecological Site:

Conclusion:

Based upon the preponderance of evidence, the granitic hills ecological site is achieving Standard 3. Nine sites achieve both objectives and one site is achieving one objective. Use-pattern mapping indicates slight livestock utilization in the area around PBI site 63.

Objectives:

- Maintain vegetative canopy cover at 16 percent,
- Maintain recruitment of saguaros at the current rate of 0.83 young saguaros per 12.5 meter radius plot.

Discussion:

Eight of nine PBI study sites (63, 181, 183, 194, 196, 198, 199, 200 and 201) achieve the vegetative canopy cover objective. PBI site 63 does not achieve the objective at only 9.5 percent canopy cover, but there were no signs of accelerated erosion present. The ten granitic hills sites do not have DPC objectives for vegetative composition due to the fact that the majority of this ecological site is inaccessible to livestock.

Results of the PBI saguaro study indicate recruitment of young saguaros is occurring at 0.83 stems per plot, which is sufficient to maintain the population of saguaros (see Table F.23, ": Saguaro Cover & Stem Count Information for the Palo Verde-Mixed Cacti Community (PBI 2004)" (p. 1179)). Young saguaros are defined as less than 1 meter tall and are referred to as short stems in Pacific Biodiversity Institute Saguaro Study (p.).

F.10.2.2. Summary of Ecological Site Analysis

Conclusion:

Based upon the preponderance of evidence, *the majority of the Big Horn allotment is achieving Standard 3.* One ecological site, the limy upland deep ecological site, does not achieve Standard 3 and represents 29,384 acres of the 92,204 acres within the allotment.

Rationale:

The upland land health was assessed for biotic integrity at four key areas representing the major ecological sites within the allotment. This assessment indicates that the plant communities are functioning close to expected for the site (see Table F.17, "Departure from Ecological Site Description" (p. 1159).

Use-pattern mapping results (see Map F-5) indicate a general pattern of moderate (41 percent to 60 percent) utilization in the areas immediately surrounding some of the livestock waters. As distance from livestock waters increases, the use pattern zone moves to light (21 percent to 40 percent) and slight (6 to 20 percent) use. The majority of the Big Horn allotment within the SDNM falls within the slight use category.

Utilization at key areas and the results of use pattern mapping (short-term monitoring data) indicate that *current livestock management is a significant causal factor on 2,974 acres within the limy upland deep ecological site, which is not achieving the Standard 3 objectives* for canopy cover.

Table F.9. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Big Horn Allotment

Meets St. 3*	Ecological Site	Key Area/ PBI Site	Canopy Cover Objective	Actual Canopy Cover	Composi-tion Objective	Actual Composition	Achieved Canopy Cover**	Achieved Composi-tion**
Y	Sandy wash	BH-1	34%	36%	14%	22%	Yes	Yes
		BH-4	34%	48%	14%	20%	Yes	Yes
		BH-8	40%	41%	14%	12	Yes	Yes
		190	34%	32%	14%	55%	Yes	Yes
		192	34%	31%	14%	18%	Yes	Yes
		202	34%	45.5%	14%	25.5%	Yes	Yes
		203	34%	43%	14%	19.5%	Yes	Yes
Y	Loamy swale	BH-7	20%	36%	10%	13%	Yes	Yes
Y	Limy fan	BH-2	7%	5%	9%	6%	No	No
		BH-3	7%	11%	9%	20%	Yes	Yes
		58	7%	8.25%	9%	12%	Yes	Yes
N	Limy upland deep	BH-5	10%	14%	12%	26%	Yes	Yes
		BH-13	10%	6%	12%	17%	No	Yes
		59	10%	7.25%	12%	13%	No	Yes
		60	10%	5.5%	12%	36%	No	Yes
		61	10%	15.5%	12%	14.5%	Yes	Yes
Y	Limy upland	BH-9	12%	14%	5%	4%	Yes	Yes
		BH-12	12%	12%	5%	5%	Yes	Yes
Y	Sandy loam deep	BH-6	15%	13%	16%	16%	Yes	Yes

Meets St. 3*	Ecological Site	Key Area/ PBI Site	Canopy Cover Objective	Actual Canopy Cover	Composi-tion Objective	Actual Composition	Achieved Canopy Cover**	Achieved Composi-tion**
Y	Granitic hills	63	16%	9.5%	n/a	n/a	No	n/a
		181	16%	9.5%	n/a	n/a	Yes	n/a
		183	16%	29.5%	n/a	n/a	Yes	n/a
		194	16%	28.5%	n/a	n/a	Yes	n/a
		196	16%	30%	n/a	n/a	Yes	n/a
		198	16%	43.5%	n/a	n/a	Yes	n/a
		199	16%	19%	n/a	n/a	Yes	n/a
		200	16%	24.5%	n/a	n/a	Yes	n/a
		201	16%	59%	n/a	n/a	Yes	n/a

*More than 50 percent of the key areas and PBI plots representing an ecological site had to be achieving all of the desired plant community objectives for the ecological site within an allotment to be considered achieving Standard 3. This represents a preponderance of evidence approach to ascertain whether Standard 3 was achieved. This approach was used because a statistical approach was not feasible as the number of key areas and PBI plots on each ecological site were not adequate to statistically analyze each ecological site.

** Ecological site variability was considered when making the final determination of whether or not a site is achieving Standard 3 objectives. Rather than using the absolute value to determine achievement of the objective, if the canopy cover or the composition vegetative attributes measured were within approximately 80 percent of the attribute value, the site was considered achieving the objective.

F.11. Beloat Allotment

F.11.1. Land Health Standard 1 — Upland Sites

Conclusion:

Upland sites within the Beloat allotment are achieving Standard 1.

Objective:

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Rationale:

This finding is based upon the preponderance of evidence of the indicators used to determine attainment of Standard 1. The results of the assessment indicate a slight departure from the ecological site descriptions for one key area and slight to moderate departure for two key areas (see Table 18: Departure from Ecological Site Description). The majority of the key areas and PBI plots (16 of 18) had vegetative cover levels that are appropriate for the site and the qualitative assessments of the soil-related indicators (rills, flow patterns, pedestals, bare ground, gullies, litter movement, and soil compaction, etc.) did not indicate any signs of accelerated erosion. PBI cover data indicate that microbiotic crusts are at appropriate levels in relation to the BGR/Area A comparison area (see Table F.19, “Average Cover of Microbiotic Crusts (% by Plot)” (p. 1161)).

F.11.2. Land Health Standard 3 — Desired Resources Conditions

Objective:

Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

F.11.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites

F.11.2.1.1. Sandy Wash Ecological Site

Conclusion:

Based upon the preponderance of evidence, *the sandy wash ecological site is not achieving Standard 3*. Both sites achieve the canopy cover objectives; however, only one of two sites achieves the palatable browse objective. The results of use-pattern mapping were negligible to light use and therefore *indicate that current livestock management is not the causal factor* for the site that is not achieving the palatable browse objective.

Objectives:

- Maintain sandy washes that have 34 percent canopy cover,
- Maintain canopy cover at 40 percent for the potential CFPO sandy wash site (B-2),
- Maintain sandy washes at 14 percent composition of palatable browse species.

Discussion:

Key area B-4 meets the canopy cover objective at 41 percent. Key area B-2 achieves the CFPO canopy cover objective. All of the vegetative components which form a multi-layered structure are present for potential CFPO and other wildlife habitat. The tree layer is represented by blue palo verde and ironwood, the tall shrub layer is represented by catclaw acacia, desert hackberry, and wolfberry, and the low shrub layer is represented by big bursage, triangle-leaf bursage and bricklebush.

Key area B-4 achieves the palatable species objective (15 percent). B-2 does not achieve the composition objective at 8 percent (Table F.10, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Beloat Allotment" (p. 1118)).

F.11.2.1.2. Loamy Swale Ecological Site:

Conclusion:

Standard 3 is being achieved for the loamy swale ecological site.

Objectives:

- Maintain perennial grasses at 10 percent composition,
- Maintain total vegetative canopy cover at 20 percent.

Discussion:

Data from the loamy swale (B-5) key area indicates that the DPC objectives are being achieved with perennial grasses at 23 percent composition and vegetative cover at 79 percent (Table F.8, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – BGR/Area A" (p. 1108)).

F.11.2.1.3. Limy Fan Ecological Site:

Conclusion:

Based upon the preponderance of evidence the limy fan ecological site is not achieving *Standard 3*. Only four of the eight sites (Key Area B-8 and 7 PBI sites) achieve both DPC objectives. Use levels were negligible to slight (less than 20 percent) and indicate that *current livestock management is not the causal factor* for not achieving the objectives.

Objectives:

- Maintain vegetative canopy cover at 7 percent,
- Maintain ratany-bursage shrub group at 9 percent of total composition.

Discussion:

Data from Key area B-8 does not achieve the canopy cover objective (Table F.10, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Beloat Allotment" (p. 1118)). All seven PBI study plots (40-46) in the limy fan site achieve the canopy cover objective (Table 9). There were no signs of accelerated erosion on any sites.

Key area B-8 achieves the ratany-bursage composition objective and four of the seven PBI sites achieve the objective. PBI sites 40, 43, and 45 do not achieve the objective (Table 9).

F.11.2.1.4. Limy Upland Ecological Site:

Conclusion:

The limy upland ecological site is achieving Standard 3.

Objectives:

- Maintain total vegetative canopy cover at 12 percent,
- Maintain composition of palatable browse at 5 percent,
- Maintain recruitment of saguaros at the current rate of 0.96 young saguaros per 12.5 meter radius plot.

Discussion:

Key area B-9 is achieving the canopy cover objective at 13 percent and achieving the objective for composition of palatable browse at 16 percent composition (Table 9). Results of the PBI Saguaro Study indicate recruitment of young saguaros is occurring at 0.96 stems per plot. Young saguaros

are defined as less than 1 meter tall and are referred to as short stems in Pacific Biodiversity Institute Saguaro Study (p.).

F.11.2.1.5. Granitic Hills Ecological Site:

Conclusion:

Based upon the preponderance of evidence the granitic *hills ecological site is achieving Standard 3*. Five sites achieve both objectives. Key area B-1 is not achieving the canopy cover DPC objective.

Objectives:

- Maintain vegetative canopy cover at 16 percent,
- Maintain recruitment of saguaros at the current rate of 0.83 young saguaros per 12.5 meter radius plot.

Discussion:

Eight of nine PBI study sites (63, 181, 183, 194, 196, 198, 199, 200 and 201) achieve the vegetative canopy cover objective. PBI site 63 does not achieve the objective at only 9.5 percent canopy cover, but there were no signs of accelerated erosion present. The ten granitic hills sites do not have DPC objectives for vegetative composition because the majority of this ecological site is inaccessible to livestock.

Results of the PBI saguaro study indicate recruitment of young saguaros is occurring at 0.83 stems per plot, which is sufficient to maintain the population of saguaros. Young saguaros are defined as less than 1 meter tall and are referred to as short stems in Pacific Biodiversity Institute Saguaro Study (p.).

F.11.2.2. Summary of Ecological Site Analysis

Conclusion:

Based upon the preponderance of evidence, *the Beloat allotment is not fully achieving Standard 3*. The limy fan and sandy wash ecological sites, which comprise 17,969 acres out of 33,600 acres within the allotment, are not achieving Standard 3.

Rationale:

The upland land health was assessed for biotic integrity at three key areas that represents the major ecological sites within the allotment. This assessment indicates that the plant communities are functioning close to expected for the site (see Table F.17, “Departure from Ecological Site Description” (p. 1159)).

The results of use-pattern mapping (short-term monitoring data) indicate that *current livestock management is not a significant causal factor* for those sites that are not achieving Standard 3. Use-pattern mapping results for 2008 indicate a general pattern of slight (6 percent - 20 percent) and light (21 percent to 40 percent) use in the area surrounding one livestock water and negligible use (0 to 5 percent) around another. The majority of the Beloat Allotment within the SDNM falls within the slight use category. (See ???).

Table F.10. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Beloat Allotment

Meets St. 3*	Ecological Site	Key Area/ PBI Site	Canopy Cover Objective	Actual Canopy Cover	Composi- tion Objective	Actual Composition	Achieved Canopy Cover**	Achieved Composi- tion**
N	Sandy wash	B-2	40%	76%	14%	8%	Yes	No
		B-4	34%	41%	14%	15%	Yes	No
Y	Loamy swale	B-5	20%	79%	10%	23%	Yes	Yes
N	Limy fan	B-8	7%	4%	9%	9%	No	Yes
		40	7%	7%	9%	0%	Yes	No
		41	7%	11%	9%	9%	Yes	Yes
		42	7%	8%	9%	25%	Yes	Yes
		43	7%	7%	9%	0%	Yes	No
		44	7%	11%	9%	45%	Yes	Yes
		45	7%	8%	9%	3%	Yes	No
		46	7%	8.5%	9%	27%	Yes	Yes
Y	Limy upland	B-9	12%	13%	5%	16%	Yes	Yes
Y	Granitic hills	B-1	16%	8%	n/a	n/a	No	Yes
		48	16%	8%	n/a	n/a	No	Yes
		49	16%	46.5%	n/a	n/a	Yes	Yes
		50	16%	31%	n/a	n/a	Yes	Yes
		51	16%	37%	n/a	n/a	Yes	Yes
		52	16%	48%	n/a	n/a	Yes	Yes

*More than 50 percent of the key areas and PBI plots representing an ecological site had to be achieving all of the desired plant community objectives for the ecological site within an allotment to be considered achieving Standard 3. This represents a preponderance of evidence approach to ascertain whether Standard 3 was achieved. This approach was used because a statistical approach was not feasible as the number of key areas and PBI plots on each ecological site were not adequate to statistically analyze each ecological site.

** Ecological site variability was considered when making the final determination of whether or not a site is achieving Standard 3 objectives. Rather than using the absolute value to determine achievement of the objective, if the canopy cover or the composition vegetative attributes measured were within approximately 80 percent of the attribute value, the site was considered achieving the objective.

F.12. Conley Allotment

F.12.1. Land Health Standard 1 — Upland Sites

Objective:

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Conclusion:

Upland sites within the Conley allotment are achieving Standard 1.

Rationale:

This finding is based upon the preponderance of evidence of the indicators used to determine attainment of Standard 1. The majority of the key areas had vegetative cover levels that are appropriate for the site. Twelve of the sixteen sites achieve the canopy cover objectives. Soil/site stability and hydrologic function were evaluated at seven key areas to determine the departure from the site descriptions. The results of the assessment indicate at most a slight departure from the ecological site descriptions (see Table F.17, "Departure from Ecological Site Description" (p. 1159)) and the assessments of the soil-related indicators (rills, flow patterns, pedestals, bare ground, gullies, litter movement, and soil compaction, etc.) did not indicate signs of accelerated erosion.

The analysis indicates soil stability and hydrologic functions on the allotment are appropriate to prevent accelerated erosion, and that the watersheds are in properly functioning condition. Erosion has been documented in localized areas around two stock tanks. These are more erosive soils that have received heavy recreation use both on and off of the trails in addition to livestock use.

PBI cover data indicates that microbiotic crusts are at appropriate levels in relation to the BGR/Area A comparison area (see Table F.19, "Average Cover of Microbiotic Crusts (% by Plot)" (p. 1161)).

F.12.2. Land Health Standard 3 — Desired Resources Conditions

Objective:

Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

F.12.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites

F.12.2.1.1. Sandy Wash Ecological Site

Conclusion:

Based upon the preponderance of evidence, *the sandy wash ecological site is not achieving Standard 3*. Only one of four key areas achieves both objectives.

Use-pattern mapping indicates that livestock use is light at Key Areas C-3 and C-7 and slight at C-1, and that utilization of key species at C-7 was light (see Table F.7, "Utilization Estimates on Key Areas Within the Big Horn and Conley Allotments" (p. 1106)), which indicate that *current livestock management is not the causal factor* for non-achievement of Standard 3.

Objectives:

- Maintain sandy washes that have 34 percent canopy cover,
- Maintain sandy washes that have 14 percent composition of palatable browse species.

Discussion:

All key areas achieve the canopy cover objective. Key Area C-7 achieves the palatable browse composition objective at 35 percent. Key Areas C-1 and C-3 and PBI Site 4 do not achieve the palatable browse composition objective at 9 percent, 2 percent, and 7 percent, respectively (see Table F.11, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment " (p. 1122)).

F.12.2.1.1.1. Loamy Swale Ecological Site:

Conclusion:

Land Health Standard 3 is being achieved for the loamy swale ecological site.

Objectives:

- Maintain perennial grasses at 10 percent composition,
- Maintain total vegetative canopy cover at 20 percent.

Discussion:

Data from the loamy swale (C-9) key area shows that the objectives are being achieved with perennial grasses at 15 percent composition and canopy cover at 47 percent (Table F.11, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment " (p. 1122)).

F.12.2.1.1.2. Limy Fan Ecological Site:

Conclusion:

Based upon the preponderance of evidence, the *limy fan ecological site is not achieving Standard 3*. The majority of the key areas and PBI sites do not achieve both objectives. Use levels were slight (less than 20 percent) to light and *indicates current livestock management is not the causal factor* for not achieving the objectives.

Objectives:

- Maintain vegetative canopy cover at 7 percent,
- Maintain ratany-bursage shrub group at 9 percent of total composition.

Discussion:

Key areas C-4 and C-2 and 2 – plots 3 and 5 of the four PBI sites, plots 3, 5, 16, and 29 – achieve the canopy cover objective. PBI plots 16 and 29 do not achieve the objective at 5 percent and 3 percent, respectively.

Only PBI plot 5 achieves the objective to have the ratany-bursage shrub group at 9 percent of total composition. (Table 10).

F.12.2.1.1.3. Limy Upland Deep Ecological Site:

Conclusion:

Based upon the preponderance of evidence, *the limy upland deep ecological site is not achieving Standard 3*. PBI site 6 achieves only one of two objectives. Long-term trend data are not available to ascertain whether significant progress towards achievement is being made. Use-pattern mapping indicates light use on key species (see ???) and indicates that *current livestock management is not the causal factor* for not achieving the objectives.

Objectives:

- Maintain vegetative canopy cover at 10 percent,
- Maintain ratany-bursage shrub group at 12 percent of total composition.

Discussion:

PBI site 6 achieves the canopy cover objective at 8 percent; however, it does not achieve the composition objective at 3 percent (Table F.11, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment " (p. 1122)).

F.12.2.1.1.4. Limy Upland Ecological Site:

Conclusion:

Based upon the preponderance of evidence, *the limy upland ecological site is not achieving Standard 3.* One key area is achieving all three objectives and one key area is achieving two of three objectives. Use-pattern mapping at Key Area C-5 and C-10 was at slight use and utilization on key species at C-5 was at light and slight use, which indicates *current livestock grazing is the causal factor* for non-achievement of the objective.

Objectives:

- Maintain total vegetative canopy cover at 12 percent,
- Maintain composition of palatable browse at 5 percent,
- Maintain recruitment of saguaros at the current rate of 0.96 young saguaros per 12.5 meter radius plot.

Discussion:

Key area C-10 is achieving the canopy cover objective at 24 percent, but Key Area C-5 is not achieving the objective at 8 percent. Key areas C-5 and C-10 are achieving the palatable browse composition objective at 16 percent and 12 percent, respectively (Table F.11, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment " (p. 1122)).

Results of the PBI saguaro study indicate recruitment of young saguaros is occurring at 0.96 stems per plot, which achieves the objective. Young saguaros are defined as less than 1 meter tall and are referred to as short stems in Pacific Biodiversity Institute Saguaro Study (p.).

F.12.2.2. Summary of Ecological Site Analysis

Conclusion:

Based upon the preponderance of evidence, *most of the Conley allotment is not achieving Standard 3*. The majority of the ecological sites, which comprise approximately 73,278 acres out of approximately 77,708 acres within the allotment that are accessed by livestock, are not achieving Standard 3.

Although Standard 3 is not being achieved throughout the entire allotment, the upland land health assessing biotic integrity at seven key areas indicates that the plant communities are functioning close to expected for the site (see Table F.17, "Departure from Ecological Site Description" (p. 1159)). There were no indications of accelerated erosion at any of the key areas.

Utilization at key areas and the results of use-pattern mapping (short-term monitoring data) indicate that *current livestock management is a significant causal factor for not achieving Standard 3* on a total of 5,517 acres.

Approximately 5,006 acres are within the limy fan ecological site, 320 acres are within the limy upland ecological site, 191 acres are within the granitic hills ecological site, and 10 acres are within the sandy wash ecological site (these 10 acres are not accounted for in the total acres because this ecological site is a linear feature within the upland ecological sites). These data were collected during a year with full permitted use and additional ephemeral livestock authorizations. Several utilization transects were run in addition to those located at the key areas for the purposes of this evaluation (see Table 6: Utilization Estimates on Key Areas Within the Big Horn and Conley Allotments). Use levels at these nine additional sites were rated at slight to light use with the exception of white ratany utilization at two sites (CU-4, CU-10), which were in the moderate level. Sites CU-8 and CU-9 indicated light use; however, this exceeded the utilization level set for wilderness areas.

Use-pattern mapping results indicate a general pattern of light (21 to 40 percent) to slight use (6 to 20 percent) in the areas surrounding most livestock waters with small areas of heavier (61 to 80 percent) use around two waters. One small area was mapped as severe use along a road used by livestock to travel between water sources. The majority of the allotment falls within the slight and light use categories. (See Map F-5)

Table F.11. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment

Meets St. 3*	Ecological Site	Key Area/ PBI Site	Canopy Cover Objective	Actual Canopy Cover	Composition Objective	Actual Composi-tion	Achieved Canopy Cover**	Achieved Composi-tion**
N	Sandy wash	C-1	34%	71%	14%	9%	Yes	No
		C-3	34%	68%	14%	2%	Yes	No
		4	34%	55%	14%	7%	Yes	No
		C-7	34%	31%	14%	35%	Yes	Yes
Y	Loamy swale	C-9	20%	47%	10%	15%	Yes	Yes
N	Limy fan	C-2	7%	6%	9%	0%	Yes	No
		C-4	7%	8%	9%	7%	Yes	No
		3	7%	17%	9%	0%	Yes	No
		5	7%	9.5%	9%	31%	Yes	Yes
		16	7%	5%	9%	0%	No	No
		29	7%	3%	9%	0%	No	No
N	Limy upland deep	6	10%	8%	12%	3%	Yes	No

N	Limy upland	C-5	12%	8%	5%	16%	No	Yes
		C-10	12%	24%	5%	12%	Yes	Yes
N	Granitic hills	7	16%	9%	n/a	n/a	No	n/a
		187	16%	18%	n/a	n/a	Yes	n/a

*More than 50 percent of the key areas and PBI plots representing an ecological site had to be achieving all of the desired plant community objectives for the ecological site within an allotment to be considered achieving Standard 3. This represents a preponderance of evidence approach to ascertain whether Standard 3 was achieved. This approach was used because a statistical approach was not feasible as the number of key areas and PBI plots on each ecological site were not adequate to statistically analyze each ecological site.

** Ecological site variability was considered when making the final determination whether or not a site is achieving Standard 3 objectives. Rather than using the absolute value to determine achievement of the objective, if the canopy cover or the composition vegetative attributes measured was within approximately 80 percent of the attribute value, the site was considered achieving the objective.

F.13. Hazen Allotment

F.13.1. Land Health Standard 1 — Upland Sites

Conclusion:

Upland sites within the Hazen Allotment achieve Standard 1.

Objective:

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Rationale:

This finding is based upon the preponderance of evidence of the indicators used to determine attainment of Standard 1. The land health assessments from five key areas indicate two sites with a slight departure from the ecological site descriptions and three sites at slight to moderate departure (see Table F.17, “Departure from Ecological Site Description” (p. 1159)).

Nine of the eleven sites (key areas and PBI sites) had canopy cover levels that are appropriate for the ecological site and soil-related indicators (rills, flow patterns, pedestals, bare ground, gullies, litter movement, and soil compaction, etc.) that did not indicate signs of accelerated erosion. PBI cover data indicated that microbiotic crusts are at appropriate levels in relation to the BGR/Area A comparison area (see Table F.19, “Average Cover of Microbiotic Crusts (% by Plot)” (p. 1161)).

F.13.2. Land Health Standard 3 — Desired Resources Conditions

Objective:

Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

F.13.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites

F.13.2.1.1. Sandy Wash Ecological Site

Conclusion:

Based upon the preponderance of evidence, the sandy wash ecological site is not achieving Standard 3. Only two of four key areas and PBI sites achieve both objectives. It is more likely than not that the failure of this site to meet Standard 3 is not due to existing grazing-management practices or levels of grazing use, as livestock use levels were at negligible (0 to 5 percent) and slight (6 to 20 percent) levels.

Objectives:

- Maintain sandy washes at 34 percent canopy cover,
- Maintain canopy cover at 40 percent for the potential CFPO sandy wash site (Key Area H-7),
- Maintain sandy washes at 14 percent composition of palatable browse.

Discussion:

Key Area H-7 achieves the CFPO canopy cover objective at 62 percent. PBI plot 228 achieves the canopy cover objective at 39 percent vegetative cover. Key area H-4 and PBI plot 230 do not achieve the canopy cover objective at 20 and 25 percent, respectively (Table F.12, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment" (p. 1126)). PBI plot 230 (20 percent), PBI plot 228 (11.5 percent) and Key Area H-4 (38 percent) achieve the palatable browse composition objective (Table 11). Composition data were not collected at Key Area H-7.

F.13.2.1.2. Limy Fan Ecological Site:

Conclusion:

Based upon the preponderance of evidence, *the limy fan ecological site is not achieving Standard 3*. Key area H-1 achieves both objectives; however, the two PBI sites are not achieving both objectives. It is more likely than not that the failure of this site to meet Standard 3 is not due to existing grazing-management practices or levels of grazing use, as livestock use levels were at negligible (0 to 5 percent) and slight (6 to 20 percent) levels.

Objectives:

- Maintain vegetative canopy cover at 7 percent,
- Maintain ratany-bursage shrub group at 9 percent of total composition.

Discussion:

Key Area H-1 and PBI plots 227 and 229 achieve the canopy cover objective. Key Area H-1 achieves the ratany-bursage composition objective at 13 percent. PBI plots 227 (4 percent) and 229 (0 percent) do not achieve the objective (Table F.12, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment" (p. 1126)).

F.13.2.1.3. Limy Upland Deep Ecological Site:

Conclusion:

Based upon the preponderance of evidence, *the limy upland deep ecological site is achieving Standard 3*. Both key areas achieve both objectives.

Objectives:

- Maintain vegetative canopy cover at 10 percent,
- Maintain ratany-bursage shrub group at 12 percent of total composition.

Discussion:

Key areas H-6 and H-2 achieve the canopy cover objective at 12 percent and 8 percent. Both key areas achieve the ratany-bursage composition objective with more than 12 percent composition (See Table F.12, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment" (p. 1126)).

F.13.2.1.4. Granitic Hills Ecological Site:

Conclusion:

Based upon the preponderance of evidence, *the granitic hills ecological site is achieving Standard 3*. PBI site 231 and Key Area H-5 achieve both objectives.

Objectives:

- Maintain vegetative canopy cover at 16 percent,
- Maintain recruitment of saguaros at the current rate of 0.83 young saguaros per 12.5 meter radius plot.

Discussion:

PBI plot 231 achieves the objective with 21 percent canopy cover. Key Area H-5 also achieves the canopy cover objective at 12 percent, as this location has a lower potential based on lower precipitation (6-8 inches) than the reference area (See Table F.12, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment" (p. 1126)).

Results of the PBI saguaro study indicate recruitment of young saguaros is occurring at 0.83 stems per plot, which is sufficient to maintain the population of saguaros. Young saguaros are defined as less than 1 meter tall and are referred to as short stems in Attachment 5 – Pacific Biodiversity Institute Saguaro Study.

F.13.2.2. Summary of Ecological Site Analysis

Based upon the preponderance of evidence, *the majority of the Hazen allotment is achieving Standard 3*. The sandy wash and limy fan ecological sites, which comprise approximately 5,699 acres out of approximately 31,926 acres within the allotment that are accessed by livestock, are not achieving Standard 3. It is more likely than not that the failure of these sites to meet Standard 3 is not due to existing grazing-management practices or levels of grazing use, as livestock use levels were at negligible (0 to 5 percent) and slight (6 to 20 percent) levels. The remaining 26,227 acres are achieving Standard 3.

The upland land health was assessed at five key areas representing the major ecological sites within the allotment. The biotic integrity attribute was evaluated at these sites to determine the departure from the ecological site descriptions. Two of the five key areas were rated at none to slight, and three were rated at slight to moderate (see Table 11). This would indicate that the plant communities are functioning close to expected for the site and that biotic integrity on the allotment is appropriate.

Use-pattern mapping was only collected near the two wildlife waters located within the allotment. One area received slight (6 to 20 percent) use, and the other area received negligible use (0 to 5 percent) use. (See Map F-5) The utilization at both of these areas was from wildlife use as livestock have not been on this allotment for several years.

Table F.12. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Hazen Allotment

Meets St. 3**	Ecological Site	Key Area/ PBI Site	Canopy Cover Objective	Actual Canopy Cover	Composition Objective	Actual Composition	Achieved Canopy Cover***	Achieved Composi-tion***
N	Sandy wash	H-4	34%	20%	14%	38%	No	Yes
		H-7	40%	62%	n/a	n/a	Yes	n/a
		228	34%	39%	14%	11.5%	Yes	Yes
		230	34%	25%	14%	20	No	Yes
N	Limy fan	H-1	7%	7%	9%	13%	Yes	Yes
		227	7%	26%	9%	4%	Yes	No
		229	7%	8%	9%	0%	Yes	No
Y	Limy upland deep	H-2	10%	8%	12%	15%	Yes	Yes
		H-6	10%	12%	12%	21%	Yes	Yes
Y	Granitic hills	H-5*	16%	12%	n/a	n/a	Yes	n/a
		231	16%	21%	n/a	n/a	Yes	n/a

*Key area H-5 lies within a lower precipitation zone of 6 to 8 inches precipitation per year, compared with the reference area site that lies within a precipitation zone of 8 to 10 inches precipitation per year. Because of the lesser precipitation, Key Area H-5 has a lower potential and greater variability in canopy cover produced. The criterion for achieving an objective was relaxed to accept a lesser threshold in this case and it was determined that 12 percent canopy cover was achieving the canopy cover objective.

**More than 50 percent of the key areas and PBI plots representing an ecological site had to be achieving all of the desired plant community objectives for the ecological site within an allotment to be considered achieving Standard 3. This represents a preponderance of evidence approach to ascertain whether Standard 3 was achieved. This approach was used because a statistical approach was not feasible as the number of key areas and PBI plots on each ecological site were not adequate to statistically analyze each ecological site.

*** Ecological site variability was considered when making the final determination whether or not a site is achieving Standard 3 objectives. Rather than using the absolute value to determine achievement of the objective, if the canopy cover or the composition vegetative attributes measured was within approximately 80 percent of the attribute value, the site was considered achieving the objective.

F.14. Lower Vekol Allotment

F.14.1. Land Health Standard 1 — Upland Sites

Conclusion:

Upland sites within the Lower Vekol allotment achieve Standard 1.

Objective:

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Rationale:

This finding is based upon the preponderance of evidence of the indicators used to determine attainment of Standard 1. The LHE at three key areas indicates all three sites had a slight departure from the ecological site descriptions (see Table F.17, "Departure from Ecological Site Description" (p. 1159)). All key areas and PBI plots had canopy cover levels that are appropriate for the site and the assessment of the soil-related indicators (rills, flow patterns, pedestals, bare ground, gullies, litter movement, and soil compaction, etc.) did not indicate signs of accelerated erosion.

F.14.2. Land Health Standard 3 — Desired Resources Conditions

Objective:

Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

F.14.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites

F.14.2.1.1. Sandy Wash Ecological Site

Conclusion:

The sandy wash ecological site is not achieving Standard 3. Key area LV-3 achieved only one of two objectives for the ecological site. Use- pattern mapping at the key area was at light use, indicating *current livestock grazing may not be the causal factor for non-achievement of the standard.*

Objectives:

- Maintain sandy washes that have 34 percent canopy cover,
- Maintain sandy washes that have 14 percent composition of palatable browse species.

Discussion:

Key area LV-3 achieves the canopy cover objective at 60 percent. The key area does not achieve the palatable browse objective at 6 percent (Table F.13, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Lower Vekol Allotment" (p. 1130)), resulting in not achieving Standard 3 on 2 miles (7 acres; 11 percent) of the desert wash community.

F.14.2.1.2. Loamy Swale Ecological Site:

Conclusion:

Land Health Standard 3 is being achieved for the loamy swale ecological site.

Objectives:

- Maintain perennial grasses at 10 percent composition,
- Maintain total vegetative canopy cover at 20 percent.

Discussion:

Data from the loamy swale (LV-1) key area shows that both objectives are being achieved with perennial grasses at 46 percent composition and canopy cover at 69 percent (Table 12).

F.14.2.1.3. Limy Upland Deep Ecological Site:

Conclusion:

The limy upland deep ecological site is achieving Standard 3.

Objectives:

- Maintain vegetative canopy cover at 10 percent,
- Maintain ratany-bursage shrub group at 12 percent of total composition.

Discussion:

Key area LV-2 has 19 percent canopy cover which achieves the objective. Composition of the ratany/bursage group exceeds 12 percent; therefore achieving the objective (Table 12).

F.14.2.1.4. Limy Upland Ecological Site:

Conclusion:

The limy upland ecological site is not achieving Standard 3. The key area achieves two of three objectives and therefore does not achieve Standard 3. Use-pattern mapping indicated light use at the key area; therefore current *livestock grazing is not the causal factor* for non-achievement of the standard.

Objectives:

- Maintain total vegetative canopy cover at 12 percent,
- Maintain composition of palatable browse at 5 percent,

- Maintain recruitment of saguaros at the current rate of 0.96 young saguaros per 12.5 meter radius plot.

Discussion:

Key area LV-4 has 1 percent composition of palatable browse, which does not achieve the objective of 5 percent (Table F.13, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Lower Vekol Allotment" (p. 1130))

Results of the PBI saguaro study indicate recruitment of young saguaros is occurring at 0.96 stems per plot, which achieves the objective. Young saguaros are defined as less than 1 meter tall and are referred to as short stems in Attachment 5 – Pacific Biodiversity Institute Saguaro Study.

F.14.2.1.5. Granitic Hills Ecological Site:

Conclusion:

The granitic hills ecological site is achieving Standard 3.

Objectives:

- Maintain vegetative canopy cover at 16 percent,
- Maintain recruitment of saguaros at the current rate of 0.83 young saguaros per 12.5 meter radius plot.

Discussion:

All six PBI plots (185, 204-207 and 209) in the granitic hills site have canopy cover achieving or exceeding the objective of 16 percent (see Table 12).

Results of the PBI saguaro study indicate recruitment of young saguaros is occurring at 0.83 stems per plot, which is sufficient to maintain the population of saguaros. Young saguaros are defined as less than 1 meter tall and are referred to as short stems in Pacific Biodiversity Institute Saguaro Study (p.).

F.14.2.2. Summary of Ecological Site Analysis

Based upon the preponderance of evidence, the Lower Vekol allotment is achieving Standard 3. The sandy wash and limy upland ecological sites are not achieving Standard 3, but they represent only 583 of the 15,409 acres.

The biotic integrity attribute was evaluated to determine the departure from the ecological site descriptions. Two of the key areas were rated at none to slight, and one was rated at slight to moderate, indicating that the plant communities are functioning close to what is expected for the site.

Use-pattern mapping results indicate light (21 to 40 percent) to slight use (6 to 20 percent) within the majority of the allotment. One area of heavy (61 to 80 percent) use occurred around one livestock water, and an area of moderate (41 to 60 percent) use occurred in close proximity to another livestock water. (See Map F-5) Utilization data indicate it is more likely than not that

existing grazing management practices or levels of grazing use are factors in failing to achieve Standard 3 on 2 miles (7 acres; 11 percent) of the desert wash community.

Table F.13. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Lower Vekol Allotment

Meets St. 3*	Ecological Site	Key Area/ PBI Site	Canopy Cover Objective	Actual Canopy Cover	Composition Objective	Actual Composition	Achieved Canopy Cover**	Achieved Composi-tion**
N	Sandy wash	LV-3	34%	60%	14%	6%	Yes	No
Y	Loamy swale	LV-1	20%	69%	10%	46%	Yes	Yes
Y	Limy upland deep	LV-2	10%	19%	12%	25%	Yes	Yes
N	Limy upland	LV-4	12%	10%	5%	1%	Yes	No
Y	Granitic hills	185	16%	48%	n/a	n/a	Yes	
		204	16%	38%	n/a	n/a	Yes	
		205	16%	81%	n/a	n/a	Yes	
		206	16%	40%	n/a	n/a	Yes	
		207	16%	41%	n/a	n/a	Yes	
		209	16%	70%	n/a	n/a	Yes	

*More than 50 percent of the key areas and PBI plots representing an ecological site had to be achieving all of the desired plant community objectives for the ecological site within an allotment to be considered achieving Standard 3. This represents a preponderance of evidence approach to ascertain whether Standard 3 was achieved. This approach was used because a statistical approach was not feasible as the number of key areas and PBI plots on each ecological site were not adequate to statistically analyze each ecological site.

**Ecological site variability was considered when making the final determination whether or not a site is achieving Standard 3 objectives. Rather than using the absolute value to determine achievement of the objective, if the canopy cover or the composition vegetative attributes measured was within approximately 80 percent of the attribute value, the site was considered achieving the objective.

F.15. Arnold Allotment

F.15.1. Land Health Standard 1 — Upland Sites

Conclusion:

Upland sites within the Arnold Allotment are achieving Standard 1.

Objective:

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Rationale:

This finding is based upon the preponderance of evidence of the indicators used to determine attainment of Standard 1. The LHE from Key Area A-4 indicates only a slight departure from the ecological site description (see Table F.17, “Departure from Ecological Site Description” (p. 1159)). Although the key area did not achieve the canopy cover DPC objective, there were no signs of accelerated erosion based on the assessment of the soil-related indicators (rills, flow patterns, pedestals, bare ground, gullies, litter movement, and soil compaction, etc.).

Soil and site stability and hydrologic function are appropriate to prevent accelerated erosion and the watershed is properly functioning.

F.15.2. Land Health Standard 3 — Desired Resources Conditions

Objective:

Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

F.15.2.1. Analysis of Desired Plant Community Objectives by Key Areas and PBI Sites

F.15.2.1.1. Limy Fan Ecological Site:

Conclusion:

The limy fan ecological site is not achieving Standard 3. The composition objective is being achieved; however, the canopy cover objective is not. Use pattern mapping results indicate slight use within the SDNM indicating *current livestock grazing is likely not the causal factor* for non-achievement.

Objectives:

- Maintain vegetative canopy cover at 7 percent,
- Maintain ratany-bursage shrub group at 9 percent of total composition.

Discussion:

Key area A-4 does not achieve the canopy cover objective at 1 percent canopy cover (Table F.14, "Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Arnold Allotment" (p. 1132)). The key area achieves the ratany-bursage composition objective at 13 percent (Table 13).

F.15.2.2. Summary of Ecological Site Analysis

There is one key area (A-4) located within the SDNM on the Arnold Allotment. The Arnold Allotment comprises only a minor percentage (1 percent) of acres (1,609) within the SDNM. The key area does not achieve Standard 3 due to non-achievement of the canopy cover objective.

There were no PBI plots located within the Arnold Allotment.

The biotic integrity attribute was evaluated through the LHE to determine the departure from the ecological site; the key area was rated at none to slight (see Table F.17, "Departure from Ecological Site Description" (p. 1159)).

Use pattern mapping results indicate slight use (6 to 20 percent) in the allotment (see Map F-5) within the SDNM indicating *current livestock grazing is not likely the causal factor* for non-achievement of Standard 3.

Table F.14. Attainment of Objectives by Key Area/Pacific Biodiversity Institute Site – Arnold Allotment

Meets St. 3*	Ecological Site	Key Area/ PBI Site	Canopy Cover Objective	Actual Canopy Cover	Composition Objective	Actual Composition	Achieved Canopy Cover**	Achieved Composi-tion**
N	Limy fan	A-4	7%	1%	9%	13%	No	Yes

*More than 50 percent of the key areas and PBI plots representing an ecological site had to be achieving all of the desired plant community objectives for the ecological site within an allotment to be considered achieving Standard 3. This represents a preponderance of evidence approach to ascertain whether Standard 3 was achieved. This approach was used because a statistical approach was not feasible as the number of key areas and PBI plots on each ecological site were not adequate to statistically analyze each ecological site.

** Ecological site variability was considered when making the final determination whether or not a site is achieving Standard 3 objectives. Rather than using the absolute value to determine achievement of the objective, if the canopy cover or the composition vegetative attributes measured was within approximately 80 percent of the attribute value, the site was considered achieving the objective.

F.16. Management Recommendations

The recommended adjustments to permitted livestock use and management practices will allow for continued achievement and significant progress towards achievement of Land Health Standards. It will also ensure continued protection of the objects of the Monument. This includes adjustments to permitted use, terms and conditions, and management practices.

The following recommendations consider the paramount purpose of protecting the biological and cultural objects of the Monument.

Table F.15. SDNM Grazing Allotments Permitted Use* (AUMs)

Allotment Name	Current Permitted Use for Entire Allotment	Current Permitted Use Within LSFO	Current Permitted Use Within SDNM	Recommended Total Permitted Use**	Recommended Permitted Use Within SDNM
Big Horn (95% within SDNM)	2,960*	148	2,812	2,184	2,031
Beloat (26% within SDNM)	2,988	2,212	776	2,752	541
Conley (88% within SDNM)	3,867	464	3,403	2,036	1,572
Hazen (75% within SDNM)	1,181	295	886	708	531
Lower Vekol (71% within SDNM)	1,164	338	826	912	646
Arnold***	0	0	0	0	0
Total					5,321

* "Permitted use" means the forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and is expressed in AUMs.

** Two AUM values were calculated to provide the final recommended Active preference. The Lower Gila South RMP Resource Protection Alternative AUMs were prorated to the acres within the Monument for each allotment. The current permitted AUMs were prorated for the allotment acres outside of the Monument. The AUMs for the Big Horn allotment also reflect the reduction in permitted use due to the closure of the portion of the allotment south of I-8.

*** The Arnold Allotment will remain authorized as ephemeral only.

Rationale:

- Utilization data indicate that existing grazing management practices or levels of grazing use are factors in failing to achieve Standard 3 on 8,498 acres (within multiple polygons) of the 252,000 acres (3.4 percent) of the public lands north of I-8,
- The majority of desirable perennial forage is browse species and winter/spring annuals,
- Utilization limits (20 percent) established for the wilderness areas substantially limits forage available for current permitted AUMs established from LGSRMP,
- Reduces potential competition for forage with special status and other wildlife species,
- Supported by inventory and monitoring data,
- Diet study for livestock based on the University of Arizona's Big Horn Allotment Cattle Diet Study (1982).

It also is recommended that the period and level of use be adjusted to primarily fall-winter-spring, with reduced use levels during the summer months as follows:

- Approximately 65 percent of permitted use would occur from Oct. 1 to April 30, and 35 percent of permitted use would occur during the summer season, from May 1 through Sept. 30.

Rationale:

- Bimodal precipitation pattern with more consistent and widespread rainfall during winter and spring seasons,
- Majority of desirable perennial forage are winter browse species and winter/spring annuals,
- Reduces potential competition with wildlife during critical hot summer months,
- Reduces effects of concentrated livestock use around watering facilities,
- Reflects general pattern of current grazing management practices,
- Majority of forage production occurs during the winter/spring season (in above average precipitation years up to 2,000 lbs. + / acre),
- Supported by the University of Arizona's Big Horn Allotment Cattle Diet Study (1982).

Monitoring and inventory data indicate that the majority of desirable perennial forage constitutes important browse species. These browse species are utilized by both livestock and wildlife. Reducing permitted use and adjusting the majority of the grazing use to the fall, winter, and spring seasons will reduce potential competition with special status wildlife and other wildlife species during the critical summer months.

During years of above average rainfall, ephemeral vegetation (annual species) adds materially to the forage base (important browse species) for these allotments. Annual species germinate rapidly and mature early under the combination of favorable temperature and adequate moisture. However, they are short-lived, and field observations indicate they are available as forage for up to 16 weeks, depending on available moisture. Some annuals, such as Indian wheat (Plantago spp.), are used as forage even after curing, which is attributable to its high protein content. During

years with ephemeral vegetation, the ephemeral production (400 to 2,000 lbs per acre air dry weight) can be many times the yearly perennial production.

Ephemeral grazing will still be authorized for these grazing permits if the authorized officer determines that there will be available ephemeral forage. This determination must be based on a prediction of ephemeral forage production and be consistent with Guideline 3-5 "Grazing on designated ephemeral rangeland" (See Appendix L, *Guidelines for Grazing Administration* (p. 1253)).

F.17. References

Arizona Game and Fish Department and U.S. Fish and Wildlife Service. 2000. Cactus ferruginous pygmy-owl survey protocol.

Biological Opinion for the Lower Gila South Resource Management Land Use Plan (2-21-85F-0069)

Crother, B.I. 2000. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in our Understanding. Society for the Study of Amphibians and Reptiles, Herpetological Circular Number 29.

Krausman, Paul R.; Kuenzi, Amy J.; Etchberger, Richard C.; Rautenstrauch, Kurt R.; Ordway, Leonard L.; Hervert, John J. 1997. "Diets of Desert Mule Deer." *Journal of Range Management*, September.

Habitat Guidelines for Mule Deer, Southwest Deserts Ecoregion, 2006. Mule Deer Working Group.

The Nature Conservancy: Hall, J.A., P. Comer, A. Gondor, R. Marshall, and S. Weinstein. 2004. "Conservation Elements of and a Biodiversity Management Framework for the Barry M. Goldwater Range, Arizona." The Nature Conservancy of Arizona. 199 + ix p. + 15 unpaginated figures.

Pima County. 2001. "Priority Vulnerable Species: Analysis and Review of Species Proposed for Coverage by the Multi-Species Conservation Plan." Sonoran Desert Conservation Plan. Pima County Administrator's Office, Tucson, Arizona.

Robinett, Daniel G. 1997. Rangeland section of the Soil Survey of Gila Bend–Ajo Area, Arizona.

U.S. Department of Interior, Bureau of Land Management. 1996. Sampling Vegetation Attributes. Technical Reference 1734-4. National Applied Resource Sciences Center, Denver, Co: U.S. Department of Interior.

U.S. Department of Interior, Bureau of Land Management. 1996. Utilization Studies and Residual Measurements. Technical Reference 1734-3. National Applied Resource Sciences Center, Denver, Co: U.S. Department of Interior.

U.S. Fish and Wildlife Service. 1997. Endangered and threatened wildlife and plants; Determination of endangered status for the cactus ferruginous pygmy-owl in Arizona. Federal Register 62: 10730-10747.

U.S. Department of Interior, Bureau of Land Management. 2000. Interpreting Indicators of Rangeland Health Version 3. Technical Reference 1734-6. National Science and Technology Center Information and Communications Group, Denver, Co: U.S. Department of Interior.

University of Arizona. 1982. Big Horn Allotment cattle diet study.

Stebbins, R.C. 1985. A Field Guide to Western Reptiles and Amphibians. 2nd edition. Houghton Mifflin Company, Boston.

F.18. ATTACHMENT 1: Arizona Rangeland Health Standards and Guidelines for Grazing Administration

F.18.1. Introduction

The Department of the Interior's final rule for Grazing Administration, issued on February 22, 1995, and effective August 21, 1995, requires that Bureau of Land Management (BLM) State Directors develop State or regional standards and guidelines for grazing administration in consultation with BLM Resource Advisory Councils (RAC), other agencies and the public. The final rule provides that fallback standards and guidelines be implemented, if State standards and guidelines are not developed by February 12, 1997. Arizona Standards and Guidelines and the final rule apply to grazing administration on public lands as indicated by the following quotation from the Federal Register, Volume 60, Number 35, page 9955:

"The fundamentals of rangeland health, guiding principles for standards and the fallback standards, address ecological components that are affected by all uses of public rangelands, not just livestock grazing. However, the scope of this final rule, and therefore the fundamentals of rangeland health of USC 4180.1, and the standards and guidelines to be made effective under USC 4180.2, are limited to grazing administration."

Although the process of developing standards and guidelines applies to grazing administration, present rangeland health is the result of the interaction of many factors in addition to grazing by livestock. Other contributing factors may include, but are not limited to, past land uses, land use restrictions, recreation, wildlife, rights-of-way, wild horses and burros, mining, fire, weather, and insects and disease.

With the commitment of BLM to ecosystem and interdisciplinary resource management, the standards for rangeland health as developed in this current process will be incorporated into management goals and objectives. The standards and guidelines for rangeland health for grazing administration, however, are not the only considerations in resolving resource issues.

The following quotations from the Federal Register, Vol. 60, No. 35, page 9956, February 22, 1995, describe the purpose of standards and guidelines and their implementation:

1. "The guiding principles for standards and guidelines require that State or regional standards and guidelines address the basic components of healthy rangelands. The Department believes that by implementing grazing-related actions that are consistent with the fundamentals of CFR 4180.1 and the guiding principles of CFR 4180.2, the long-term health of public rangelands can be ensured.

2. "Standards and guidelines will be implemented through terms and conditions of grazing permits, leases, and other authorizations, grazing-related portions of activity plans (including allotment management plans), and through range improvement-related activities.

3. The Department anticipates that in most cases the standards and guidelines themselves will not be terms and conditions of various authorizations but that the terms and conditions will reflect the standards and guidelines.

4. The Department intends that assessments and corrective actions will be undertaken in priority order as determined by BLM.

5. "The Department will use a variety of data including monitoring records, assessments, and knowledge of the locale to assist in making the "significant progress" determination. It is anticipated that in many cases it will take numerous grazing seasons to determine direction and magnitude of trend. However, actions will be taken to establish significant progress toward conformance as soon as sufficient data are available to make informed changes in grazing practices."

F.18.2. Fundamentals & Definitions of Rangeland Health

The Grazing Administration Regulations, at 43 CFR 4180.1, Federal Register Vol. 60, No. 35, pg. 9970, direct that the authorized officer ensures that the following conditions of rangeland health exist:

(a) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

(c) Water quality complies with State water-quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives such as meeting wildlife needs.

(d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal proposed, Category 1 and 2 Federal candidate and other special status species.

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This committee defines rangeland health "as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." The committee also emphasizes "the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The committee also recommends that "The determination of whether a rangeland is healthy, at risk, or unhealthy

should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

Standards describe conditions necessary to encourage proper functioning of ecological processes on specific ecological sites. An ecological site is the logical and practical ecosystem unit upon which to base an interpretation of rangeland health. Ecological site is defined as "a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management" (Journal of Range Management, 48:279, 1995).

Ecological sites result from the interaction of climate, soils, and landform (slope, topographic position). The importance of this concept is that the "health" of different kinds of rangeland must be judged by standards specific to the potential of the ecological site. Acceptable erosion rates, water quality, productivity of plants and animals, and other features are different on each ecological site.

Since there is wide variation of ecological sites in Arizona, standards and guidelines covering these sites must be general. To make standards and guidelines too specific would reduce the ability of the BLM and interested publics to select specific objectives, monitoring strategies, and grazing permit terms and conditions appropriate to specific land forms.

Ecological sites have the potential to support several different plant communities. Existing communities are the result of the combination of historical and recent uses and natural events. Management actions may be used to modify plant communities on a site. The desired plant community for a site is defined as follows: "Of the several plant communities that may occupy a site, [the desired plant community is] the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site at a minimum" (Journal of Range Management, 48:279, 1995).

Fundamentals (a) and (b) define physical and biological components of rangeland health and are consistent with the definition of rangeland health as defined by the Committee on Rangeland Classification, Board on Agriculture, National Research Council, as discussed in the paragraph above. These fundamentals provide the basis for sustainable rangelands.

Fundamentals (c) and (d) emphasize compliance with existing laws and regulation and therefore define social and political components of rangeland health. Compliance with fundamentals (c) and (d) is accomplished by managing to attain a specific plant community and associated wildlife species present on ecological sites. These desired plant communities are determined in the BLM planning process or, where the desired plant community is not identified, a community may be selected that will meet the conditions of fundamentals (a) and (b) and also adhere to laws and regulations. Arizona Standard 3 is written to comply with fundamentals (c) and (d) and provide a logical combination of Standards and Guidelines for planning and management purposes.

F.18.3. Standards and Guidelines Definitions

Standards are goals for the desired condition of the biological and physical components and characteristics of rangelands. Standards:

1. Are measurable and attainable; and

2. Comply with various Federal and State statutes, policies, and directives applicable to BLM Rangelands.

Guidelines are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

1. Typically identify and prescribe methods of influencing or controlling specific public land uses;

2. Are developed and applied consistent with the desired condition and within site capability; and

3. May be adjusted over time.

F.18.3.1. Implementing Standards & Guidelines

The authorized officer will review existing permitted livestock use, allotment management plans, or other activity plans which identify terms and conditions for management on public land. Existing management practices and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet, or are making significant progress toward meeting, the standards and are in conformance with the guidelines. The review will be interdisciplinary and conducted under existing rules which provide for cooperation, coordination, and consultation with affected individuals, federal, state, and local agencies, tribal governments, private landowners, and interested publics.

This review will use a variety of data, including monitoring records, assessments, and knowledge of the locale to assist in making the significant progress determination. Significance will be determined on a case by case basis, considering site potential, site condition, weather and financial commitment. It is anticipated there will be cases where numerous years will be needed to determine direction and magnitude of trend.

Upon completion of review, the authorized officer shall take appropriate action as soon as practicable but no later than the start of the next grazing year upon determining that the existing grazing management practices or level of use on public land are significant factors contributing to failure to achieve the standards and conform with the guidelines that are made effective under 43 CFR 4180.2. Appropriate action means implementing actions that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with guidelines.

Livestock grazing will continue where significant progress toward meeting standards is being made. Additional activities and practices would not be needed on such allotments. Where new activities or practices are required to assure significant progress toward meeting standards, livestock grazing use can continue contingent upon determinations from monitoring data that the implemented actions are effective in making significant progress toward meeting the standards. In some cases, additional action may be needed as determined by monitoring data over time.

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

F.18.4. Arizona Standards & Guidelines

Arizona Standards and Guidelines (Standards & Guidelines) for grazing administration have been developed through a collaborative process involving the BLM State S&G Team and the Arizona Resource Advisory Council. Together, through meetings, conference calls, correspondence, and open houses with the public, the BLM State team and RAC prepared Standards & Guidelines to address the minimum requirements outlined in the grazing regulations. The Standards & Guidelines, including the criteria for meeting Standards and relevant indicators, is an integrated document that conforms to the fundamentals of rangeland health and the requirements of the regulations when taken as a whole.

Upland sites, riparian-wetland areas, and desired resource conditions are each addressed by a Standard and associated Guidelines.

F.18.4.1. Standard 1: Upland Sites

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).

F.18.4.1.1. Criteria for meeting Standard 1:

Soil conditions support proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including appropriate amounts of vegetative cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the potential of the site.

Ground cover in the form of plants, litter, or rock is present in patterns, kind, and amounts sufficient to prevent accelerated erosion for the ecological site and ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

As indicated by such factors as:

- Ground cover,
- Litter,
- Live vegetation, amount and type (e.g., grass, shrubs, trees, etc.),
- Rock,
- Signs of erosion,
- Flow pattern,
- Gullies,
- Rills,
- Plant pedestaling.

Exceptions and exemptions (where applicable):

None

F.18.4.1.1.1. Guidelines:

Guideline 1-1: Management activities will maintain or promote groundcover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites within management units. The groundcover should maintain soil organisms and plants and animals to support the hydrologic and nutrient cycles, and energy flow. Groundcover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

Guideline 1-2: When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

F.18.4.2. Standard 2: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

F.18.4.2.1. Criteria for meeting Standard 2:

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large woody debris is present to dissipate stream energy associated with high water flows.

Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetative, soil and erosion-deposition factors. BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as indicated by the results of the application of the appropriate checklist.

The checklist for riparian areas is in Technical Reference 1737-9 “Process for Assessing Proper Functioning Condition.” The checklist for wetlands is in Technical Reference 1737-11 “Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas.” These checklists are reprinted on the pages following the Guidelines for Standard 3.

As indicated by such factors as:

- Gradient,
- Width/depth ratio,
- Channel roughness and sinuosity of stream channel,
- Bank stabilization,
- Reduced erosion,
- Captured sediment,
- Ground-water recharge,

- Dissipation of energy by vegetation.

Exceptions and exemptions (where applicable):

- Dirt tanks, wells, and other water facilities for the purpose of providing water for livestock or wildlife that have not been determined through local planning efforts to provide for riparian or wetland habitat are exempt;
- Water impoundments permitted for construction, mining, or similar activities are exempt.

F.18.4.2.1.1. Guidelines:

Guideline 2-1: Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.

Guideline 2-2: New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

Guideline 2-3: The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

F.18.4.3. Standard 3: Desired Resource Conditions

Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

F.18.4.3.1. Criteria for meeting Standard 3:

Upland and riparian-wetland plant communities meet desired plant community objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species, and the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and appropriate laws, regulations, and policies.

Desired plant community objectives will be developed to assure that soil conditions and ecosystem function described in Standard 1 and Standard 2 are met. They detail a site-specific plant community objective, which when obtained, will meet rangeland health standards, State water-quality standards, and adequate habitat for endangered, threatened, and sensitive species. Thus, desired plant community objectives will be used as an indicator of ecosystem function and rangeland health.

As indicated by such factors as:

- Composition,
- Structure,

- Distribution.

Exceptions and exemptions (where applicable):

- Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical.

F.18.4.3.1.1. Guidelines:

Guideline 3-1: The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, or (d) cannot compete with already established non-native species.

Guideline 3-2: Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance and restoration of their habitats.

Guideline 3-3: Management practices maintain, restore, or enhance water quality in conformance with State and Federal standards.

Guideline 3-4: Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of plant species needed to reach desired plant community objectives.

Guideline 3-5: Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

- Ephemeral vegetation is present in draws, washes, and under shrubs and has grown to usable levels at the time grazing begins;
- Sufficient surface and subsurface soil moisture exists for continued plant growth;
- Serviceable waters are capable of providing for proper grazing distribution;
- Sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and
- Monitoring is conducted during grazing to determine if objectives are being met.

Guideline 3-6: Management practices will target populations of noxious weeds that can be controlled or eliminated by approved methods.

Guideline 3-7: Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical and prehistoric sites and plants of significance to Native American people.

F.18.5. Lotic and Lentic Checklist

General Instructions:

1. The concept “relative to capability” applies wherever it may be inferred;

2. This checklist constitutes the minimum national standards required to determine proper functioning condition of lotic or lentic riparian-wetland areas;

3. As a minimum, an ID team will use this checklist to determine the degree of function of a lotic or lentic riparian-wetland area;

4. Mark one box for each element. Elements are numbered for the purpose of cataloging comments. The numbers do not declare importance;

5. For any item marked "No," the severity of the condition must be explained in the "Remarks" section and must be a subject for discussion with the ID team in determining riparian-wetland functionality. Using the "Remarks" section to explain items marked "Yes" is encouraged but not required;

6. Based on the ID team's discussion, "functional rating" will be resolved and the checklist's summary section will be completed;

7. Establish photo points where possible to document the site.

Form may be obtained by contacting the BLM office.

F.19. ATTACHMENT 2: SDNM Presidential Proclamation

Presidential Proclamation 7397 of January 17, 2001

THE WHITE HOUSE Office of the Press Secretary For Immediate Release, January 17, 2001
ESTABLISHMENT OF THE SONORAN DESERT NATIONAL MONUMENT BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

The Sonoran Desert National Monument is a magnificent example of untrammeled Sonoran desert landscape. The area encompasses a functioning desert ecosystem with an extraordinary array of biological, scientific, and historic resources. The most biologically diverse of the North American deserts, the monument consists of distinct mountain ranges separated by wide valleys, and includes large saguaro cactus forest communities that provide excellent habitat for a wide range of wildlife species.

The monument's biological resources include a spectacular diversity of plant and animal species. The higher peaks include unique woodland assemblages, while the lower elevation lands offer one of the most structurally complex examples of palo verde/mixed cacti association in the Sonoran Desert. The dense stands of leguminous trees and cacti are dominated by saguaros, palo-verde trees, ironwood, prickly pear, and cholla. Important natural water holes, known as tinajas, exist throughout the monument. The endangered acuña pineapple cactus is also found in the monument.

The most striking aspect of the plant communities within the monument are the abundant saguaro cactus forests. The saguaro is a signature plant of the Sonoran Desert. Individual saguaro plants are indeed magnificent, but a forest of these plants, together with the wide variety of trees, shrubs, and herbaceous plants that make up the forest community, is an impressive site to behold. The saguaro cactus forests within the monument are a national treasure, rivaling those within the Saguaro National Park.

The rich diversity, density, and distribution of plants in the Sand Tank Mountains area of the monument is especially striking and can be attributed to the management regime in place since the area was withdrawn for military purposes in 1941. In particular, while some public access to the area is allowed, no livestock grazing has occurred for nearly 50 years. To extend the extraordinary diversity and overall ecological health of the Sand Tanks Mountains area, land adjacent and with biological resources similar to the area withdrawn for military purposes should be subject to a similar management regime to the fullest extent possible.

The monument contains an abundance of packrat middens, allowing for scientific analysis of plant species and climates in past eras. Scientific analysis of the midden shows that the area received far more precipitation 20,000 years ago, and slowly became more arid. Vegetation for the area changed from juniper-oak-pinion pine woodland to the vegetation found today in the Sonoran Desert, although a few plants from the more mesic period, including the Kofa Mountain barberry, Arizona rosewood, and junipers, remain on higher elevations of north-facing slopes.

The lower elevations and flatter areas of the monument contain the creosote-bursage plant community. This plant community thrives in the open expanses between the mountain ranges, and connects the other plant communities together. Rare patches of desert grassland can also be found throughout the monument, especially in the Sand Tank Mountains area. The washes in the area support a much denser vegetation community than the surrounding desert, including mesquite, ironwood, paloverde, desert honeysuckle, chuperosa, and desert willow, as well as a variety of herbaceous plants.

This vegetation offers the dense cover bird species need for successful nesting, foraging, and escape, and birds heavily use the washes during migration.

The diverse plant communities present in the monument support a wide variety of wildlife, including the endangered Sonoran pronghorn, a robust population of desert bighorn sheep, especially in the Maricopa Mountains area, and other mammalian species such as mule deer, javelina, mountain lion, gray fox, and bobcat. Bat species within the monument include the endangered lesser long-nosed bat, the California leaf-nosed bat, and the cave myotis. Over 200 species of birds are found in the monument, including 59 species known to nest in the Vekol Valley area. Numerous species of raptors and owls inhabit the monument, including the elf owl and the western screech owl. The monument also supports a diverse array of reptiles and amphibians, including the Sonoran desert tortoise and the red-backed whiptail. The Bureau of Land Management has designated approximately 25,000 acres of land in the Maricopa Mountains area as critical habitat for the desert tortoise. The Vekol Valley and Sand Tank Mountain areas contain especially diverse and robust populations of amphibians. During summer rainfall events, thousands of Sonoran green toads in the Vekol Valley can be heard moving around and calling out.

The monument also contains many significant archaeological and historic sites, including rock art sites, lithic quarries, and scattered artifacts. Vekol Wash is believed to have been an important prehistoric travel and trade corridor between the Hohokam and tribes located in what is now Mexico. Signs of large villages and permanent habitat sites occur throughout the area, and particularly along the bajadas of the Table Top Mountains. Occupants of these villages were the ancestors of today's O'odham, Quechan, Cocopah, Maricopa, and other tribes. The monument also contains a much used trail corridor 23 miles long in which are found remnants of several important historic trails, including the Juan Bautista de Anza National Historic Trail, the Mormon Battalion Trail, and the Butterfield Overland Stage Route.

Section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), authorizes the President, in his discretion, to declare by public proclamation historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest that are situated upon the lands owned or controlled by the Government of the United States to be national monuments, and to reserve as a part thereof parcels of land, the limits of which in all cases shall be confined to the smallest area compatible with the proper care and management of the objects to be protected.

WHEREAS, it appears that it would be in the public interest to reserve such lands as a national monument to be known as the Sonoran Desert National Monument.

NOW, THEREFORE, I, WILLIAM J. CLINTON, President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34 Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Sonoran Desert National Monument, for the purpose of protecting the objects identified above, all lands and interest in lands owned or controlled by the United States within the boundaries of the area described on the map entitled “Sonoran Desert National Monument” attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 486,149 acres, which is the smallest area compatible with the proper care and management of the objects to be protected.

For the purpose of protecting the objects identified above, all motorized and mechanized vehicle use off road will be prohibited, except for emergency or authorized administrative purposes. Nothing in this proclamation shall be deemed to enlarge or diminish the jurisdiction of the State of Arizona with respect to fish and wildlife management.

The establishment of this monument is subject to valid existing rights.

All Federal lands and interests in lands within the boundaries of this monument are hereby appropriated and withdrawn from all forms of entry, location, selection, sale, or leasing or other disposition under the public land laws, including but not limited to withdrawal from location, entry, and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, other than by exchange that furthers the protective purposes of the monument. Lands and interests in lands within the monument not owned by the United States shall be reserved as a part of the monument upon acquisition of title thereto by the United States.

This proclamation does not reserve water as a matter of Federal law nor relinquish any water rights held by the Federal Government existing on this date. The Federal land management agencies shall work with appropriate State authorities to ensure that water resources needed for monument purposes are available.

The Secretary of the Interior shall manage the monument through the Bureau of Land Management, pursuant to applicable legal authorities, to implement the purposes of this proclamation. That portion identified as Area A on the map, however, shall be managed under the management arrangement established by section 3 of Public Law No. 99-606, 100 Stat. 3460-61, until November 6, 2001, at which time, pursuant to section 5(a) of Public Law No. 99-606, 100 Stat. 3462-63, the military withdrawal terminates. At that time, the Secretary of the Interior shall assume management responsibility for Area A through the Bureau of Land Management.

The Secretary of the Interior shall prepare a management plan that addresses the actions, including road closures or travel restrictions, necessary to protect the objects identified in this proclamation. Laws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument; provided, however, that grazing permits on Federal lands within the monument south of Interstate Highway 8 shall not be renewed at the end of their current term; and provided further, that grazing on Federal lands north of Interstate 8 shall be allowed to continue only to the extent that the Bureau of Land Management determines that grazing is compatible with the paramount purpose of protecting the objects identified in this proclamation.

Nothing in this proclamation shall be deemed to revoke any existing withdrawal, reservation, or appropriation; however, the national monument shall be the dominant reservation.

Nothing in this proclamation shall preclude low level overflights of military aircraft, the designation of new units of special use airspace, or the use or establishment of military flight training routes over the lands included in this proclamation.

In order to protect the public during operations at the adjacent Barry M. Goldwater Range, and to continue management practices that have resulted in an exceptionally well preserved natural resource, the current procedures for public access to the portion of the monument depicted as Area A on the attached map shall remain in full force and effect, except to the extent that the United States Air Force agrees to different procedures which the Bureau of Land Management determines are compatible with the protection of the objects identified in this proclamation.

Warning is hereby given to all unauthorized persons not to appropriate, injure, destroy, or remove any feature of this monument and not to locate or settle upon any of the lands thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this seventeenth day of January, in the year of our Lord two thousand one, and of the Independence of the United States of America the two hundred and twenty-fifth.

WILLIAM J. CLINTON

F.20. ATTACHMENT 3: Key Area Data

Table F.16. Vegetation Composition Data

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
Big Horn Allotment					
BH-1 (2009)	Sandy Wash	Grasses			
		Annuals		5%	5%
		Ditaxis	ARNE2	3%	3%
		Forbs			
		Annuals		7%	7%
		Ditaxis	ARNE2	3%	3%
		Shrubs			
		Burrobush	HYSA	13%	3%
		Big Bursage	AMAM2	2%	1%
		Desert Lavender	HYEM	1%	5%
		Anderson Wolfberry	LYAN	42%	10%
		Creosote	LATR2	5%	5%
		Sweetbush Bebbia	BEJU	1%	1%
		Trees			
		Blue Palo Verde	PAFL6	3%	3%
		Ironwood	OLTE	8%	8%
		Mesquite	PRVE	3%	3%
		Catclaw Acacia	ACGR	7%	7%
		Total		**100%**	**57%**
BH-2 (2009)	Limy Fan	Grasses			
		Annuals		8%	5%
		Forbs			
		Annuals		8%	8%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	6%	6%
		Saguaro	CAGI10	1%	1%
		Ratany	KRPA	0%	0%
		Anderson Wolfberry	LYAN	2%	1%
		Creosote	LATR2	64%	60%
		Staghorn Cholla	CYVE3	1%	1%
		Trees			
		Little-leaf Palo Verde	PAMI5	1%	1%
		Ironwood	OLTE	11%	1%
		Total		**100%**	**83%**

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
BH-3 (2009)	Limy Fan	Grasses			
		Annuals		5%	5%
		Forbs			
		Ditaxis	ARNE2	1%	0%
		Annuals		8%	8%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	16%	16%
		Ratany	KRPA	4%	4%
		Creosote	LATR2	50%	50%
		Anderson Wolfberry	LYAN	4%	1%
		Trees			
		Little-leaf Palo Verde	PAMI5	4%	1%
		Ironwood	OLTE	8%	1%
		Total		**100%**	**85%**
BH-4 (2009)	Sandy Wash	Grasses			
		Annuals		4%	4%
		Forbs			
		Annuals		6%	6%
		Ditaxis	ARNE2	10%	7%
		Mat Spurge	EUPHO	3%	3%
		Shrubs			
		Burrobush	HYSA	10%	4%
		Sweetbush Bebbia	BEJU	3%	1%
		Anderson Wolfberry	LYAN	18%	13%
		Creosote	LATR2	4%	2%
		Vine Milkweed	FUCY	1%	1%
		Trees			
		Blue Palo Verde	PAFL6	22%	17%
		Ironwood	OLTE	5%	3%
		Catclaw Acacia	ACGR	14%	14%
		Total		**100%**	**75%**
BH-5 (2009)	Limy Upland Deep	Grasses			
		Bush Muhly	MUPO2	1%	1%
		Annuals		3%	3%
		Forbs			
		Ditaxis	ARNE2	3%	3%
		Annuals		5%	5%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	20%	14%
		Ratany	KRPA	6%	4%
		Creosote	LATR2	57%	57%
		Cholla	OPUNTIA spp.	1%	1%
		Trees			
		Little-leaf Palo Verde	PAMI5	2%	1%
		Total		**100%**	**89%**

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
BH-6 (2009)	Sandy Loam Deep	Grasses			
		Big Galleta	PLRI3	T	T
		Bush Muhly	MUPO2	1%	1%
		Annuals		3%	3%
		Forbs			
		Annuals		3%	3%
		Globemallow	SPAM2	1%	1%
		Janusia	JAGR	T	
		Shrubs			
		Triangle-leaf Bursage	AMDE4	20%	20%
		Creosote	LATR2	42%	19%
		White Bursage	AMDU2	13%	13%
		Anderson Wolfberry	LYAN	2%	1%
		Catclaw Acacia	ACGR	2%	2%
		Whitehorn Acacia	ACCR2	2%	2%
		Burro Bush	HYSA	1%	1%
		Trees			
		Mesquite	PRVE	2%	2%
		Ironwood	OLTE	3%	3%
		Little-leaf Palo Verde	PAMI5	5%	5%
		Total		**100%**	**76%**
BH-7 (2009)	Loamy Bottom	Grasses			
		Big Galleta	PLRI3	13%	10%
		Annuals		8%	8%
		Forbs			
		Annuals		5%	5%
		Ditaxis	ARNE2	15%	9%
		Globemallow	SPAM2	2%	1%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	15%	2%
		Anderson Wolfberry	LYAN	3%	3%
		Brittlebush	ENFA	1%	0%
		Trixis	TRCA8	2%	2%
		Desert Lavender	HYEM	1%	0%
		White Ratany	KRGR	3%	3%
		Creosote	LATR2	21%	17%
		Trees			
		Blue Palo Verde	PAFL6	4%	3%
		Ironwood	OLTE	2%	2%
		Catclaw Acacia	ACGR	6%	5%
		Total		**100%**	**70%**

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
BH-8 (2009)	Sandy Wash	Grasses			
		Annuals		6%	6%
		Forbs			
		Annuals		7%	7%
		Mat Spurge	EUPHO	1%	1%
		Globemallow	SPAM2	3%	3%
		Shrubs			
		Limberbush	JACA2	3%	1%
		White Ratany	KRGR	2%	1%
		Big Bursage	AMAM2	4%	1%
		Christmas Cholla	CYLE8	3%	3%
		Desert Lavender	HYEM	2%	1%
		Triangle-leaf Bursage	ANDE4	4%	2%
		Saguaro	CAGI10	1%	1%
		Jumping Cholla	CYFU10	1%	1%
		Coulter's Bricklebush	BRCO	1%	1%
		Creosote	LATR2	5%	2%
		Desert Hackberry	CEPA	1%	1%
		Trees			
		Little-leaf Palo Verde	PAMI5	7%	7%
		Blue Palo Verde	PAFL6	10%	10%
		Ironwood	OLTE	2%	2%
		Catclaw Acacia	ACGR	8%	8%
		Whitethorn Acacia	ACCO2	8%	4%
		Total		**100%**	**71%**
BH-9 (2009)	Limy Upland	Grasses			
		Fluffgrass	ERPU14	1%	1%
		Annuals		5%	5%
		Forbs			
		Ditaxis	ARNE2	1%	1%
		Mat Spurge	EUPHO	5%	4%
		Annuals		5%	5%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	34%	34%
		Ratany	KRPA	4%	3%
		Creosote	LATR2	17%	17%
		Buck Horn Cholla	CYACM	6%	5%
		Saguaro	CAGI10	T	
		Limberbush	JACA2	T	
		Trees			
		Little-leaf Palo Verde	PAMI5	18%	7%
		Ironwood	OLTE	4%	2%
		Total		**100%**	**84%**

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
BH-12 (2009)	Limy Upland	Grasses			
		Annuals		4%	4%
		Forbs			
		Buckwheat	ERIOG	4%	0%
		Annuals		3%	3%
		Shrubs			
		Anderson Wolfberry	LYAN	5%	5%
		Fishook Pincushion	MAMMI	2%	1%
		Hedgehog	ECEN	1%	1%
		Brittlebush	ENFA	2%	2%
		Triangle-leaf Bursage	AMDE4	12%	12%
		Christmas Cholla	CYLE8	13%	6%
		Creosote	LATR2	35%	19%
		Trees			
		Ironwood	OLTE	2%	1%
		Little-leaf Palo Verde	PAMI5	14%	9%
		Saguaro	CAGI10	3%	2%
		Total		**100%**	**65%**
BH-13 (2009)	Limy Upland Deep	Grasses			
		Annuals		3%	3%
		Forbs			
		Annuals		6%	6%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	7%	6%
		White Bursage	AMDU2	3%	3%
		White Ratany	KRGR	7%	7%
		Creosote	LATR2	71%	71%
		Staghorn Cholla	CYVE3	3%	1%
		Teddybear Cholla	CYBI9	1%	1%
		Trees			
		Little-leaf Palo Verde	PAMI5	T	T
		Total		**100%**	**98%**
Beloat Allotment					
B-1 (2004)	Granitic Hills	Grasses			
		Annuals		10%	10%
		Forbs			
		Annuals		5%	5%
		Shrubs			
		Brittlebush	ENFA	12%	10%
		Triangle-leaf Bursage	AMDE4	25%	25%
		Anderson Wolfberry	LYAN	2%	2%
		Creosote	LATR2	18%	13%
		Pincushion	MAGRG4	1%	1%
		Buckhorn Cholla	CYACM	2%	2%
		Trees			

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
		Little-leaf Palo Verde	PAMI5	25%	15%
		Total		**100%**	**83%**
B-2 (2004)	Sandy Wash	Grasses			
		Annual		10%	10%
		Forbs			
		Annual		15%	15%
		Shrubs			
		Burrobush	HYSA	1%	1%
		Triangle-leaf Bursage	AMDE4	7%	2%
		Anderson Wolfberry	LYAN	31%	10%
		Creosote	LATR2	26%	5%
		Trees			
		Blue Palo Verde	PAFL6	6%	6%
		Catclaw Acacia	ACGR	2%	2%
		Mesquite	PRVE	2%	2%
		Total		**100%**	**53%**
B-4 (2004)	Sandy Wash	Grasses			
		Annuals		5%	5%
		Forbs			
		Annuals		7%	7%
		Shrubs			
		Drummond's Clematis	CLDR	7%	2%
		Janusia	JAGR	1%	1%
		Vine Milkweed	SACY2	17%	8%
		Triangle-leaf Bursage	AMDE4	1%	1%
		Anderson Wolfberry	LYAN	15%	5%
		Trees			
		Blue Palo Verde	PAFL6	25%	20%
		Catclaw Acacia	ACGR	22%	10%
		Total		**100%**	**59%**
B-5 (2004)	Loamy Bottom	Grasses			
		Big Galleta	PLRI3	23%	10%
		Annuals		10%	10%
		Forbs			
		Annuals		15%	15%
		Globemallow	SPAM2	1%	1%
		Shrubs			
		Burrobush	HYSA	1%	0%
		Anderson Wolfberry	LYAN	29%	18%
		Creosote	LATR2	2%	2%
		Vine Milkweed	SACY2	12%	0%
		Trees			
		Catclaw Acacia	ACGR	7%	7%
		Total		**100%**	**64%**

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
B-8 (2004)	Limy Fan	Grasses			
		Annual		10%	10%
		Forbs			
		Annual		15%	15%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	9%	8%
		Creosote	LATR2	65%	60%
		Christmas Cholla	CYLE8	1%	1%
		Trees			
		Mesquite	PRVE	1%	1%
		Total		**100%**	**95%**
B-9 (2004)	Limy Upland	Grasses			
		Annuals		4%	4%
		Forbs			
		Spurge	EUPHO	2%	0%
		Desert Trumpet	ERIN4	1%	1%
		Annuals		3%	3%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	17%	17%
		White Ratany	KRGR	13%	10%
		Mormon Tea	EPHED	2%	2%
		White Bursage	AMDU2	1%	1%
		Creosote	LATR2	34%	19%
		Hedgehog	ECEN	1%	1%
		Brittlebush	ENFA	2%	2%
		Trees			
		Little-leaf Palo Verde	PAMI5	19%	9%
		Ironwood	OLTE	1%	1%
		Total		**100%**	**70%**
Conley Allotment					
C-1 (2009)	Sandy Wash	Grasses			
		Annuals		6%	6%
		Bush Muhly	MUPO2	2%	2%
		Forbs			
		Annuals		7%	7%
		Globemallow	SPAM2	1%	1%
		Arrowleaf Milkweed	FUCY	1%	1%
		Drommond's Clematis	CLDR	2%	2%
		Ditaxis	ARNE2	1%	1%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	22%	2%
		Anderson Wolfberry	LYAN	28%	9%
		Creosote	LATR2	10%	4%
		Trees			
		Blue Palo Verde	PAFL6	10%	10%
		Ironwood	OLTE	1%	1%

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
		Catclaw Acacia	ACGR	2%	2%
		Mesquite	PRVE	7%	7%
		Total		**100%**	**55%**
C-2 (2009)	Limy Fan	Grasses			
		Annual		5%	5%
		Forbs			
		Annuals		7%	7%
		Shrubs			
		Creosote	LATR2	84%	60%
		Trees			
		Mesquite	PRVE	2%	2%
		Total		**100%**	**55%**
C-3 (2009)	Sandy Wash	Grasses			
		Annuals		5%	5%
		Forbs			
		Annuals		9%	9%
		Ditaxis	ARNE2	2%	2%
		Tobacco	NIOB	2%	2%
		Wirelettuce	STPA3	2%	2%
		Shrubs			
		Big Bursage	AMAM2	25%	4%
		Drummond's Clematis	CLDR	2%	2%
		Desert Broom	BASA2	2%	1%
		Creosote	LATR2	1%	1%
		Trees			
		Catclaw Acacia	ACGR	6%	6%
		Blue Palo Verde	PAFL6	42%	20%
		Mesquite	PRVE	2%	2%
		Total		**100%**	**56%**
C-4 (2009)	Limy Fan	Grasses			
		Annual		6%	6%
		Forbs			
		Annuals		9%	9%
		Shrubs			
		Greythorn	ZIOB	3%	1%
		Anderson Wolfberry	LYAN	3%	1%
		Barrel Cactus	FEWI	T	
		Triangle-leaf Bursage	AMDE4	7%	7%
		Creosote	LATR2	70%	60%
		Trees			
		Blue Palo Verde	PAFL6	2%	1%
		Total		**98%**	**85%**

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
C-5 (2009)	Limy Upland	Grasses			
		Annuals		4%	4%
		Big Galleta	PLRI3	1%	1%
		Forbs			
		Annuals		2%	2%
		Shrubs			
		White Ratany	KRGR	4%	4%
		Creosote	LATR2	75%	19%
		Triangle-leaf Bursage	AMDE4	2%	2%
		White Bursage	AMDU2	10%	10%
		Total		**100%**	**44%**
C-7 (2009)	Sandy Wash	Grasses			
		Annuals		8%	8%
		Forbs			
		Annuals		10%	10%
		Shrubs			
		Burrobush	HYSA	28%	3%
		Arrowleaf Milkweed	FUCY	1%	1%
		Anderson Wolfberry	LYAN	17%	13%
		Creosote	LATR2	2%	1%
		Big Bursage	AMAM2	3%	2%
		Trees			
		Blue Palo Verde	PAFL6	11%	11%
		Ironwood	OLTE	7%	7%
		Mesquite	PRVE	2%	1%
		Catclaw Acacia	ACGR	11%	9%
		Total		**100%**	**66%**
C-9 (2009)	Loamy Bottom	Grasses			
		Big Galleta	PLRI3	12%	10%
		Bush Muhly	MUPO2	3%	3%
		Annuals		7%	7%
		Forbs			
		Globemallow	SPAM2	2%	2%
		Ditaxis	ARNE2	3%	3%
		Annuals		7%	7%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	2%	2%
		Creosote	LATR2	4%	2%
		Drummond's Clematis	CLDR	1%	0%
		Arrowleaf Milkweed	FUCY	1%	0%
		Coulter's Brickelbush	BRCO	1%	1%
		Anderson Wolfberry	LYAN	37%	18%
		Trixis	TRCA8	2%	2%
		Trees			
		Blue Palo Verde	PAFL6	10%	9%

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
		Mesquite	PRVE	6%	6%
		Catclaw Acacia	ACGR	2%	1%
		Total		**100%**	**73%**
C-10 (2009)	Limy Upland	Grasses			
		Annuals		4%	4%
		Forbs			
		Annuals		3%	3%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	8%	8%
		Creosote	LATR2	54%	19%
		Ocotillo	FOSP2	3%	2%
		Anderson Wolfberry	LYAN	1%	1%
		White Ratany	KRGR	11%	10%
		Trees			
		Little-leaf Bursage	AMDE4	8%	8%
		Creosote	LATR2	54%	19%
		Ocotillo	FOSP2	3%	2%
		Anderson Wolfberry	LYAN	1%	1%
		White Ratany	KRGR	11%	10%
		Little-leaf Palo Verde	PAMI5	16%	8%
		Total		**100%**	**55%**
Hazen Allotment					
H-1 (2009)	Limy Fan	Grasses			
		Annual		5%	5%
		Forbs			
		Annual		8%	8%
		Shrubs			
		White Ratany	KRGR	2%	2%
		Triangle-leaf Bursage	AMDE4	11%	11%
		Creosote	LATR2	64%	60%
		Saguaro	CAGI10	2%	2%
		Trees			
		Little-leaf Palo Verde	PAMI5	8%	2%
		Total		**100%**	**90%**
H-2 (2009)	Limy Upland Deep	Grasses			
		Annuals		3%	3%
		Forbs			
		Annuals		2%	2%
		Shrubs			
		White Ratany	KRGR	2%	2%
		Triangle-leaf Bursage	AMDE4	13%	13%
		Wolfberry	LYEX	5%	0%
		Creosote	LATR2	66%	66%
		Greythorn	ZIOB	4%	0%
		Trees			

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
		Little-leaf Palo Verde	PAMI5	5%	1%
		Total		**100%**	**87%**
H-4 (2009)	Sandy Wash	Grasses			
		Annual		5%	5%
		Forbs			
		Annuals		7%	7%
		Arrowleaf Milkweed	FUCY	1%	1%
		Shrubs			
		Burrobush	HYSA	28%	5%
		Triangle-leaf Bursage	AMDE4	3%	2%
		Sweetbush Bebbia	BEJU	3%	3%
		Anderson Wolfberry	LYAN	15%	5%
		Creosote	LATR2	4%	4%
		Trees			
		Blue Palo Verde	PAFL6	14%	14%
		Little-leaf Palo Verde	PAMI5	5%	5%
		Mesquite	PRVE	8%	5%
		Whitethorn Acacia	ACCO2	3%	3%
		Catclaw Acacia	ACGR	4%	4%
		Total		**100%**	**63%**
H-5 (2009)	Granitic Hills	Grasses			
		Annuals		10%	10%
		Forbs			
		Annuals		7%	7%
		Shrubs			
		Brittlebush	ENFA	3%	3%
		Triangle-leaf Bursage	AMDE4	7%	7%
		Wolfberry	LYEX	3%	3%
		Creosote	LATR2	38%	12%
		Buckhorn Cholla	CYACM	11%	10%
		Barrel Cactus	FECY	1%	
		Trees			
		Little-leaf Palo Verde	PAMI5	20%	15%
		Total		**100%**	**67%**
H-6 (2009)	Limy Upland Deep	Grasses			
		Annuals		3%	3%
		Forbs			
		Annuals		2%	2%
		Shrubs			
		Ratany	KRPA	12%	11%
		White Bursage	AMDU2	3%	2%
		Triangle-leaf Bursage	AMDE4	6%	5%
		Creosote	LATR2	74%	74%
		Total		**100%**	**97%**
Lower Vekol Allotment					

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
LV-1 (2009)	Loamy Bottom	Grasses			
		Big Galleta	PLRI3	44%	35%
		Bush Muhly	MUPO	22%	2%
		Annuals		4%	4%
		Forbs			
		Annuals		4%	4%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	15%	10%
		Anderson Wolfberry	LYAN	11%	9%
		Creosote	LATR2	6%	6%
		Trees			
		Mesquite	PRVE	6%	6%
		Catclaw Acacia	ACGR	8%	6%
		Total		**100%**	**82%**
LV-2 (2009)	Limy Upland Deep	Grasses			
		Annuals		3%	3%
		Forbs			
		Annuals		4%	4%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	15%	10%
		Anderson Wolfberry	LYAN	11%	9%
		Creosote	LATR2	6%	6%
		Trees			
		Mesquite	PRVE	6%	6%
		Catclaw Acacia	ACGR	8%	6%
		Total		**100%**	**82%**
LV-3 (2009)	Sandy Wash	Grasses			
		Annual		5%	5%
		Forbs			
		Ditaxis	ARNE2	1%	1%
		Annual		7%	7%
		Shrubs			
		Burrobush	HYSA	1%	1%
		Triangle-leaf Bursage	AMDE4	9%	2%
		Desert Hackberry	CEPA	1%	1%
		Anderson Wolfberry	LYAN	5%	2%
		Creosote	LATR2	29%	8%
		Trees			
		Blue Palo Verde	PAFL6	11%	11%
		Ironwood	OLTE	1%	1%
		Whitethorn Acacia	ACCO2	8%	4%
		Catclaw Acacia	ACGR	5%	3%
		Mesquite	PRVE	17%	7%
		Total		**100%**	**53%**

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
LV-4 (2009)	Limy Upland	Grasses			
		Annuals		3%	3%
		Forbs			
		Annuals		3%	3%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	32%	32%
		Ratany	KRPA	1%	1%
		Creosote	LATR2	49%	19%
		Ocotillo	FOSP2	1%	1%
		Staghorn	CYVE3	1%	1%
		Jumping Cholla	CYFU10	5%	5%
		Trees			
		Saguaro	CAGI10	1%	1%
		Little-leaf Palo Verde	PAMI5	4%	4%
		Total		**100%**	**70%**
Arnold Allotment					
A-4 (2009)	Limy Fan	Grasses			
		Annuals		5%	5%
		Forbs			
		Annuals		8%	8%
		Ditaxis	ARNE2	3%	3%
		Spurge	EUPHO	8%	8%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	6%	6%
		Creosote	LATR2	63%	46%
		Ratany	KRPA	7%	7%
		Totals		**100%**	**83%**

*ESD: Ecological Site Descrption. Each NRCS Ecological Site Description provides a listing of plant species composition that could be present (or "allowed") on the site. The "% Present" column indicates what was present on the site.

Table F.17. Departure from Ecological Site Description

Site	Soil/Site Stability	Hydrologic Function	Biotic Integrity
Big Horn			
BH-1	None to slight	None to slight	Slight to moderate
BH-2	Slight to moderate	Slight to moderate	None to slight
BH-4	None to slight	None to slight	None to slight
BH-5	None to slight	None to slight	None to slight
Beloat			
B-2	Slight to moderate	Slight to moderate	Slight to moderate
B-4	None to slight	None to slight	Slight to moderate
B-5	Slight to moderate	Slight to moderate	Slight to moderate
Conley			
C-1	None to slight	None to slight	None to slight
C-2	None to slight	None to slight	None to slight
C-3	None to slight	None to slight	None to slight
C-4	None to slight	None to slight	None to slight
C-5	None to slight	None to slight	None to slight
C-7	None to slight	None to slight	None to slight
C-9	None to slight	None to slight	None to slight

Hazen			
H-1	Slight to moderate	Slight to moderate	Slight to moderate
H-2	Slight to moderate	Slight to moderate	Slight to moderate
H-4	None to slight	None to slight	None to slight
H-5	None to slight	None to slight	None to slight
H-6	Slight to moderate	Slight to moderate	Slight to moderate
Lower Vekol			
LV-1	None to slight	None to slight	None to slight
LV-2	None to slight	None to slight	Slight to moderate
LV-3	None to slight	None to slight	None to slight
Arnold			
A-4	None to slight	None to slight	None to slight

Table F.18. Ground Cover Data (%)

Key Area	Ecological Site	Vegetative Canopy (%)
Big Horn Allotment		
BH-1	Sandy Wash	36%
BH-2	Limy Fan	5%
BH-3	Limy Fan	11%
BH-4	Sandy Wash	48%
BH-5	Limy Upland Deep	14%
BH-6	Sandy Loamy Deep	13%
BH-7	Loamy Bottom	36%
BH-8	Sandy Wash	41%
BH-9	Limy Upland	12%
BH-12	Limy Upland	12%
BH-13	Limy Upland Deep	6%
Beloat Allotment		
B-1	Granitic Hills	8%
B-2	Sandy Wash	76%
B-4	Sandy Wash	41%
B-5	Loamy Bottom	79%
B-8	Limy Fan	4%
B-9	Limy Upland	13%
Conley Allotment		
C-1	Sandy Wash	71%
C-2	Limy Fan	6%
C-3	Sandy Wash	68%
C-4	Limy Fan	8%
C-5	Limy Upland	8%
C-7	Sandy Wash	31%
C-9	Loamy Bottom	31%
C-10	Limy Upland	24%
Hazen Allotment		
H-1	Limy Fan	7%
H-2	Limy Upland Deep	8%
H-4	Sandy Wash	20%
H-5	Granitic Hills	12%
H-6	Limy Upland Deep	12%
H-7	Sandy Wash	62%
Lower Vekol Allotment		
LV-1	Loamy Bottom	69%
LV-2	Limy Upland Deep	19%
LV-3	Sandy Wash	60%

LV-4	Limy Upland	10%
Arnold Allotment		
A-4	Limy Fan	1%
Other cover data (litter, gravel and bare ground) were also collected at each key area. These were not included in the overall data analysis. Litter cover can vary dramatically from year to year, depending on precipitation. Gravel covers, which range from 5-60% are highly variable for these soil series and are not good indicators of rangeland condition. Instead, ecological sites within the grazed portions of the SDNM were compared to similar ecological sites in the ungrazed sites in BGR/Area A.		

Table F.19. Average Cover of Microbiotic Crusts (% by Plot)

Vegetation Community (Ecological Site)	BGR/Area A	Big Horn	Conley	Beloat	Hazen	Lower Vekol
Creosote Bursage (Limy Fan, Limy Upland Deep)	1.8	9.5	3.2	2.1	5.0	**
Xeroriparian (Sandy Wash)	0.0	1.7	1.0	**	1.5	**
Other cover data (litter, gravel and bare ground) were also collected at each key area. These were not included in the overall data analysis. Litter cover can vary dramatically from year to year, depending on precipitation. Gravel covers, which range from 5-60% are highly variable for these soil series and are not good indicators of rangeland condition. Instead, ecological sites within the grazed portions of the SDNM were compared to similar ecological sites in the ungrazed sites in BGR/Area A.						

Table F.20. BMG/Area A Comparison Plots – Big Horn Allotment

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
BHPP1S (2009)	Limy Upland Deep	Grasses			
		Annuals		2%	2%
		Forbs			
		Mat Spurge	EUPHO	1%	0%
		Annuals		4%	4%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	34%	11%
		Ratany	KRPA	11%	7%
		Creosote	LATR2	34%	34%
		Buckhorn Cholla	CYACM	4%	1%
		Hedgehog	ECEN	1%	0%
		Saguaro	CAGI10	1%	1%
		Ocotillo	FOSP2	3%	2%
		Trees			
		Little-leaf Palo Verde	PAMI	4%	0.5%
		Ironwood	OLTE	1%	0.5%
		Total		100%	63%

Transect	Ecological Site	Plant species	Symbol	% Present	% Allowed in ESD*
BHPP2S (2009)	Limy Fan	Grasses			
		Annuals		3%	3%
		Forbs			
		Annuals		5%	5%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	24%	17%
		Ratany	KRPA	4%	3%
		Creosote	LATR2	51%	51%
		Mistletoe	PHCA	T	
		Burrobush	HYSA	1%	0%
		Buckhorn Cholla	CYACM	3%	1%
		Saguaro	CAGI10	1%	1%
		Limberbush	JACA2	T	
		Trees			
		Ironwood	OLTE	4%	1%
		Catclaw Acacia	ACGR	1%	0%
		Little-leaf Palo Verde	PAMI	3%	1%
		Total		100%	83%
BHPP3S (2009)	Sandy Wash	Grasses			
		Annuals		5%	5%
		Forbs			
		Ditaxis	ARNE2	1%	1%
		Annuals		6%	6%
		Spurge	EUPHO	1%	1%
		Shrubs			
		Triangle-leaf Bursage	AMDE4	6%	2%
		Coulter's Bricklebush	BRCO	2%	2%
		Big Bursage	AMAM	1%	1%
		Creosote	LATR2	30%	5%
		Burrobush	HYSA	1%	1%
		Anderson Wolfberry	LYAN	9%	7%
		Trees			
		Catclaw Acacia	ACGR	1%	1%
		Ironwood	OLTE	33%	14%
		Little-leaf Palo Verde	PAMI	4%	4%
		Total		100%	19%

*ESD: Ecological Site Descrption. Each NRCS Ecological Site Description provides a listing of plant species composition that could be present (or "allowed") on the site. The "% Present" column indicates what was present on the site.

Table F.21. BGR/Area A Pacific Biodiversity Institute Plots

Plot #	Scientific Name	% Cover	% Composition
Limy Fan			
236	*Larrea Divaricata Tridentata*	6%	92%
	Cylindropuntia Acanthocarpa	0.25%	4%
	Camegiea Gigantea	0.25%	4%
	Total	6.5%	100%

Plot #	Scientific Name	% Cover	% Composition
237	*Larrea Divaricata Tridentata*	8%	100%
	Total	8%	100%
240	*Larrea Divaricata Tridentata*	7%	88%
	Krameria Grayi	1%	12%
	Total	8%	100%
Limy Upland Deep			
269	*Muhlenbergia Porteri*	1%	5%
	Larrea Divaricata Tridentata	7%	38%
	Krameria Grayi	2%	11%
	Fouquieria Splendens	3%	16%
	Erioneuron Pulchellum	3%	16%
	Cylindropuntia Leptocaulis	1%	5%
	Ambrosia Deltoidea	0.25%	1%
	Total	18%	97%
272	*Pleuraphis Rigida*	0.25%	1%
	Larrea Divaricata Tridentata	8%	46%
	Cylindropuntia Fulgida	9%	53%
	Total	17%	100%
234	*Larrea Divaricata Tridentata*	5%	63%
	Krameria Grayi	2%	25%
	Ambrosia Dumosa	1%	12%
	Total	8%	100%
Granitic Hills			
232	*Parkinsonia Microphylla*	4%	25%
	Lycium	3%	18%
	Larrea Divaricata Tridentata	2%	12%
	Fouquieria Splendens	3%	18%
	Echinocereus Engelmannii	1%	6%
	Cylindropuntia Acanthocarpa	1%	6%
	Carnegiea Gigantea	0.25%	2%
	Ambrosia Dumosa	1%	6%
	Ambrosia Deltoidea	1%	6%
	Total	16%	100%
Sandy Wash			
233	*Ziziphus Obtusifolia*	2%	5%
	Sebastiania Bilocularis	0.25%	1%
	Parkinsonia Florida	15%	40%
	Olneya Tesota	15%	40%
	Lycium Andersonii	3%	8%
	Larrea Divaricata Tridentata	1%	3%
	Condalia Warnockii	0.25%	1%
	Carnegiea Gigantea	0.25%	1%
	Ambrosia Ambrosioides	1%	3%
	Total	38%	100%

Plot #	Scientific Name	% Cover	% Composition
252	*Parkinsonia Microphylla*	30%	63%
	Olneya Tesota	10%	21%
	Lycium	1%	2%
	Larrea Divaricata Tridentata	2%	4%
	Janusia Gracile	2%	4%
	Fagonia Californica	0.25%	1%
	Encelia Farinosa	1%	2%
	Ditaxis Ianceolata	0.25%	1%
	Cylindropuntia Acanthocarpa	0.25%	1%
	Carnegiea Gigantea	0.25%	1%
	Brickellia Coulteri	0.25%	1%
	Ambrosia Deltoidea	0.25%	1%
	Total	47.5%	100%
262	*Ziziphus Obtusifolia*	0.25%	1%
	Trixis Californica	0.25%	1%
	Prosopis Velutina	1%	4%
	Parkinsonia Microphylla	8%	34%
	Lyrocarpa Coulteri	0.25%	1%
	Lycium	1%	4%
	Larrea Divaricata Tridentata	3%	13%
	Krameria Grayi	0.25%	13%
	Fouquieria Splendens	0.25%	1%
	Ditaxis Ianceolata	0.25%	1%
	Condalia Warnockii	1%	4%
	Bebbia Juncea Aspera	2%	9%
	Asclepias Subulata	1%	4%
	Ambrosia Confertifolia	1%	4%
	Ambrosia Ambrosioides	1%	4%
	Acacia Greggii	3%	13%
	Total	23.5%	100%
271	*Ziziphus Obtusifolia*	2%	8%
	Prosopis Velutina	2%	8%
	Parkinsonia Microphylla	3%	12%
	Olneya Tesota	2%	8%
	Lycium	4%	15%
	Larrea Divaricata Tridentata	10%	38%
	Ephedra Aspera	2%	8%
	Atriplex Canescens	0.25%	1%
	Ambrosia Deltoidea	0.25%	1%
	Acacia Greggii	0.25%	1%
	Acacia Constricta	0.25%	1%
	Total	26%	100%

F.21. ATTACHMENT 4: Pacific Biodiversity Institute Study Plots

Table F.22. Pacific Biodiversity Institute Study Plots

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
Big Horn Allotment				
58	Limy Fan	*Larrea Divaricata Tridentata*	7%	85%
		Cylindropuntia Acanthocarpa	0.25%	3%
		Ambrosia Deltoidea	1%	12%
		Total	8%	100%
59	Limy Upland Deep	*Larrea Divaricata Tridentata*	6%	80%
		Ferocactus Cylindraceus	0.25%	3%
		Ambrosia Deltoidea	1%	13%
		Total	7.25%	96%
60	Limy Upland Deep	*Mammilliaria*	0.25%	5%
		Larrea Divaricata Tridentata	3%	54%
		Cylindropuntia Acanthocarpa	0.25%	5%
		Ambrosia Deltoidea	2%	36%
		Total	5.5%	100%
61	Limy Upland Deep	*Parkinsonia Microphylla*	2%	13%
		Larrea Divaricata Tridentata	11%	71%
		Krameria Grayi	0.25%	1.5%
		Carnegiea Gigantea	0.25%	1.5%
		Ambrosia Deltoidea	2%	13%
		Total	15.5%	100%
63	Granitic Hills	*Parkinsonia Microphylla*	6%	62%
		Mammallaria Grahamii	0.25%	3%
		Lycium	0.25%	3%
		Larrea Divaricata Tridentata	1%	10%
		Fouquieria Splendens	0.25%	3%
		Ferocactus Emoryi	0.25%	3%
		Encelia Farinosa Farinosa	0.25%	3%
		Cylindropuntia Acanthocarpa	1%	10%
		Ambrosia Deltoidea	0.25%	3%
		Total	9.5%	100%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
181	Granitic Hills	*Parkinsonia Microphylla*	6%	20%
		Olneya Tesota	4%	14%
		Larrea Divaricata Tridentata	0.25%	1%
		Krameria Grayi	2%	7%
		Fouquieria Splendens	3%	10%
		Fagonia Californica	2%	7%
		Euphorbia	1%	3%
		Erioneuron Pulchellum	1%	3%
		Encelia Farinosa Farinosa	1%	3%
		Carnegiea Gigantea	0.25%	1%
		Ambrosia Deltoidea	9%	31%
		Total	29.5%	100%
183	Granite Hills	*Granitic Hills*	1%	2%
		Parkinsonia Microphylla	20%	51%
		Lycium	2%	5%
		Larrea Divaricata Tridentata	1%	2%
		Fouquieria Splendens	1%	2%
		Fagonia Californica	3%	8%
		Eriogonum Inflatum	0.25%	1%
		Encelia Farinosa Farinosa	1%	2%
		Draba Cuneifolia	0.25%	1%
		Cylindropuntia Acanthocarpa	1%	2%
		Caliandra Eriophylla	3%	8%
		Aristida	1%	2%
		Ambrosia Deltoidea	5%	13%
		Total	39.5%	99%
194	Granitic Hills	*Parkinsonia Microphylla*	18%	63%
		Lycium	1%	3%
		Larrea Divaricata Tridentata	3%	11%
		Hyptis Emoryi	1%	3%
		Fouquieria Splendens	0.25%	1%
		Fagonia Californica	0.25%	1%
		Eriogonum Fasiculatum	4%	14%
		Encelia Farinosa Farinosa	0.25%	1%
		Brickellia Coulteri	0.25%	1%
		Aristida Purpurea	0.25%	1%
		Ambrosia Deltoidea	0.25%	1%
		Total	28.5%	100%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
196	Granitic Hills	*Parkinsonia Microphylla*	9%	30%
		Lycium Parishii	1%	3%
		Larrea Divaricata Tridentata	8%	27%
		Fouquieria Splendens	0.25%	1%
		Euphorbia	1%	3%
		Ditaxis Ianceolata	0.25%	1%
		Cylindropuntia Fulgida	0.25%	1%
		Cylindropuntia Acanthocarpa	0.25%	1%
		Carnegiea Gigantea	1%	3%
		Ambrosia Deltoidea	9%	30%
		Total	30%	100%
198	Granitic Hills	*Parkinsonia Microphylla*	20%	46%
		Olneya Tesota	2%	4%
		Mammillaria Grahamii	0.25%	1%
		Lycium	0.25%	1%
		Larrea Divaricata Tridentata	1%	2%
		Krameria Grayi	1%	2%
		Janusia Gracile	0.25%	1%
		Fouquieria Splendens	2%	4%
		Fagonia Californica	1%	2%
		Ditaxis Lanceolata	0.25%	1%
		Cylindropuntia Acanthocarpa	1%	2%
		Carnegiea Gigantea	0.25%	1%
		Aristida Purpurea	0.25%	1%
		Ambrosia Deltoidea	14%	32%
		Total	43.5%	100%
199	Granitic Hills	*Sphaeralcea Ambigua*	1%	5%
		Parkinsonia Florida	1%	5%
		Notholaena Standleyi	0.25%	1%
		Nicotaiana Obtusifolia	0.25%	1%
		Muhlenbergia Porteri	0.25%	1%
		Machaeranthera Pinnatifida	0.25%	1%
		Lycium	1%	5%
		Janusia Gracile	0.25%	1%
		Hyptis Emoryi	7%	37%
		Fagonia Californica	1%	5%
		Ephedra Aspera	1%	5%
		Encelia Farinosa Farinosa	2%	11%
		Ditaxis Lanceolata	0.25%	1%
		Cylindropuntia Acanthocarpa	0.25%	1%
		Carnegiea Gigantea	0.25%	1%
		Brickellia Coulteri	3%	16%
		Total	19%	97%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
200	Granitic Hills	*Trixis Californica*	0.25%	1%
		Pleuraphis Rigida	0.25%	1%
		Parkinsonia Microphylla	3%	13%
		Mammillaria Grahamii	0.25%	1%
		Hyptis Emoryi	4%	16%
		Hibiscus Denudatus	4%	16%
		Fouquieria Splendens	2%	8%
		Fagonia Californica	0.25%	1%
		Encelia Farinosa Farinosa	8%	33%
		Ditaxis Adenophora	0.25%	1%
		Cylindropuntia Acanthocarpa	1%	4%
		Carnegiea Gigantea	0.25%	1%
		Aristida	1%	4%
		Total	24.5%	100%
201	Granitic Hills	*Selaginella Arizonica*	25%	42%
		Parkinsonia Microphylla	6%	10%
		Krameria Grayi	3%	5%
		Hyptis Emoryi	1%	2%
		Fouquieria Splendens	3%	5%
		Euphorbia	1%	2%
		Eriogonum Inflatum	1%	2%
		Encelia Farinosa Farinosa	6%	10%
		Ditaxis Ianceolata	1%	2%
		Cylindropuntia Acanthocarpa	1%	2%
		Aristida Purpurea	3%	5%
		Ambrosia Deltoidea	6%	10%
		Acacia Constricta	2%	3%
		Total	59%	100%
190	Sandy Wash	*Sphaeralcea Ambigua*	0.25%	1%
		Prosopis Velutina	2%	6%
		Parkinsonia Florida	3%	9%
		Olneya Tesota	3%	9%
		Nicotiana Obtusifolia	1%	3%
		Muhlenbergia Porteri	0.25%	1%
		Lyrocarpa Coulteri	2%	6%
		Hymenoclea Salsola	15%	47%
		Euphorbia Polycarpa	1%	3%
		Euphorbia Arizonica	0.25%	1%
		Ditaxis Ianceolata	0.25%	1%
		Cylindropuntia Acanthocarpa	0.25%	1%
		Calliandra Eriophylla	0.25%	1%
		Ambrosia Deltoidea	0.25%	1%
		Acacia Greggii	3%	9%
		Total	32%	99%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
192	Sandy Wash	*Parkinsonia Microphylla*	10%	32%
		Parkinsonia Florida	7%	22%
		Nicotiana Obtusifolia	0.25%	1%
		Lyrocarpa Coulteri	0.25%	1%
		Lycium Parishii	3%	10%
		Larrea Divaricata Tridentata	4%	12%
		Hymenoclea Salsola	3%	10%
		Ditaxis Neomexicana	0.25%	1%
		Cylindropuntia Leptocaulis	0.25%	1%
		Cylindropuntia Acanthocarpa	0.25%	1%
		Carnegiea Gigantea	0.25%	1%
		Ambrosia Deltoidea	0.25%	1%
		Ambrosia Ambrosioides	0.25%	1%
		Total	31%	100%
202	Sandy Wash	*Viguiera Parishii*	0.25%	0.5%
		Trixis Californica	1%	2%
		Pleuraphis Rigida	0.25%	0.5%
		Parkinsonia Microphylla	20%	44%
		Menodora Scabra	0.25%	0.5%
		Lycium	1%	2%
		Larrea Divaricata Tridentata	0.25%	0.5%
		Janusia Gracile	3%	6%
		Hyptis Emoryi	3%	6%
		Hibiscus Denudatus	0.25%	0.5%
		Heteropogon Contortus	0.25%	0.5%
		Fouquieria Splendens	0.25%	0.5%
		Fagonia Californica	2%	4%
		Eriogonum Inflatum	1%	2%
		Eriogonum Fasiculatum	1%	2%
		Ephedra Aspera	0.25%	0.5%
		Encelia Farinosa Farinosa	2%	4%
		Ditaxis Ianceolata	1%	2%
		Cylindropuntia Acanthocarpa	1%	2%
		Carnegiea Gigantea	1%	2%
		Calliandra Eriophylla	1%	2%
		Ayenia Microphylla	0.25%	0.5%
		Aristida	0.25%	0.5%
		Ambrosia Deltoidea	5%	11%
		Total	45.5%	96%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
203	Sandy Wash	*Trixis Californica*	1%	2%
		Selaginella Arizonica	0.25%	0.5%
		Parkinsonia Florida	25%	58%
		Lycium	1%	2%
		Janusia Gracile	0.25%	0.5%
		Hyptis Emoryi	2%	5%
		Heteropogon Contortus	0.25%	0.5%
		Fouquieria Splendens	2%	4.5%
		Eriogonum Inflatum	0.25%	0.5%
		Eriogonum Fasiculatum	3%	7%
		Ephedra Aspera	0.25%	0.5%
		Encelia Farinosa Farinosa	4%	9%
		Ditaxis Ianceolata	1%	2%
		Cylindroputina Acanthocarpa	1%	2%
		Carnegiea Gigantea	0.25%	0.5%
		Aristida Purpurea	1%	2%
		Ambrosia Deltoidea	0.25%	0.5%
		Total	43%	97.5%
Beloat Allotment				
40	Limy Fan	*Larrea Divaricata Tridentata*	7%	100%
41	Limy Fan	*Lycium Andersonii*	0.25%	2%
		Larrea Divaricata Tridentata	10%	89%
		Ambrosia Deltoidea	1%	9%
		Total	11%	100%
42	Limy Fan	*Larrea Divaricata Tridentata*	6%	75%
		Ambrosia Deltoidea	2%	25%
		Total	8%	100%
43	Limy Fan	*Larrea Divaricata Tridentata*	7%	100%
44	Limy Fan	*Larrea Divaricata Tridentata*	6%	53%
		Euphorbia	0.25%	2%
		Ambrosia Deltoidea	5%	45%
		Total	11%	100%
45	Limy Fan	*Parkinsonia Microphylla*	0.25%	3%
		Larrea Divaricata Tridentata	7%	88%
		Ferocactus Wislizeni	0.25%	3%
		Euphorbia	0.25%	3%
		Ambrosia Deltoidea	0.25%	3%
		Total	8%	100%
46	Limy Fan	*Larrea Divaricata Tridentata*	6%	70%
		Krameria Grayi	0.25%	3%
		Carnegiea Gigantea	0.25%	3%
		Ambrosia Deltoidea	2%	24%
		Total	8.5%	100%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
48	Granitic Hills	*Trixis Californica*	0.25%	T
		Sphaeralcea Ambigua	2%	4%
		Selaginella Arizonica	30%	47%
		Porophyllum Gracile	0.25%	T
		Parkinsonia Microphylla	15%	23%
		Mirabilis Laevis v. Villosa	1%	2%
		Menodora Scabra	1%	2%
		Lycium Berlandieri	1%	2%
		Lycium	0.25%	T
		Larrea Divaricata Tridentata	0.25%	T
		Janusia Gracile	3%	5%
		Fouquieria Splendens	1%	2%
		Eriogonum Fasiculatum	3%	5%
		Ephedra Aspera	0.25%	T
		Encelia Farinosa Farinosa	4%	6%
		Ditaxis Ianceolata	0.25%	T
		Cylindropuntia Acanthocarpa	0.25%	T
		Carnegiea Gigantea	0.25%	T
		Ambrosia Deltoidea	1%	2%
		Acacia Greggii	0.25%	T
		Total	64%	100%
49	Granitic Hills	*Trixis Californica*	1%	2%
		Viguiera Parishii	1%	2%
		Stephanomeria Pauciflora	0.25%	T
		Sphaeralcea	4%	9%
		Selaginella Arizonica	7%	16%
		Pleuraphis Rigida	1%	2%
		Parkinsonia Microphylla	10%	23%
		Lycium Exsertum	1%	2%
		Lycium Berlandieri	5%	11%
		Janusia Gracile	4%	9%
		Hyptis Emoryi	0.25%	T
		Fouquieria Splendens	0.25%	T
		Eriogonum Wrightii	0.25%	T
		Ephedra Aspera	1%	2%
		Encelia Farinosa Farinosa	9%	20%
		Ditaxis Ianceolata	1%	2%
		Cylindropuntia Acanthocarpa	0.25%	T
		Carnegiea Gigantea	0.25%	T
		Total	46.5%	100%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
50	Granitic Hills	*Viguiera Parishii*	2%	6%
		Senna Covesii	0.25%	1%
		Porophyllum Gracile	2%	6%
		Parkinsonia Microphylla	5%	16%
		Mirabilis Laevis v. Villosa	1%	3%
		Lycium	0.25%	1%
		Larrea Divaricata Tridentata	0.25%	1%
		Krameria Grayi	2%	6%
		Janusia Gracile	1%	3%
		Fouquieria Splendens	1%	3%
		Eriogonum Inflatum	1%	3%
		Eriogonum Fasiculatum	1%	3%
		Ephedra Aspera	0.25%	1%
		Encelia Farinosa Farinosa	2%	6%
		Echinocereus Engelmannii	1%	3%
		Cylindropuntia Bigelovii	4%	13%
		Cylindropuntia Acanthocarpa	4%	13%
		Carnegiea Gigantea	0.25%	1%
		Ambrosia Dumosa	3%	10%
		Total	31%	99%
51	Granitic Hills	*Viguiera Parishii*	3%	8%
		Tridens Muticus	0.25%	1%
		Sphaeralcea Ambigua	3%	8%
		Selaginella Arizonica	1%	3%
		Porophyllum Gracile	1%	3%
		Parkinsonia Microphylla	4%	9%
		Opuntia Chlorotica	1%	3%
		Muhlenbergia Porteri	1%	3%
		Mirabilis Laevis v. Villosa	1%	3%
		Lycium Berlandieri	3%	8%
		Larrea Divaricata Tridentata	5%	13%
		Krameria Grayi	2%	5%
		Janusia Gracile	5%	13%
		Gymnosperma Glutinosum	0.25%	1%
		Fouquieria Splendens	1%	3%
		Eriogonum Fasiculatum	2%	5%
		Ephedra Aspera	0.25%	1%
		Cylindropuntia Acanthocarpa	3%	8%
		Celtis Pallida Pallida	0.25%	1%
		Agave Deserti Simplex	0.25%	1%
		Total	37%	100%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
52	Granitic Hills	*Viguiera Parishii*	0.25%	0.5%
		Stephanomeria Pauciflora	0.25%	0.5%
		Selaginella Arizonica	22%	46%
		Salsola Tragus	0.25%	0.5%
		Prophyllum Gracile	0.25%	0.5%
		Parkinsonia Microphylla	0.25%	0.5%
		Mammillaria Grahamii	0.25%	0.5%
		Lycium Berlandieri	0.25%	0.5%
		Lycium	0.25%	0.5%
		Larrea Divaricata Tridentata	3%	6%
		Krameria Grayi	0.25%	0.5%
		Janusia Gracile	0.25%	0.5%
		Fouquieria Splendens	3%	6%
		Eriogonum Fasiculatum	0.25%	2%
		Encelia Farinosa Farinosa	0.25%	31.5%
		Ditaxis Ianceolata	0.25%	0.5%
		Cylindropuntia Acanthocarpa	1%	2%
		Total	48%	99%
Conley Allotment				
29	Limy Fan	*Larrea Divaricata Tridentata*	3%	100%
3	Limy Fan	*Larrea Divaricata Tridentata*	17%	100%
5	Limy Fan	*Prosopis Velutina*	1%	11%
		Lycium Andersonii	0.25%	3%
		Larrea Divaricata Tridentata	5%	52%
		Ferocactus	0.25%	3%
		Ambrosia Deltoidea	3%	31%
		Total	9.5%	100%
16	Limy Fan	*Larrea Divaricata Tridentata*	5%	95%
		Carnegiea Gigantea	0.25%	5%
		Total	5%	100%
4	Sandy Wash	*Sphaeralcea Coulteri*	0.25%	0%
		Prosopis Velutina	0.25%	0%
		Parkinsonia Florida	35%	64%
		Lycium Andersonii	15%	27%
		Larrea Tridentata	4%	7%
		Ambrosia Deltoidea	0.25%	0%
		Total	55%	100%
6	Limy Upland Deep	*Larrea Divaricata Tridentata*	7%	90%
		Cylindropuntia Acanthocarpa	0.25%	3%
		Carnegiea Gigantea	0.25%	3%
		Ambrosia Deltoidea	0.25%	3%
		Total	8%	99%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
7	Granitic Hills	*Parkinsonia Microphylla*	0.25%	3%
		Lycium Andersonii	0.25%	3%
		Larrea Divaricata Tridentata	1%	10%
		Hyptis Emoryi	1%	10%
		Encelia Farinosa Farinosa	6%	65%
		Cylindropuntia Acanthocarpa	0.25%	3%
		Carnegiea Gigantea	0.25%	3%
		Aristida	0.25%	3%
		Total	9%	100%
187	Granitic Hills	*Parkinsonia Microphylla*	4%	22%
		Olneya Tesota	0.25%	1%
		Mammillaria	0.25%	1%
		Lycium	0.25%	1%
		Larrea Divaricata Tridentata	2%	11%
		Krameria Grayi	1%	6%
		Fagonia Californica	0.25%	1%
		Euphorbia	2%	11%
		Eriogonum Inflatum	0.25%	1%
		Encelia Farinosa Farinosa	3%	17%
		Echinocereus	0.25%	1%
		Ditaxis Ianceolata	0.25%	1%
		Cylindropuntia Bigelovii	0.25%	1%
		Cylindropuntia Acanthocarpa	2%	11%
		Carnegiea Gigantea	0.25%	1%
		Ambrosia Deltoidea	1%	6%
		Allionia Incarnata	1%	6%
		Total	18%	99%
Hazen Allotment				
227	Limy Fan	*Sphaeralcea Ambigua*	0.25%	1%
		Parkinsonia Florida	12%	46%
		Olneya Tesota	0.25%	1%
		Larrea Divaricata Tridentata	12%	46%
		Hymenoclea Salsola	0.25%	1%
		Encelia Farinosa Farinosa	0.25%	1%
		Ambrosia Deltoidea	1%	4%
		Total	26%	100%
229	Limy Fan	*Larrea Divaricata Tridentata*	5%	59%
		Echinocereus Engelmannii	0.25%	3%
		Cylindropuntia Bigelovii	3%	35%
		Cylindropuntia Acanthocarpa	0.25%	3%
		Total	9%	100%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
231	Granitic Hills	*Viguiera Parishii*	2%	10%
		Sphaeralcea Ambigua	1%	5%
		Senecio	0.25%	1%
		Parkinsonia Microphylla	2%	10%
		Mammillaria Grahamii	0.25%	1%
		Larrea Divaricata Tridentata	2%	10%
		Hyptis Emoryi	1%	5%
		Fouquieria Splendens	0.25%	1%
		Fagonia Californica	0.25%	1%
		Encelia Farinosa Farinosa	5%	24%
		Echinocereus Engelmannii	0.25%	1%
		Ditaxis Ianceolata	0.25%	1%
		Cylindropuntia Bigelovii	4%	19%
		Cylindropuntia Acanthocarpa	1%	5%
		Carnegiea Gigantea	0.25%	1%
		Aristida	1%	5%
		Total	21%	100%
228	Sandy Wash	*Parkinsonia Microphylla*	2%	5%
		Olneya Tesota	20%	51%
		Lycium Berlandieri	10%	26%
		Larrea Divaricata Tridentata	4%	10%
		Hyptis Emoryi	0.25%	1%
		Hymenoclea Salsola	1%	2.5%
		Encelia Farinosa Farinosa	0.25%	1%
		Ditaxis Ianceolata	0.25%	1%
		Ambrosia Deltoidea	1%	2.5%
		Total	39%	100%
230	Sandy Wash	*Parkinsonia Microphylla*	7%	29%
		Olneya Tesota	3%	12%
		Lycium Berlandieri	2%	8%
		Larrea Divaricata Tridentata	4%	17%
		Krameria Grayi	2%	8%
		Fagonia Californica	1%	4%
		Encelia Farinosa Farinosa	1%	4%
		Ditaxis Ianceolata	0.25%	4%
		Aristida	0.25%	1%
		Ambrosia Dumosa	1%	4%
		Ambrosia Deltoidea	3%	12%
		Total	25%	100%
Lower Vekol Allotment				

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
185	Granitic Hills	*Parkinsonia Microphylla*	25%	52%
		Lycium	6%	13%
		Fouquieria Splendens	3%	6%
		Encelia Farinosa Farinosa	3%	6%
		Cylindropuntia Acanthocarpa	1%	2%
		Ambrosia Deltoidea	10%	21%
		Total	48%	100%
204	Granitic Hills	*Viguiera Parishii*	0.25%	1%
		Trixis Californica	0.25%	1%
		Sphaeralcea Ambigua	0.25%	1%
		Senecio Lemmonii	0.25%	1%
		Selaginella Arizonica	4%	10%
		Pleuraphis Rigida	0.25%	1%
		Parkinsonia Microphylla	7%	19%
		Mirabilis Laevis v. Villosa	1%	2%
		Mammaillaria Grahamii	0.25%	1%
		Lycium	3%	8%
		Larrea Divaricata Tridentata	0.25%	1%
		Krameria Grayi	1%	2%
		Hyptis Emoryi	3%	8%
		Hibiscus Denudatus	0.25%	1%
		Fouquieria Splendens	1%	2%
		Fagonia Californica	0.25%	1%
		Eriogonum Inflatum	1%	2%
		Ephedra Aspera	1%	2%
		Encelia Farinosa Farinosa	9%	24%
		Ditaxis Ianceolata	0.25%	1%
		Cylindropuntia Bigelovii	1%	2%
		Cylindropuntia Acanthocarpa	0.25%	1%
		Carnegiea Gigantea	0.25%	1%
		Ayenia Microphylla	0.25%	1%
		Aristida	1%	2%
		Ambrosia Deltoidea	1%	2%
		Adenophyllum Porophylloides	0.25%	1%
		Acleisanthes Iongiflora	0.25%	1%
		Total	38%	100%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
205	Granitic Hills	*Viguiera Parishii*	15%	18%
		Stephanomeria Pauciflora	1%	1%
		Sphaeralcea Ambigua	2%	3%
		Senecio Lemmonii	2%	3%
		Selaginella Arizonica	20%	25%
		Parkinsonia Microphylla	2%	3%
		Nicotiana Obtusifolia	0.25%	T
		Mirabilisi Laevis v. Villosa	0.25%	T
		Menodora Scabra	1%	1%
		Lycium	5%	6%
		Larrea Divaricata Tridentata	5%	6%
		Krameria Grayi	1%	1%
		Janusia Gracile	10%	12%
		Hyptis Emoryi	0.25%	T
		Fouquieria Splendens	3%	4%
		Eriogonum Wrightii	2%	3%
		Eriogonum Fasiculatum	0.25%	T
		Ephedra Aspera	1%	1%
		Cylindropuntia Acanthocarpa	2%	3%
		Celtis Pallida Pallida	1%	1%
		Brickellia Coulteri	1%	1%
		Aloysia Wrightii	0.25%	T
		Agave Desert Simplex	2%	3%
		Adenophyllum Porophylloides	0.25%	T
		Acacia Greggii	3%	4%
		Total	81%	99%
206	Granitic Hills	*Granitic Hills*	1%	2%
		Selaginella Arizonica	10%	24%
		Parkinsonia Microphylla	9%	22%
		Menodora Scabra	0.25%	1%
		Lycium Andersonii	0.25%	1%
		Krameria Grayi	2%	5%
		Janusia Gracile	0.25%	1%
		Fouquieria Splendens	0.25%	1%
		Eriogonum Fasiculatum	2%	5%
		Ephedra Aspera	0.25%	1%
		Encelia Farinosa Farinosa	1%	2%
		Ditaxis Ianceolata	0.25%	1%
		Cylindropuntia Bigelovii	5%	12%
		Cylindropuntia Acanthocarpa	0.25%	1%
		Carnegiea Gigantea	0.25%	1%
		Aristida	0.25%	1%
		Ambrosia Deltoidea	8%	19%
		Total	40.25%	100%

Plot #	Ecological Site	Scientific Name	% Cover	% Composition
207	Granitic Hills	*Selaginella Arizonica*	8%	20%
		Parkinsonia Microphylla	10%	26%
		Lycium	2%	5%
		Krameria Grayi	1%	2%
		Janusia Gracile	1%	2%
		Fouquieria Splendens	1%	2%
		Eriogonum Fasiculatum	1%	2%
		Ephedra Aspera	1%	2%
		Encelia Farinosa Farinosa	3%	7%
		Echinocereus	0.25%	1%
		Cylindropuntia Bigelovii	1%	2%
		Cylindropuntia Acanthocarpa	1%	2%
		Carnegiea Gigantea	0.25%	1%
		Ambrosia Deltoidea	8%	20%
		Agave Deserti Simplex	0.25%	1%
		Acacia Constricta	2%	5%
		Total	41%	100%
209	Granitic Hills	*Viguiera Parishii*	4%	6%
		Stephanomeria Pauciflora	3%	4%
		Sphaeralcea Ambigua	2%	3%
		Senecio Lemmoni	1%	1%
		Selaginella Arizonica	25%	36%
		Parkinsonia Microphylla	2%	3%
		Menodora Scabra	1%	1.5%
		Lycium	1%	1.5%
		Krameria Grayi	2%	3%
		Janusia Gracile	2%	3%
		Hyptis Emoryi	2%	3%
		Fouquieria Splendens	3%	4%
		Eriogonum Fasiculatum	15%	22%
		Ephedra Aspera	2%	3%
		Encelia Farinosa Farinosa	1%	1.5%
		Echinocereus	0.25%	T
		Cylindropuntia Acanthocarpa	1%	1.5%
		Carnegiea Gigantea	0.25%	T
		Aristida	0.25%	T
		Agave Deserti Simplex	0.25%	T
		Adenophyllum Porophylloides	1%	1.5%
		Acacia Greggii	1%	1.5%
		Total	70%	100%

F.22. ATTACHMENT 5: Pacific Biodiversity Institute Saguaro Study

Table F.23. : Saguaro Cover & Stem Count Information for the Palo Verde-Mixed Cacti Community (PBI 2004)

Dependent Variable	Location	
	Former Area A and BMGR (mean ± SD)	Remainder SDNM (mean ± SD)
Palo Verde-Mixed Cacti-Mixed Scrub on Bajadas (Includes Limy Upland Ecological Site)		
Sample Size (n)	5	30
# Total Stems	2.00 ± 1.00	2.44 ± 3.38
# Short Stems	0.00 ± 0.00	0.96 ± 1.81
# Medium Stems	0.60 ± 0.89	0.70 ± 1.26
# Tall Stems	1.40 ± 1.14	0.78 ± 1.42
% Cover	0.40 ± 0.34	0.67 ± 0.76
Palo Verde-Mixed Cacti-Mixed Scrub on Rocky Slopes (Includes Granitic Hills Ecological Site)		
Sample Size (n)	28	36
# Total Stems	4.33 ± 4.35	2.67 ± 3.92
# Short Stems	1.26 ± 1.43	0.83 ± 1.42
# Medium Stems	2.11 ± 2.78	1.33 ± 2.28
# Tall Stems	0.96 ± 1.22	0.50 ± 0.90
% Cover	0.62 ± 0.55	0.34 ± 0.25

F.23. ATTACHMENT 6: Resource Condition Objectives Related to Grazing Management

Objectives from the Lower Gila South RMP (LGSRMTAP), 1988

- Maintain ecological rangeland conditions currently in good to excellent condition and improve those areas in poor to fair condition.

Resource objectives from the Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona (TP), 1990.

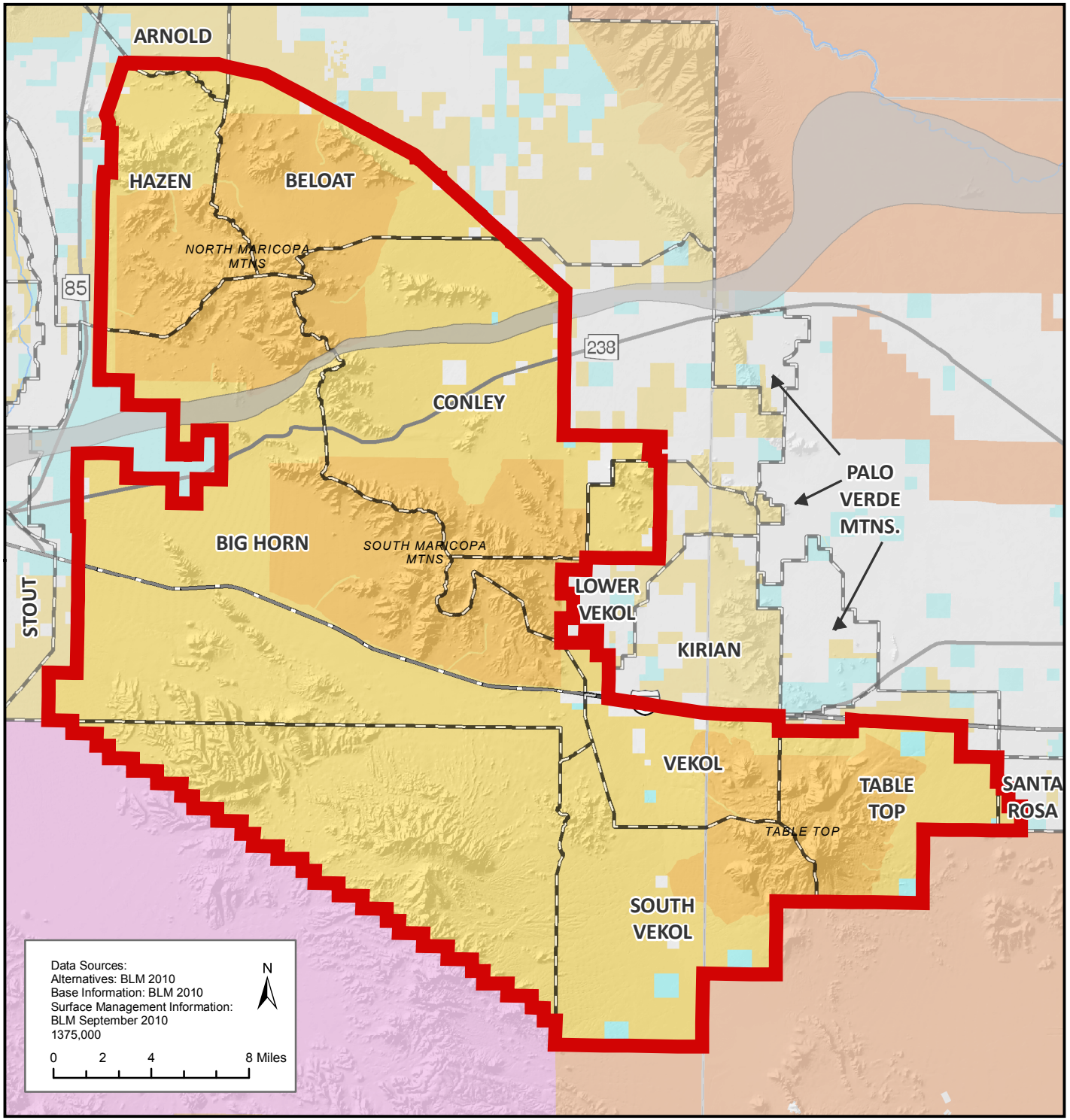
- Ensure that livestock use is consistent with the category goals, objectives and management actions of the Rangewide Plan and this strategy. This may include limiting, precluding, or deferring livestock use as documented in activity plans or other site-specific plans. The Habitat Category Goals are: Category I - Maintain stable, viable populations and protect existing tortoise habitat values; increase populations, where possible. Category II - Maintain stable, viable populations and halt further declines in tortoise habitat values. Category III - Limit tortoise habitat and population declines to the extent possible by mitigating impacts.
- Manage livestock to allow adequate and suitable native forage and cover for tortoises throughout the year.
- Where ecological site potential permits, manage livestock grazing to increase native perennial grasses, forbs and shrubs that are required by tortoise.
- Allow utilization of tortoise forage and cover plants by livestock only to levels which allow for long-term plant vigor and adequate standing vegetation for late summer-fall tortoise use.
- Ephemeral ranges are managed for the protection of perennial vegetation and dependent wildlife species.

F.24. ATTACHMENT 7: Key Management Species List

Important browse species list for livestock and mule deer:

- Parry dalea (DAPA)
- White burrobush (HYSA)
- Lance-leaf ditaxis (DILA)
- Saltbush (ATCA)
- White bursage (AMDU)
- Slender janusia (JAGR)
- Drummond's clematis (CLDR)
- Ratany (KR spp.)
- Twinberry (MESC)

- Mormon tea (EP spp.)
- Desert lavender ((HYEM)
- Wolfberry (LY spp.)
- Whitestem paperflower (PSCO)
- Goldeneye (VIDE)
- Coulter lyrefruit (LYCO)
- White flythicket (BRIN)
- Trumpet buckwheat (ERIN)
- Abutilon (AB spp.)
- Sweetbush bebbia (BEJU)
- Trixis (TRCA)
- Bricklebush (BRCO)
- Desert hibiscus (HIDE)
- False mesquite (CAER)
- Flattop buckwheat (ERFA)



Appendix F - Map 1

Land Health Evaluation

SDNM Location and Grazing Allotments

Lower Sonoran and Sonoran Desert National Monument Draft RMP/EIS

Allotment Boundaries

Anza National Historic Trail

Surface Management

Bureau of Land Management

Bureau of Land Management Wilderness

State

Private

General Reference

Sonoran Desert National Monument

Interstate

State Route

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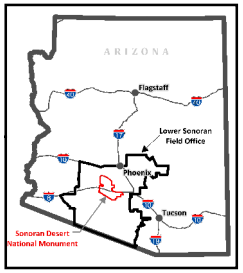
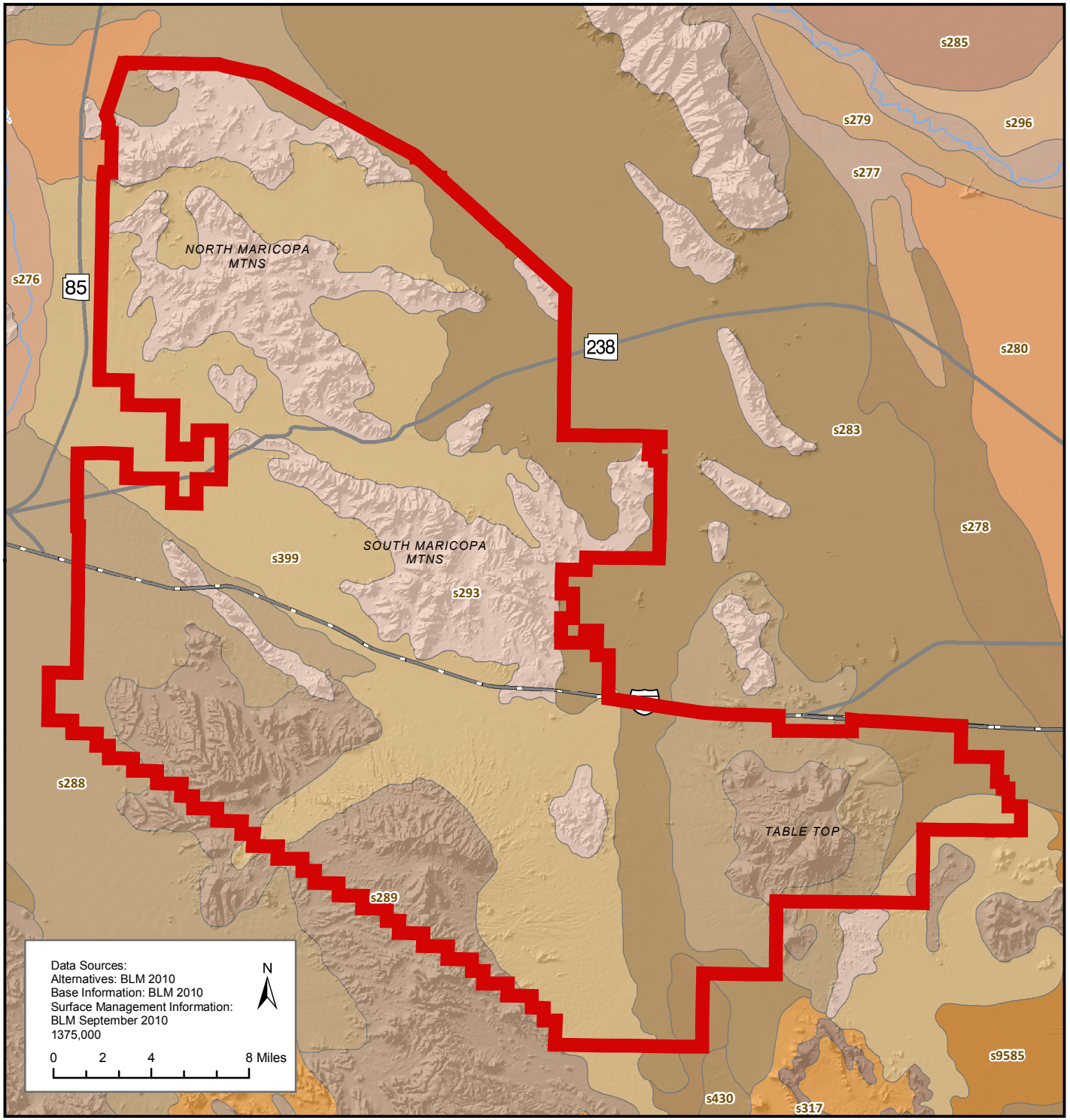


Gila and Salt River Meridian
Universal Transverse Mercator
Zone 12, Units Meters
GRS 1980 Spheroid
NAD83 Datum

Bureau of Land Management
Lower Sonoran Field Office

Map Last Revised: April 2011



Appendix F - Map 2

Land Health Evaluation

SDNM Soils

Lower Sonoran and Sonoran Desert National Monument Draft RMP/EIS

- Cherioni - Hyder - Cipriano (s289)
- Gunsight - Chuckawalla (s288)
- Gunsight - Rillito - Denure (s399)
- Mohall - Dateland (s283)
- Quilotosa - Rock Outcrop - Momoli (s293)

General Reference

- Sonoran Desert National Monument
- Interstate
- State Route

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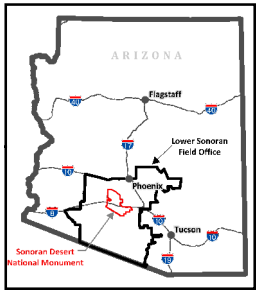

Gila and Salt River Meridian
Universal Transverse Mercator
Zone 12, Units Meters
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NAD83 Datum

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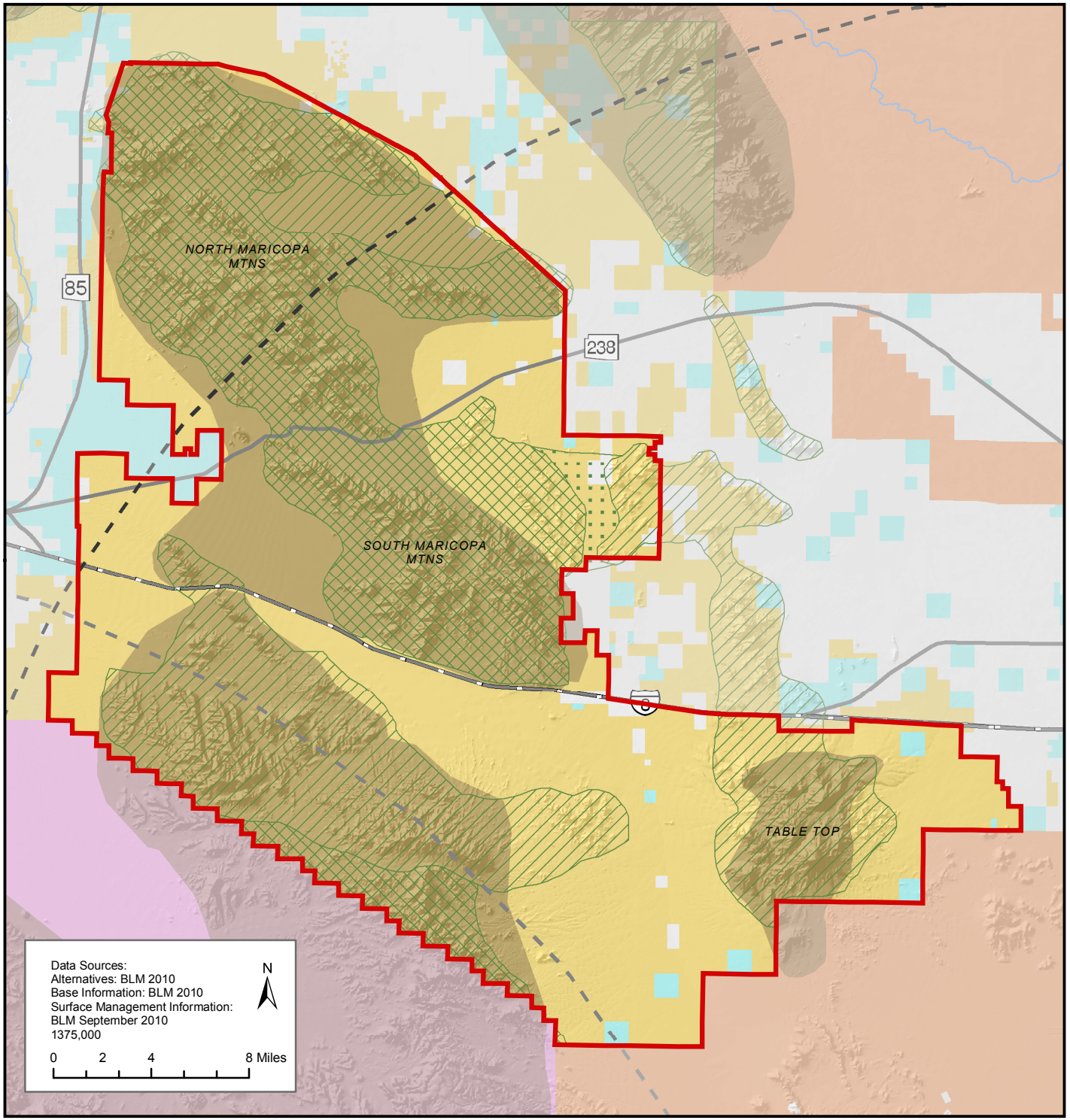

Appendix F - Map 3

Land Health Evaluation

SDNM Wildlife

Lower Sonoran and Sonoran Desert National Monument Draft RMP/EIS

Bighorn Sheep Habitat

50 Mile Radious from Old Mammon Mine - Lesser Long Nosed Bat

50 Mile Radious from Blue Bird Mine - Lesser Long Nosed Bat

Desert Tortoise

Category 1

Category 2

Category 3

Surface Management

Bureau of Land Management

Bureau of Land Management Wilderness

State

Private

General Reference

Sonoran Desert National Monument

County Boundary

Interstate

State Route

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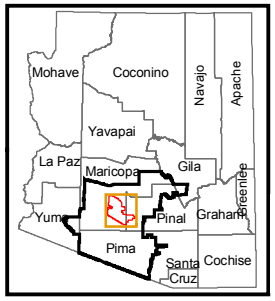
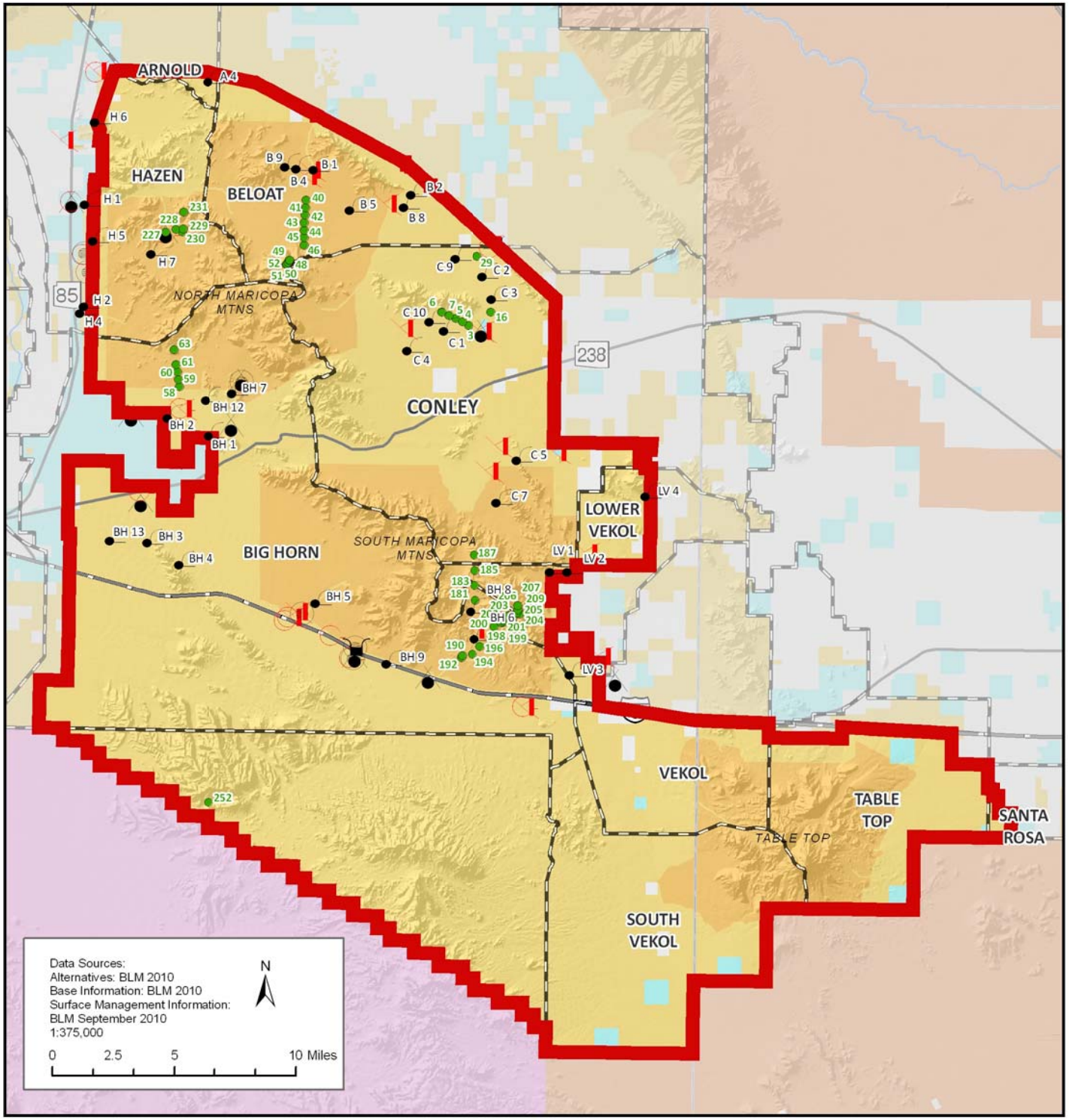


Gila and Salt River Meridian
Universal Transverse Mercator
Zone 12, Units Meters
GRS 1980 Spheroid
NAD83 Datum

Bureau of Land Management
Lower Sonoran Field Office

Map Last Revised: Jan. 2010



Appendix F - Map 4

Land Health Evaluation

SDNM Grazing Allotments & Monitoring Sites

Lower Sonoran and Sonoran Desert National Monument Draft RMP/EIS

- PBI Plots
- BLM Key Areas

Range Improvements
- Corral
- Fenced Reservoir
- Unfenced Reservoir
- Storage Tank
- Trough
- Well

Allotment Boundaries

Surface Management
- Bureau of Land Management
- Bureau of Land Management Wilderness
- State
- Private

General Reference
- Sonoran Desert National Monument
- Interstate
- State Route

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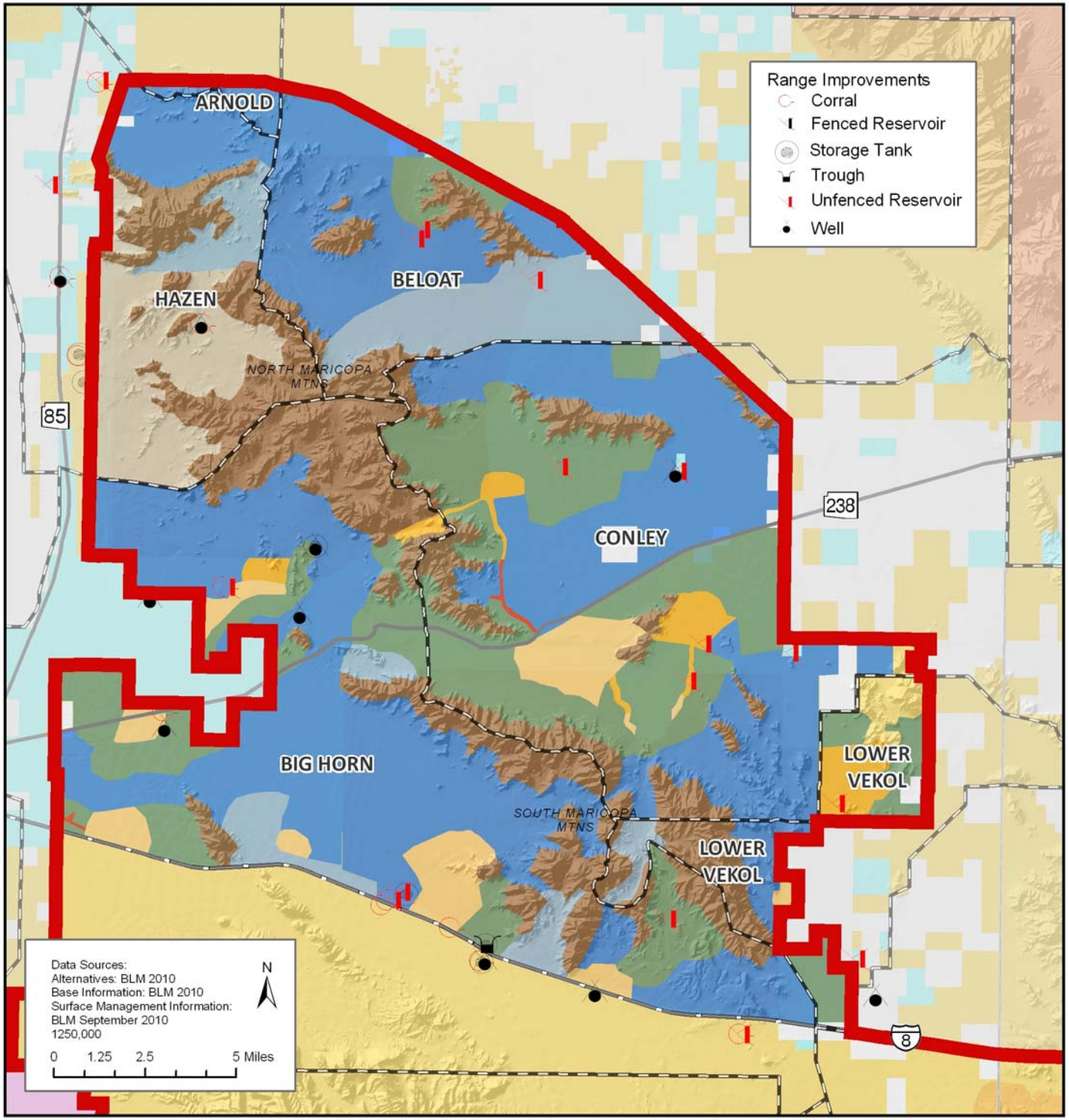

Appendix F - Map 5

Land Health Evaluation

SDNM Grazing Allotments & Use Pattern Mapping

Lower Sonoran and Sonoran Desert National Monument Draft RMP/EIS

Allotment Boundaries

Utilization Class

- Negligible 0 to 5%
- Slight 6 to 20%
- Light 21 to 40%
- Moderate 41 to 60%
- Heavy 61 to 80%
- Severe 81 to 95%
- No Livestock Use
- Unsurveyed or Inaccessable

Surface Management

- Bureau of Land Management
- Bureau of Land Management Wilderness
- State
- Private

General Reference

- Sonoran Desert National Monument
- Interstate
- State Route

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Gila and Salt River Meridian
Universal Transverse Mercator
Zone 12, Units Meters
GRS 1980 Spheroid
NAD83 Datum

Bureau of Land Management
Lower Sonoran Field Office

Map Last Revised: Apr. 2011

Appendix G. Sonoran Desert National Monument Recreational Target Shooting Analysis

G.1. Summary

This analysis was undertaken to ascertain the suitability of recreational target shooting in Arizona's Sonoran Desert National Monument (SDNM). Increased use of public lands for recreational target shooting, the resultant impacts to resources from this activity, and concerns for visitor safety have raised awareness of management issues related to target shooting. The analysis was conducted in two parts: 1) a geographic information system (GIS) analysis was conducted to find areas with significant presence of Monument objects and high natural or cultural resource sensitivity, and to locate areas where the natural slope of the terrain may be conducive to safe target shooting; and 2) field visits to all areas not excluded from target shooting by the GIS analysis were made, whereby significant presence of Monument objects and high natural and/or cultural resource sensitivity, visitor safety and experience, and site accessibility were assessed. The GIS analysis indicated that approximately 389,989 acres, or 80 percent, of the SDNM could be adversely impacted by recreational target shooting and is unsuitable for such activity. The GIS analysis also indicated that of the remaining 96,411 acres, or 20 percent, of the SDNM, eight sites appear to have sufficient slope to allow safe target shooting. Field visits to these eight sites indicate that one 84-acre area may be highly suitable for target shooting and one area totaling approximately 107 acres may be moderately suitable for target shooting. The remaining six sites are unsuitable due to concerns for visitor safety, potential impacts to Monument objects, or inaccessibility by motor vehicles.

G.2. Introduction

Invoking his authority under the Antiquities Act of 1906, President Clinton designated the SDNM with Presidential Proclamation 7397 on Jan. 17, 2001. Since designation of the SDNM, impacts from recreational target shooting have increasingly become a management concern. Such impacts commonly include damage to protected plants, particularly saguaro; areas denuded of vegetation, both at sites from which shooting occurs and at target areas; accumulation of debris used as targets, such as discarded appliances, propane bottles, glassware, furniture, automobile tires, plywood, sheet metal, and numerous other types of trash; and safety of other visitors, particularly with regard to inadequate backstops. Currently, recreational target shooting is dispersed throughout the SDNM; however, the activity is concentrated near the northern boundary along the El Paso Natural Gas Company pipeline road, and at smaller sites adjacent to State Route 238 and Vekol Valley Road. During October-November, 2008 the Bureau of Land Management (BLM) removed six tons of debris from recreational target shooting sites in these areas. (See ??? (p. 1194) and ??? (p. 1195) for photos of the sites).

Proclamation 7397 directed the BLM to manage the SDNM for the paramount purpose of protecting its "objects." The following analysis was undertaken to determine areas of the SDNM where continued recreational target shooting would cause unacceptable impact to the objects for which the SDNM was designated, as well as to identify areas where such activity is compatible with such objects.

G.3. Method of Analysis

The BLM established a two-part process using two sets of criteria with which to evaluate the potential impacts of recreational target shooting on the SDNM (see Table G.1, "Shooting Analysis Criteria" (p. 1184)). Known concentrations of Monument objects or significant presence of high natural and/or cultural resource sensitivity were determined using GIS analysis. Portions of the SDNM that scored high for these variables from this analysis were determined to be unsuitable for continued recreational target shooting and excluded from further analysis.

Table G.1. Shooting Analysis Criteria

Phase 1: Criteria applied through GIS analysis	Phase 2: Criteria applied through on-site field visits
1. Significant presence of Monument objects or high natural resource sensitivity. 2. Presence of suitable terrain for shooting (existing natural backstop or berm).	1. Significant presence of Monument objects or high natural and cultural resource sensitivity that was not captured through GIS analysis. 2. Visitor safety and experience where shooting is incompatible with other uses or where it could result in adverse impacts to facilities, public use sites, or other BLM and private assets. 3. Accessibility by motor vehicle. 4. Physical suitability of terrain for shooting activity.

In areas that were not excluded due to concerns for Monument objects, GIS analysis was further used to distinguish areas where the natural slope of the terrain indicated that target shooting might be conducted safely. In order for dispersed, undeveloped target shooting to occur in a safe environment on public lands without risk to others, a natural backstop or berm with sufficient dimensions must be located behind the target. There are vast, flat areas in the SDNM where target shooting would not meet minimum safety standards due to the absence of any natural backstops.

Following the GIS analysis, field criteria were developed for areas where significant presence of Monument objects was not expected and where adequate slopes were found. Each of these areas was visited in the field and assessed against these criteria, which are presented above in Table 1.

G.3.1. Phase One: GIS Analysis

G.3.1.1. GIS Criteria 1: Presence of Monument Objects

Three data sets, or "overlays," indicating significant present of Monument objects and high natural resource sensitivity were used. The overlays were 1) presence of palo verde-mixed cacti vegetation community; 2) presence of high quality desert tortoise habitat; and 3) presence of Juan Bautista de Anza National Historic Trail corridor segments. These data sets were analyzed cumulatively, or merged, in the order presented above, and the cumulative acreage of the SDNM found to be unsuitable for continued recreational target shooting was tabulated. Each of these areas was visited in the field and assessed against these criteria, which are presented above in Table G.1, "Shooting Analysis Criteria" (p. 1184).

G.3.1.1.1. Presence of Palo Verde-Mixed Cacti Vegetation Community

Rationale: The palo verde-mixed cacti vegetation community, described and mapped by the U.S. Geological Survey (2004), provides the best-known image of the Sonoran Desert: dense "forests" of saguaro (*Carnegia gigantea*) and other cacti, and thick woodlands of palo verde (*Cercidium microphyllum*), mesquite (*Prosopis sp*.), and ironwood (*Olneya tesota*) trees covering the slopes and outwash plains of jagged, isolated mountain ranges. Map G-1 shows the extent of this vegetation community within the SDNM. These dominant cactus and trees species provide forage, nesting, and cover habitat for numerous wildlife species and are particularly vulnerable to damage from shooting. Intentional or incidental destruction of saguaros and trees is common at shooting sites. For examples of such damage, see ??? (p. 1196) and ??? (p. 1197). See Comparison of Imapcts Documented at Shooting and Non-Shooting Sites (p.).

G.3.1.1.2. Presence of High Quality Desert Tortoise Habitat

Rationale: The Sonoran desert tortoise (*Gopherus agassizii*) is a signature species of the Sonoran Desert and is managed by the BLM as a federally listed candidate species. The goal of BLM management with regard to the desert tortoise in Arizona is to "[c]onserve and improve where feasible, the distribution, quantity and quality of desert tortoise habitat on public lands with no net loss in quantity or quality of Category I and Category II habitats on public land" (BLM 1990). See Map G-2 showing the extent of Category I and Category II habitat on the SDNM. The desert tortoise excavates and inhabits burrows in rocky hillsides against which target shooters often place targets. Sustained target shooting may cause direct mortality to desert tortoise and indirect impacts to tortoise habitat through loss of forage and cover due to damage or loss of vegetation, increased vulnerability to predation as predators are attracted to areas of trash and garbage, and ingestion of plastic and other trash.

G.3.1.1.3. Presence of Juan Bautista de Anza National Historic Trail Corridor

Rationale: The Juan Bautista de Anza National Historic Trail (Anza NHT) was designated in 1990 by amendment of the NHT Act and is the premier historic cultural site of the SDNM. See Map G-3 for the trail's location within the SDNM. The Anza NHT is managed in a corridor approximately 1 mile wide across the SDNM, with the general landscape view largely unchanged from that of 1776 when the Anza Expedition occurred. The Anza NHT corridor is frequently used by visitors to the SDNM for sightseeing, camping, and youth group educational events. Recreational target shooting poses safety concerns where the trail passes through the North Maricopa Mountains. Here, user groups are forced into close proximity to existing and potential shooting sites by the mountainous terrain, and the level terrain to the east and west of the mountains does not provide suitable backstops in the corridor.

G.3.1.2. GIS Criteria 2: Presence of Suitable Terrain

In areas that were not excluded due to concerns for Monument objects, GIS analysis was further used to distinguish areas where the natural slope of the terrain indicated that target shooting might be safely conducted. Only one overlay indicating presence of suitable terrain was used, which was the presence of existing natural backstop or berm.

G.3.1.2.1. Presence of Existing Natural Backstop or Berm

Rationale: There are vast, flat areas in the SDNM where safe target shooting is naturally precluded by the absence of natural backstops. Based on recommendations for managed shooting ranges (Daughtry, 2007; Luke, 1996), a minimum height of 15 feet for a shooting backstop is acceptable, but 20 to 25 feet is recommended. Further, the recommended slope for a backstop is 45 degrees or greater. Because these criteria were established for constructed ranges and not for unmanaged, open shooting areas, they were taken as guidelines but not strict requirements when evaluating the natural terrain's capability to provide target-shooting backstops in the SDNM. For example, areas with a 45-degree slope are scarce in the SDNM, so this was not included as a primary criterion to locate safe shooting areas. On the other hand, a hill rising to 15 or 20 feet may not be sufficiently safe depending on the slope of the hill, the position of shooter, or other factors. ??? (p. 1198) shows examples of potentially appropriate backstops.

To locate all areas in the SDNM with potentially appropriate backstop dimensions expected to be safe for target shooting, the BLM conducted a GIS terrain analysis to identify areas of the SDNM with slopes greater than 15 degrees. This lower threshold was employed so that all areas with significant elevation changes could be identified and examined for their potential as safe shooting areas. Map G-4 depicts the natural slopes in the SDNM.

G.3.2. Phase Two: Field Analysis

Areas of the SDNM not determined through GIS analysis to be unsuitable for recreational target shooting were each visited in the field. The objective of the field visits was to determine if such areas remained potentially suitable for recreational target shooting after evaluation against the four field criteria presented in Table G.1, "Shooting Analysis Criteria" (p. 1184). The criteria are:

1. Significant presence of Monument objects or high natural and cultural resource sensitivity that was not captured through GIS analysis,
2. Visitor safety and experience in areas where shooting is incompatible with other uses or where it cold result in adverse impacts to facilities, public use sites, or other BLM and private assets,
3. Accessibility by motor vehicle, and
4. Physical suitability of terrain for shooting activity.

G.3.2.1. Field Criteria 1: Monument Objects or High Resource Sensitivity

Rationale: The data overlays used in the GIS analysis included specific types of natural and cultural resources that represented extensive areas with a significant presence of Monument objects or with high natural and cultural resource sensitivity. The overlays do not represent comprehensive surveys of all Monument objects and resources. For example, the SDNM has not been fully surveyed for cultural resources; geological features such as prominent rock outcrops are not represented by the GIS data overlays; and resources, such as raptor nesting sites, could only be considered in the field. Target shooting sites located in such areas would be incompatible with protection of Monument objects. (For examples, see ??? (p.) and ??? (p.).) The BLM developed the guidelines listed below in Table G.3, "Field Criteria for Visitor Safety and Nearby

Uses and Facilities" (p. 1188) to rank suitability for target shooting at specific sites with regard to protection of Monument objects.

Table G.2. Field Criteria for Resources and Monument Objects

Low Suitability for Target Shooting	• High diversity of vegetation • Exemplary plants and assemblages present • Dense vegetative cover and canopy • Within sensitive wildlife habitats • Known desert tortoise burrowing sites in area • Raptor nesting sites in area • High potential for defacing and damaging geological features • Cultural resources present
Moderate Suitability for Target Shooting	• Moderate diversity of vegetation • No exemplary plants and assemblages present • Moderate vegetative cover and canopy • Away from sensitive wildlife habitats • No known desert tortoise burrowing sites in area • No raptor nesting sites in area • Minimal potential for defacing and damaging geological features • No known cultural resources present
High Suitability for Target Shooting	• Low vegetation diversity • No exemplary plants or assemblages present or adjacent • Free of vegetative cover or sparsely vegetated • Away from sensitive wildlife habitats • No known desert tortoise burrowing sites in area • No raptor nesting sites in area • No potential for defacing and damaging geological features • No known cultural resources present

G.3.2.2. Field Criteria 2: Visitor Safety and Experience

Rationale: The location of other uses, sites, and facilities on the SDNM relative to the location of target shooting activity is an important factor in determining visitor safety, incompatible uses, and protection of property. Nearby uses and facilities that could be affected by target shooting include designated campsites, large group sites, and staging areas; corrals, stock ponds, water

tanks, wells, windmills, and drinking troughs; wildlife waters; dispersed recreation areas such as trailheads; cultural sites designated for public use; utility corridors and facilities; and the location of frequently used roads and trails. Additionally, the following state laws and BLM regulations govern the discharge of firearms on public lands in Arizona:

- Arizona Revised Statute (A.R.S.) 17-309a(4): It is unlawful for a person to discharge a firearm while taking wildlife within one-fourth mile of an occupied farmhouse or other residence, cabin, lodge or building without permission of the owner or resident.

- A.R.S. 17-301b: No person may knowingly discharge any firearm or shoot any other device upon, from, across, or into a road or railway.

- 43 CFR 8365.1-4(a): No person shall cause a public disturbance or create a risk to other persons on public lands by engaging in activities, which include ... (2) Creating a hazard or nuisance.

- 43 CFR 8365.2-5: On developed recreation sites and areas, unless otherwise authorized, no person shall: (a) Discharge or use firearms, other weapons, or fireworks.

These laws and regulations were used as guidelines in the field to assess the potential for hazardous situations involving target shooting with respect to proximity to nearby residences, facilities, and other areas where visitors commonly drive or gather. The BLM developed the criteria listed below in Table G.4, "Field Criteria for Motor Vehicle Accessibility" (p. 1189) to rank suitability for target shooting based on considerations for visitor safety and other nearby uses.

Table G.3. Field Criteria for Visitor Safety and Nearby Uses and Facilities

Low Suitability for Target Shooting	• Site is within ¼-mile of livestock waters or corrals, designated campsites, trailheads, and other temporarily occupied sites; • The sites's shooting fan is within a 1–mile radius of roads or trails, livestock and wildlife waters, designated campsites, trailheads and other temporarily occupied sites, or communication sites, utilities and other surface facilities; • The site's shooting fan is within 1.5–2.5 miles of occupied residences.
Moderate Suitability for Target Shooting	• Site is at least ¼-mile of livestock waters or corrals, designated campsites, trailheads, and other temporarily occupied sites; • The site's shooting fan is 1–1.5 miles from roads or trails, communication sites, utilities, and other surface facilities; • The site's shooting fan is at least 1.5 miles from the closest residences or areas likely to be developed for residential use.
High Suitability for Target Shooting	• Site is at least ¼-mile from livestock waters or corrals, designated campsites, trailheads, and other temporarily occupied sites; • The site's shooting fan is at least 1.5 miles from roads or trails, communication sites, utilities, and other surface facilities; • The site's shooting fan is 3.5 miles from occupied residences; • The site's shooting fan is 2 miles from the closest residence or area likely to be developed for residential use.

G.3.2.3. Field Criteria 3: Accessibility by Motor Vehicle

Rationale: Target shooting in an undeveloped setting on public lands is almost exclusively associated with sites that are readily accessible by motorized vehicle, with shooting activity occurring very near the vehicle. Accessibility by motor vehicle is considered in this analysis in order to assure that areas identified as suitable will satisfy the preference of most shooters to remain near their vehicles. Sites not located within a short walking distance (up to 400 yards) from an existing, designated BLM vehicle route are considered by most to be unsuitable for recreational target shooting.

Driving time from residence and from a paved highway is also an important consideration. Interviews conducted in the Tucson area revealed that recreational target shooters "want shooting opportunities within a 15-30 minute drive from home" (Institute for Environmental Conflict Resolution, 2006). Daughtry (2007) estimated that Tucson shooters were willing to travel approximately 45 minutes, which is supported by interviews conducted with shooters throughout Arizona that indicated most travel about 45 minutes to shoot on federal lands (Responsive Management, 2008). The SDNM is accessible by three paved highways: Arizona Highway 85, Arizona and Maricopa Route 238, and Interstate 8. For the purposes of this analysis, driving time was calculated as the time it took to drive from any of these three primary access routes to a site. The BLM developed the criteria listed below in Table G.5, "Field Criteria for Physical Suitability of Target Shooting" (p. 1190) to rank suitability for target shooting at specific sites with regard to access by motor vehicle.

Table G.4. Field Criteria for Motor Vehicle Accessibility

Low Suitability for Target Shooting	• Site is accessible by four wheel-drive, high clearance vehicles only • Requires one hour or more driving time to arrive from paved highway • Is not accessible by a BLM-designated existing vehicle route • No legal public access
Moderate Suitability for Target Shooting	• Site generally is accessible by two-wheel-drive, high clearance vehicles • Is located within a forty-minute drive from paved highway • Is located adjacent to a BLM-designated vehicle route
High Suitability for Target Shooting	• Site is accessible by passenger cars • Located within a twenty to forty minute drive from paved highway • Located adjacent to a BLM-designated vehicle route

G.3.2.4. Field Criteria 4: Physical Suitability of Terrain

Rationale: For dispersed, non-facilitated target shooting to occur in a safe environment on public land without risk to others, a natural backstop or berm and down range safety fan of sufficient dimensions must be present behind the target.

Recommendations given for developed shooting ranges provide that acceptable backstops be a minimum height of 15 feet (although 20 to 25 feet is desirable), wide enough to allow a horizontal shooting fan of 45 degrees or greater, and have a vertical slope of 20 degrees or greater (Daughtry,

2007; Luke, 1996). Although these recommendations were established for constructed and intensely managed shooting ranges rather than unmanaged shooting areas, they were taken as guidelines for evaluating the capability of natural terrain to provide appropriate target shooting site backstops in the SDNM. Examples of backstops considered safe are illustrated in ??? (p. 1198). The BLM developed the criteria listed below in Table G.5, "Field Criteria for Physical Suitability of Target Shooting" (p. 1190) to rank physical suitability of terrain for target shooting.

Table G.5. Field Criteria for Physical Suitability of Target Shooting

Low Suitability for Target Shooting	● Only one shooting party at a time could be supported ● Backstop provides narrow horizontal shooting fan that is less than 15 degrees and a vertical fan less than 5 degrees ● Backstop surface composed predominantly of hard rock or hard pan material ● Site located in uneven, broken terrain with drainages, washes, dense vegetation, or other obstacles that hinder observation of others during target setup/retrieval and shooting
Moderate Suitability for Target Shooting	● Site could support two to three shooting parties at one time ● Backstop provides horizontal shooting fan from 15 to 45 degrees and a vertical fan from 5 to 20 degrees ● Backstop surface composed of mixed hard rock and unconsolidated material ● Site located in uneven, broken terrain with drainages or vegetation that could impede observation of others during target setup/retrieval and shooting
High Suitability for Target Shooting	● Site could support multiple shooting parties at one time (more than three parties) ● Backstop provides wide horizontal shooting fan that is greater than 45 degrees and a vertical shooting fan greater than 20 degrees ● Backstop surface composed predominantly of unconsolidated, loose soil material ● Site located in even, open terrain with little or low vegetation that allows for ready observation of others during target setup/retrieval and shooting

G.3.2.5. Field Rating

Using the "Field Rating Sheet" illustrated in Attachment G-2, the field criteria presented in Tables 3 through 6 were applied to areas of the SDNM that remained potentially suitable for recreational target shooting following application of the GIS analysis. The potentially suitable areas were assessed by traveling the existing vehicle route system and recording observations relating to the field criteria on the form. Representative photographs of each area were taken, as were photographs of outstanding features or additional considerations.

G.4. Results of Analysis

G.4.1. Phase One: GIS Analysis

G.4.1.1. Results from Significant Presence of Monument Objects

The results of step one - GIS analysis for significant presence of Monument objects or high natural resource sensitivity - are presented below in Table G.6, "GIS Overlays and Cumulative

Acreage of the SDNM Not Suitable for Recreational Target Shooting" (p. 1191) and in Map G-5. Approximately 389,989 acres, or 80.2 percent, of the SDNM were determined to not be suitable for recreational target shooting based on the cumulative application of the GIS criteria presented in Table G.1, "Shooting Analysis Criteria" (p. 1184).

Table G.6. GIS Overlays and Cumulative Acreage of the SDNM Not Suitable for Recreational Target Shooting

Data Overlay	Total Acres	Cumulative Acres
Palo Verde-Mixed Cacti Vegetation Community	303,308	303,308
Desert Tortoise Habitat, Category I and II	290,706	81,646
Juan Bautista de Anza National Historic Trail Corridor	7,793	5,035
Total	601,807	389,989

Excluding the acres determined through GIS analysis to be unsuitable for recreational target shooting, 12 areas remained (totaling approximately 96,411 acres, or 19.8 percent, of the SDNM) where potentially suitable target shooting sites might be found. Each of these potentially suitable target-shooting areas was given a geographic name and is illustrated on Map G-6. Results from the GIS analysis were used to formulate Alternative B in the Lower Sonoran-SDNM Draft RMP. (See Section 2.8.4, "Recreation Management (RM)" (p. 158) and Map 2-13b.)

G.4.1.2. Results from Presence of Suitable Terrain

The results of the terrain analysis of the SDNM are shown on see Map G-6. Within the twelve areas where potentially suitable target-shooting sites may be found, eight locations exhibited slopes of 15 degrees or greater. These areas total approximately 1,726 acres in extent, and range from 37 acres (Hidden Valley [B]) to 682 acres (Gap Tank [B]).

G.4.2. Phase Two: Field Analysis

G.4.2.1. Step 1: Summary Rankings by Area and Field Criteria

A summary of the field analysis for each of the eight potentially suitable target-shooting sites of the SDNM is provided below in Table G.7, "Summary of Field Analysis for Sites Potentially Suitable for Recreational Target Shooting in the SDNM" (p. 1191). These rankings offer an indication of the overall suitability of each site; however, the BLM also believes it is important to provide a single summary ranking for each potential site to contrast overall suitability between sites and compare findings. To do this, values were assigned to each ranking: High = 2, Moderate = 1, and Low = 0. Then, each category of field criteria was weighted to reflect the significance of the criteria with regard to the purpose of the shooting analysis.

Table G.7. Summary of Field Analysis for Sites Potentially Suitable for Recreational Target Shooting in the SDNM

SDNM Sites Potentially Suitable for Target Shooting (see ???)	Field Criteria			
	Presence of Monument Objects*	Visitor Safety and Nearby Uses	Motor Vehicle Access	Physical Suitability
Gap Tank (A) (427 acres)	L	H	L	M
Gap Tank (B) (682 acres)	H	H	L	H
Gap Tank (C) (56 acres)	L	L	H	M
Gap Well (A) (107 acres)	L	M	H	M
Hidden Valley (A) (94 acres)	H	L	M	H

SDNM Sites Potentially Suitable for Target Shooting (see ???)	Field Criteria			
	Presence of Monument Objects*	Visitor Safety and Nearby Uses	Motor Vehicle Access	Physical Suitability
Hidden Valley (B) (37 acres)	H	M	L	M
Hidden Valley (C) (84 acres)	H	M	H	H
Pipeline 1 (A) (239 acres)	M	L	H	H
Total Acres: 1,726				
*H = High; M = Moderate; L = Low				

G.4.2.2. Step 2: Numeric Suitability Rankings by Area and Field Criteria

Management concerns related to target shooting on the SDNM focus more on resource damage than any other factor. The paramount purpose of the SDNM is protection of Monument objects, and the primary consideration relating to target shooting on the SDNM is the protected status of the biological, cultural, and geological resources of the SDNM. Therefore, areas found to be of "low" suitability with regard to presence of Monument objects were excluded from further consideration. Human safety is of concern with target shooting activities; therefore, the criteria for safety and nearby uses and facilities were given a weight of three (3). Although the physical suitability of an area partially addresses safety issues, these criteria also focus on accommodation of shooting and the manageability of an area. These are less significant factors in determining appropriate shooting locations, so this category was given a weight of two (2). Finally, although accessibility was a necessary factor to consider in this analysis, access by motor vehicle was probably the least significant because it is relative to each shooter. For this reason, the accessibility factor was given a weight of one (1). Site rankings based on values assigned to each rating and weights given to each category are shown in Table G.9, "Summary of Potentially Suitable Target Shooting Sites by Numeric Ranking" (p. 1193).

Table G.8. Numeric Suitability Rankings for Sites Potentially Suitable for Target Shooting in the SDNM

Site	Resources & Monument Objects (Weight = 3)	Safety, nearby uses and facilities (Weight = 3)	Motor Vehicle Access (Weight = 1)	Physical Suitability (Weight = 2)	Numeric Suitability Ranking (Total Score = 0 to18)
Gap Tank (A)	Excluded for presence of Monument objects				
Gap Tank (B)	6	6	0	4	16
Gap Tank (C)	Excluded for presence of Monument objects				
Gap Well (A)	Excluded for presence of Monument objects				
Hidden Valley (A)	6	0	1	4	11
Hidden Valley (B)	6	3	0	2	11
Hidden Valley (C)	6	3	2	4	15
Pipeline 1 (A)	3	0	2	4	9

G.4.2.3. Step 3: Site Categorization Based on Numeric Ranking

The next step of the process was to categorize each site based on its numeric suitability ranking. By dividing the 18-digit scale in thirds to generate ranges for Low (0-6), Moderate (7-12), and High (13-18), the sites fall into the categories summarized in Table G.10, "Comparison of Impacts Documented at Shooting & Non-Shooting Sites in the SDNM, 2003-2005" (p. 1203).

Table G.9. Summary of Potentially Suitable Target Shooting Sites by Numeric Ranking

Low Suitability (0-6)	Moderate Suitability (7-12)	High Suitability (13-18)
Gap Tank (A) (427 acres) Gap Tank (C) (56 acres) Gap Well (A) (107 acres) Total Acres: 590	Hidden Valley (A) (94 acres) Hidden Valley (B) (37 acres) Pipeline 1 (A) (239 acres) Total Acres: 370	Gap Tank (B) (682 acres) Hidden Valley (C) (84 acres) Total Acres: 766

G.5. Summary Conclusions

Based on the criteria used for this analysis, two areas were identified on the SDNM that may be highly suitable for recreational target shooting: Gap Tank (B) and Hidden Valley (C). Hidden Valley (C) is currently used as a target shooting area but is only moderately safe as a shooting site using the criteria presented in this analysis (see ??? (p. 1201) (C), view to the north and ??? (p. 1201) (C), view to the south), and Gap Tank (B) is not accessible by motor vehicle. Three areas were identified to be moderately suitable for recreational target shooting; however, one of these, Hidden Valley (B), is not accessible by motor vehicle and two others, Hidden Valley (A) and Pipeline 1 (A), were determined to be unsafe shooting sites (see Map G-7).

These findings are important because they show that very few locations on a landscape level qualify as appropriate places for recreational target shooting activity on the SDNM. The results of this analysis also indicate that shooting activity, for reasons of potential impacts to Monument objects, visitor safety, accessibility, and physical suitability of terrain, would likely be limited to one area, the Hidden Valley (C) location.

The combination of moderated and highly potentially suitable areas for recreational target shooting were used to formulate Alternative C in the DRMP (Section 2.8.4, "Recreation Management (RM)" (p. 158) and Map 2–13c). These areas total 1,136 acres, or 0.2 percent of the SDNM; however, four of these areas received only moderate or low rankings for concerns over visitor safety.

The BLM does not compromise on the safety of its visitors. Improving user and visitor safety at the Hidden Valley (C) location would require direct management, funding, and development. Current policy guidance provides two methods for allocating public lands for target shooting: direct sale under Section 203 of FLPMA or through patents issued under the Recreation and Public Purposes (R&PP Act) of 1926 (Washington Office Instruction Memorandum No. 2008-074). Neither of these methods would be compliant with the provisions provided under the Monument proclamation or management goals and objectives identified in the DRMP, and they are not presented or analyzed as alternatives in the DRMP. From these concerns, as well as concerns about impacts to Monument objects discussed throughout this analysis, Alternatives D and E were formulated in the DRMP (see Section 2.8.4, "Recreation Management (RM)" (p. 158)). Under these alternatives, 486,400 acres, or 100 percent, of the SDNM will be unavailable for recreational target shooting.

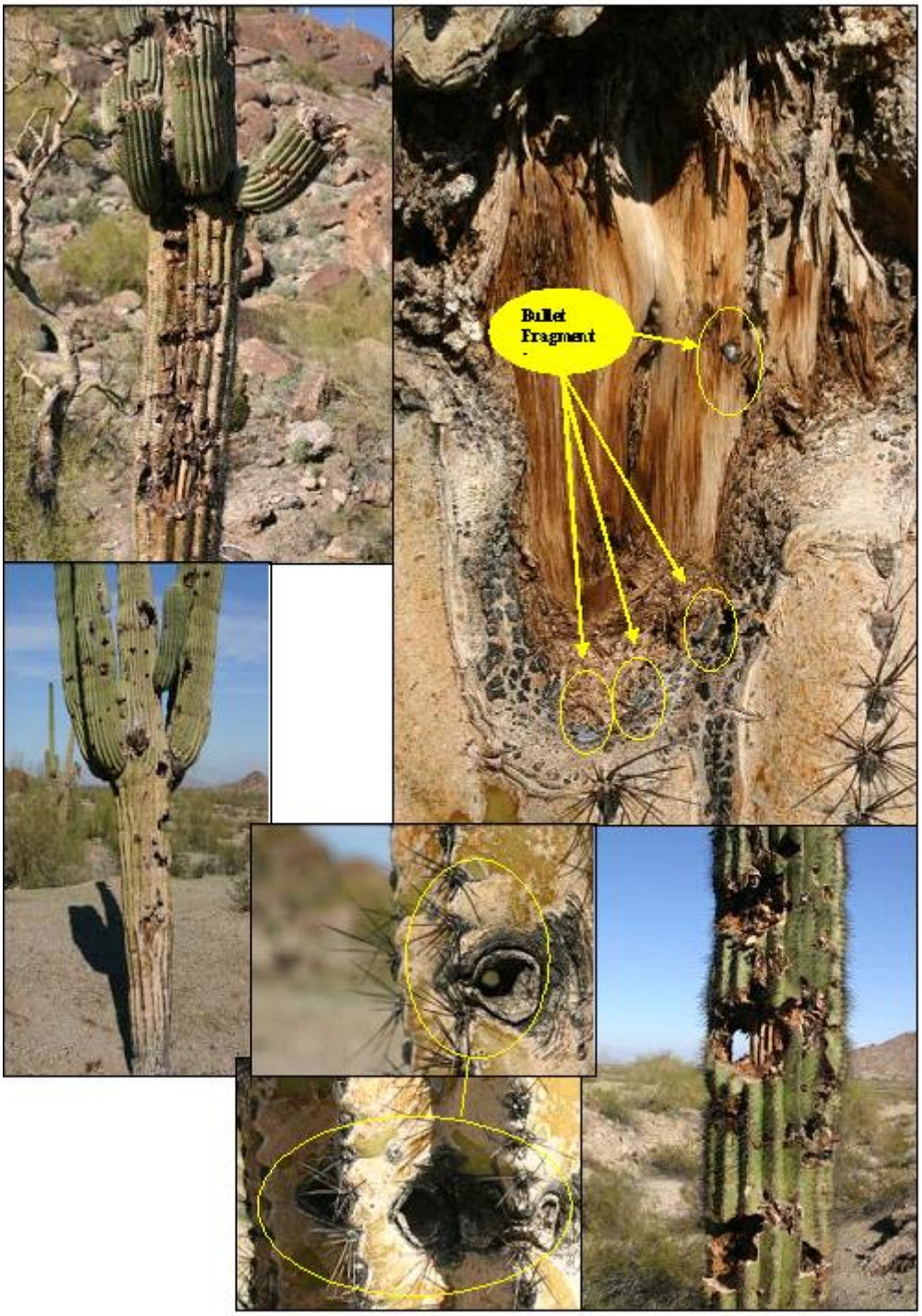
G.6. Figures

Examples of shooting areas denuded of vegetation and littered with debris.

Figure G.1. Litter in Shooting Sites

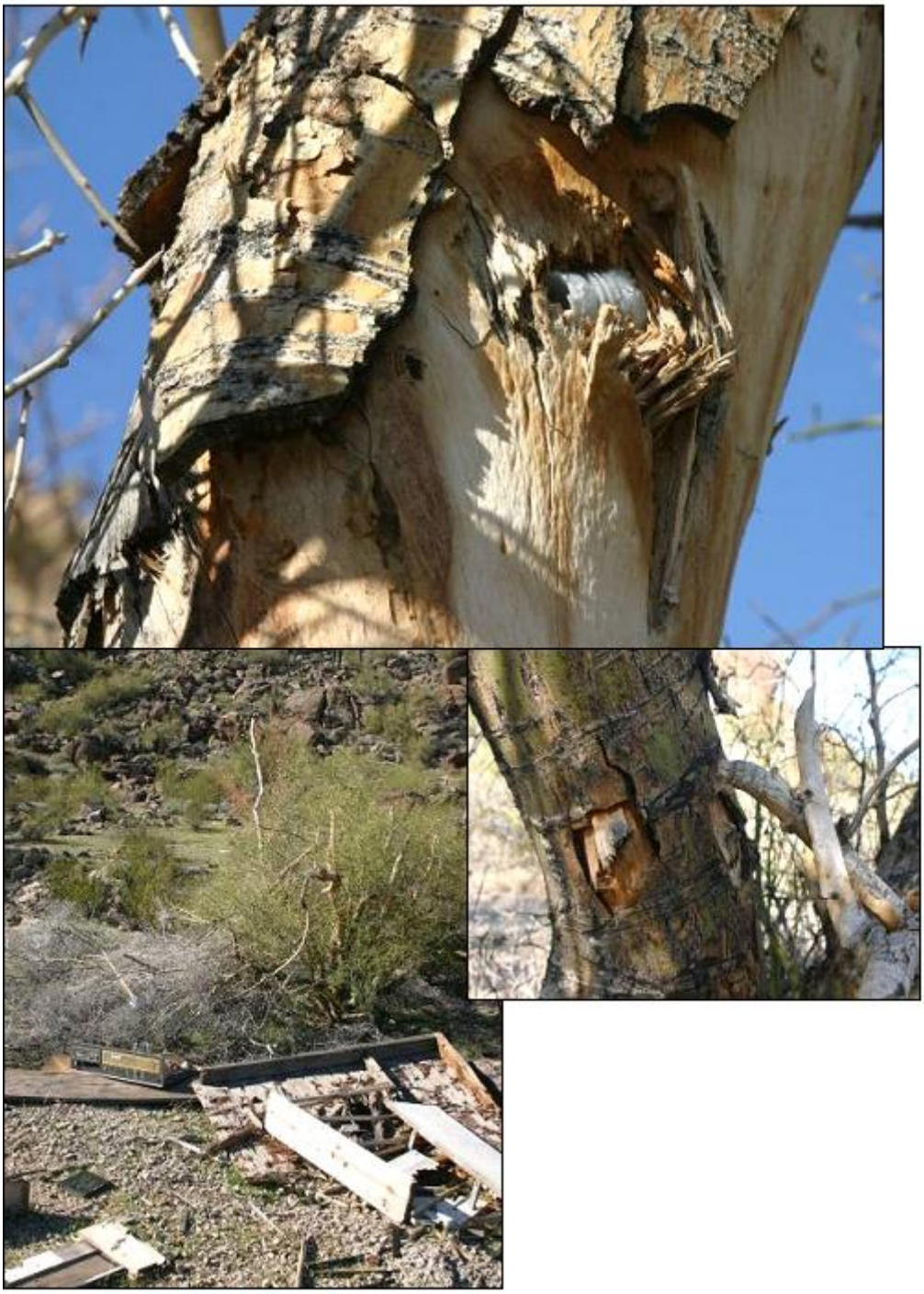
Examples of shooting areas that are inappropriate or do not have backstops.

Figure G.2. Inappropriate Shooting Sites



Examples of damage to saguaros from firearms use at recreational target-shooting sites in the SDNM.

Figure G.3. Damage to Saguaros



Bullets lodged in trees, broken branches, and bullet-scarred trees and shrubs are common at shooting sites in the SDNM.

Figure G.4. Damage to Trees

Potentially appropriate backstops include areas with a wide horizontal shooting fan greater than 45 degrees; vertical shooting fan greater than 20 degrees; backstop surface composed predominantly of unconsolidated, loose soil material; location in even, open terrain with little or low vegetation that allows for ready observation of others during target setup/retrieval and shooting; and minimum height of 15 feet.

Figure G.5. Potentially Appropriate Backstops

Rock outcrops are easily damaged from bullet impact and inappropriate targets, such as cans of paint, and pose visitor safety concerns from bullet ricochet.

Figure G.6. Damage to Rocks

Scattered artifacts, such as pottery shards and unoccupied raptor nests, in themselves do not necessarily render an area unsuitable for target shooting; however, a prevalence of artifacts or presence of high-value wildlife habitat render it inappropriate for target shooting.

Figure G.7. Examples of Artifacts and Wildlife Habitat

Hidden Valley (C), view to the south

Figure G.8. Potential Shooting Site

Hidden Valley (C), view to the north

Figure G.9. Potential Shooting Site

G.7. References

Bureau of Land Management (BLM). 1990. *Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona.* Arizona State Office.

Daughtry, David. 2007. [Pima County Shooting Sports Program Manager]. Personal communication from meeting at BLM Tucson Field Office, October 10, 2007.

Foti, Pam, and Nina Chambers. 2005. Sonoran Desert National Monument Recreation Impact Inventory: Final Report. Prepared for BLM-Phoenix District.

Responsive Management. 2008. *Sport Shooter's and Archer's Attitudes on Shooting and Appropriate Behavior on Public Lands and the Messages to Which They Will Respond.* A Survey Conducted for the Federal Lands Hunting and Shooting Sports Roundtable. Report available at: http://www.responsivemanagement.com/download/reports/Shoot_Public_Lands_Report.pdf

Luke, David. 1996. "Baffles, Berms and Backstops." Article reprinted from the *Third National Shooting Range Symposium*. Article available at: http://www.rangeinfo.org/resource_library/resLibDoc.cfm?filename=facility_mngmnt/design/baffles berms.htm&CAT=Facility%20Management

U.S. Geological Survey (USGS). 2004. *Southwest Regional GAP Analysis Project Final Report.* USGS Gap Analysis Program, NatureServe, and Utah State University.

U.S. Institute for Environmental Conflict Resolution. 2006. Final Report: Tucson Basin Shooting on Public Lands Workshop Project. Tucson. Report available at: http://www.ecr.gov/pdf/Tucson_Basin_Final.pdf

G.8. Attachment G-1: Comparison of Impacts Documented at Shooting and Non-Shooting Sites

G.8.1. Data Analysis

During 2003-2005, the extent of recreation impacts to the Sonoran Desert National Monument was determined with a comprehensive inventory of all recreation impact sites visible from the vehicle route network. At each site, impacts were assessed for a variety of impact variables and sites were categorized into five levels of relative impact based on the presence of these impacts. Sites were also categorized as "non-shooting sites" or "shooting sites," based primarily on the presence of shooting-related litter such as spent ammunition casings and clay pigeons (Foti and Chambers, 2005). This inventory identified 243 recreation sites that predominantly were used for activities other than target shooting and 63 sites that were predominantly used for target shooting (see Recreation Impact Sites in the SDNM (p. 1208)). Impacts identified at the two types of sites were analyzed to determine if significant differences existed between non-shooting and shooting sites with respect to management of Monument objects.

The major types of impacts relevant to this analysis were defined as follows:

Damage to Saguaro Cactus. Evidence of human-caused damage such as chopping, shooting, painting, and vehicle collisions; number of incidents counted.

Damage to Rock Formations. Evidence of human-caused disturbance or damage such as bullet marks, painting, and displacement; number of incidents counted.

Damage to Trees. Evidence of human-caused damage such as chopping, breaking, burning, and vehicle collisions; number of incidents counted and grouped into classes of occurrence.

Damage to Shrubs. Evidence of human-caused damage such as chopping, breaking, uprooting, and crushing (particularly with vehicles); number of incidents counted and grouped into classes of occurrence.

Presence of Litter. One piece of litter ranged from the very small, such as a bottle cap, to the very large, such as a discarded home appliance; number of pieces counted and grouped into classes of occurrence.

Presence of Off-Road Vehicle Impact. Number of vehicle tracks; number of tracks counted and grouped into classes of occurrence.

Number of Barren Cores. A common measurement of recreation site impacts, the "barren core" is that area that has been disturbed to the point of being cleared for recreational use, often for campsites. The barren core size was measured as the area observed to be disturbed due to recreation activities. On the SDNM, one barren core is a minimum of 400 square feet in area. Number of barren cores counted.

Table G.10. Comparison of Impacts Documented at Shooting & Non-Shooting Sites in the SDNM, 2003-2005

Type of Impact	Number of Sites Exhibiting Evidence of Impact		Percentage of Sites Exhibiting Evidence of Impact (%)		Difference is Significant ($p < 0.01$)
	Non-Shooting Sites (n=243)	Shooting Sites (n=63)	Non-Shooting Sites	Shooting Sites	
Damage to Saguaro Cactus	13	18	5.3	28.6	Yes
Damage to Rock Formations	72	29	29.6	46.0	No[1]
Damage to Trees					
0 incidents of damage	88	0	36.2	0.0	Yes
1 to 5 incidents of damage	84	12	34.6	19.0	
6 to 30 incidents of damage	57	23	23.4	36.5	
31 to 60 incidents of damage	12	23	4.9	36.5	
61 to 90 incidents of damage	2	3	0.8	4.8	
More than 90 incidents of damage	0	2	0.0	3.2	
Damage to Shrubs					

Type of Impact	Number of Sites Exhibiting Evidence of Impact		Percentage of Sites Exhibiting Evidence of Impact (%)		Difference is Significant (p < 0.01)
	Non-Shooting Sites (n=243)	Shooting Sites (n=63)	Non-Shooting Sites	Shooting Sites	
0 incidents of damage	21	8	8.6	12.7	Yes
1 to 5 incidents of damage	100	9	41.1	14.3	
6 to 30 incidents of damage	82	27	33.7	42.9	
31 to 60 incidents of damage	29	15	11.9	23.8	
61-90 incidents of damage	7	1	2.9	1.6	
More than 90 incidents of damage	4	3	1.6	4.8	
Presence of Litter					
0 pieces of litter	16	7	6.6	11.1	Yes
1 to 5 pieces of litter	83	1	34.2	1.6	
6 to 30 pieces of litter	72	5	29.6	7.9	
31 to 60 pieces of litter	34	9	14.0	14.3	
61 to 90 pieces of litter	7	10	2.9	15.9	
More than 90 pieces of litter	31	31	12.8	49.2	
Presence of Off-Road Vehicle Impact					
0 incidents	125	17	51.4	27.0	Yes
1 to 5 incidents	61	15	25.1	23.8	
6 to 30 incidents	49	18	20.2	28.6	
31 to 60 incidents	5	9	2.1	14.3	
61 to 90 incidents	1	1	0.4	1.6	
More than 90 incidents	2	3	0.8	4.8	
Number of Barren Cores					
0 barren core	5	6	2.1	9.5	Yes
1 barren core	175	29	72.0	46.0	
2 barren cores	35	11	14.4	17.5	
3 barren cores	13	7	5.3	11.1	
4 barren cores	8	4	3.3	6.3	
5 barren cores	4	2	1.6	3.2	
6 barren cores	2	2	0.8	3.2	
7 barren cores	0	0	0.0	0.0	
8 barren cores	0	2	0.0	3.2	
9 barren cores	1	0	0.4	0.0	

[1]Difference is significant at p < 0.05.

G.8.2. Statistical Analysis

G.8.2.1. Method

Data for “Damage to Saguaro Cactus” and “Damage to Rock Formations” were tested for significant differences by normal approximation of binomial probabilities. A normal probability distribution was used to approximate binomial probabilities because only two mutually exclusive outcomes were possible (impact or no impact), the observations were independent, the probability

of observations remained constant at each location, and the number of observations was greater than 30 in both populations. The tests were conducted with a 1 percent chance of rejecting the null hypothesis that the proportions of impacts observed at non-shooting sites and shooting sites were not different when, in fact, they were different.

Data for other variables was collected in classes; therefore, testing for differences between non-shooting and shooting sites was conducted against a chi-square probability distribution. The tests were conducted with a 1 percent chance of rejecting the null hypothesis that the frequencies of impacts observed at non-shooting sites and shooting sites were not different when, in fact, they were different.

G.8.2.1.1. Standard Normal Approximation

Three steps are involved to analyze the relative proportions of two populations, culminating in determination of the "z statistic," or the standardized value of a normal distribution equating the sample population mean to zero (0) and standard deviation to one (1). The calculated z statistic is then compared to the critical value of z to determine the likelihood of rejecting the null hypothesis based on the level of significance required, i.e. 1 percent.

Step 1. Pool the two sample proportions:

$I = n_1p_1 + n_2p_2 / n_1+n_2$

Where: I = pooled sample proportions; n_1 = number of observations in population 1; n_2 = number of observations in population 2; p_1 = proportion of population 1 exhibiting variable 1; p_2 = proportion of population 2 exhibiting variable 2

For "Damage to Saguaro Cactus," I = [(243 * 0.05350) + (63 * 0.28571)] / (243+63)

= 0.10131

Step 2. Determine the standard error of difference between the two sample proportions:

$Qp_1\text{-}p_2$ = Square Root $I(1\text{-}I)/n_1 + I(1\text{-}I)/n_2$

Where: $Qp_1\text{-}p_2$ = standard error of difference

For "Damage to Saguaro Cactus," $Qp_1\text{-}p_2$ = Square Root [0.10131(1-0.10131)/243 + 0.10131(1-0.10131)/63]

= 0.04254

Step 3. Calculate the value of the standard normal z statistic for testing the null hypothesis that there is no difference between the two population proportions:

$z = p_1 - p_2 / Qp_1\text{-}p_2$

Where: z = standard normal value where population mean = 0 and standard deviation = 1

For "Damage to Saguaro Cactus," z = 0.05350-0.28571 / 0.04254

= -5.45863

Interpretation of Standard Normal Approximation. The null hypothesis stated that the proportion of "Damage to Saguaro Cactus" observed at non-shooting sites is no different than the proportion of "Damage to Saguaro Cactus" observed at shooting sites.

Given a 1 percent chance (p = 0.01) of rejecting the null hypothesis when it is in fact true, the critical z statistic is +/- 2.58. The calculated z statistic for "Damage to Saguaro Cactus" is -4.35015, less than the critical z statistic of -2.58. Thus, there is a less than 1 percent chance that the observed higher proportion of damage to saguaro cactus at shooting sites is not different than the proportion of damage to saguaro cactus observed at non-shooting sites.

G.8.2.1.2. Chi-Square Test

Two steps are required to test for differences among several population proportions, culminating in calculation of a chi-square statistic. The calculated chi-square statistic is then compared to the critical value for chi-square corresponding to the relevant proportion of the chi-square distribution for a given level of significance, i.e. 1 percent, with X degrees of freedom. Degrees of freedom are the number of variables free to vary within the calculation, and are calculated by multiplying the number of data classes (r), less one, by the number of sample populations (k), less one.

Step 1. Calculate the expected frequency of observation in each population:

$f_e = (f_r * f_k) / n$

Where: f_e = Expected Frequency; fr = Sum of Observed Frequency for Data Category, r; f_k = Sum of Observations for Population, k; n = Total Observations

For "Damage to Trees, 0 incidents of damage, Non-Shooting Sites"

$f_e = [(88 + 0) * 243] / 306$

= 69.9

Step 2. Calculate Chi-Square

Chi-Square = Sum of $[(f_o - f_e)2 / f_e]$

Where: f_o = Observed Frequency for Data Category; f_e = Expected Frequency for Data Category

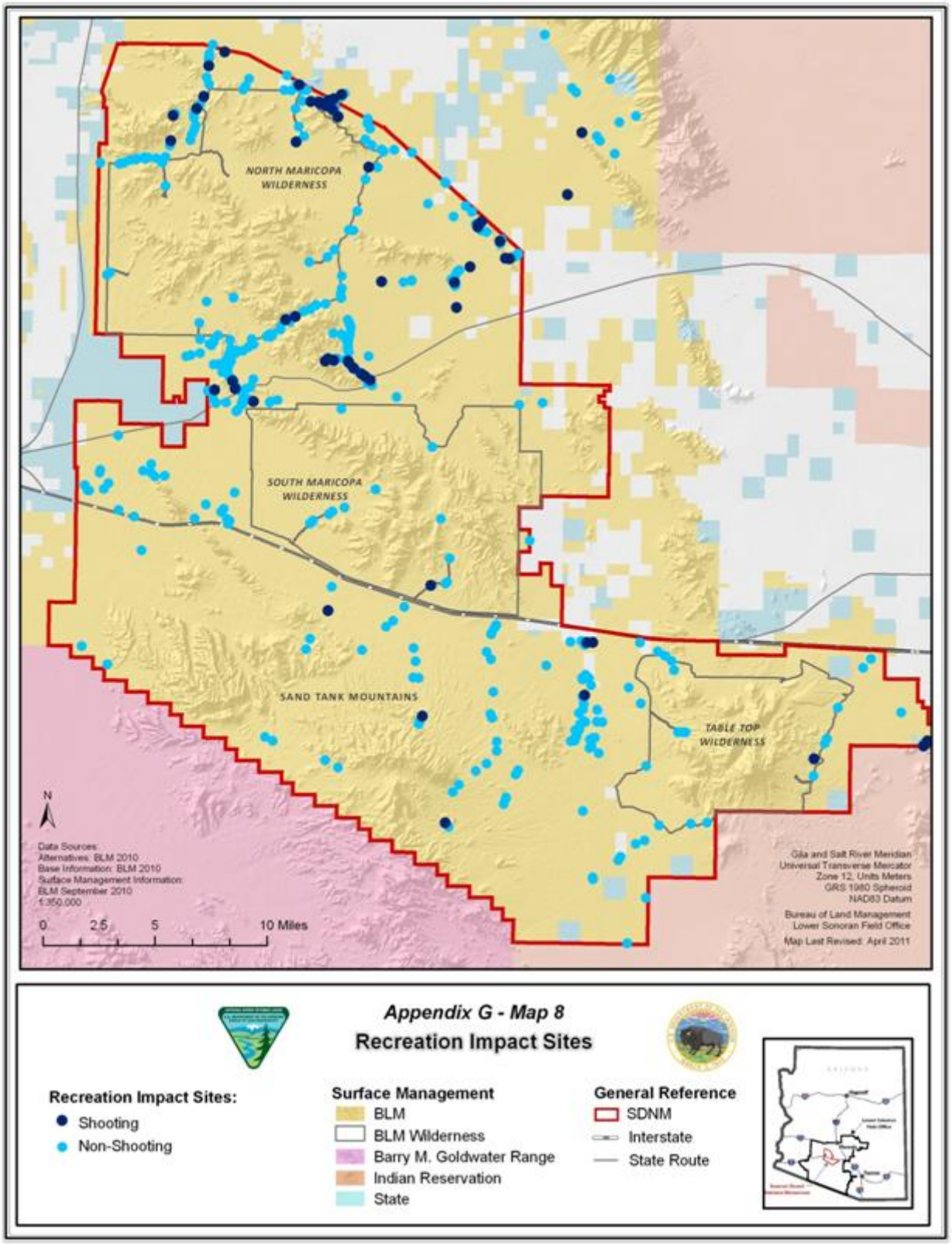
For "Damage to Trees," Chi-Square = [(88-69.9)2/69.9] + [(96-76.2)2/76.2] + [(80-63.5)2/63.5] + [(35-27.8)2/27.8] + [(5-4)2/4] + [(2-1.6)2/1.6]

= 85.97

and degrees of freedom = (6-1) * (2-1) = 5

Interpretation of Chi-Square Test. The null hypothesis stated that the frequency of "Damage to Trees" observed at non-shooting sites is not different from the frequency of "Damage to Trees" observed at shooting sites.

Given a 1 percent chance ($p = 0.01$) of rejecting the null hypothesis when it is in fact true, and with five (5) degrees of freedom, the critical chi-square statistic is 15.09. The calculated chi-square statistic for "Damage to Trees" is 85.97, greater than the critical value for chi-square. Thus, there is a less than 1 percent chance that the observed higher frequency of damage to trees at shooting sites is not different than the frequency of damage to trees observed at non-shooting sites.



SDNM recreation sites surveyed as part of a 2005 NAU study.

Map G.1. Recreation Impact Sites in the SDNM

Appendix G Sonoran Desert National Monument
Recreational Target Shooting Analysis
Statistical Analysis

G.9. Attachment G-2: Sample Field Rating Sheet

Field Rating Sheet, Suitability for Target Shooting, SDNM

Area: HIDDEN VALLEY (c)

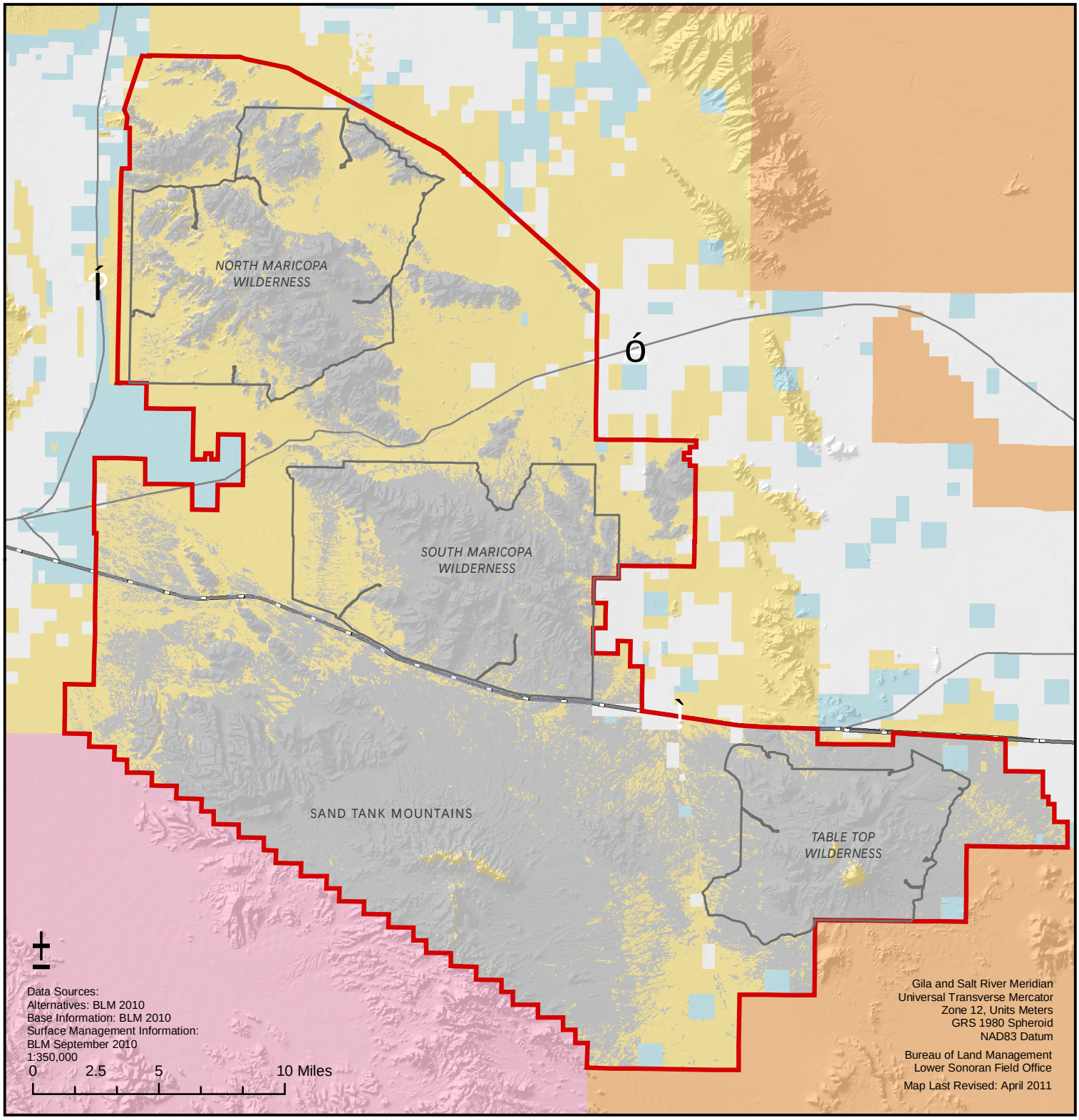
Observer(s): SCARBROUGH Date: 7-6-2010

Criteria		
1. Significant presence of monument objects / high natural and cultural resource sensitivity.		
Diversity of Vegetation • exemplary plants & assemblages • dense vegetative cover/canopy	scattered saguaro & palo verde but not in dense clumps or "forests"	Yes No
Sensitive Wildlife Habitat • desert tortoise burrowing sites • raptor nesting sites	none evident	Yes No
Geological Features • rock outcrops	some rock outcrops / boulders but not predominant, hill on N. side much rockier	Yes No
Cultural Resources • evidence of site presence	none evident	Yes No
Suitability Rating • High: 4 No • Moderate: 1 Yes • Low: ≥2 Yes		**High** **Moderate** **Low**
2. Visitor safety and nearby uses and facilities.		
Safe Site Location • distance from facilities >1/4-mi **Shooting Fan** • downrange distance	no facilities w/in 1/4-mile; Schumacher road within 1.2 miles; occupied ~~resid~~ residences w/in 1.75 miles BLM route & wildcat routes behind backstops & would need to be closed / managed	**High** **Moderate** **Low**

photos: 3578, 3579, 3580, - view to south
3581, 3582, 3583 - view to north

Figure G.10. Sample Field Rating Sheet

3. Motor vehicle accessibility.		
Site is Physically Accessible • vehicle clearance • 4wd v. 2wd	Site is accessible by high clearance 2wd	Yes No
Driving Time is Reasonable • distance / time from pavement	driving time from pavement is approx. 30-min.	Yes No
Site is adjacent to BLM-designated Route • proximity to BLM route	adjacent to blm route 8037 & Un-numbered blm route on Lower Sonoran F.O.	Yes No
Suitability Rating • High: 3 Yes • Moderate: 2 Yes • Low: ≤ 1 Yes		**High** **Moderate** **Low**
4. Physical suitability.		
Number of Parties • room for more than two		Yes No
Safe Backstop • dimension of horizontal fan • dimension of vertical fan • backstop material	horizontal & vertical dimensions appropriate; backstop material not predominantly rocky (vertical slope ~ 20%)	Yes No
Character of terrain • Allows for safe target setup / retrieval • Allows for observation of others		Yes No
Suitability Rating • High: 3 Yes • Moderate: 2 Yes • Low: ≤ 1 Yes		**High** **Moderate** **Low**



Appendix G - Map 1

SDNM Palo Verde-Mixed Cacti Vegetation Community

Legend

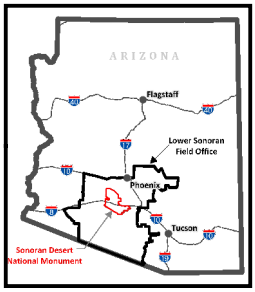
- Palo Verde-Mixed Cacti Vegetation Community

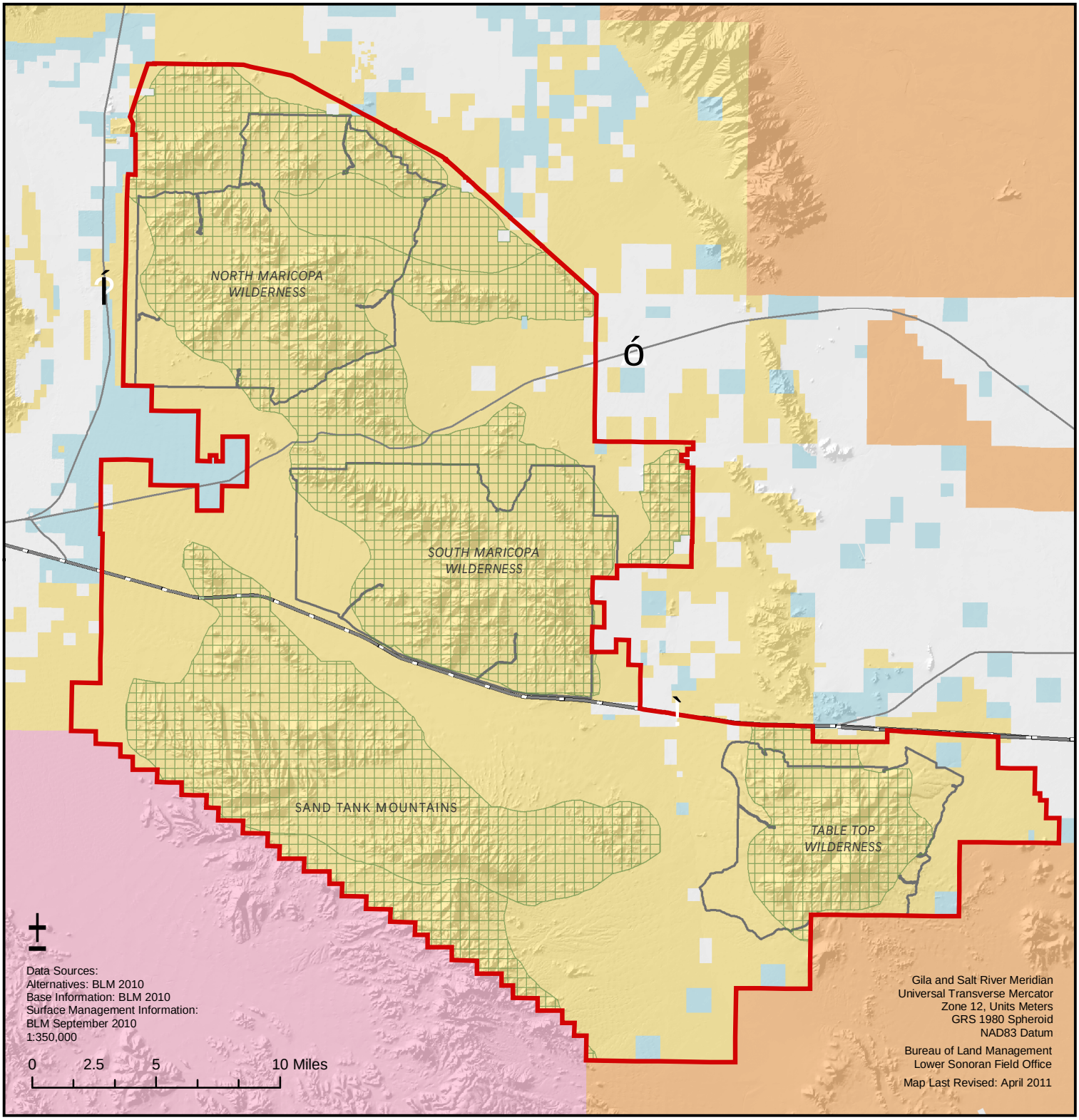
Surface Management

- Bureau of Land Management
- BLM Wilderness
- Barry M. Goldwater Range
- Indian Reservation
- State

General Reference

- SDNM
- Interstate
- State Route





Appendix G - Map 2

SDNM Desert Tortoise Habitat

Legend

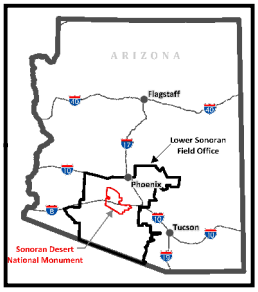
- Category I & II Desert Tortoise Habitat

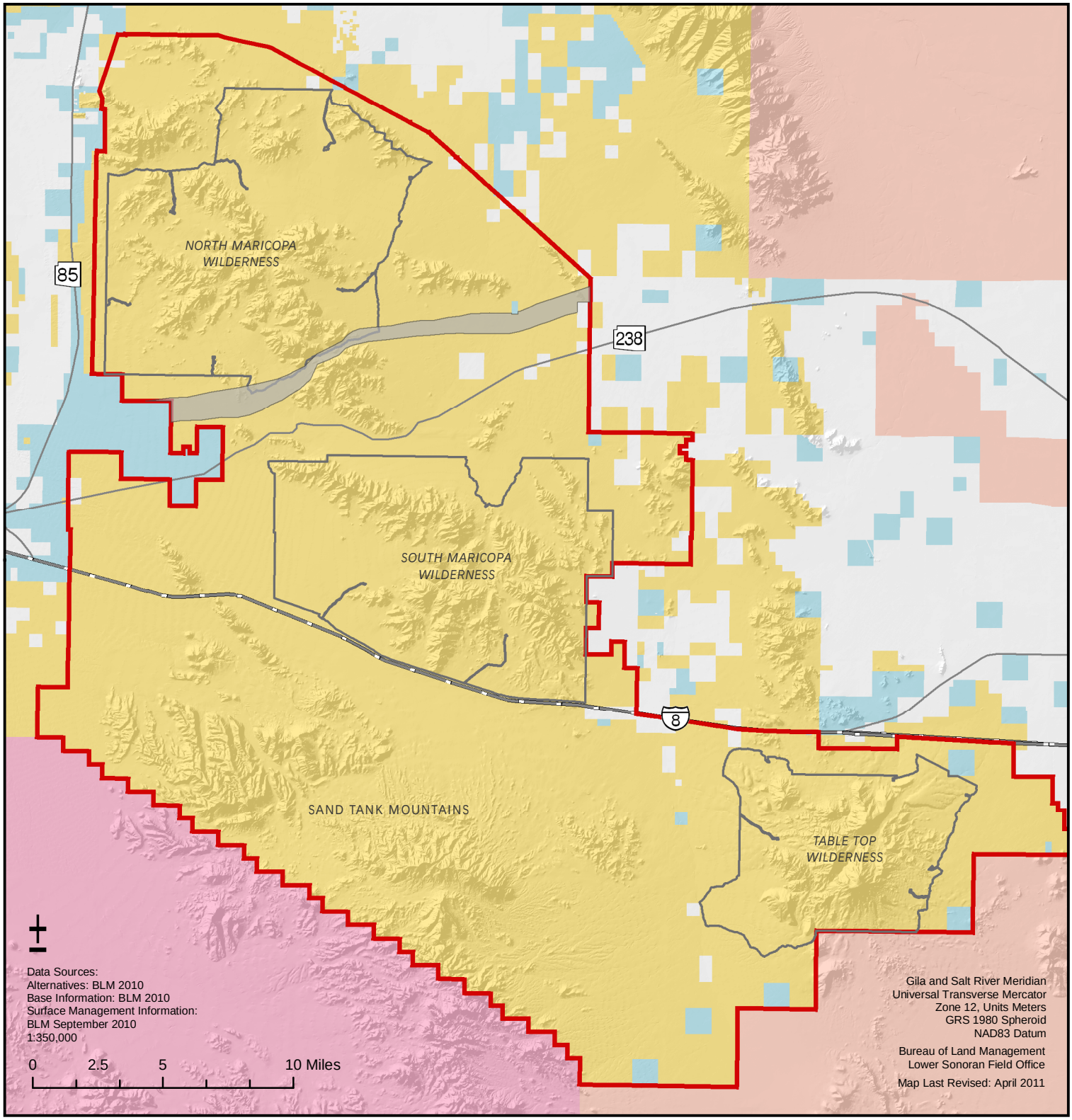
Surface Management

- Bureau of Land Management
- BLM Wilderness
- Barry M. Goldwater Range
- Indian Reservation
- State

General Reference

- SDNM
- Interstate
- State Route





Appendix G - Map 3

Anza National Historic Trail

Legend

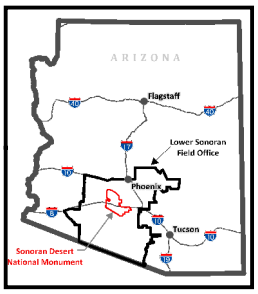
- Juan Bautista de Anza National Historic Trail

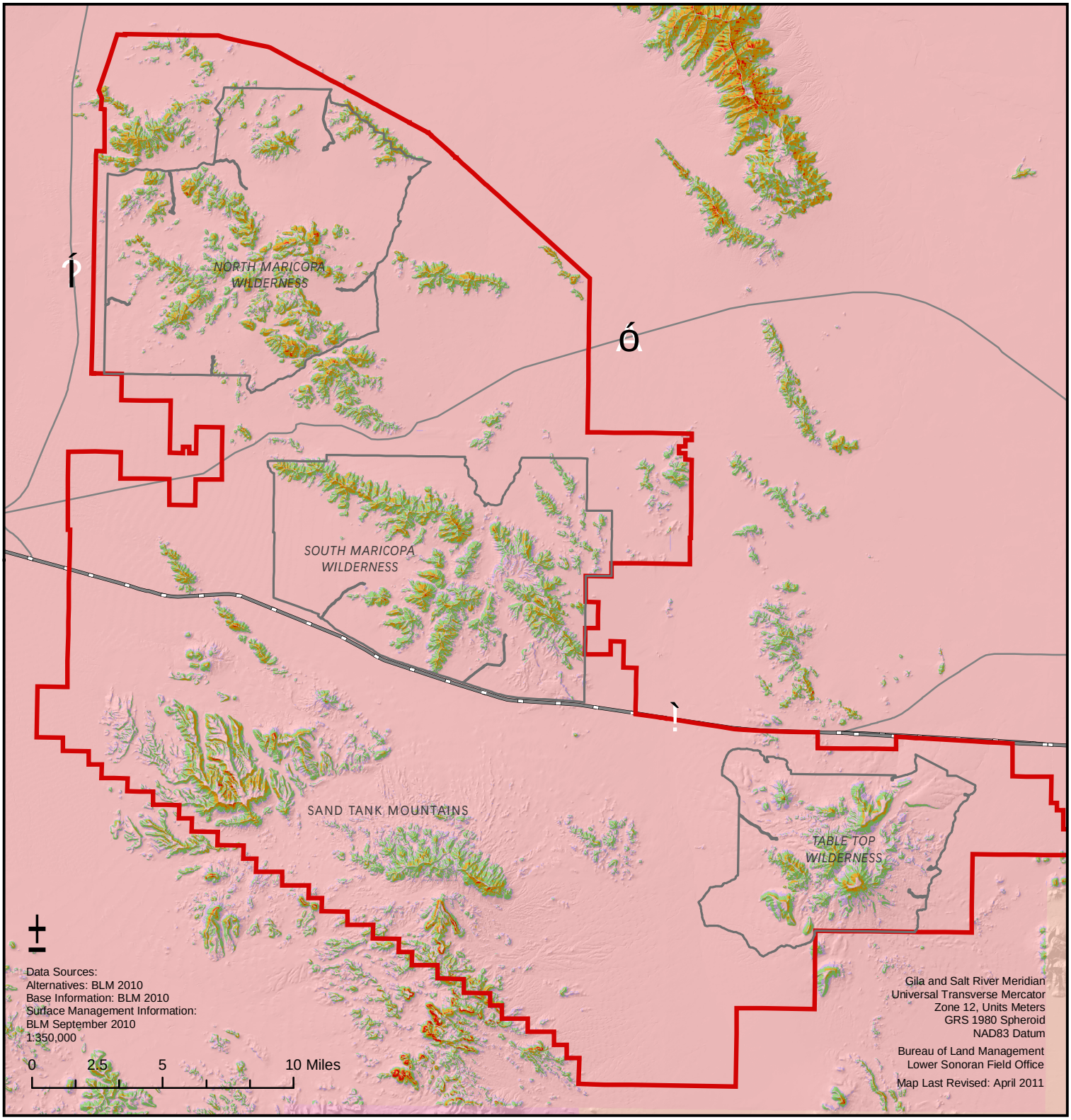
Surface Management

- Bureau of Land Management
- BLM Wilderness
- Barry M. Goldwater Range
- Indian Reservation
- State

General Reference

- SDNM
- Interstate
- State Route





Appendix G - Map 4

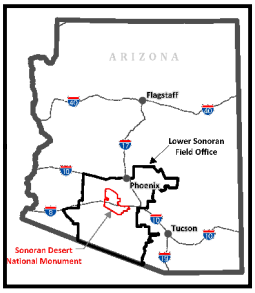
Slope of Terrain

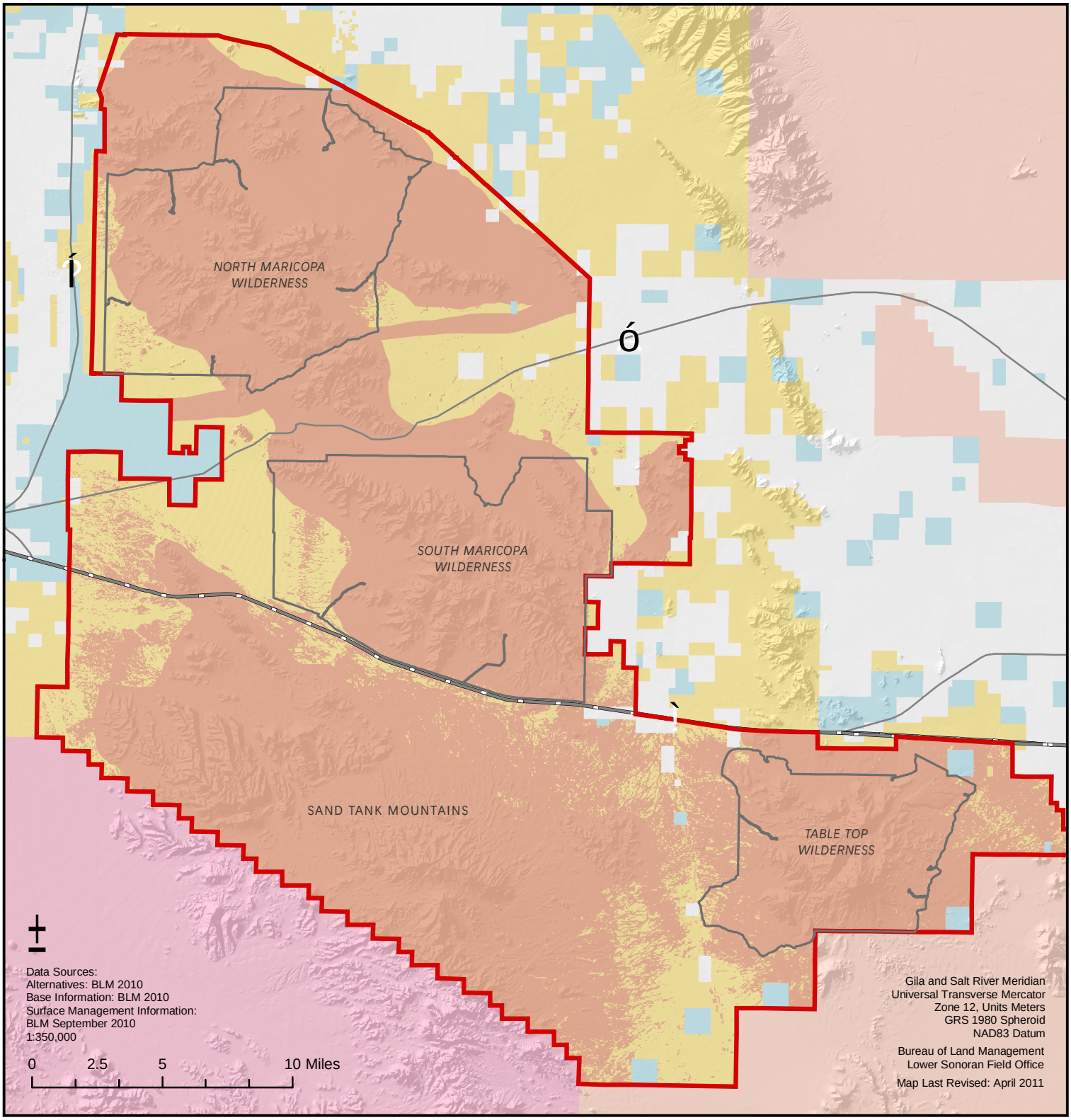
Legend

- Slope 0 to 14.9 Degrees
- Slope 15 to 19.9 Degrees
- Slope 20 to 29.9 Degrees
- Slope 30 to 39.9 Degrees
- Slope 40 Degrees and Greater

General Reference

- SDNM
- BLM Wilderness
- Interstate
- State Route





Appendix G - Map 5

Areas Not Suitable for Target Shooting in SDNM

Legend

Cumulative Areas Not Suitable for Target Shooting Based on Monument Objects

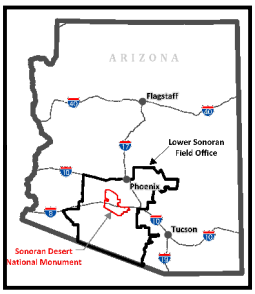
(GIS Analysis - Criteria 1; 389,989 acres; Alternative B in LS-SDNM DRMP)

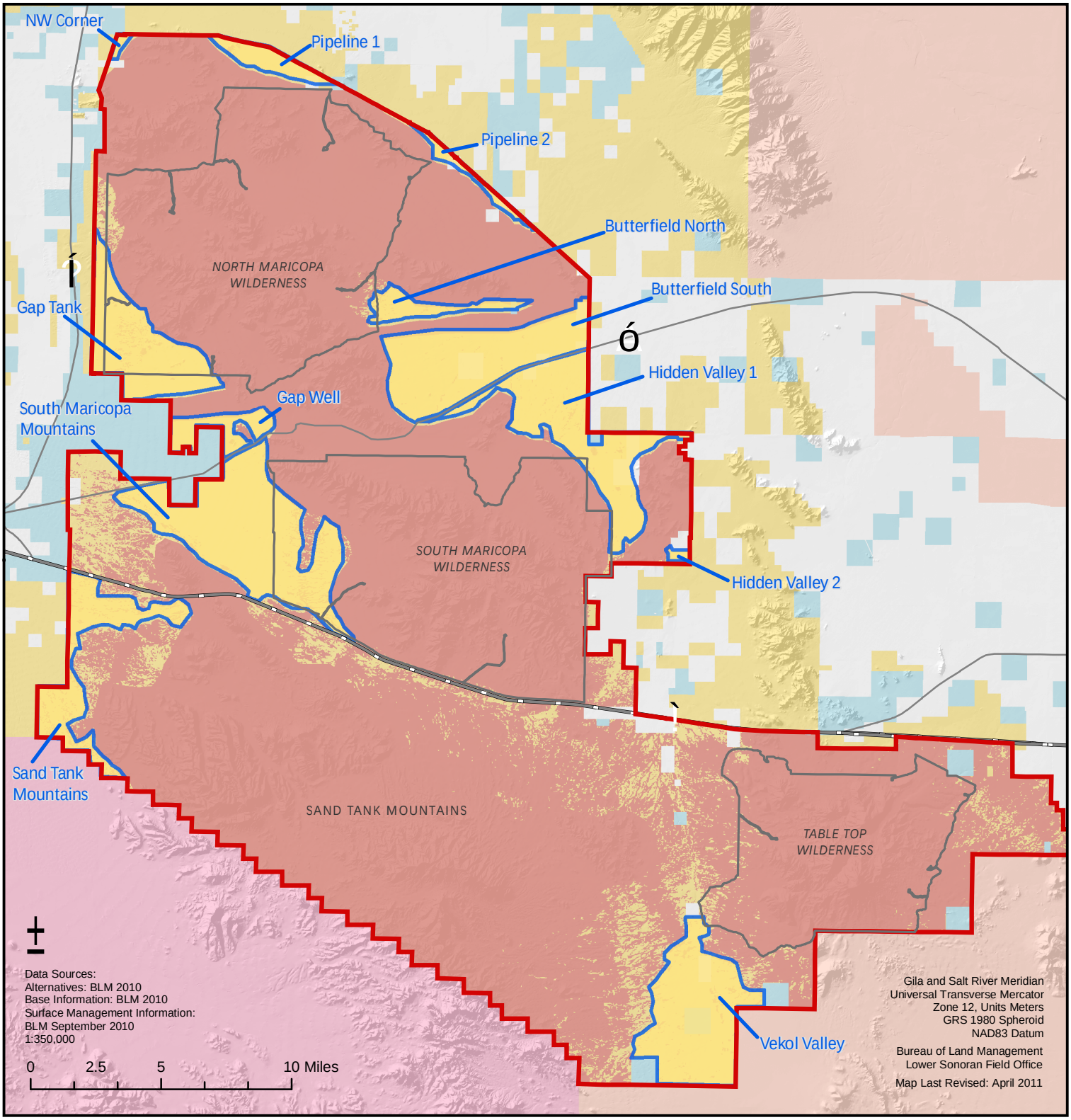
Surface Management

- Bureau of Land Management
- BLM Wilderness
- Barry M. Goldwater Range
- Indian Reservation
- State

General Reference

- SDNM
- Interstate
- State Route





Appendix G - Map 6

Areas Potentially Suitable for Target Shooting Sites in the SDNM

Legend

- Areas Where Potentially SuitableTarget Shooting Sites May be Found

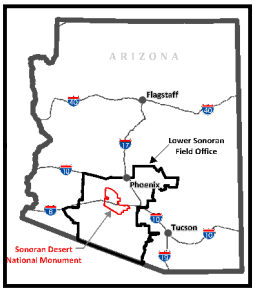
(GIS Analysis - Criteria 1; 12 areas - 96,411 acres; Alt. B in LS-SDNM DRMP)

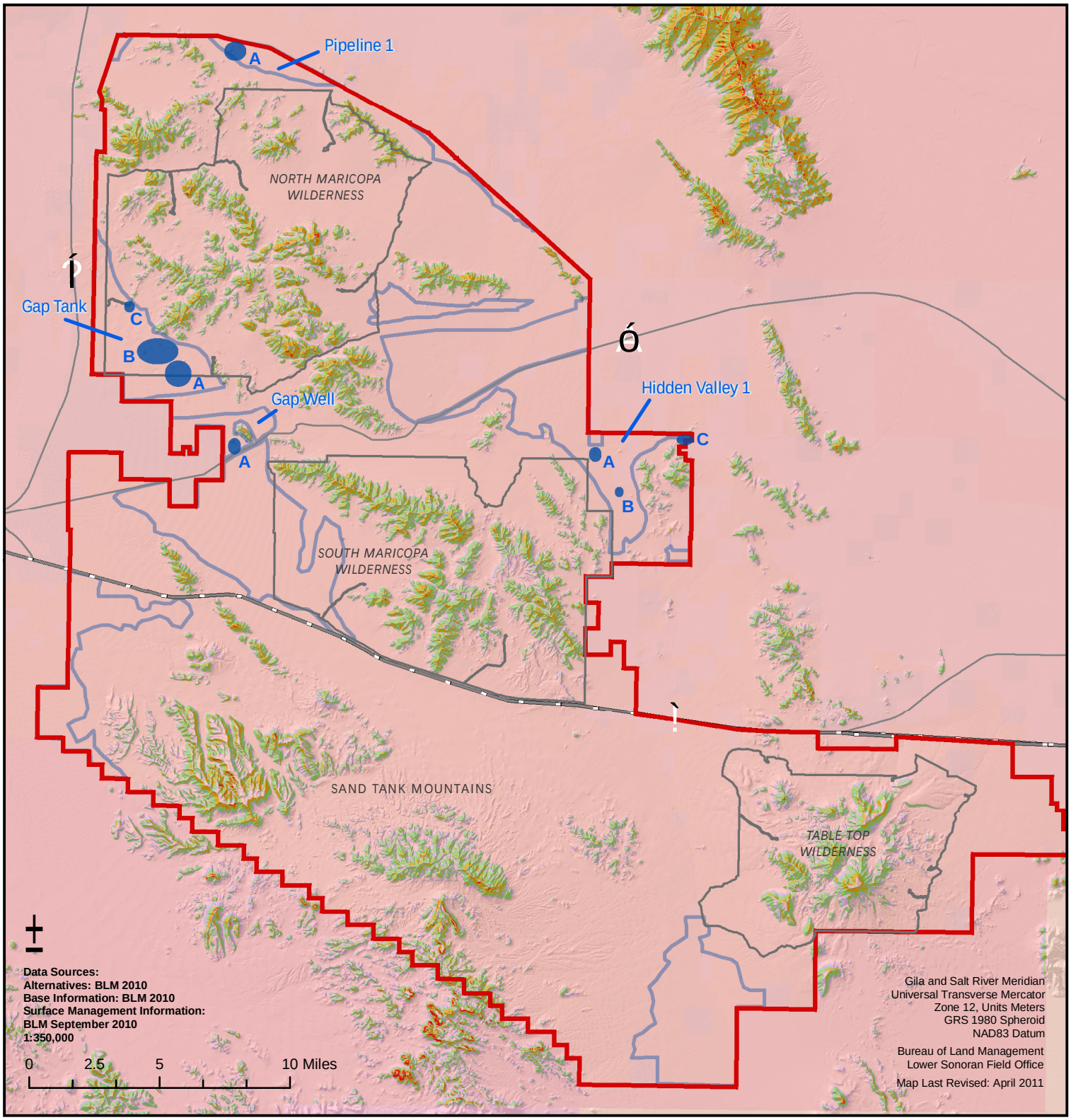
Surface Management

- Bureau of Land Management
- BLM Wilderness
- Barry M. Goldwater Range
- Indian Reservation
- State

General Reference

- SDNM
- Interstate
- State Route





Appendix G - Map 7

Sites Potentially Suitable for Target Shooting in the SDNM

Legend

Sites Potentially Suitable for Target Shooting Based on Suitable Terrain

(GIS Analysis - Criteria 2; 8 areas - 1,726 acres)

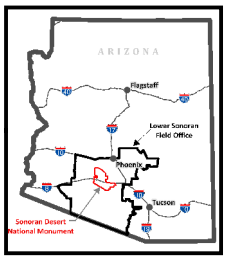
Potential Site Areas

Slope of Terrain

- 0 to 14.9 Degrees
- 15 to 19.9 Degrees
- 20 to 29.9 Degrees
- 30 to 39.9 Degrees
- 40 Degrees and Greater

General Reference

- SDNM
- Interstate
- State Route



Appendix H. Best Management Practices & Standard Operating Procedures

Best Management Practices

Best Management Practices (BMPs) are land and resource management techniques determined to be the most effective and practical means of maximizing beneficial results and minimizing conflicts and negative environmental impacts from management actions. BMPs can include structural and nonstructural controls, specific operations, and maintenance procedures. BMPs can be applied before, during, and after activities to reduce or eliminate negative environmental impacts. BMPs are not one-size-fits-all solutions. BMPs should be selected and adapted through interdisciplinary analysis to determine which management practices are necessary to meet the goals and objective of the resource-management plan (RMP). The best practices and mitigation measures for a particular site are evaluated by considering site-specific conditions, local resource conditions, and a suite of techniques that guide or may be applied to management actions to aid in achieving desired outcomes. BMPs are often developed in conjunction with land-use plans, but they are not considered a land-use plan decision unless the land-use plan specifies that they are mandatory. They may be updated or modified without a plan amendment if they are not mandatory.

Standard Operating Procedures

Standard Operating Procedures (SOPs) are procedures carried out daily during proposal implementation which are based on laws, regulations, executive orders, BLM planning manuals, policies, instruction memoranda, and applicable planning documents. SOPs describe the flow of actions as well as identifying roles and responsibilities. Policy and planning procedures either already exist or have been identified through collaborative planning processes which are used as a guide during the implementation of management decisions. It is the goal of SOP to maintain operational efficiency and consistency during the planning and implementation processes.

H.1. Resources

H.1.1. Cave Resources

Standard Operating Procedures

- Survey priorities will be assigned to those areas that are most likely to include significant cave resources, are relatively accessible to the public, and/or vulnerable to damage or loss from land use activities.

H.1.2. Cultural Resources

Standard Operating Procedures

- Where impacts are occurring, implement protection measures to stop, limit, or repair damage to sites. A variety of protection measures, described in BLM Manual 8140, may be used to

protect the integrity of sites at risk such as signing, fencing or barriers, trash removal, target shooting closures, erosion control, backfilling, repairing, shoring up, or stabilizing structures, restricting uses and access, and closures. Structural and material stabilization techniques may use chemical, mechanical, or structural elements to retard deterioration of cultural resources.

- Ensure that all proposed undertakings and authorizations are reviewed and conducted in compliance with Section 106 of the NHPA, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act (NAGPRA) and other applicable laws.

- Compliance with Section 106 of the National Historic Preservation Act:

1. All undertakings will be subject to thorough cultural resource inventory in order to identify all cultural resources that lie within the Area of Potential Effect (APE).

2. All identified cultural resources within the APE will be evaluated for National Register eligibility.

3. All undertakings shall be scrutinized for ways to design or re-design proposed projects to avoid cultural resources. Every effort shall be made to minimize impacts on cultural resources.

- Those cultural resources within the APE that have the characteristics that would make them eligible for the National Register of Historic Places (NRHP) would be mitigated using appropriate treatment strategies, in order to reduce the intensity of the impact to the lowest level possible.

- Evaluate project designs and proposed activities and mitigate or adjust activities to avoid disturbing or removing Native American human remains and associated items to the maximum extent possible and practicable. Where disturbance cannot be avoided, the BLM will consult with associated tribes under NAGPRA. Avoid directing site visitors toward areas where these items would be observed or disturbed.

- Complete Class II (sample) and Class III (intensive) field inventories to identify cultural resources and evaluate the condition of sites, in accord with Section 110 of the NHPA. Use the information obtained through these surveys to allocate sites to proper use categories, develop protection measures, and integrate survey results into research designs and interpretation efforts. Priorities for inventory will be determined based on resource use and an area's or site's protection priority.

H.1.3. Paleontological Resources

Standard Operating Procedures

- The collection of “reasonable” amounts of common invertebrate and plant fossils would be allowed without a permit when not aided by mechanical or motorized devices (43 CFR 3620).

- Paleontological inventory of project areas would be done prior to authorizing surface-disturbing activities to protect vertebrate or noteworthy occurrences of invertebrate or plant fossils.

- Survey priorities will be assigned to those areas that are most likely to include significant paleontological resources, are relatively accessible to the public, and/or vulnerable to damage or loss from land use activities.
- For all authorized surface-disturbing activities, inventories will be conducted on a case-by-case basis, as deemed necessary by the authorized officer, for each proposed surface-disturbing activity to ensure maintenance or integrity of paleontological values.
- The following stipulations may be applied to surface-disturbing activities:

1. User/operators shall be responsible for informing all persons associated with a project that they shall be subject to prosecution for damaging, altering, excavating, or removing any vertebrate or noteworthy occurrences of invertebrate or plant fossils on site.
2. If vertebrate or noteworthy occurrences of invertebrate or plant fossils are discovered, the user/operator shall suspend all operations that further disturb such materials and immediately contact the authorized officer.
3. User/operators shall not resume until written authorization to proceed is issued by the authorized officer.
4. Within five working days, the authorized officer will evaluate the discovery and inform the operator of actions that will be necessary to prevent loss of significant scientific values.
5. The user/operator shall be responsible for the cost of any mitigation required by the authorized officer.
6. Upon verification from the authorized officer that the required mitigation has been completed, the operator shall be allowed to resume operations.

H.1.4. Soil Resources

Best Management Practices

- Best management practices would be applied when authorizing vegetative or surface disturbances to limit soil loss and erosion and protect water quality.
- Disturbance to surface resources would be minimized when constructing new developments or reconstructing existing facilities. Mitigation plans would be developed, disturbed surfaces would be restored, and soils would be stabilized in accordance with restoration objectives.

H.1.5. Vegetation Resources

Standard Operating Procedures

- Several treatment methods and standard operating procedures would be used in a vegetation treatment program. Bureau of Land Management's policies and guidance for public land treatments would be followed in implementing all treatment methods. SOPs and guidelines are provided in the following documents:

1. Manual Section 1740, BLM Arizona Standards for Rangeland Health (Land Health Standards)
2. "Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic EIS" (BLM 2007) and "Vegetation Treatments on BLM Lands in 17 Western States Programmatic Environmental Report (ER)" (BLM 2007)
3. Other general and specific program policy, procedures, and standards for implementing renewable resource improvements

- The programmatic EIS and ER described above provide information regarding the application of herbicides and pesticides and identify procedures and guidelines that would be followed by the BLM to ensure that risks to human health and the environment from treatment actions would be kept to a minimum. Included are SOPs those for the prevention of weeds and weed control, and a compilation of treatment-specific procedures and guidelines based on various guidance in BLM manuals, handbooks, regulations, and standard agency and industry practices. For resource specific SOPs and guidelines including those for fire use, and mechanical, manual, biological and chemical methods, see Table 2-5 in the ER. These methods would be used under all alternatives.

H.1.6. Visual Resource Management

Standard Operating Procedures

Facility Construction. Facility construction will achieve resource management and use benefits and focus on resource protection, resource management, and public safety. Facilities will be constructed to be visually unobtrusive while emphasizing protection of resources. Facilities will be located in areas where they are visually unobtrusive and will cause minimal damage to resources. Recreational facilities, including visitor centers, will be preferentially located off site in nearby communities and built through the use of partnerships.

Scenic quality. Measures to mitigate potential visual impacts include the use of natural materials, screening, painting, project design, location sighting, or restoration.

H.1.7. Wildlife Resources

Standard Operating Procedures

- Coordinate with AZGFD on migratory bird inventories when migratory bird inventories are proposed by BLM or required of third parties.
- Coordinate with AZGFD when Sonoran desert tortoise inventories are proposed by BLM or required of third parties. The inventories should be completed using standardized protocols such as those developed by AZGFD.
- Wildlife water developments proposed in Wilderness Areas would have to meet the non-impairment criteria.

Best Management Practices

- Reasonable administrative vehicular access to wildlife water facilities would be granted to AGFD, BLM and authorized permittee personnel for the purposes of constructing, maintaining, and/or repairing facilities or conducting research or surveys.
- The use of new technologies, products, and construction designs that provide for the lowest degree of maintenance and a visually obscure wildlife water development that is compatible with the surrounding terrain would be emphasized.
- See manuals 6500 (*Wildlife and Fisheries Management*) and 6780 (*Habitat Management Plans*)
- Fences constructed will comply with applicable wildlife fence standards (Fences – BLM Manual Handbook H-1741-1). Existing fences that impede big game movement or that otherwise conflict with wildlife may be modified to comply with applicable wildlife fence standards on a case-by-case basis.
- The PDO will consult agency species management plans and other conservation plans as appropriate to guide management and devise mitigation measures when needed. Examples of these plans include but are not limited to the North American Landbird Conservation Plan, National and Arizona Partners in flight Bird Conservation Plans, Arizona Bat Conservation Plan, and the Arizona State Wildlife Action Plan (Comprehensive Wildlife Conservation Strategy).
- The PDO would comply with the *BLM Migratory Bird Treaty Act- Interim Management Guidance* (Instructional Memorandum 2008-050)

H.2. Resource Uses

H.2.1. Lands & Realty

Standard Operating Procedures Access

Access:

- Reasonable public and administrative access to BLM-administered land will be obtained in the following ways:

1. Require reciprocal access easements to meet specific program needs;
2. Consider and manage the use of public land for right of way[s] (ROW)s, ROW reservations, easements, permits, leases, licenses, agreements, etc, except for those areas identified as exclusion areas;
3. Secure access easements as needed to prevent closing of access to public land.

Corridors & Communication Sites:

- A corridor is used for one or more of the following major facilities:

1. Natural gas and other pipelines that are at least 10 inches in diameter;

2. Electric transmission facilities that have a capacity of 115 kilovolt lines or greater voltage;
3. Major telephone transmission, cable, or fiber optic lines;
4. Significant canals that provide delivery of water to urban areas;
5. Transportation facilities that are those formally defined as Current or Proposed Roads of Regional Significance or Current or Proposed Major Arterials (functional class) identified by a local government jurisdiction as regionally significant and projected to carry 20,000 or more vehicles per day by the year 2015;
6. Utilities, whether interstate, intrastate, or local, should be collocated in designated corridors to the maximum degree possible to minimize impacts to public lands;
7. Transportation routes, whether interstate, intrastate, or local, should be collocated with utilities in designated corridors to the maximum degree possible to minimize impacts to public lands.

- The BLM will strive to coordinate applicable transportation-related planning efforts for the Lower Sonoran Planning Area with ADOT, Maricopa County Department of Transportation, Maricopa Association of Governments, and Pinal, Pima, Yuma, and Gila counties.
- Smaller utility lines needed for local service in the vicinity of the corridors should be co-located within a corridor unless doing so would limit the opportunity to collocate additional major utility lines in the corridor.
- Avoidance of sensitive or special resources is a primary consideration in future planning and designation of utility corridors.
- BLM planning should promote, whenever possible, optimal energy transfer efficiency and support alternative energy sources such as use of photovoltaic cells (solar energy) and wind power.
- In February 2003, the Department of Homeland Security (DHS) issued the National Strategy for the Physical Protection of Critical Infrastructures and Key Assets (DHS 2003), which summarized the initial assessment of and planning to protect against vulnerabilities to the terrorist threat. As DHS continues to carry out its mandate, the designation of utility and transportation corridor location and the planning and maintenance of utilities; railroads; and Federal, State, and interstate highways that cross BLM-administered lands will be consistent with all directives, policies, and procedures that DHS may institute to minimize vulnerabilities to the energy grid.
- Whenever possible, utility transmission lines will be designed and/or routed to minimize adverse visual impacts to the surrounding land and vistas.
- The BLM's utility corridor designations must be consistent with authority granted under FLPMA Title V, Sections 501–511 (43 United States Code [USC] 1761–1771), the Mineral Leasing Act of 1928 (CFR 2880) and the BLM ROW Manual, Sections 2801.11 and 2801.12.
- In accordance with Executive Order No. 13212, the Energy Project Streamlining process (signed May 18, 2001), Federal energy-related planning must serve to expedite the production, transmission, or conservation of energy.

- The BLM will continue to cooperate as a full partner with the U.S. Forest Service, Arizona Public Service Company, and Salt River Project in Arizona in the Western Utility Group, whose mission is to facilitate an exchange of information and coordinate planning efforts between Federal agencies and utility providers throughout the western United States.
- The BLM will, as appropriate, coordinate communication-related planning efforts with the Federal Communications Commission.
- Bureau of Land Management planning related to telecommunication infrastructure must, in accordance with the Telecommunications Act of 1996, help facilitate implementation of wireless telephone systems, in compliance with existing law, by making Federal land and facilities available for communication sites.
- New ROWs will make maximum use of existing routes and will share facilities whenever possible, including joint use by different types of utilities, such as transmission line towers and communication sites.
- Communications related planning efforts will be coordinated with the Federal Communications Commission, as needed.
- If areas are discovered that require the protection of a withdrawal, the withdrawal will be processed. If other Agency withdrawals are revoked - the BLM will manage the lands the same as the adjacent lands.
- New utilities within the El Paso Natural Gas multiuse corridor must comply with the adopted IOPs for the administration of energy transport development. These IOPs meet the requirements of Section 368 to expedite the permitting process (see Appendix B of the Approved Resource Management Plan/ Record of Decision (ROD) for Designation of Energy Corridors on BLM Administered Lands in 11 Western States, 2009). The IOPs provide coordinated, consistent interagency management procedures for permitting ROWs within the corridors. The IOPs also identify mandatory requirements that will help ensure that future projects developed within Section 368 corridors are planned, constructed, operated, and eventually decommissioned in a manner that protects and enhances environmental resources and long-term sustainability.

H.2.2. Livestock Grazing

Standard Operating Procedures

- Rest rotation, deferred rotation, seasonal or short duration use, or other grazing management systems may be implemented where the need has been identified through monitoring. Monitoring will be used to assess the effectiveness of changes brought about by new management practices.
- Intensity, season and frequency, and distribution of grazing use should provide for growth and reproduction of the plant species needed to reach Desired Plant Community (DCP) objectives.
- Deferment of livestock will be considered, where possible in cooperation with lease and permit holders, to allow for the use of prescribed fire or other vegetative treatments, or the use of the area as a grass bank to allow for rest in other grazing allotments.

- Administrative vehicular access to repair range improvements by the grazing lessee is assured through issuance of the grazing permit.
- Any compensation for a loss of range improvements will be made in accordance with 43 CFR 4120.3-6.
- Livestock management changes may be made when sufficient assessment, inventory, or monitoring data are available.
- Fence construction and maintenance will follow guidance provided in BLM handbook on Fencing No. 1741-1.

H.2.3. Mineral Resources

Standard Operating Procedures

Specific to the Lower Sonoran Decision Area:

- Unless otherwise restricted, all Federal mineral estates administered by the BLM within the Planning Area are available for orderly and efficient development of mineral resources. Mineral exploration and development is generally encouraged on public lands in keeping with BLM's multiple use concept. Overall guidance on the management of mineral resources appears in the Mining and Minerals Policy Act of 1970, Sec. 102(a), 120 of FLPMA, National Materials and Minerals Policy, Research and Development Act of 1980, and BLM's Energy and Minerals Policy of August 26, 2008.
- Exploration and development of all mineral resources will be conducted in accordance with all applicable laws and regulations.
- Acquired land will be opened to mineral entry unless critical resource values (T&E species, riparian habitat, scenic values, etc.) or public health and safety require closure. Issuing ROWs where there are active mining claims is routine and covered by legislation and regulation. The ROW purchaser or permittee is informed of the rights of the mining claimant. Mining might intermittently or temporarily obstruct the ROW.

H.2.4. Recreation

Standard Operating Procedures

The following provisions are set forth by regulation or bureau policy and thus do not require planning decisions to be implemented as part of management actions.

General standard operating procedures:

- Encourage "Tread Lightly" and "Leave No Trace" travel and camping techniques.
- Adopt measures to increase visitor responsibility for campfire etiquette and to reduce proliferation of campfire rings.

- Implement procedures for systematic monitoring of sites developed or authorized for public visitation. Restrict visitor access or group tours if necessary to prevent damage from visitor use.

- Determine areas where comprehensive site assessments are needed to determine existing physical and social impacts of recreation activities, to define desired conditions and standards, or to establish monitoring plans to manage camping and other uses.

- Develop and maintain partnerships and identify cooperative, sustainable recreation and tourism-based economic opportunities with nearby communities.

- Develop and maintain partnerships with local clubs and organizations to help maintain and monitor motorized and non-motorized trails.

- Post applicable toll-free phone numbers on kiosks, maps, brochures, permits, and other public outreach conveyances to keep the public involved in reporting emergencies and criminal activities, including damage to resources.

- Allow cultural and natural resource interpretation signs and facilities where needed for visitor enjoyment or resource protection. Interpretive developments must be compatible with recreation management objectives, desired recreation settings, and VRM standards.

- Pursue interpretation and environmental educational opportunities, outreach development, and implementation of on-site and off-site programs for adults and children.

- Develop school curricula focusing on the BLM's mission with staffs from schools, school districts, and other learning institutions.

- Pursue multicultural interpretation and environmental education opportunities, outreach, development, and implementation of programs for adults and children. Apply learning modalities and incorporate various learning styles in program design and delivery. Encourage the use of multiple intelligence or other theories for program presentations.

- Support existing educational and interpretive programs and initiatives such as Project Archaeology; Leave No Trace; Tread Lightly; Project Learning Tree; and other proven national, State, regional, and local programs.

- Develop websites and distribute brochures, maps, access guides, and information sheets to provide information on recreational opportunities, interpreted sites, resource protection, designated trails and travel routes, safe travel, and safe shooting practices.

Special recreation permits: The BLM issues special recreation permits (SRPs) to manage visitor use; to protect natural and cultural resources; to meet the goals and objectives of the field office recreation program as outlined in a land-use plan; and to authorize specific types of recreational activities. Special recreation permits (including academic, educational, scientific, or research use) are issued to qualified applicants on a first-come, first-served and a case-by-case basis based on resource values and how the SRPs meet resource and public health and safety concerns. Permit authorization numbers will be set and could be adjusted based on monitoring of areas to be used to accurately accommodate level of use, and to sustain resources while maintaining desired social and managerial settings.

Special recreation permit stipulations. In addition to the conditions and stipulations listed on the Special Recreation Application and Permit form, supplemental office and resource-specific stipulations are included with approved permits that are designed to protect the land and resources involved, reduce user conflicts, and/or minimize health and safety hazards. These stipulations must be followed to keep the permit in good standing. Failure to comply with the stipulations may result in the loss of permit privileges.

Standard SRP stipulations are listed below. Not all stipulations may apply in every SRP, and stipulations may be added, modified, or deleted on a case-by-case basis based on the specific event being permitted.

General SRP stipulations:

- Estimated fee payments or the minimum non-refundable annual fee, whichever is applicable, will be submitted in advance to the BLM authorized officer prior to issuance or validation of the SRP. Any additional use fees will be due at the end of the 6-month reporting period in which the fees were accrued. Overpayment of fees will be applied to the following year's estimated use fees. Use fees for commercial permits are as set (currently 3 percent of gross revenue or the minimum annual fee of $95, whichever is greater).
- Post-use reports and estimated fee payments for annual and multi-year permits will be submitted to the BLM on a fiscal year semi-annual basis. They are due within 15 days after the 6 month use period (April 15 and October 15).
- The permittee is required to contact private landowners and other governmental agencies whose property is affected by the use associated with the permit (this includes the Arizona State Land Department for State Trust land). Evidence that authorization has been obtained must be available to the BLM authorized officer upon request.
- Any changes to the approved Plan of Operations must first be approved by the BLM authorized officer. This includes the use of subcontractors.
- The permit does not authorize exclusive use and shall not be construed in any way so as to prevent public use or access on any public land except as expressly allowed under the permit.
- The permittee is required to provide the BLM authorized officer with a copy of a valid Certificate of Insurance covering the periods of use. The U.S. Government must be named as a co-insured party on the policy. Minimum general liability limits are as set (currently $300,000 per occurrence and $600,000 annual aggregate for bodily injury, and $30,000 property damage per occurrence and $50,000 annual aggregate, if the policy specifies aggregate limits).
- It is the responsibility of the permittee to ensure valid insurance coverage including general public liability, with the limits listed above, is provided for all equipment and services supplied by subcontractors. A copy of the valid insurance coverage must be made available to the BLM authorized officer upon request.
- A copy of this permit and the stipulations must be carried by guides during all tours conducted on BLM-administered land, and must be made available to any BLM employee or client upon request.
- Any violation of the permit terms, conditions, and stipulations may be subject to penalties prescribed in 43 CFR 8372.0-7, which may include fines as set (currently up to $1,000

and/or imprisonment up to 12 months). Additionally, any such violation may result in permit probation, suspension, or revocation. Examples that can lead to permit violations include, but are not limited to delinquent post use reports and/or payments, deviations to operating plan not approved by authorized official, violation of laws and regulations, significant resource damage, and public endangerment.

- All signs on public land must be authorized by the BLM in writing.
- The permittee is responsible for ensuring the safety of all clients and support personnel, assuring that all permit actions are in conformance with local, State, and Federal health and safety standards and providing for appropriate emergency attention.
- All injuries requiring emergency hospital care will be reported to the BLM authorized officer within 2 days of the occurrence and a Death and Injury Report submitted to the BLM authorized officer within 10 days of the occurrence.
- The BLM reserves the right to alter the terms, condition, or stipulations of a permit at any time for reasons such as significant policy, administrative procedure, or stipulation change.
- Annual permits remain valid if the permittee is in good standing by complying with all terms, conditions, and stipulations including timely submission of post use reports, and applicable use fee payments. For multi-year permits, an annual review is done at the beginning of each fiscal year (October 1) and permits are validated for the upcoming fiscal year. For a permit to be validated, the permittee must be in good standing by complying with all terms, conditions, and stipulations including timely submission of post use reports and applicable use fee payments. In addition, certificates of insurance shall be current and operating plans must be reviewed and updated with any changes before a permit will be validated for the upcoming fiscal year.

1. Require holders of special recreation permits (SRPs) to give site visitors suitable educational information on archaeological site etiquette and resource conservation.
2. SRP applicants will be strongly encouraged to have a working knowledge of Leave No Trace and Tread Lightly principles. Additionally, applicants will be asked to incorporate Leave No Trace and Tread Lightly principles into their tour, program, or event activities.

Resource protection stipulations:

- All activities are to remain on the approved roads, trails, washes, and/or staging areas. No deviation to these routes is permitted without prior approval from the BLM authorized officer. Motorized vehicles are not permitted in riparian areas or in running washes except at road crossings.
- Employees and clients will be instructed that it is unlawful to disturb, deface, excavate, or remove any archaeological or paleontological objects or structures (i.e., "look but do not touch!"). Rock art may be photographed but not touched. Collection of prehistoric or historic artifacts is not allowed. Any prehistoric or historic cultural site or human remains discovered by the permittee, employees, or clients will be left undisturbed and reported as soon as possible to the BLM authorized officer.
- Permittee must notify the BLM authorized officer of any specific archaeological sites proposed for inclusion on tours. Tours to sites are subject to BLM approval and protective stipulations.

- Historical mine sites should not be disturbed. Collecting artifacts from these sites is strictly prohibited. • All persons operating under the SRP, including subcontractors, are prohibited from entering abandoned mines.

- Proposed activities will be conducted in a manner that will not interfere with mining or exploration operations. No minerals are to be collected from areas encumbered by active mining claims unless authorized by the claimant(s).

- Harassment of livestock, wildlife, and wild horses or burros or destruction of private and public improvements such as fences and gates is prohibited. All gates and fences shall be left as found. The taking of any T&E plant or animal is prohibited.

- Collection, harassment, and disturbance of desert tortoises and Gila monsters are prohibited by Arizona State Law. If encountered on roads or trails, the animals should be avoided. If a desert tortoise is encountered and cannot be avoided, it should be carefully moved to safety by carrying it horizontal to the ground, not tilted, and placed in the shade the minimum distance needed to remove it from harm's way. Gila monsters should be avoided and not handled. They are venomous and can inflict a serious and painful bite.

- Vegetation clearing, trimming, or removal is not permitted without prior approval from the BLM authorized official.

- If the volume of use is determined to be adversely impacting soils or riparian condition through erosion, bank alteration, or other means, the BLM may restrict use of affected areas or routes to allow restoration and recovery of degraded areas. During wet periods, certain road and trail segments may be closed to all traffic. The BLM will consider the applicant's needs when designing and implementing restrictions or watershed restoration efforts that could influence the operation.

- In order to minimize the importation or spread of noxious weeds, all vehicles are to be washed thoroughly (including the undercarriage and engine compartment) before entering public land to remove all soil and vegetation debris (including seeds and seed heads) acquired from previous use. This washing should occur at the home base of operations of the permittee before traveling to public land. All vehicles used for activities approved by this permit are subject to inspection by the BLM.

- The permittee will be committed to preserving and protecting public lands by learning, practicing, and promoting the "Leave No Trace" principles as presented by the Leave No Trace Center for Outdoor Ethics (see www.lnt.org).

Motorized vehicle-use stipulations:

- Motorized routes and non-motorized trails will be evaluated on a case-by-case basis for use in permitted events and suitability for future use, closure, re-routing, rehabilitation, upgrading or authorization as an approved and permitted course will be determined.

- No motorized vehicles are permitted in riparian areas or in running washes except at road crossings. Substantiated reports of unauthorized use in these areas will result in immediate probation and possible suspension or revocation of permit privileges.

- Per 43 CFR 9268, all motor vehicle use will comply with existing BLM and State motorized vehicle laws and regulations on public lands relating to use, standards, registration, operation and inspection. These regulations include, but are not limited to, the following:

1. No person shall operate an OHV on public land in a reckless, careless or negligent manner; in excess of established speed limits; while under the influence of alcohol, narcotics or drugs; or in a manner causing, or likely to cause, significant undue damage to or disturbance of the soil, wildlife, wildlife habitat, improvements, cultural resources or vegetation.

2. Drivers shall yield the ROW to pedestrians, saddle horses, pack trains, and animal drawn vehicles.

3. Drivers are prohibited from operating a motor vehicle unless the driver and each front seat passenger are restrained by a properly fastened safety belt.

- The permittee will be committed to preserving and protecting the public land by learning, practicing, and promoting the "Tread Lightly!" principles as presented by the Tread Lightly non-profit organization (see www.treadlightly.org).

Hunting outfitter/guide supplemental stipulations: The following stipulations for hunting outfitters and guides are in addition to the terms and conditions listed on the back of the special recreation application and permit form and the standard stipulations for BLM's Phoenix District and LSFO. The stipulations listed below are part of the permit: Failure to comply with them may result in the loss of permit privileges.

- Hunters shall not hunt within ¼ of a mile of any developed recreation or archaeological site.

- Hunters may not use motorized vehicles of any type to retrieve injured or killed animals, including hunters with Challenged Hunter Access/Mobility Permits. Outside of wilderness areas, the use of wheeled game carts is allowed and recommended.

- No base camps may be established in undisturbed areas for hunting groups larger than eight people without the prior approval of the BLM.

- The BLM shall be notified of any base camp stays anticipated to occur over the standard 14-day camping limit. This notification shall be received at least three business days prior to the fourteenth day of occupancy. Under no circumstances is the base camp occupancy to exceed the length of the hunting season for which the hunt permit/tag is drawn.

- Portable self-contained chemical toilets are the preferred method for human waste disposal and are required for groups larger than eight people. "Catholes" may be used for groups less than eight people and must be located at least 200 feet from water sources or dry wash beds. Toilet paper and feminine hygiene products are to be packed out and properly disposed. Waste from self-contained toilets shall be disposed of at State approved sewage disposal facilities.

- The permittee must notify the BLM three business days in advance if horses or pack stock animals are to be used for hunting activities.

- The permittee shall provide the BLM contact with the following information at least three business days prior to the start of the hunt:

1. Hunt number and Game Management Units for which the permit-tag was drawn

2. Anticipated area of concentration for hunt and location of overnight base camps

3. If applicable, the following additional information needs to be provided: 1) Name of the lead guide, 2) Vehicle information including make, model, color and license number

Parking, Staging Areas, Roads, and other Facilities and Sites. Facilities to manage concentrated recreation use typically are planned and authorized by site-specific planning that is conducted at the project level on a case-by-case basis:

- Facilities (such as camping locations, motorized and non-motorized activity staging areas, toilets, scenic turnouts, cultural interpretive sites, directional and interpretive signs, non-motorized trails, and roads) will be authorized where needed for resource protection, visitor safety, resolution of visitor use conflicts, or to implement an RMP or implementation-plan decision.

- To the greatest extent possible, all new construction and modifications for recreational facilities, outdoor developed areas, and any related programs and activities will be accessible to people with disabilities in accord with the Architectural Barriers Act of 1968 and Section 504 of the Rehabilitation Act of 1973, with later amendments. Guidance, requirements, and standards applicable to conform with the above legislation may be found in the following:

1. Uniform Federal Accessibility Standards,

2. Americans with Disabilities Act (ADA) Accessibility Guidelines,

3. ADA-ABA Accessibility Guidelines (use whichever guidance is most stringent), and

4. Proposed Outdoor Developed Areas Guidelines (U.S. Access Board found at http://www.access-board.gov and 43 CFR Part 17, Subpart E found at http://www.gpoaccess.gov/cfr/index.html.)

- Roads and trails will be maintained as needed.

- Per 43 CFR 9268, all motor vehicle use will comply with existing BLM and State motorized-vehicle laws and regulations on public lands relating to use, standards, registration, operation and inspection.

- Vehicle and recreational uses and access to areas with known listed, sensitive, threatened, or endangered species (plant and wildlife) will be avoided.

- Recreational use and vehicular traffic will be minimized when the soils are so wet or abnormally dry that the route or surrounding resources may be damaged by use and during high fire-threat conditions.

- The BLM will work with private property owners to reduce conflicts between private owners and recreational activities.

- Coordinate with partners and nearby land owners and managers to develop joint campgrounds on and off public lands.

- Develop partnerships and volunteer opportunities with local clubs, organizations, and communities to maintain and monitor routes, recreation sites, and other areas.

- Develop brochures, maps, and information sheets to disseminate recreation use information to the public.

Recreational target shooting. Public lands administered by the BLM generally are available for recreational target shooting unless otherwise specifically closed to that use. To assure the safety of themselves and other visitors to public lands, and to avoid undue degradation of natural resources, the following best management practices on the part of shooters are advised:

- Have a safe backstop, defined as one that:

1. Is composed predominantly of unconsolidated, loose soil material and located in even, open terrain with little or low vegetation that allows for ready observation of others during target setup and retrieval;

2. Is a minimum of 15 feet in height, although 20 to 25 feet is desirable; wide enough to allow a horizontal shooting fan of 45 degrees or greater; and has a vertical slope of 20 degrees or greater;

3. Has no facilities such as roads, trails, campsites, livestock waters and corrals, communications sites, utilities, etc. within a downrange shooting fan of at least 3.5 miles; and,

4. Is located more than ¼-mile from any residence or occupied structure.

- Do not put others at risk by shooting toward or across areas where other people congregate such as roads, hiking trails, vehicle parking and staging areas, and trailheads.

- Do not damage vegetation and other natural and cultural resources.

- Remove all targets, spent casings, and other materials used on-site. Failure to do so is littering.

- Under the CFR (43 CFR 8365.2-5(a)), no person shall, "[d]ischarge or use firearms" in a developed recreation site. Under 43 CFR 8360.0-5(c), "Developed Recreation Sites and Areas" are defined as "sites and areas that contain structures or capital improvements primarily used by the public for recreation purposes.

H.2.5. Travel Management

Standard Operating Procedures

- The development of standards for monitoring the route system will be directed by compliance with laws, regulations, and travel management plan goals and objectives

- Routes for permitted events will be evaluated on a case-by-case basis and determined if they are suitable or if they require action such as closure, re-routing, rehabilitation, upgrading, or authorization as an approved permitted course.

- Route or area closures or mitigation will be enacted where OHV or special vehicle use is determined to be inconsistent with established recreational management objectives, and/or such use is causing harm to natural or cultural resources.

- Motorized cross-country use will be permitted only when specifically authorized for completing a BLM-approved task.
- Partnerships will be developed with local clubs and organizations to help maintain and monitor motorized routes and non-motorized trails.
- Communities, user groups, and agencies can bring non-motorized trail or motorized route proposals forward for management attention.

Non-motorized Trail Construction.

- Non-motorized trails are designed to minimize surface disturbance. • Linear areas of interest would be marked with fiberglass posts or rock cairns to establish the footpath.
- Alternative types of transportation to link areas of interest should be considered.
- Specific to the Sonoran Desert National Monument Decision Area • Surface disturbance will be minimized by using the designated roads system for motorized recreation.
- New route development would be considered only for resource protection or public safety purposes when no other options meet the management need. If such development is required, routes and management strategies will be planed, designated, and developed with community and user input. Limits of acceptable change indicators and standards would be adopted and user conflicts reduced.

H.2.6. Wildland Fire & Fuels Management

Standard Operating Procedures

- Fire suppression will be carried out in a manner consistent with Interagency Standards for Fire and Aviation Operations, which is updated on an annual basis by the National Interagency Fire Center. Logistical support, operation and coordination, and policies and procedures for mobilization of fire fighting resources are outlined in the Southwest Area Mobilization Guide.
- Fire management activities will continue to avoid disturbing known archaeological sites or sites found during such activities. Fires will not be intentionally started at known sites. Archaeologists will serve as resource advisors for fire management and help develop and implement fire and fuels management plans, which would address effects on cultural resources. Fire crews will be educated about the need to protect cultural resources.
- In areas suitable for fire, the BLM will monitor existing air quality levels and weather conditions to determine which prescribed fires can be ignited and which, if any, must be delayed to ensure that air quality meets federal and state standards. If air quality approaches unhealthy levels, the BLM will delay igniting prescribed fires.
- The BLM will update and maintain Fire Management Plans to include site-specific actions for managing wildfire and fuels in accordance with Federal fire policies and this plan. These plans will be coordinated with the FWS and AGFD to address site-specific concerns for Federally protected species. These plans will incorporate the Conservation Measures (see Appendix K, *Conservation Measures from Fish and Wildlife Service Biological Opinions* (p. 1239)). Consultation with the FWS will occur with these project-level plans, as necessary.

- Avoid impacts to protected plants or their habitats by developing, modifying, redesigning, mitigating, or abandoning projects. • Use suppression tactics that limit damage or disturbance to the habitat and landscape. Use no heavy equipment (such as dozers) unless approved.
- Use fire retardants or chemicals next to waterways in accordance with the Environmental Guidelines for Delivery of Retardant or Foam near Waterways (Interagency Standards for Fire and Aviation Operations Task Group 2004).
- Protect all known cultural resources from disturbance.
- Use MIST, comply with the management plan to the maximum extent possible, and coordinate with resource advisors.
- Implement general and species-specific conservation measures to the extent possible to minimize harm to federally listed, proposed, or candidate species within the action area.

Best Management Practices

The appropriate management response concept represents a range of available management responses to wildland fires, which can range from full fire suppression to managing fires for resource benefits (i.e., fire use). Management responses applied to a fire will be identified in the fire management plan and be based on objectives derived from the LUP and associated implementation plans; relative risk to resources, the public, and fire fighters; potential complexity; and the ability to defend management boundaries. Any wildland fire can be aggressively suppressed and any fire that occurs in an area designated for fire use can be managed for resource benefits if it meets the prescribed criteria from an approved fire management plan.

H.3. Special Designations

None identified.

H.3.1. Back Country Byways

- Site-specific analysis will be conducted if road is determined to qualify for nomination, and appropriate agency, landowner and/or community partnerships have been obtained.
- Prior to the Back Country Byway nomination process, complete locale-specific visitor-use and potential resource-impact studies to determine if byway designation is appropriate and consistent with the RMP.
- Coordinate and partner with interested agencies and organizations, including Maricopa County.
- Manage byways for compatibility with other resource allocations and uses.
- Install speed limit, directional, vehicle safety, and interpretive signs to enhance public use, enjoyment, and stewardship of byways.
- Develop maps and brochures.

- Continuously coordinate with the AGFD to develop limits of acceptable change for resources and road conditions within byway corridors. Monitor for increases in byway width; sensitive cultural resources; threatened, endangered, and sensitive species habitat; and negative effects to wildlife populations adjacent to byway corridors. If impacts exceed limits of acceptable change, management actions would be implemented to reduce resource impacts accordingly.
- For the Agua Caliente proposed byways, coordinate with the Yuma Field Office regarding nomination, implementation and management of the byway.

H.3.2. Areas of Critical Environmental Concern

Standard Operating Procedures

- All authorized uses would be designed with mitigation to minimize surface disturbance.
- Fences would be designed to reduce adverse impacts to wildlife movement using specifications in BLM Manual 1747, local directives, or subsequent guidance. Existing fences in wildlife habitat that do not meet BLM specifications would be modified appropriately when scheduled for replacement or maintenance.

H.4. Social & Economic

H.4.1. Public Health & Safety

Standard Operating Procedures

- Releases of hazardous materials will be minimized through compliance with current regulations. When hazardous materials are released into the environment, their impacts on each resource will be assessed and the appropriate response, removal, and remedial actions to take will be determined.
- All actions (including land-use authorizations and disposals, mining and milling activities, and unauthorized land uses) will be evaluated for hazardous materials, waste minimization, and pollution prevention. Appropriate mitigation will be identified for surface-disturbing and disruptive activities associated with all types of hazardous materials and waste management and all types of fire management.
- Investigate all reported hazardous-materials and solid-wastes sites. Identify the probable scope of needed containment and clean-up efforts. Plan necessary containment and/or cleanup responses on a case-by-case basis as soon as possible upon report.
- Conduct active investigations to identify potentially responsible parties and recover planning, containment, cleanup, monitoring, investigation, and enforcement costs associated with spill/release responses.
- Site-specific inventories will be completed when land is being disposed or acquired. It is DOI policy to minimize potential liability of the department and its bureaus (including the BLM) by acquiring property that is not contaminated unless directed by Congress, court mandate, or as determined by the Secretary.

- Mining and milling sites will be inspected to determine appropriate management for hazardous materials.
- Parties responsible for contamination will be identified and be liable for cleanup and resource damage costs, as prescribed by law.
- Maintain current and develop new, as needed, law enforcement/public safety patrol, fire suppression, and search and rescue programs.
- Complete site-specific inventories when lands are being disposed or acquired. It is departmental policy to minimize potential liability of the Department of Interior (DOI) and its bureaus by acquiring property that is not contaminated unless directed by Congress, court mandate, or as determined by the Secretary.
- Inspect mining and milling sites to determine appropriate management for hazardous materials.
- Evaluate all actions (including land use authorizations and disposals, mining and milling activities, and unauthorized land uses) for hazardous materials, waste minimization, and pollution prevention. Minimize releases of hazardous materials through compliance with current regulations. Identify appropriate mitigation for activities associated with all types of hazardous materials and waste management and all types of fire management.

Appendix I. Cultural Use Allocations

Site Allocation Categories and Descriptions

Guidance how to allocate to five cultural-use categories is prescribed in BLM Manual 8100. Some sites may be allocated to two (or more) categories simultaneously. Some categories are mutually exclusive. In order to manage a diversity of cultural sites, allocations to these categories are necessary. Allocation is done as sites are identified, recorded, and evaluated. The categories are as follows:

1. **Scientific use:** Applied to any cultural property determined to be available for consideration as the subject of scientific or historical study using current techniques. Study includes methods that would result in the property's physical destruction. Sites that are most important for the scientific or historical information they contain are allocated to scientific use, based on the following: significance and uniqueness of site; potential to contribute toward scientific understanding; capability of current available scientific methods to achieve research goals; or appropriate research proposals that will further scientific understanding or resource management.

2. **Conservation for future use:** Reserved for those properties that are unique, scarce, unusual, architecturally interesting, or culturally important. These types of properties are deemed worthy of segregation from all other land or resource uses, including cultural resource uses that would threaten its present condition or setting. Sites allocated to this category are of singular historic importance. Their unusual significance makes them unsuitable for scientific or historical study that would result in their physical alteration.

3. **Traditional use:** Sites allocated to this category are those that are perceived by a specified social or cultural group as important in maintaining the cultural identity, heritage, or well-being of Indian tribes or other cultural groups. Sites may be allocated to this category based on consultations with affiliated tribes or groups. Management actions will be developed in consultation with the affiliated tribe or groups that will recognize the importance ascribed to them and seek to accommodate their continuing traditional uses.

4. **Public use:** Sites allocated to this category are those found to be appropriate for use as an interpretive exhibit in place or for related educational and recreational uses by members of the general public. The following criteria will be applied in selecting sites suitable for public use:

   - Presence of aboveground features, such as structures or rock art, landscape characteristics, or other features that are of interest to the public and are amenable to interpretive development,
   - The condition of the site and the feasibility of treating or stabilizing selected areas to withstand visitation,
   - Accessibility to travel routes,
   - Visitor safety,
   - Compatibility of other land uses and site values, such as traditional use by Native Americans,

- Feasibility of regular inspections by BLM staff and volunteers,
- Partnership opportunities for interpretive and educational projects.

5. Experimental use: May be applied to a site judged to be suited for controlled experimental study that may result in the property's alteration, including the loss of integrity or destruction of physical elements. Sites in this category would be considered for studies such as testing and measuring the rate of natural or human-caused deterioration, testing the effectiveness of certain protection measures, and testing the effects of fire. Studies would develop new research or interpretation methods or would generate similar kinds of practical management information. Experimental study would not be applied to cultural properties with strong research potential, traditional cultural importance, or good public use potential if it would significantly diminish those values. Justifications would be made in terms of weighing the benefits of specific information to be gained versus the loss of cultural attributes or data that may occur during the experiment or study.
6. Discharged from management: Sites that have no remaining identifiable use may be assigned to this category. Sites discharged from management remain in the inventory but are removed from further management attention and do no constrain other land uses. These are limited to those having no remaining information potential and/or no traditional values. Sites will be allocated to this category only on a case-by-case basis after inspection and recordation in the field, and only after complying with Section 106 of the National Historic Preservation Act (NHPA). Generally, this category will be limited to small surface artifact scatters that have been thoroughly documented. Larger, more complex sites may be discharged from management if they have been destroyed by human or natural causes. This category is very rarely used.

Potential Site Allocations

Sites projected to occur may be allocated on the basis of existing data and landscape-level considerations.

For example the following classes may be allocated to scientific use:

1. Sites from classes of prehistoric sites include:
   - Village sites, camp sites, agricultural sites, rock shelters or cave sites;
   - Lithic scatters, artifact scatters;
   - Groundstone manufacturing sites;
   - Rock features and alignments;
   - Food and other resource processing sites, roasting pits;
   - Hunting blinds and ambush sites;
   - Trail sites.
2. Sites from classes of historic sites include:
   - Ranches, homesteads, and associated features and components;

- Livestock raising related sites, agricultural features;
- Mines and prospecting sites;
- Settlements and camps;
- Roads, trails, and driveways, railroads and associated features, stage stops and stations;
- Public works sites, military camps and sites;
- Rock features and walls;
- Facilities used in commerce;
- Wells and water developments, water control features;
- Artifact scatters;
- Historic aboriginal sites;
- Historical rock art;
- Trash dumps.

Site Re-allocation Criteria

Reallocation is possible based on changing management and physical scenarios and does not require a land-use plan amendment. Cultural site allocations may be revised if the following conditions and criteria are met (per BLM Manual 8110):

- New data become known about the site;
- Land uses change;
- Development of lands causing direct or indirect impacts to site attributes or setting;
- Land tenure adjustments;
- Administrative changes (e.g., withdrawals, Recreation and Public Purposes Act, closures, easements);
- Tribal interest;
- Severe or unusual weathering or erosion causes changes loss of site integrity;
- Changes in accessibility;
- Loss of site values (due to data recovery during mitigation, vandalism, and trespass activities or other inadvertent damage).

Appendix J. Wildlife & Plant Priority Species

Table J.1. Priority Species in the Lower Sonoran and SDNM Decision Areas

COMMON NAME	SCIENTIFIC NAME	FEDERAL	STATE	OTHER	OCCURRENCE
Mammals					
Allen's (Mexican) big-eared bat	*Idionycteris phyllotis*	BS	-	-	h
Arizona myotis	*Macrotus californicus*	BS	-	-	h
California Leaf-nosed Bat	*Macrotus californicus*	BS	-	-	v
Cave myotis	*Myotis velifer*	BS	-	-	v
Desert bighorn sheep	*Ovis canadensis mexicana*	-	G	-	v
Greater western mastiff bat	*Eumops perotis californicus*	BS	-	-	h
Javelina (collared peccary)	*Pecari tajacu*	-	G	-	v
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	E	-	-	v
Mountain lion	*Puma concolor*	-	G	-	v
Mule deer	*Odocoileus hemionus*	-	G	-	v
Sonoran pronghorn	*Antilocapra americana sonoriensis*	E	-	-	v
Spotted bat	*Euderma maculatum*	BS	-	-	h
Townsend's big-eared bat	*Corynorhinus (=Plecotus) townsendii*	BS	-	-	v
White-tailed deer	*Odocoileus virginianus couesii*	-	G	-	v
Birds					
American kestrel	*Falco sparverius*	-	-	R	v
American peregrine falcon	*Falco peregrines anatum*	BS	-	BCC	h
Bald eagle	*Falco peregrines anatum*	T	-	R	v
Bald eagle (non-listed DPS)	*Haliaeetus leucocephalus*	BS	-	R	v
Bell's vireo	*Vireo bellii*	-	-	BCC	v
Black vulture	*Coragyps atratus*	-	-	R	v
Black-chinned sparrow	*Spizella atrogularis*	-	-	BCC	h
Cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	BS	-	BCC	v
California black rail	*Laterallus jamaicensis coturniculus*	BS	-	-	h
Chestnut-collared longspur	*Calcarius ornatus*	-	-	BCC	h
Common barn owl	*Tyto alba*	-	-	R	v
Cooper's hawk	*Accipiter cooperii*	-	-	R	v
Costa's hummingbird	*Calypte costae*	-	-	BCC	v
Crissal thrasher	*Toxostoma crissale*	-	-	BCC	v
Crested caracara	*Caracara cheriway*	-	-	R	v
Desert purple martin	*Progne subis hesperia*	BS	-	-	v
Elf owl	*Micrathene whitneyi*	-	-	BCC	v
Ferruginous Hawk	*Buteo regalis*	BS	-	R	v
Gambel's quail	*Callipepla gambelii*	-	G	-	v

COMMON NAME	SCIENTIFIC NAME	FEDERAL	STATE	OTHER	OCCURRENCE
Gilded flicker	*Colaptes chrysoides*	BS	-	BCC	v
Golden eagle	*Aquila chrysatos*	BS	-	R	h
Gray vireo	*Vireo vicinior*	-	-	BCC	h
Great-horned owl	*Bubo virginianus*	-	-	R	v
Harris's hawk	*Parabuteo unicinctus*	-	-	R	v
LeConte's thrasher	*Toxostoma lecontei*	BS	-	-	v
Long-eared owl	*Asio otis*	-	-	R	v
Lucy's warbler	*Vermivora luciae*	-	-	BCC	v
Merlin	*Falco columbarius*	-	-	R	v
Mourning dove	*Zenaida macroura*	-	G	-	v
Northern Harrier	*Circus cyaneus*	-	-	R	v
Northern Goshawk	*Accipiter gentilis atricapillus*	BS	-	-	h
Pinyon jay	*Gymnorhinus cyanocephalus*	BS	-	-	v
Prairie falcon	*Falco mexicanus*	-	-	BCC/R	v
Red-tailed hawk	*Buteo jamaicensis*	-	-	R	v
Southwestern willow flycatcher	*Empidonax trailli extimus*	E	-	BCC	h
Swainson's hawk	*Buteo swainsoni*	-	-	R	v
Western Burrowing Owl	*Athene cunicularia hypugaea*	BS	-	BCC	v
Western screech owl	*Megascops kennicottii*	-	-	R	v
White-winged dove	*Zenaida asiatica*	-	G	-	v
Yellow-billed cuckoo	*Coccyzus americanus*	C	-	BCC	h
Yellow warbler	*Dendroica petechia*	-	-	BCC	v
Yuma clapper rail	*Rallus longirostris yumanensis*	E	-	-	v
Amphibians & Reptiles					
Great Plains narrow-mouthed toad	*Bufo cognatus*	BS	-	-	v
Lowland burrowing treefrog	*Pternohyla fodiens*	BS	-	-	v
Lowland leopard frog	*Lithobates yavapaiensis*	BS	-	-	v
Sonora mud turtle	*Kinosternon sonoriense sonoriense*	BS	-	-	v
Sonoran desert tortoise	*Gopherus agassizii*	C	-	-	v
Sonoran green toad	*Bufo retiformis*	BS	-	-	h
Tucson Shovel-nosed snake	*Chionactis occipitalis klauberi*	C	-	-	v
Fish					
Desert sucker	*Catostomus clarki*	BS	-	-	v
Long-fin dace	*Agosia chrysogaster*	BS	-	-	v
Sonora sucker	*Catostomus insignis*	BS	-	-	v
Invertebrates					
Hydrobiid spring snails	All species in genus *Pyrgulopsis*	BS	-	-	h
Succineid snails	All species in family *Succineidae*	BS	-	-	h
Plants					
Acuña cactus	*Echinomastus erectocentrus var. acunensis*	C	-	-	

COMMON NAME	SCIENTIFIC NAME	FEDERAL	STATE	OTHER	OCCURRENCE
Arizona hedgehog cactus	*Echinocereus triglochidiatus var. arizonicus*	E	-	-	h
Kofa Mt barberry	*Berberis harrisoniana*	BS	-	-	
Arizona Sonoran rosewood	*Vauquelinia californica* spp *sonorensis*	BS	-	-	
Tumamoc globeberry	*Tumamoca macdouglii*	BS	-	-	

Federal Status	State Status	Other	Occurrence
E – Endangered	G – Game species	BCC – Birds of Conservation Concern/ FWS MTBA Focal Species	h– Probable, Potential, or Hypothetical Occurrence
T — Threatened		R – Raptor	v– Occurring
C – Candidate			
BS – BLM Sensitive			

Note: The Arizona BLM Sensitive Species List is dynamic. The list is currently in revision to reflect guidance from the revised BLM 6840 Manual dated June 2008. In addition, changes in species taxonomy, information on species distribution, abundance, or new knowledge on security or threats can come any time requiring changes to this list.

Appendix K. Conservation Measures from Fish and Wildlife Service Biological Opinions

Endangered Species Act

The Endangered Species Act of 1973, as amended (ESA), provides for the protection of threatened, endangered and proposed threatened or endangered (T/E) species of plants and animals. The following requirements are prescribed in BLM Manual 6840:

- The BLM shall conserve T/E species and the ecosystems upon which they depend and shall use existing authority in furtherance of the purposes of the ESA. Specifically the BLM shall:

    1. Determine, to the extent practical, the occurrence and distribution of all T/E species on BLM public lands and evaluate the significance of these habitats in the conservation of those species.

    2. Identify BLM public lands that are essential habitat and designated critical habitat of T/E species and prescribe management for the conservation of these habitats in land use plans.

    3. Develop and implement management plans that will ensure the conservation of T/E species and their habitats.

    4. Evaluate ongoing management activities to ensure T/E species conservation objectives are being met.

    5. Ensure that all activities affecting the populations and habitats of T/E species are designed to be consistent with recovery needs and objectives.

- Ensure that all actions authorized, funded, or carried out by the BLM are in compliance with the ESA. To accomplish this, the BLM shall:

1. Screen all proposed actions to determine whether T/E species or their habitat may be affected. Normally the environmental analysis process is used.

2. Initiate consultation with the U.S. Fish & Wildlife Service (FWS) as appropriate for those that may affect T/E species or their habitats.

3. Until the consultation proceedings are completed and a final decision has been reached, the BLM shall not carry out any actions that would cause irreversible or irretrievable commitment of resources or reduce the future management options for the species involved.

4. Ensure that no BLM action will adversely affect the likelihood of recovery of any T/E species.

- Cooperate with the FWS in planning and providing for the recovery of T/E species. To accomplish this the BLM shall:

1. Participate on recovery teams and in recovery plan preparation, as well as State or regional working teams responsible for T/E species recovery.

2. Review technical and agency drafts of recovery plans for species affected by BLM management to ensure that proposed actions assigned to the BLM are technically and administratively feasible and consistent with the BLM's mission and authority.

3. Ensure that the decisions, terms, and conditions of land-use plans, as well as more detailed site-specific plans, prepared for lands covered by previously approved recovery plans are consistent with meeting recovery plan objectives.

- Retain in Federal ownership all habitats essential for the survival or recovery of any T/E species, including habitat used historically by these species.

- Species proposed for listing as T/E and proposed critical habitat shall be managed with the same level of protection provided for T/E species except that formal consultations are not required. The BLM shall confer with the FWS on any action that will adversely affect a proposed species or proposed critical habitat.

- Candidate species will be managed so as not to contribute to the need for them to become listed as threatened or endangered.

Conservation Measures for the Sonoran Pronghorn

The conservation measures below have been developed through U.S. Fish and Wildlife Service Biological Opinions and are adopted in this plan, as amended, below.

Measures from the Plan Amendment for the Lower Gila South RMP (02-21-85-F-069) and an Amended Proposed Action for the Five Livestock Grazing Allotments in the Vicinity of Ajo, Arizona (02-21-94-F-192) 2004:

Sonoran Pronghorn (FE).

- **FE-1.** Install, operate, and maintain forage enhancement plots, in cooperation and coordination with the Sonoran Pronghorn Recovery Team as funding becomes available.

- **FE-2.** Install, operate, and maintain ground-level drinking troughs and associated existing wells on the Cameron allotment area in cooperation and coordination with the recovery team. Design, site selection, prioritization and implementation will be subject to recovery team review and will fully comply with facility maintenance guidelines for the Sonoran pronghorn and funding availability.

- **FE-3.** The BLM will only authorize ephemeral grazing on the Coyote Flat II and Childs Allotments in accordance with ephemeral use criteria contained in the Arizona Land Health Standards when the following conditions are met:

1. Ephemeral forage on the Coyote Flat II and Childs allotments is not an important part of ephemeral available to pronghorn, either in terms of forage quality or acreage of greenup because it is abundant and occurs across the range of the Sonoran pronghorn;

2. The U.S. Sonoran pronghorn population must be above 100 animals and increasing; and

3. Prior to authorizing ephemeral grazing, the BLM will work with the U.S. Fish and Wildlife Service (FWS) and the Arizona Game and Fish Department (AGFD) in evaluating the above conditions.

- **FE-4.** Continue implementing the drought policy developed in 2003 Instruction Memorandum AZ-020-03-003 Lower Sonoran Field Office Drought Policy for Four Ajo Block Allotments and Sentinel Allotment for the Coyote Flat II, Childs and Sentinel allotments.

- **FE-5.** The BLM will, in coordination with the Sonoran Pronghorn Recovery Team, install, operate, and maintain forage enhancement plots in at least two locations and as many as eight locations in pronghorn habitat. Design, site selection, prioritization, and implementation will be subject to recovery team oversight and funding availability.

- **FE-6.** The BLM will operate and maintain the four existing wells on the Cameron Allotment area for listed species management. Timing of the maintenance will be coordinated with the Sonoran Pronghorn Recovery Team to avoid adverse impacts and will also fully comply with the facility maintenance guidelines contained in the conservation measures for CFPO.

- **FE-7.** The BLM will, in coordination with the Sonoran Pronghorn Recovery Team, install, operate, and maintain ground-level drinking troughs at existing wells on the Cameron allotment area. Design, site selection, prioritization, and implementation will be coordinated with the Sonoran Pronghorn Recovery Team and subject to funding availability.

- **FE-8.** The BLM will remove all interior fences and cooperate with Organ Pipe Cactus National Monument (OPCNM) and Cabeza Prieta National Wildlife Refuge (CPNWR) in the removal of common boundary fences with the Cameron allotment area.

- **FE-9.** The BLM, in coordination with AGFD, will modify existing dirt tanks to minimize conditions conductive to biting midge propagation, subject to an evaluation of need and feasibility assessment.

- **FE-10.** The BLM will continue to seek funding to complete the ongoing study on the potential of disease transmission from livestock to pronghorn.

- **FE-11.** The BLM will identify areas of heavy recreational impacts and, to the extent practicable, initiate measures to rehabilitate these areas. Implementation will be subject to availability of funding.

- **FE-12.** The BLM will enforce a maximum 14 day camping limit, or more restrictive as determined by the RMP, in the Ajo Special Recreation Management Area (SRMA), and direct all camping activities to the Gunsight Wash camping area.

- **FE-13.** The BLM will continue to implement the annual seasonal closure to public use between March 15 and July 15, or as agreed upon by the Sonoran Pronghorn Recovery Team excluding the camping area at Gunsight Wash. The area to be closed is the area west of state route 85 and south of the Darby Well/Scenic Loop Road/Chico Shunie Road. (Area defined as the Cuerda de Lena WHA, ACEC and/or Ajo SRMA in the various Draft RMP alternatives).

- **FE-14.** The BLM will consult with FWS concerning all vehicle routes within Sonoran pronghorn habitat during the travel management route designation process to be conducted within 5 years after the completion of the Lower Sonoran-SDNM Draft RMP.

- **FE-15.** The BLM will continue to support the priority recovery items for Sonoran pronghorn as recommended by the Sonoran Pronghorn Recovery Team.

Conservation Measures for Fire Management Activities

From the Arizona Statewide Plan Amendment for Fire, Fuels and Air Quality Management:

During fire-suppression actions, resource advisors may be designated to coordinate concerns regarding federally protected species and to serve as liaisons between the field office managers and the incident commanders or the incident management team. They also serve as field contact representatives responsible for coordination with the FWS. The resource advisors will have the necessary information on federally protected species and habitats in the area and the available conservation measures for the species. They will be briefed on the intended suppression actions for the fire and will provide input on which conservation measures are appropriate. The incident commander has the final decision making authority on implementation of conservation measures during fire-suppression operations.

For fire-suppression activities, a protocol for consultation has been developed as a part of the biological opinion (BO) for the Arizona Statewide Plan Amendment for Fire, Fuels and Air Quality Management. This programmatic consultation contains conservation measures and prescriptions for use in fire-suppression activities. Emergency consultation should only be needed when suppression actions fall outside of these prescriptions. The BO outlines coordination needs for emergency response actions that may affect a listed/proposed species or critical habitat.

The following protocols will apply:

- The BLM will contact the appropriate FWS biologist as soon as practical once a wildfire starts and a determination is made that a federally protected species or its habitat could be affected by the fire or fire-suppression activities.
- The FWS will work with the BLM during the emergency response to apply the appropriate conservation measures.
- If conservation measures cannot be applied during the suppression activities, the BLM will consult with the responding agency after the fact on any suppression actions that may have affected the federally protected species or its habitat.
- If conservation measures are adhered to, the BLM will report on the actions taken and the effects to the species and its habitat following the fire, but no further consultation on that incident will be required.

Because of the number of species located within the area and the variety of fire-suppression and fire-management activities, conflicts may occur in attempting to implement all conservation measures for every species potentially affected by a particular activity.

Implementing these conservation measures effectively depends on the number of federally protected species and their individual life history or habitat requirements within a particular location that is being affected by either fire-suppression or a proposed fire management activity. This would be particularly true for timing restrictions on fuels treatment activities if the ranges of several species with differing restrictions overlap, making effective implementation of the activity unachievable. Resource advisors (in coordination with the FWS), fire management officers

or incident commanders, and other resource specialists will coordinate to determine which conservation measures are implemented during a particular activity. If conservation measures for a species cannot be implemented, the BLM is required to initiate Section 7 consultation with the FWS for that particular activity.

The BLM will update and maintain fire management plans to include site-specific actions for managing wildfire and fuels in accordance with Federal fire policies and this plan. These plans will be coordinated with the FWS and the Arizona Game and Fish Department (AGFD) to address site-specific concerns for federally protected species. These plans will incorporate the conservation measures. Consultation with the FWS will occur with these project-level plans, as necessary.

Wildland Fire Suppression (FS)

The following conservation measures will be implemented during fire-suppression operations unless firefighter or public safety or the protection of property, improvements, or natural resources render them infeasible during a particular operation. Each conservation measure has been given an alphanumerical designation for organizational purposes (e.g. FS-1). Necessary modifications of the conservation measures or impacts to federally protected species and habitat during fire-suppression operations will be documented by the resource advisor and coordinated with the FWS.

- **FS-1.** Protect known locations of habitat occupied by federally listed species. Minimum impact suppression tactics (MIST) will be followed in all areas with known federally protected species or habitat.

- **FS-2.** Resource advisors will be designated to coordinate natural resource concerns, including federally protected species. They will also serve as a field contact representative responsible for coordination with the FWS. Duties will include identifying protective measures endorsed by the field office manager, and delivering these measures to the incident commander; surveying prospective campsites, aircraft landing and fueling sites; and performing other duties necessary to ensure adverse effects to federally protected species and their habitats are minimized. On-the-ground monitors will be designated and used when fire-suppression activities occur within identified occupied or suitable habitat for federally protected species.

- **FS-3.** All personnel on the fire (firefighters and support personnel) will be briefed and educated by resource advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel will be informed of the conservation measures designed to minimize or eliminate take of the species present. This information is best identified in the incident objectives.

- **FS-4.** Permanent road construction will not be permitted during fire-suppression activities in habitat occupied by federally protected species. Construction of temporary roads is approved only if necessary for safety or the protection of property or resources, including federally protected species habitat. Temporary road construction should be coordinated with the FWS, through the resource advisor.

- **FS-5.** Crew camps, equipment staging areas, and aircraft landing and fueling areas should be located outside of listed species habitats, and preferably in locations that are disturbed. If camps must be located in listed species habitat, the resource advisor will be consulted to

ensure habitat damage and other effects to listed species are minimized and documented. The resource advisor should also consider the potential for indirect effects to listed species or their habitat from the siting of camps and staging areas (e.g., if an area is within the water flow pattern, there may be indirect effects to aquatic habitat or species located off-site).

- **FS-6.** All fire management protocols to protect federally protected species will be coordinated with local fire-suppression agencies that conduct fire-suppression on BLM-administered lands to ensure that the agency knows how to minimize impacts to federally protected species in the area.

- **FS-7.** The effectiveness of fire-suppression activities and conservation measures for federally protected species should be evaluated after a fire when practical, and the results shared with the FWS and AGFD. Revise future fire-suppression plans and tactical applications as needed and as practical.

Fuels Treatments (Prescribed Burning and Other Fuels Management) (FT)

The following conservation measures are mandatory when implementing wildland fire use, prescribed fires, and the proposed vegetation treatments (mechanical, chemical, biological):

- **FT-1.** Biologists will be involved in the development of prescribed burn plans and vegetation treatment plans to minimize effects to federally protected species and their habitats within, adjacent to, and downstream from proposed project sites. Biologists will consider the protection of seasonal and spatial needs of federally protected species (e.g., avoiding or protecting important use areas or structures and maintaining adequate patches of key habitat components) during project planning and implementation.

- **FT-2.** MIST will be followed in all areas with known federally protected species or habitats.

- **FT-3.** Pre-project surveys and clearances (biological evaluations/assessments) for federally protected species will be required for each project site before implementation. All applicable conservation measures will be applied to areas with un-surveyed suitable habitat for federally protected species, until a survey has been conducted by qualified personnel to clear the area for the treatment activity.

- **FT-4.** Use of motorized vehicles during prescribed burns or other fuels treatment activities in suitable or occupied habitat will be restricted, to the extent feasible, to existing roads, trails, washes, and temporary fuel breaks or site-access routes. If off-road travel is deemed necessary, any cross-country travel paths will be surveyed prior to use and will be closed and rehabilitated after the prescribed burn or fuels treatment project is completed.

- **FT-5.** As part of the mandatory fire briefing held prior to prescribed burning, all personnel (firefighters and support personnel) will be briefed and educated by resource advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel will be informed of the conservation measures designed to minimize or eliminate take of the species present.

Rehabilitation and Restoration (RR)

- **RR-1.** When rehabilitating important areas for federally listed species that have been damaged by fire or other fuels treatments, the biologist will give careful consideration to minimizing short-term and long-term impacts. Someone who is familiar with fire impacts and the needs of the affected species will contribute to rehabilitation plan development. Appropriate timing of rehabilitation and spatial needs of federally listed species will be addressed in rehabilitation plans.

- **RR-2.** Seed from regionally native or sterile alien (non-native) species of grasses and herbaceous vegetation will be used in areas where reseeding is necessary following ground disturbance to stabilize soils and prevent erosion by both wind and water.

- **RR-3.** Sediment traps or other erosion control methods will be used to reduce or eliminate influx of ash and sediment into aquatic systems.

- **RR-4.** Use of motorized vehicles during rehabilitation or restoration activities in suitable or occupied habitat will be restricted, to the extent feasible, to existing roads, trails, or washes, and to temporary access roads or fuel breaks created to enable the fire suppression, prescribed burn, or fuels treatment activities to occur. If off-road travel is deemed necessary, any cross-country travel paths will be surveyed prior to use and will be closed and rehabilitated after rehabilitation or restoration activities are completed.

- **RR-5.** All temporary roads, vehicle tracks, skid trails, and off-road vehicle (ORV) trails resulting from fire suppression and the proposed fire management activities will be rehabilitated (water bars, etc.), and will be closed or made impassible for future use.

- **RR-6.** Burned area emergency rehabilitation (BAER) activities and long-term restoration activities should be monitored, and the results provided to the FWS and AGFD. Section 7 consultation for BAER activities will be conducted independently, if necessary.

- **RR-7. (Recommended)** Develop public education plans that discourage or restrict fires and fire-prone recreation uses during high fire-risk periods. Develop brochures, signs, and other interpretive materials to educate recreationists about the ecological role of fires, and the potential dangers of accidental fires.

Wildland Fire Suppression & Rehabilitation in Riparian and Aquatic Habitats (RA)

The following conservation measures will be implemented during fire-suppression operations in riparian, wetland, or aquatic habitats, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Necessary modifications of the conservation measures or impacts to federally protected species and habitat during fire-suppression operations will be documented by the resource advisor, and coordinated with the FWS. The BLM's 1987 policy statement on riparian area management defines a riparian area as "an area of land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lakeshores and stream banks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil."

- **RA-1.** During wildfire suppression, apply MIST within riparian areas. Fire-suppression actions in riparian areas should be prioritized to minimize damage to stands of native

vegetation from wildfire or suppression operations. To the extent possible, retain large, downed woody materials and snags that are not a hazard to firefighters.

- **RA-2.** Fire suppression and rehabilitation in riparian corridors will be coordinated with the resource advisor or qualified biologist approved by the BLM.

- **RA-3.** Site-specific implementation plans that include project areas with federally protected aquatic or riparian-obligate species will specify fire management objectives and wildland fire-suppression guidance, taking into account the special concerns related to these species.

- **RA-4.** In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical, use wet firebreaks in sandy overflow channels rather than constructing fire lines by hand or with heavy equipment.

- **RA-5.** Construction or development of a crossing for motorized vehicles across a perennial stream will not be permitted, unless an established road already exists or where dry, intermittent sections occur.

- **RA-6.** Avoid the use of fire retardants or chemical foams in riparian habitats or within 300 feet of aquatic habitats, particularly sites occupied by federally protected species. Apply operational guidelines as stated in the Interagency Standards for Fire and Fire Aviation Operations 2003 (or updates), "Environmental Guidelines for Delivery of Retardant or Foam Near Waterways," Chapter 8 (pp. 8-13 through 8-15).

- **RA-7.** When using water from sources supporting federally protected species, care must be taken to ensure adverse impacts to these species are minimized or prevented. Unused water from fire abatement activities will not be dumped in sites occupied by federally protected aquatic species to avoid introducing non-native species, diseases, or parasites.

- **RA-8.** If water is drafted from a stock tank or other body of water for fire suppression, it will not be refilled with water from another tank, lakes, or other water sources that may support non-native fishes, bullfrogs, crayfish, or salamanders.

- **RA-9.** Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

- **RA-10. (Recommended)** Develop and implement restoration plans for affected riparian or aquatic areas, including long-term monitoring, to document changes in conditions in the riparian zone and watershed that maintain flood regimes and reduce fire susceptibility. Monitor stream water quality and riparian ecosystem health to determine effects of wildfire and fire management activities. Coordinate efforts and results with the FWS and AGFD.

Fuels Treatments (prescribed fire; mechanical, chemical, and biological treatments)

The following conservation measures are mandatory when implementing wildland fire use, prescribed fires, and the proposed vegetation treatments (mechanical, chemical, and biological) within riparian, wetland, or aquatic habitats.

- **RA-11.** All conservation measures for wildland fire suppression (RA-1 to RA-11) also apply to fuels treatment activities (prescribed fire; mechanical, chemical, and biological treatments) in riparian, wetland, and aquatic habitats.

- **RA-12.** Fire management treatments within or adjacent to riparian and aquatic habitats will be designed to provide long-term benefits to aquatic and riparian resources by reducing threats associated with dewatering and surface disturbance, or by improving the condition of the watershed and enhancing watershed function.

- **RA-13.** For priority fire/fuels management areas (e.g., WUIs) with federally protected species or designated critical habitat downstream, BLM biologists and other resource specialists, as appropriate, in coordination with FWS and AGFD, will determine:

1. The number of acres and the number of projects or phases of projects to occur within one watershed per year.

2. An appropriately-sized buffer adjacent to perennial streams in order to minimize soil and ash from entering the stream.

3. Where livestock grazing occurs in areas that have been burned, specialists will determine when grazing can be resumed. Such deferments from grazing will only occur when necessary to protect streams from increased ash or sediment flow into streams[1] .

Species Specific Conservation Measures: .

In addition to the general conservation measures, the following species-specific conservation measures will be applied during wildfire suppression to the extent possible, and will be required during fuels treatment activities (wildland fire use, prescribed fire, vegetation treatments). Necessary modifications of the conservation measures or impacts to federally protected species and habitat during fire suppression operations will be documented by the resource advisor, and coordinated with the FWS.

Birds

Cactus ferruginous pygmy-owl (CO).

- **CO-1.** Treatment of riparian habitat, Sonoran desert/desert scrub, or mesquite-invaded grasslands under 4,000 feet in elevation that may support nesting cactus ferruginous pygmy owls will only occur during the non-nesting season of August 1 to January 31, unless pre-project surveys indicate the area does not support pygmy-owls or mitigation plans approved by the FWS have alleviated negative consequences.

- **CO-2.** Develop mitigation plans in coordination with the FWS for fuels treatment projects (prescribed fire; vegetation treatments) that may adversely affect cactus ferruginous pygmy-owls or their habitat. Mitigation plans for prescribed fire shall limit to the extent practicable the possibility that fire would spread to riparian habitats. Mitigation plans will be approved by the FWS.

- **CO-3. (Recommended)** To the extent possible, maintain habitat features necessary to support breeding populations of the pygmy-owl within their historic range and review ongoing fire management activities for effects on essential habitat features needed by cactus ferruginous

pygmy-owls. Modify activities, where necessary, to sustain the overall suitability of the habitat for the owls. Priority will be given to activities in or near occupied or recently (w/in the last 10 years) occupied habitat.

- **CO-4.** Development or other disturbing activities should not occur within 400 meters (0.25 miles) of an active nest site during the most sensitive periods of the breeding season (February 1 through July 31). Development or disturbance planned to occur within 100 meters (330 feet) of any known pygmy-owl nest site should be evaluated on a site-specific basis, but significant modification of habitat within this area should be avoided year-round.

Southwestern willow flycatcher (WF).

- **WF-1.** Implement the conservation measures for Fire Management Activities in Riparian and Aquatic Habitats.

- **WF-2.** Except where fires are active in occupied habitat, minimize unnecessary low-level helicopter flights during the breeding season (April 1 – September 30). Approach bucket dip sites at a 90-degree direction to rivers to minimize flight time over the river corridor and occupied riparian habitats. Locate landing sites for helicopters at least ¼ mile from occupied sites to avoid impacts to willow flycatchers and their habitat.

- **WF-3.** Minimize use of chainsaws or bulldozers to construct fire lines through occupied or suitable habitat except where necessary to reduce the overall acreage of occupied habitat or other important habitat areas that would otherwise be burned.

- **WF-4.** Implement activities to reduce hazardous fuels or improve riparian habitats (prescribed burning or vegetation treatments) within occupied or found to be occupied habitat for southwestern willow flycatchers only during the non-breeding season (October 1 to March 31).

- **WF-5.** Avoid developing access roads that would result in fragmentation or a reduction in habitat quality. Close and rehabilitate all roads that were necessary for project implementation (see RR 5).

- **WF-6.** Prescribed burning will only be allowed within ½ mile of occupied or found to be occupied habitat when weather conditions allow smoke to disperse away from the habitat when birds may be present (breeding season of April 1 – September 30).

- **WF-7.** Vegetation treatment projects adjacent to occupied or found to be occupied habitat will only be conducted when willow flycatchers are not present (October 1 – March 31).

- **WF-8.** The following reasonable and prudent measure, terms, and conditions are necessary and appropriate to minimize take of southwestern willow flycatchers:

1. Minimize the effects of harassment, harm, and mortality to southwestern willow flycatchers.

2. In cooperation with FWS and using guidance from southwestern willow flycatcher recovery plan, the BLM shall incorporate the elements recommended for fire risk evaluation and planning into its fire management plans for all current flycatcher breeding sites on or adjacent to BLM-administered lands.

3. If additional sites become occupied, the BLM shall include them in the yearly fire management plans in cooperation with FWS, prior to the next wildfire season.

Yellow-billed cuckoo (YC).

- **YC-1.** Implement the conservation measures for Fire Management Activities in Riparian and Aquatic Habitats.

Yuma clapper rail (CR).

- **CR-1.** Implement the conservation measures for Fire Management Activities in Riparian and Aquatic Habitats.
- **CR-2.** Any prescribed fire or vegetation treatment project in occupied or suitable marsh habitat would only occur between September 1 and March 15 to avoid the Yuma clapper rail breeding and molting seasons.
- **CR-3.** Mechanical removal of overstory habitat (Tamarisk) could occur as early as August 15, after the breeding season for Yuma clapper rails.
- **CR-4.** Herbicide application would not occur in Yuma clapper rail habitat and drift-inhibiting agents would be used to assure that the herbicide does not enter adjacent marsh areas.
- **CR-5.** The following reasonable and prudent measure, terms, and conditions are necessary and appropriate to minimize take of Yuma clapper rail:

1. Minimize disturbance to Yuma clapper rails during prescribed fire activities.
2. To allow for a better estimate of the number of birds in the affected area, the BLM or their designated representative shall conduct surveys of the site to be prescribed burned during the breeding season prior to the burn. Since prescribed fires would be conducted during September to March, the surveys shall be done the preceding March to May.

Fish

The following conservation measure will be implemented for all federally protected fish species that may be affected by the Proposed Action during fire suppression to the extent possible, and are mandatory for wildland fire use, prescribed fire, and vegetation treatment activities:

- **FI-1.** The BLM will cooperate with other agencies to develop emergency protocols to decrease the impacts of fire suppression and fuels treatment activities on federally listed fish species. Emergency protocols will include appropriate agency contacts, a list of facilities that can hold fish, sources of equipment needed (e.g., sampling gear, trucks) and how to address human health and safety issues.

Currently, there are no federally listed fish species within the Lower Sonoran Planning area.

Flowering Plants

The following conservation measures for known locations and un-surveyed habitat of all federally protected plant species within the planning area will be implemented during fire suppression to the extent possible, and are mandatory for wildland fire use, prescribed fire, and vegetation treatment activities:

- **PL-1.** Known locations and potential habitat for plant populations will be mapped to facilitate planning for wildland fire use, prescribed fires, and vegetation treatments, and to ensure protection of these populations during fire suppression.

- **PL-2.** The BLM will coordinate with FWS to delineate buffer areas around plant populations prior to prescribed fire and vegetation treatment activities. The BLM will coordinate with FWS during any emergency response and wildland fire use activities to ensure protection of plant populations from fire and fire-suppression activities.

- **PL-3.** During fire suppression, wildland fire use, and prescribed fire in habitat occupied by federally protected plant species, no staging of equipment or personnel will be permitted within 100 meters of identified individuals or populations, nor will off-road vehicles be allowed within the 100-meter buffer area, unless necessary for firefighter or public safety or the protection of property, improvements, or other resources (see FS-7). Primary threats to many of these plant species are trampling or crushing from personnel and vehicles.

- **PL-4.** No prescribed burning will be implemented within 100 meters of identified locations or un-surveyed suitable habitat for federally protected and sensitive plant populations unless specifically designed to maintain or improve the existing population.

There are no additional species-specific conservation measures for the federally protected plant species Acuña Cactus (*Echinomastus erectocentrus var. acunensis*).

Mammals

Lesser long-nosed bat (LB).

- **LB-1.** Instruct all crew bosses (wildfire suppression, wildland fire use, prescribed fire, and vegetation treatments) in the identification of agave and columnar cacti and the importance of their protection.

- **LB-2.** Prior to implementing any fuels treatment activities (prescribed fire, vegetation treatments), pre-project surveys will be conducted for paniculate agaves and saguaros that may be directly affected by fuels management activities.

- **LB-3.** Protect long-nosed bat forage plants—saguaros and high concentrations of agaves—from wildfire and fire-suppression activities, and from modification by fuels treatment activities (prescribed fire, vegetation treatments), to the greatest extent possible. Agave concentrations are contiguous stands or concentrations of more than 20 plants per acre. Avoid driving over plants, piling slash on top of plants, and burning on or near plants. Staging areas for fire crews or helicopters will be located in disturbed sites, if possible.

- **LB-4.** No seeding/planting of nonnative plants will occur in any wildfire rehabilitation site or fuels treatment site with paniculate agaves or saguaros.

- **LB-5.** A mitigation plan will be developed by the Bureau in coordination with the FWS for prescribed fires or fuels management projects (mechanical, chemical, biological treatments) within 0.5 mi of bat roosts or in areas that support paniculate agaves or saguaros. The mitigation plan will ensure that effects to bat roosts and forage plants are minimized and will include monitoring of effects to forage plants. The plan will be approved by the FWS.

- **LB-6. (Recommended)** BLM personnel should examine concentrations of agaves (including shindagger (*A. schottii*) within each proposed fuels treatment area, and blackline or otherwise protect from treatments any significant concentrations of agaves that appear to be amidst fuel loads that could result in mortality greater than 20 percent (>50% for *A. schottii*). BLM personnel should use their best judgment, based on biological and fire expertise, to determine which significant agave stands are prone to mortality greater than 20 percent (>50% for *A. schottii*) (see conservation measures FT-1 and FT-3).

- **LB-7. (Recommended)** the BLM should continue to support and cooperate in the investigations of agave relationships to livestock grazing, and of the effects of prescribed fire on paniculate agaves.

Reptiles

Desert tortoise, Sonoran population (DT).

Implement management actions for the Desert Tortoise, Sonoran population, as appropriate as developed by the Rangewide Strategy.

[1] The Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook, Exhibit 4-2, BLM supplemental guidance, page 5 of 9 (http://fire.r9.fws.gov/ifcc/ESR/handbook/4PolicyGuidance.htm) establishes the following policy for livestock exclusion following burns: Exclusion of livestock is critical for the recovery of burned vegetation or establishment and maintenance of new seedlings and use of these areas should not be permitted until the vegetation recovers or is established. Both re-vegetated and burned but not re-vegetated areas will be closed to livestock grazing for at least two growing seasons following the season in which the wildfire occurred to promote recovery of burned perennial plants or facilitate the establishment of seeded species. Livestock permittees must be informed of the closure early during the plan preparation process, and livestock closures will be made a condition or term on the grazing license or permit through the issuance of grazing decision (see 43 CFR 4160). Livestock closures for less than two growing seasons may be justified on a case-by-case basis based on sound resource data and experience. Livestock management following seedling establishment or burned area recovery should maintain non-native and native species to meet land use (including Standards for Rangeland Health and Guidelines for Grazing Management) or activity plan objectives.

Appendix L. Guidelines for Grazing Administration

The Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (referred to as Standards and Guidelines or S&Gs) (BLM 1997) are a series of management practices used to ensure that grazing meets the standards for rangeland health, which are referred to in this plan as Land Health Standards (see Section 2.5.3, "Arizona Land Health Standards" (p. 43)). Upland sites, riparian-wetland areas and desired resource conditions are each addressed by a standard along with associated guidelines. The guidelines are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

1. Typically identify and prescribe methods of influencing or controlling specific public land uses;
2. Are developed and applied consistent with the desired condition and within site capability; and
3. May be adjusted over time.

The following guidelines from the S&G are hereby adopted and apply to all areas where grazing occurs.

Guidelines for Standard 1: Uplands Sites

1-1. Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites within management units. The ground cover should maintain soil organisms and plants and animals to support the hydrologic and nutrient cycles, and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

1-2. When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

Guidelines for Standard 2: Riparian-Wetland Areas

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.

2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

2-3. The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

Guidelines for Standard 3: Desired Resource Conditions

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

3-2. Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance or restoration of their habitats.

3-3. Management practices maintain, restore, or enhance water quality in conformance with State or Federal standards.

3-4. Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant community objectives (DPCs).

3-5. Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

- Ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;
- Sufficient surface and subsurface soil moisture exists for continued plant growth;
- Serviceable waters are capable of providing for proper grazing distribution;
- Sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and
- Monitoring is conducted during grazing to determine if objectives are being met.

3-6. Management practices will target those populations of noxious weeds which can be controlled or eliminated by approved methods.

3-7. Management practices to achieve DPCs will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites and plants of significance to Native American peoples.

DPC objectives would be quantified for each allotment through the rangeland monitoring and evaluation process. Ecological site descriptions available through the Natural Resources Conservation Service (NRCS) and other available data will be used as a guide for addressing site capabilities and potentials for change over time. These objectives are vegetation values the BLM manages over the long term. Once established, DPC objectives would be updated and monitored by the use of indicators for Land Health Standard 3.

Implementing Standards and Guidelines

The authorized officer will review existing permitted livestock use, allotment management plans, or other activity plans which identify terms and conditions for management on public land. Existing management practices and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet, or are making significant progress toward meeting, the standards and are in conformance with the guidelines. The review will be

interdisciplinary and conducted under existing rules which provide for cooperation, coordination, and consultation with affected individuals, federal, state, and local agencies, tribal governments, private landowners, and interested publics.

This review will use a variety of data, including monitoring records, assessments, and knowledge of the locale to assist in making the significant progress determination. Significance will be determined on a case by case basis, considering site potential, site condition, weather and financial commitment. It is anticipated there will be cases where numerous years will be needed to determine direction and magnitude of trend.

Upon completion of review, the authorized officer shall take appropriate action as soon as practicable but no later than the start of the next grazing year upon determining that the existing grazing management practices or level of use on public land are significant factors contributing to failure to achieve the standards and conform with the guidelines that are made effective under 43 CFR 4180.2. Appropriate action means implementing actions that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with guidelines.

Livestock grazing will continue where significant progress toward meeting standards is being made. Additional activities and practices would not be needed on such allotments. Where new activities or practices are required to assure significant progress toward meeting standards, livestock grazing use can continue contingent upon determinations from monitoring data that the implemented actions are effective in making significant progress toward meeting the standards. In some cases, additional action may be needed as determined by monitoring data over time.

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

Appendix M. Painted Rock Burro Herd Manageability Analysis

The Painted Rock Herd Area (PRHA) is located approximately 85 miles southwest of the metro Phoenix area and about 11 miles west of Gila Bend, Arizona, and surrounds the Painted Rock Reservoir area. The Herd Area (HA) encompasses approximately 38,737 acres, of which 31,106 acres are BLM-managed public lands, 4,834 acres are private lands, and 2,796 acres are Arizona state lands. The HA includes portions of three allotments: Artex, Painted Rock, and Dendora Valley. All three allotments are classified as ephemeral. The HA has been home to wild burros and a small band of horses over the years. Management of the herd area applies only to the Lower Sonoran Decision Area. No Herd Management Areas (HMAs) have been allocated within either Decision Area. The Painted Rock Herd Area is shown on Map 3-15.

The habitat of the Painted Rock Herd Area consists about 10,700 acres of river bottom between the Painted Rock Dam and Oatman Mountain. Approximately 28,000 acres of the Herd Area are upland volcanic flow in a region known as the Sentinel Plain. This area consists of broad lower Sonoran Desert plains cut by sandy washes and low mountain ranges. Vegetation consists of palo verde, cacti, creosote bush, and sage. The Gila River bisects the northern portion of the HA and is characterized by salt cedar, mesquite, cottonwood, and willows. Wildlife species that also inhabit the area include desert mule deer, javelina, dove, quail, water fowl, and a variety of small mammals, birds, amphibians, and reptiles.

The wild horses and burros that have historically inhabited this area are probably descendants from pack and work animals brought by the Spaniards and escaped or were released into the desert. With the discovery of gold and silver in the 1800s, miners and settlers brought more animals with them. Burros and ponies were often used inside the mines themselves, and burros were also used to breed with horses to produce mules, which were highly sought after for driving and packing in the rugged west.

At one time, more than 10,000 wild burros were found in California, Arizona, and Nevada. The BLM estimates that approximately 33,000 horses and 5,500 burros are roaming on BLM-managed rangelands in 10 Western states, based on the latest data available, compiled as of June 17, 2011. The 2011 Arizona population consists of 434 wild horses and 2,761 wild burros. Arizona boasts the largest burro population in America, more than the other nine states combined. Wild horses and burros have virtually no natural predators and their herd sizes can double about every four years. As a result, the agency must remove thousands of animals from the range each year to control herd sizes.

The social structure of most wild horse herds consists of breeding and bachelor bands. Breeding bands or harems usually consist of a dominant stallion, lead or dominant mare(s), a group of breeding mares, and associated foals and yearlings. Bachelor bands consist of various aged males that either have not yet established their own harem or have lost their mares (Singer et.al, 2000). Although wild horse bands tend to use the same habitat areas (home ranges) from year to year, they are not territorial and do not defend preferred habitat areas. As a result, bands often graze and water near each other, and there may be movement of mares between bands. This, in combination with the periodic displacement of the dominant stallion and removal or death of other horses, results in a very fluid social structure in most herds. These factors are beneficial in enhancing genetic diversity (Singer et.al, 2000).

In contrast to wild horses, wild burros do not form breeding bands. There are no strong individual bonds other than jenny-foal relationships. Wild burros present themselves as single animals, all-male groups, all-female groups, jenny-foal groups, or mixed groups. All of the groups are variable and their composition may change at any time. This loose social structure, where all animals are potential breeding partners, maximizes genetic diversity in small or dispersed burro populations (Singer et.al, 2000).

Burros evolved in the harsh deserts of North Africa and are very well adapted to a dry desert environment. Two distinct breeds are attributed with being the ancestors of today's western burros: Nubian burros have a black stripe across the shoulders and down the middle of the back, giving the appearance of a cross when viewed from above; Somalian burros have leg stripes on both front and hind legs, resembling a zebra's markings. These characteristics can be seen in most Arizona burro populations. Left alone in the remote region of Painted Rock with few natural predators, the wild burros survived the intense heat on the coarse vegetation and limited water. However, with the encroachment of man and the installation of fences, roads, and highways, their ability to disperse and mingle with other herds is very limited.

In 1971, Congress passed The Wild Free-Roaming Horses and Burros Act (WFRHBA, or "The Act," Public Law 92-195). The Act gave BLM the honor and the responsibility to manage wild horse and burro populations on BLM-administered lands in the west. The Act states, "It is the policy of Congress that wild, free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands." The WFRHBA goes on to define wild horse and burro "range" as, "the amount of land necessary to sustain an existing herd or herds of wild free-roaming horses and burros, which does not exceed their known territorial limits, and which is devoted principally, but not necessarily exclusively to their welfare in keeping with the multiple-use management concept for the public lands."

One of the first tasks involved in implementing the WFRHBA was to survey public lands and delineate where wild horses and burros found habitat and forage, and designate these areas as “Herd Areas” (HAs). These Herd Areas established boundaries of where wild horses and burros were located at the passage of The Act. Later, Herd Management Areas (HMAs) were established within those Herd Areas to manage healthy, self-sustaining populations of wild horses and/or burros, in accordance with BLM land use plans (i.e. RMPs) and other decisions.

The Arizona statewide inventory of known or likely wild horse and burro use areas was conducted by the BLM in 1974. Data from this inventory identified seven burros and five horses in the Painted Rock area, which became the Herd Area. However, it was later discovered that the only year-round waters available for the animals are on private farm lands in the northern third of the HA. The southern two thirds of the HA is Sonoran Desert scrub and classified as ephemeral use for cattle. (Ephemeral use means that cattle are only permitted on the rangelands during years of above-average precipitation when ephemeral forage [e.g., annual grasses and forbs] are abundant and provide hundreds or thousands of pounds of high-protein forage for short periods of time, after which the cattle are removed from the range again.)

All planning documents, including the Lower Gila South RMP, referred only to wild burros in the area. In 1993, farmers on the northern end of the HA complained about horses coming onto their farm land, and the BLM began to remove them as stray animals. The International Society for the Protection of Mustangs and Burros intervened, stating that these were wild horses and subject to protection afforded by the Wild Free-Roaming Horse and Burro Act of 1971. In 1999,

it was determined by the Phoenix Field Manager that the animals were, in fact, present in the area in 1971 and subject to the protection by the WFRHBA. However, the area remained a HA, and nuisance complaints continued from the local farmers. In approximately 1997, Phoenix Field Office proposed amendments to the Lower Gila North MFP and Lower Gila South RMP that, among other proposals, would have classified the Painted Rock Herd Area as a Herd Management Area, with proposals to establish an Appropriate Management Level (AML) of wild burros and horses to manage in the area. However, protests and litigation of the RMP Amendment resulted in a settlement agreement regarding the Painted Rock Herd Area. The BLM was instructed to conduct an analysis of the manageability of the Painted Rock burro herd and make a decision in the new RMP based on that analysis. Until that occurred, "All burros would be removed from the Painted Rock Reservoir area."

Historic aerial surveys documented 7 burros and 5 horses in 1974, 13 burros and 0 horses in 1980, and no horses or burros in 2000. However, due to the terrain and dense vegetation in some areas, it is likely that animals were not sighted, because local farmers in the Painted Rock area have occasionally requested the removal of nuisance animals from their private property. Since 1992, a total of sixty-four horses and seven burros have been removed from the HA.

In 2007, sixteen horses and one burro were captured and removed from the Painted Rock HA. From these 16 horses, 11 blood samples were collected for genetics analysis (Cothran, 2010). Results from this analysis stated:

"The Painted Rock herd shows genetics closely related to the Caspian [pony] within the Oriental horse cluster. . . . Genetic variation . . . is very low and well below the critical level (the testing indicator used is not related to sample size). . . . [This is] likely due to a low population size over a few generations. . . . Overall results suggest that this herd has been isolated and may have been founded from a small number of animals. . . . Inbreeding within the herd is likely and will probably continue and increase [which] could cause physical defects and low fertility."

Recommendations for the Painted Rock Herd Area:

The overall goal of the BLM's Wild Horse and Burro Program is to preserve the health of the land and water resources by managing wild horse and burro populations so as to restore and maintain a thriving natural ecological balance (TNEB). Appropriate management levels (AML) for the herds, the habitat requirements of the animals, the relationships with other uses of the public and adjacent private lands, are analyzed to determine the health of both the animals and the rangeland resources (43 CFR 4710.3-1). Wild horses and burros are to be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat, while maintaining their free-roaming behavior (43 CFR 4700.0-6). However, wild horses and burros must be managed within the limits the animals' herd areas (43 CFR 4710.4). Excess animals are gathered and removed, and are offered to the public through the Bureau of Land Management's Adopt a Horse or Burro Program (BLM Handbook, H-4700-1, 2010).

In determining whether or not to change the status of the Painted Rock Herd Area to a Herd Management Area, and thus manage populations of wild horses and/or burros, a herd area manageability analysis was necessary (and required per the Lower Gila South RMP Amendment settlement agreement). This analysis considers habitat requirements and availability, herd movement (including immigration and emigration), health of the herd and rangeland resources, and genetic diversity.

The BLM Wild Horses and Burros Handbook (2010) defines the four components required to manage wild horse and burro populations in a Herd Management Area: forage, water, cover, and space.

1) Forage: Forage (vegetation) is one of the essential components of wild horse and burro habitat. The authorized officer should determine whether vegetation provides sustainable forage (and cover) for the animals. Vegetation should be managed within each HMA in a manner that achieves and maintains a thriving natural ecological balance (TNEB) and assures significant progress is made toward achieving the Standards for Land Health and other site-specific or landscape-level objectives (16 USC § 1333(a)).

2) Water: An adequate year-round quantity and quality of water must be present in the HMA to sustain wild horse and burro numbers within AML. If this habitat requirement is inadequate, the authorized officer should amend or revise the land use plan to remove the area's designation as an HMA.

3) Cover (Vegetation) and Space: The terrain and vegetation that are needed to provide wild horses and burros with escape (hiding) cover and shelter from the prevailing weather. (Vegetation also provides sustainable forage). Wild horses and burros require sufficient space to allow the herd to move freely between water and forage within seasonal habitats. Cover and space are interrelated. If the HMA has barriers preventing free movement of the herds throughout the HMA or between forage and water, it would not have sufficient cover and space. Barriers can be natural (e.g., rock rims, rivers) or human-induced (e.g., fences, highways). To achieve a TNEB on the public lands, wild horses and burros should be managed in a manner that assures significant progress is made toward achieving the Land Health Standards for upland vegetation and riparian plant communities, watershed function, and habitat quality for animal populations, as well as other site-specific or landscape-level objectives, including those necessary to protect and manage Threatened, Endangered, and Sensitive Species (TES). Wild horse and burro herd health is promoted by achieving and maintaining TNEB.

On the basis of the above information, management opportunities for wild horses and burros within the Painted Rock Herd Area are extremely limited without extensive intervention and mitigation on the part of the BLM. Therefore, it is recommended that the Painted Rock Herd Area remain a herd area only, and not be converted to a herd management area. Wild horses and burros should be removed as funding is available, with a target population of zero animals. Wild horses and burros removed from the Herd Area would be available through the BLM Adopt a Wild Horse or Burro Program.

Rationale and authority for this recommendation:

1. Essential habitat components are not available for healthy herds of wild horses and/or burros: There is very limited forage and no year-round water source within the boundaries of the Painted Rock Herd Area. The only year-round waters available for the wild burros and horse are on private farm lands in the northern third of the HA. The southern two-thirds of the HA is Sonoran Desert scrub with very little palatable forage. This causes the wild horses and burros to leave the boundaries of the HA and become a nuisance by utilizing private waters and agricultural fields and pastures.

a. Habitat for wild horses and burros is composed of four essential components: forage, water, cover, and space. These components must be present within an HMA in sufficient amounts to

sustain healthy wild horse and burro populations and healthy rangelands over the long term. If they are not present in sufficient amounts, the authorized officer should consider amending or revising the land use plan to remove the area's designation as an HMA. If the decision is made to return a designated HMA to HA status, the total population of wild horses and burros should then be gathered and removed (BLM Handbook, H-4700-1, 2010). (Also see BLM Manual Section 4710.3.

b. Furthermore, "Management of wild horses and burros shall be undertaken with the objective of limiting the animals' distribution to herd areas" (43 CFR 4710.4). A recurring pattern of wild horse and/or burro movement out of the HMA to access forage, water, or thermal or hiding cover is an indication that year-long wild horses and burros use cannot be sustained. If one or more of the key habitat components is missing, the HMA should be considered as unsuitable for year-long use. In these situations, the authorized officer should consider removing the area's designation as an HMA through land use planning (BLM Handbook, H-4700-1, 2010).

2. Wild horse and burro movement is restricted:

Fences, roads, highways, and natural barriers isolate the Painted Rock HA from other (distant) herd areas, and restrict wild, free-roaming behavior of these animals. Immigration and emigration is very limited.

a. Title 43 CFR 4700.0-6 (c) states, "Management activities affecting wild horses and burros shall be undertaken with the goal of maintaining free-roaming behavior." Additionally, management of wild horses and burros on the public lands is limited to herd areas (HAs), consistent with the WFRHBA (16 USC § 1339) which states: "Nothing in this Act shall be construed to authorize the Secretary to relocate wild free-roaming horses or burros to areas of the public lands where they do not presently exist."

b) Where appropriate, a land use plan may include decisions not to manage wild horses and/or burros in all or a part of an HA. An example is intermingled and unfenced private lands within HAs where the landowners are unwilling to make them available for wild horse and burro use. Another example would be where essential habitat components (forage, water, cover and space) are unavailable or insufficient to sustain healthy wild horses and burros and healthy rangelands over the long term (BLM Handbook, H-4700-1, 2010).

3) This population of wild horses is unhealthy and unsustainable:

This Herd Area is isolated from other wild horse and burro herds, causing low genetic variability. Genetics testing of the Painted Rock horses in 2000 and 2010 indicated that genetic variation "is very low and well below the critical level, . . . likely due to a low population size over a few generations. . . . Inbreeding within the herd is likely and will probably continue and increase [which] could cause physical defects and low fertility (Cothran 2010)." Genetics were not conducted on wild burros (only one was captured in 2007), but it is also likely that genetic similarity exists in the burros in the area.

a. A minimum population size of 50 effective breeding animals (i.e., a total population size of about 150-200 animals) is currently recommended to maintain an acceptable level of genetic diversity within reproducing wild horse and burro populations (Cothran, 2009). This number is required to keep the rate of loss of genetic variation at 1 percent per generation. Animal interchange between adjacent HMAs with smaller population sizes may reduce the need for

maintaining populations of this size within each individual HMA. Research has not yet established a recommended minimum breeding herd size for burros (BLM Handbook, H-4700-1, 2010).

b. Wild horses and burros shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat (43 CFR 4700.0-6 (a)). It is unlikely that the addition of 2 or more outside mares or jennies, as suggested by the analysis (Cothran 2010), would enhance the blood lines enough to make these healthy, sustainable populations of wild horses or burros. Management of wild horse and burro herds under these conditions is inconsistent with the spirit of the WFRHBA and with 43 CFR 4700.0-6.

In accordance with the Wild Horses and Burros Management Handbook (2010), "If wild horse herd size in small, isolated HMAs is so low that mitigation is not feasible, consideration should be given to managing the HMA for non-reproducing wild horses or to removing the area's designation as an HMA through land use planning." Due to the other rationale herein (lack of essential habitat components, movement outside the HA boundaries, and barriers limiting free-roaming behavior), managing the Painted Rock Herd Area as an HMA with non-reproducing wild horses is not feasible.

Therefore, the herd area's designation should remain a Herd Area, with a target population of zero wild horses and burros. When the authorized officer determines that excess wild horses and burros exist, gathers to capture and remove the animals immediately or as soon as possible are required. For additional information, refer to BLM Manual Section 4720 (Removal) and 43 CFR 4720.1, 4740.1 and 2.

REFERENCES

Cothran, Gus, 2009. Letter dated July 16, 2009. Effective population size to keep the rate of loss of genetic variation at 1 percent per generation.

Cothran, Gus, 2010. Genetic Analysis of the Painted Rock HMA, AZ. Department of Veterinary Integrative Bioscience, Texas A&M University, College Station, Texas.

Singer, F.J., L. Zeigenfuss, L. Coates-Markle, and Rev. F. Schwieger. 2000. A demographic analysis, group dynamics, and genetic effective number in the Pryor Mountain wild horse population. Pages 73–89 in F.J. Singer and K.A. Schoenecker (compilers), Managers' summary—ecological studies of the Pryor Mountain Wild Horse Range, 1992–1997. U.S. Geological Survey, Midcontinent Ecological Science Center, Fort Collins, Colo.

Wild Horses and Burros Management Handbook: BLM Handbook H-4700-1. 2010. BLM Handbook-66-Rel-4-116. Wild Horse and Burro Program, Office of the Assistant Director, Renewble Resources and Planning, Washington, DC.

Appendix N. Analysis for Renewable Energy Sensitivity

Utility-scale renewable energy facilities are those in which the proponent has signed a purchase power agreement with a utility company to sell power. These facilities typically produce more than 100MW of power. The analysis conducted for Alternatives B through E is based on GIS data depicting a number of data sets that imply varying degrees of sensitivity of the natural and human environment to proposed utility-scale renewable energy development as described below. Those data layers were used to characterize BLM-managed public lands in one of four sensitivity categories, as identified below:

- Prohibited: Utility-scale renewable energy projects would be excluded from these areas and applications would be rejected.
- High sensitivity: Utility-scale renewable energy applications could be in non-conformance with land-use plans, no mitigation options exist for potential resource damage, and proposals would be avoided.
- Moderate sensitivity: Utility-scale renewable energy development would be entertained, but it is likely a planning objective or a resource would be adversely affected. Proposals would be avoided.
- Low known sensitivity: The known plan or resource conflicts are low, so application processing will likely proceed with little to no expected conflicts. However, upon site-specific inspections, resource conflicts may still be found that represent significant conflicts.

Applications filed within the Decision Areas would require site-specific NEPA analysis. The polygons depicted on Maps 2-7b, 2-7c, 2-7d, and 2-7e do not imply a preauthorization, but simply depict areas with the least known conflicts on public lands. Other conflicts may be revealed as site-specific analyses are conducted. Action alternatives (B, C, D, and E) management actions state that utility-scale renewable energy project applications will be rejected if the project area lies within a “prohibited” area and avoided if they lie in a “high or moderate” sensitivity area.

The GIS data analyzed to derive the four categories are described below:

- Prohibited: where public lands are legally excluded from consideration by presidential decree, congressional designation, secretarial designation, BLM policy, other forms of withdrawal, or public lands where proposals would be incompatible with RMP decisions. These areas include:
    - Sonoran Desert National Monument (all alternatives),
    - Designated wilderness areas (all alternatives),
    - Juan Batista de Anza National Historic Trail (all alternatives),
    - Fred J. Weiler (PL 1015 lands) (all alternatives),
    - Sentinel Plain (military land relinquished back to the BLM with restrictions related to public safety) (all action alternatives),

- VRM Class I (all action alternatives),
- ACECs (all action alternatives),
- Lands Managed to Maintain Wilderness Characteristics (all action alternatives),
- Cultural sites allocated to a use category (such as public and conservation use sites) (all action alternatives) and,
- Developed or other intensive use recreation areas (all action alternatives for Painted Rock Campground, Gunsight Wash camping area and trailheads; San Tan Mountains RMZ in alternative B only).

- High Sensitivity: includes public lands where proposals would be incompatible with RMP decisions or where mitigation would prove particularly difficult, costly, impractical, or impossible. These areas include:
  - Desert Tortoise Category I and II habitats (all action alternatives),
  - Desert Tortoise Category III habitats (only in alternative D),
  - VRM Class II (all action alternatives),
  - Wildlife movement corridors (only in alternative D),
  - Wildlife habitat areas (WHAs) (only in alternative D),
  - Back country recreation settings (all action alternatives),
  - Byways (1 mile wide, ½ mile from either side of the byway's centerline) (all action alternatives),
  - BLM threatened and endangered species habitats (excluding candidate species) (all action alternatives), and
  - The Fred J. Weiler Green Belt (non-PL 1015 lands) (all action alternatives).
- Moderate Sensitivity: includes public lands where resource conditions or RMP decisions would not necessarily preclude the project, but mitigation would likely be required. Some of these areas include those areas that may have considerable public opposition to a proposal (e.g., areas inventoried as having wilderness characteristics but not managed for such characteristics). These areas include:
  - SRMAs (all action alternatives),
  - Desert tortoise Category III habitats, (alternatives B, C and E),
  - VRM Class III (all action alternatives),
  - Wildlife movement corridors (alternatives B, C and E),
  - Wildlife habitat areas (WHAs) (alternatives C and E),
  - Arizona State threatened, endangered, and sensitive species' habitats (all action alternatives),

  - BLM threatened and endangered candidate species habitats (all action alternatives),
  - Areas with high locatable mineral potential (all alternatives), and
  - SCRMAs (excluding public use sites mentioned above) (all action alternatives).

- Low Known Sensitivity: includes public lands that remain after the above categories have been removed (i.e., public lands with the lowest known conflict). Projects would still require site-specific NEPA analysis.

No judgment has been made as to the suitability of these lands for any kind of renewable energy production. In its raw form, it has not been rearranged to the National Renewable Energy Laboratory solar production zones, wind production zones, geothermal production areas, Western Governors Association "Western Renewable Energy Zones," or any other dataset that would bias the outcome.

Appendix O. Arizona Land Tenure Strategy

O.1. Background Summary

From 1995 to 2007, Arizona's population increased by nearly two million residents, making it the second fastest growing State in the nation. The influx of new residents into Arizona has required housing and services, so the demands upon land for development have become significant. Likewise, growth and expansion strains a land manager's capability for protecting and enhancing resource values for public benefit.

Privately owned land necessary to accommodate new growth constitutes only 17 percent of the land ownership in Arizona. Significant major land holdings in Arizona include Indian Reservations, Federal military installations, and State of Arizona trust lands. These ownerships are normally off limits for public uses. Other types of public ownerships include National and State Parks, National Forest lands, wildlife refuges, and county and city lands.

The Bureau of Land Management (BLM) in Arizona manages about 12.2 million acres, approximately 16 percent of the lands in the State for a variety of private and public demands. The table below illustrates the total acreage of land and interests in land managed by the BLM Arizona by District as of October 2008.

BLM Arizona Administered Lands	Arizona Strip District	Colorado River District	Gila District	Phoenix District
	3 million acres	4.9 million acres	2 million acres	2.3 million acres

The distribution of, and amount of acreage managed by the BLM, coupled with the explosive growth provide a challenge to BLM management of public lands for multiple-use management. Acquisition of lands that complement existing values, and disposal of lands that are no longer needed for Federal purposes, supports our multiple-use mission. BLM land tenure goals must be accomplished using a balanced array of disposal and acquisition management tools such as sales/auctions, donations, purchases, exchanges, and creative staffing options.

O.2. Strategic Goals and Objectives

The primary goal of the Land Tenure Adjustment Strategy is to enhance the administration of public land ownership patterns through land tenure adjustments that acquire lands with high resource values and dispose of lands that are difficult and uneconomical to manage. To accomplish this objective, BLM Arizona will take action to provide the most effective configuration of lands and interests in land, consistent with land use plans developed through a full and open public involvement process, and to further the purposes of the Federal Land Policy and Management Act (FLPMA). The land tenure program will support local community needs, further the public interest, secure exceptional natural values, and to the extent allowed by law, generate revenue from the enhanced management of the public land resources that remain in public ownership.

To meet Bureau land tenure adjustment objectives, the Arizona Land Tenure Adjustment Strategy will:

- Seek to **acquire** land and interests in land to complement and enhance resource values.
- Seek to **dispose** of land and interests in land that are difficult to manage, result in burdensome management costs, or are no longer needed for Federal purposes.

The strategic goals identified above will be accomplished using available land disposal and acquisition management methods or "tools." The following brief descriptions cover the various types of actions that fall within each of the acquisition and disposal segments of the land tenure program.

O.3. Acquisition Tools for Land Tenure

Objectives for acquisition management will be achieved by actively pursuing opportunities with willing sellers using the following sources:

Land and Water Conservation Fund (LWCF) Program Funding - Congressionally appropriated funds are provided for the acquisition and conservation of significant resources within designated project areas. The highest priority is placed on acquiring "inholdings," consolidating Federal lands, and reducing management costs.

- LWCF project proposals are requested by the Washington Office each February, and submitted from each state in April. Approved project proposals are funded 2 years after.
- Successful project management includes highlighting past, present, and future leveraging accomplishments and opportunities. There is direct funding to active, ongoing projects where there is demonstrated staff and management commitment to accomplish the work.
- Appropriations for LWCF accounts have been decreasing in the past 3 years. Future funding is expected to be limited.

Federal Land Transaction Facilitation Act (FLTFA) Program Funding - Sometimes referred to as the Baca Bill **,** FLTFA is a Congressional bill enacted on July 25, 2000. It amended FLPMA to allow a percentage of receipts from qualifying public land sales, and equalization payments from qualifying exchanges, to be returned to the Department for acquisition purposes in that same state.

- Unless renewed, the Act will expire 10 years from the date of enactment on July 25, 2010.
- Acquisition of lands using FLTFA receipts is limited to "inholdings" and lands "adjacent to federally designated areas (as of July 25, 2000), that contain "exceptional resources . "
- Lands identified for disposal/sale must have been identified as such by a land use plan prior to July 25, 2000.
- Provides for the distribution of funds for land acquisition amongst four Federal land managing agencies, in proportionate amounts - BLM (60 percent), Forest Service (20 percent), National Park Service (10 percent), and Fish and Wildlife Service (10 percent).

Compensation Programs for Threatened and Endangered Species - The Arizona Sonoran Desert Tortoise policy allows for compensation in the form of money or land to be paid by a proponent seeking use or disposal of public lands containing important habitat. Mitigation funding has also been received for the Flat-tailed Horned Lizard.

- The rate of compensation to be paid is based on the quality of the habitat that will be lost by the proposed action. When compensation in the form of money is received, it is deposited in special project 7122 accounts. These funds are to be used to acquire high-quality habitat as mitigation for the affected species.

Other Options for Land Acquisition

Donations - The land is accepted if the need for public ownership is identified in a land use plan, and if there are no hazardous materials issues. Acquiring land through donation may provide the landowner with an income tax deduction based on the appraised value of the donation.

- Property donation may also arrive into BLM administration by way of supplemented partnership dollars and other agency funding mechanisms.

Easements - The BLM acquires two basic types of easements, conservation easements for the protection of resources, and access easements to enhance the ability of the public to use and enjoy the public lands. The Government acquires only an interest in the land, not title to the land. By foregoing the full fee estate purchase, a conservation easement will use less acquisition funds.

- The purchase of a conservation easement normally involves restricting or eliminating development rights, and leaving for the property owner rural non-intensive uses, ie. livestock grazing.
- BLM has been designated a "public roads agency . " The designation allows the opportunity to receive funding from the Department of Transportation in support of a public road system. These funds can be used to acquire access easements.
- Conservation easement lands must be monitored for adherence to the conditions of the deed.

Exchanges - Land exchanges have been utilized extensively by the BLM in Arizona during the past 25 years. Land exchanges are generally undertaken at the request of an external customer, although the BLM can initiate exchanges. A "determination of public interest" must be performed prior to completing an exchange.

- Consolidates ownership of scattered tracts of land. Provides for more efficient and less costly management of resources.
- Exchanges are pursued with willing landowners. Lands proposed for exchange must be of equal value and located within the same state.
- The regulations stipulate that an exchange proponent should cover at least half of the processing costs of an exchange if the BLM decides to pursue the action; however, a higher percentage of contributed costs may be negotiated.

The Washington Office National Land Exchange Team reviews all exchange proposals. The review is done at the beginning and ending stages of each exchange. At any point within the review process, the exchange can be terminated by either party (based on the terms of the exchange agreement).

O.4. Disposal Tools for Land Tenure

Strategic goals and objectives for the management of land disposal actions will be achieved by utilizing tools and direction from the following methods.

FLPMA Sales - Sales are discretionary actions undertaken by the BLM either in response to a request from an external customer, or in furtherance of land use plan decisions to dispose of lands

no longer needed by the Federal Government. In no case may the lands be sold for less than fair market value. Receipts from these types of sales are deposited into the General Treasury.

- Sales can be for the surface and/or subsurface estates.
- BLM policy requires the use of competitive sale procedures, unless the authorized officer determines the public interest would best be served by modified competitive bidding or direct (non-competitive) sale.

FLTFA Sales - Arizona FLTFA sales may be competitive, modified competitive, or direct, and are processed the same as FLPMA sales, but the FLTFA sale lands are only those that were identified for disposal in land use plans existing as of July 25, 2000.

Sales receipts are deposited into FLTFA accounts, and can be used by four Federal land managing agencies in Arizona for acquisition purposes and the associated processing costs (see page 3).

Land Exchanges - Priority properties are acquired, and lands with management deficiencies are moved out of Federal ownership. Federal lands to be traded include only those that have been identified as available for disposal in approved land use management plans.

O.5. Implementation Goals and Measures

The following measures will be implemented to ensure BLM Arizona meets the long-term goals of the Land Tenure Strategy. All are vital to the successful implementation of the program. The tasks listed can be undertaken concurrently.

1. **Prioritization of lands to meet acquisition and disposal objectives utilizing the most efficient and cost effective acquisition tool available.** Priority acquisition targets are parcels identified in approved Resource Management Plans (RMPs), for the purposes of protection, conservation, or land consolidation. Properties must have willing sellers holding clear titles, and be proven to be environmentally compliant.

   The Field Offices will thoroughly evaluate all internal and external proposals and consider the appropriate implementation and funding mechanism. Identification of the proper land tenure tool/methodology is critical for proposal analysis. The priority and focus of acquisition efforts will be as follows.

   - Congressionally mandated and directed land tenure actions.
   - Properties that qualify for time-sensitive funding mechanisms such as FLTFA and LWCF project funds. The acquisition targets consist of in holdings and edge holdings of the National Landscape Conservation System (NLCS). These federally designated lands include:
     - National Conservation Areas
     - National Monuments
     - Wilderness Areas
     - Wilderness Study Areas
     - Wild and Scenic Areas
     - National Historic and Scenic Trails
     - Wild and Scenic Rivers

- Areas of Critical Environmental Concern, and LWCF project areas (outside of the NLCS), that may also qualify for LWCF and FLTFA funding.
- Properties where timely response to donations, partnership dollars and other agency funding mechanisms are necessary.
- Habitat preservation acquisitions using monies that are readily available in mitigation compensation accounts. These discretionary funds are not normally time sensitive. The funds can be held, and then applied to the acquisition of sensitive species habitat in locations identified in RMPs.
- The consolidation of split estate ownerships. There are inherent issues that occur with less than fee estate ownership. The acquisition of partial ownerships will be elevated in priority for compelling environmental reasons only, such as in cases where the acquisition of development/water rights (conservation easements) enhances management efficiency within a NLCS unit or other specific areas identified in RMPs.
- The use of land exchanges for acquisition or disposal is a method to be considered when appropriate. Land exchanges are complicated, time consuming and expensive. Therefore, the manager must give careful thought if this option is contemplated. The funding spent between the BLM and the proponent must be carefully considered.

Land disposal objectives will target Federal parcels that have been identified in approved RMPs.

2. **Establishment of the Arizona Land Tenure Adjustment Steering Committee.** The State Leadership Team will re-charter the Arizona Land Exchange Steering Committee to form one group called the Arizona Land Tenure Adjustment Steering Committee. The Steering Committee will be comprised of the Associate State Director, the Deputy State Director of Resources, and the four District Managers.

   - The Arizona Land Tenure Steering Committee will review and approve a centralized list/map of priority properties identified for disposal and acquisition. The committee will recommend establishment or changes to policy on the prioritization of all acquisition, exchange, and disposal actions on a statewide basis.
   - The Steering Committee will evaluate staffing needs for the skill positions/personnel statewide necessary to be made available to complete tasks specific to land tenure actions on a statewide basis.
   - The Arizona Land Tenure Steering Committee will meet yearly prior to Washington Office LWCF submission deadlines (February), and will allocate time as needed to meet at State Leadership Team meetings to evaluate proposals that have been sent forward from the District Offices. Time sensitive proposals with urgency may require a more immediate Steering Committee conference. The Steering Committee will render approval/disapproval recommendations, or return the proposal to the originator for modifications. The Chairperson of the Steering Committee will submit completed proposals and Steering Committee recommendations to the State Director. The State Director will approve/disapprove the land tenure proposals.

3. **Develop and maintain a skilled workforce sufficient to manage the land tenure program within Arizona.**

- Where administrative monies are available from FLTFA generated land sales, the BLM will hire term/contract personnel to assist permanent staff with workloads.

- The Arizona State Director may authorize the establishment of an interdisciplinary team to process specific land tenure actions on a statewide basis. This team would be drawn from existing land tenure and resource expertise in BLM Arizona. Implementation will be contingent upon funding sources necessary to fill core positions critical to the successful management of the land tenure program. The core team will rely on at least four staffing components:
  - Arizona State Office Land Tenure Program Lead
  - Arizona State Office Operational Realty Specialist
  - Arizona State Office Adjudication Specialist
  - National Environmental Protection Act (NEPA) Coordinator

4. **Use of partnerships and other cooperative efforts that support BLM land tenure actions.** BLM Arizona will continue to cultivate and develop partnership opportunities with Federal and State agencies, as well as with non-profit conservation minded organizations. Federal budget and staffing constraints require assistance from outside sources. A partnership often can move quickly to purchase lands and hold them until the BLM can later obtain the lands through purchase, exchange, or donation.

   - BLM Arizona maintains joint efforts and ongoing relationships with non-profit conservation groups that assist in furthering the statewide land tenure strategy. Organizations such as The Nature Conservancy, The Trust for Public Lands, The Wilderness Land Trust, and The Conservation Fund are willing partners in priority land acquisition projects.

   - BLM Arizona undertakes joint efforts with several Federal and State governmental entities. By pooling funding and staffing resources, otherwise unreachable land tenure targets may be secured.

5. **Support Field/District Office direction to prioritize and process land tenure actions within their capabilities.** Field Offices will take the initiative to identify and target land tenure opportunities. Land tenure proposals that originate at the Field Office level can be screened and evaluated immediately.

   - The District Offices will annually consolidate and update a priority list of properties which meet priority acquisition and sale criteria, especially in regards to the LWCF and FLTFA programs.

6. **Within the confines of law, explore land tenure adjustment opportunities with the State of Arizona** .

   - At this time, the State of Arizona does not have land exchange authority. In the event that the Arizona State Constitution is amended to authorize land exchanges, a pool of prospective trade lands would be evaluated.

7. **Support military land ownership adjustments in Arizona.** The Governor of Arizona established a Military Facilities Task Force by Executive Order on May 27, 2003. The purpose of the task force is to develop strategies for ensuring long-term retention of all premier military facilities in Arizona in their vital National defense missions.

8. **Maximize the effectiveness of the land tenure program by optimizing budget allowances.** Use the Budget Planning System (BPS) effectively to secure additional funding for BLM priority land tenure actions, realizing that the priority of statewide land tenure projects is directly proportionate to funding levels.

   - Develop BPS projects within benefiting sub-activities to provide operational funding levels sufficient to implement land tenure actions.
   - Ensure that externally generated actions are partially to fully funded by the applicants.
   - Capitalize on the opportunities afforded by the funding provided in the administrative accounts of the FLTFA and LWCF programs.

O.6. LAND TENURE EVALUATION PROCESS

The land tenure project approval process will originate at the Field Office level. Acquisition, exchange, and sale proposals are initiated from BLM resource specialists realizing an opportunity for program enhancement, or from public/individual inquiry.

Field Office Land Tenure Project Analysis

BLM Initiated Proposals: Identification of the proper land tenure tool/methodology is critical for proposal analysis. The Field Office will strategize on the appropriate implementation and funding mechanism for viable proposals.

- Each year, Field Offices will prepare LWCF packages (if any) for approval by the Steering Committee for submission to the Washington Office.
- The Field Office can prepare and submit packages into the evaluation and approval process that qualify for FLTFA monies when a target acquisition opportunity arises. FLTFA nomination packages that are reviewed by the Arizona Land Tenure Steering Committee, and approved by the State Director, will be forwarded to the Arizona FLTFA Interagency Team. The Arizona FLTFA Interagency Team will then make the determination as to which Arizona acquisition proposals will be forwarded to the FLTFA Executive Committee for approval and processing.
- New land exchanges, and those that are in progress, will be reviewed for current status and evaluation processing.
- Based on lands identified for disposal in RMPs, examine land sale/auction options, especially those that may allow for the revenues to remain within the State for accomplishing acquisition goals.

Public Initiated Proposals: The Field Office will respond to written or verbal notification of an interest in a land tenure adjustment action from public and private venues.

- Land tenure proposals will be evaluated as per the measures established in the Land Tenure Strategy. Proposals with obvious fatal flaws will be terminated immediately. Preliminary screening meetings and decision making will involve broad scale consideration of the feasibility of the proposal. Proposals with merit will be examined further for potential submission to the Steering Committee.

The Field Office will screen feasible internal and external proposals by developing the "Land Tenure Project Evaluation and Nomination Table" with appropriate supporting narrative explanations for each of the criteria. The Field Office will also prepare a preliminary "Proposed Staffing" worksheet. Both of these tables are located in Appendix A - Land Tenure Project Evaluaion and Nomination Table (p.). The completed evaluation worksheets cited above will constitute the proposal to be forwarded.

Those land tenure proposals that meet preliminary evaluation criteria will be approved by the Field Office Manager, and forwarded on to the District Office.

District Office Land Tenure Approval Process

The District Office realty staff will evaluate and prioritize land tenure proposal packages that have been completed by the Field Offices.

- The District Office will review all Field Office submissions to verify completeness of the package and adherence to policy.
- The District Office will analyze the expected effect of proposals upon budget and staffing by evaluating the criteria from the "Proposed Staffing" worksheet.
- The District Manager either approves the package or sends it back to the Field Office with a disapproval decision or a request for further information.

Approved land tenure proposals with merit that meet workforce and budgetary constraints will be forwarded on to the Arizona Land Tenure Steering Committee for consideration.

Arizona Land Tenure Steering Committee Evaluation

- The Arizona Land Tenure Steering Committee will allocate time as needed, to meet at each State Leadership Team meeting, or at other times to evaluate proposals that have been approved and sent forward from the District Offices. The Steering Committee will render approval/disapproval recommendations, or return the proposal to the originator for modifications. The Steering Committee will also evaluate and decide upon the extenuating circumstances of land tenure actions that may fall outside of the realm of the Implementation Goals.
- The Chairperson of the Steering Committee will submit completed proposals and Steering Committee recommendations to the State Director.
- The State Director will render an approve/disapprove decision to the land tenure proposal.

O.7. Appendix A

LAND TENURE PROJECT EVALUATION AND NOMINATION TABLE

INTRODUCTORY REMARKS

Project/Proponent Name	Proposal Date	Land Tenure Tool	Location	Property Size

Evaluation of Alternative Land Tenure Tools	Acceptability (Yes/No/NA)	Narrative Commentary
Donation		
FLTFA funding		
LWCF funding		
Other funding source		
Land exchange		
Conservation easement		
Partner contribution		
Direct/competitive sale		

Evaluation Criteria	Acceptability (Yes/No/NA)	Narrative Commentary
Land use plan conformance		
Within NLCS system		
Willing seller/buyer		
Proponent has reasonable expectations of value		
Proponent cost sharing		
Proponent flexibility with land tenure process/methodology		
Involvement of third party conservation group		
Project has other agency partners		
Full estate being offered (surface and subsurface)		
Has clear title		
Resolve split estate		
Resolve checkerboard land pattern		
Consolidation of land ownership patterns		
Existing funding source		
Concern for threat to property or to adjacent public lands		
Within recognized land tenure adjustment area		
Community and/or political support		
Recognized community value		
Meets an immediate demand for resource management		
High resource values		
Low maintenance/monitoring costs		
Environmentally clean property		
Negative impacts from not completing action		
In lieu benefits to County		
The proposal has met or exceeded the standards in ____ of the criteria established for acquisition/disposal approval. Standards for approval are not met for ___ of the criteria.		

A majority of "yes" answers in the Land Tenure Criteria column of the table indicates a favorable proposal. Depending upon the specific proposal, certain criteria may not have application (NA).

Table O.1. PROPOSED STAFFING

Proposed Staffing	Source (BLM Office)	Estimated Time Commitment	Responsibilities
Project Manager			
Water Rights Specialists			
NEPA Spec.			
Realty Specialist			
Appraiser			
Wildlife Specialist			
Hazardous Materials Specialist			
Cultural Specialist			
Legal Instruments Examiner			
Mineral Specialist			
GIS Specialist			
Public Affairs Specialist			
Administrative Support			
Field/District Manager			
Other Specialists			
Proponent Workload Support			

ARIZONA LAND TENURE STEERING COMMITTEE CHARTER

MEMBERSHIP

The Arizona Land Tenure Steering Committee will be chaired by the Associate State Director, and is comprised of the Deputy State Director of Resources, and the four District Managers.

Staff support for the Steering Committee will be provided by land tenure specialists in the Arizona State Office. The Steering Committee will support the implementation direction as developed in the Bureau of Land Management (BLM) Arizona Land Tenure Strategy.

ROLES AND RESPONSIBILITIES

- The Arizona Land Tenure Steering Committee will review all land tenure proposals. The Steering Committee will render approval/disapproval recommendations, or return the proposal to the originator for modifications. The Chairperson of the Steering Committee will submit completed proposals and Steering Committee recommendations to the State Director. The State Director will approve/disapprove the land tenure proposals.

- The Steering Committee will hold an initial meeting for Field/District Offices to present their specific land tenure priorities for the purpose of establishing statewide land tenure priorities. Subsequent yearly land tenure meetings will be staged in February for evaluating new priorities, and for reexamining prior proposals for their current validity and funding capabilities.

- The committee will review and approve a centralized database that includes a list and maps of priority properties identified for disposal and acquisition. The committee will establish/change policy on the prioritization of all acquisition, exchange, and disposal actions on a statewide basis.

- The Steering Committee will evaluate staffing and funding needs for the skill positions/personnel that are necessary for completing tasks specific to land tenure actions on a statewide basis.

PROCEDURES FOR PROPOSAL REVIEWS BY THE STEERING COMMITTEE

The Steering Committee will allocate time as needed to meet at each State Leadership Team meeting to evaluate proposals that have been sent forward from the District Offices. Time sensitive proposals with urgency may require a more immediate Steering Committee conference. All land tenure proposals presented to the Steering Committee will be evaluated in a manner in accordance with the direction provided in the BLM Arizona Land Tenure Strategy.

The State Director may concur with the Committee recommendation to approve, disapprove, or modify presented proposals, or may request additional pertinent information.

When a final decision is reached, the State Director will sign a feasibility/proposal statement formalizing the decision. The signed statement will be returned to the Chairperson for record keeping, reproduction, and distribution to Committee members.

The approved proposals/nominations are either assigned to a statewide land tenure interdisciplinary team for action, or will be sent to the Field Office for processing.

Procedural Guidance for Land Acquisition and Land Disposal Actions in the State of Arizona

Land acquisition targets will be linked with approved Resource Management Plans (RMP) for the purposes of protection, conservation, or land consolidation. The Bureau of Land Management Arizona Land Tenure Strategy prioritizes and focuses acquisition targets as follows.

- Congressionally mandated and directed land tenure actions.
- Properties that qualify for time sensitive funding mechanisms such as Federal Land Transaction Facilitation Act (FLTFA) and Land and Water Conservation Fund (LWCF) project funds. These funding sources will target the inholdings and edgeholdings of the National Landscape Conservation System (NLCS) primarily.
- Areas of Critical Environmental Concern, and LWCF project areas (outside of the NLCS), that may also qualify for LWCF and FLTFA funding.
- Properties where timely response to donations, partnership dollars and other agency funding mechanisms are necessary.
- Habitat preservation acquisitions using monies that are easily available in mitigation compensation accounts.
- The consolidation of split estate ownerships. The acquisition of partial ownerships, such as conservation easements, will be undertaken only for compelling environmental reasons.
- Land exchanges will be considered when appropriate.

Land disposal objectives will target Federal parcels that have been identified in approved RMPs. For budgeting purposes, BLM Arizona will determine a 3-year schedule of land tenure work for establishing acquisition/disposal priorities. Each District will annually consolidate a priority list of properties which meet priority acquisition and sale criteria, especially in regards to the LWCF and FLTFA programs. Districts will assess sale and acquisition opportunities that are consistent with approved RMPs. An initial meeting will provide an opportunity for offices to present their specific land tenure goals to the Arizona Land Tenure Steering Committee for the purpose of establishing statewide land tenure priorities. Subsequent yearly land tenure meetings will be staged for updating and reassessing priorities for validity and funding capabilities.

The BLM Arizona Land Tenure Strategy specifically identifies Arizona land tenure implementation goals, and land tenure proposal procedural steps. Included within the plan is an evaluation criteria worksheet for the Field/District Offices to complete and use as the format for proposals. Land tenure adjustment proposals will be submitted to the Arizona Land Tenure Adjustment Steering Committee.

Appendix P. Grazing Allotment Information

Table P.1. Grazing Allotment Information

Allotment Name		Allotment Number	Allotment Classification	Permitted AUMs	Allotment Category
Lower Sonoran (Perennial and Perennial/Ephemeral)					
1	Arkansas Gulch	06097	Perennial	36	Custodial
2	Beloat[1]	03007	Perennial/Ephemeral	2,212	Maintain
3	Big Horn[1]	03009	Perennial	148	Maintain
4	Buckeye Mountain	06050	Perennial	48	Custodial
5	Buzzards Roost	06080	Perennial/Ephemeral	48	Custodial
6	Childs	03016	Perennial/Ephemeral	3,802	Maintain
7	Clem[2]	03017	Perennial	196	Custodial
8	Conley[1]	03018	Perennial	464	Custodial
9	Coyote Flat #2[3]	00106	Perennial/Ephemeral	361	Custodial
10	Florence Junction	06053	Perennial	24	Custodial
11	Gable-Ming	03032	Perennial	4,200	Custodial
12	Gila Bend Indians	03035	Perennial/Ephemeral	903	Custodial
13	Hansen	03039	Perennial/Ephemeral	917	Custodial
14	Hazen[1]	03042	Perennial/Ephemeral	295	Maintain
15	Kirian	03046	Perennial/Ephemeral	387	Custodial
16	Lost Gulch	06014	Perennial	324	Custodial
17	Lower Vekol[1]	03053	Perennial/Ephemeral	338	Custodial
18	Rescue Canyon	06082	Perennial/Ephemeral	300	Custodial
19	Saddle Mountain	03072	Perennial/Ephemeral	553	Custodial
20	Sentinel	03076	Perennial/Ephemeral	353	Maintain
21	Smelter Canyon	06226	Perennial	12	Custodial
22	Table Top	03083	Perennial/Ephemeral	144	Custodial
23	Ward	03086	Perennial/Ephemeral	1,476	Custodial
Sub Total				17,541	
Lower Sonoran (Ephemeral Only)					
1	A Lazy T	03002	Ephemeral		Custodial
2	Amavisca	03003	Ephemeral	0	Custodial
3	Arnold*	03004	Ephemeral	0	Custodial
4	Artex	03005	Ephemeral	0	Custodial

Allotment Name		Allotment Number	Allotment Classification	Permitted AUMs	Allotment Category
5	Dendora Valley	03024	Ephemeral	0	Custodial
6	Gable-Peterson	03033	Ephemeral	0	Custodial
7	Gila River Comm.	03036	Ephemeral	0	Custodial
8	Gillespie	03037	Ephemeral	0	Custodial
9	Hazen-Shepard	03043	Ephemeral	0	Custodial
10	Jagow-Kreager	03044	Ephemeral	0	Custodial
11	Layton	03049	Ephemeral	0	Custodial
12	Mariani	03054	Ephemeral	0	Custodial
13	North Star	06248	Ephemeral	0	Custodial
14	Painted Rock	03062	Ephemeral	0	Custodial
15	Palo Verde Mtns	06174	Ephemeral	0	Custodial
16	Powers Butte	03068	Ephemeral	0	Custodial
17	Queen Valley	06173	Ephemeral	0	Custodial
18	Santa Rosa	05055	Ephemeral	0	Custodial
19	Sevey	03039	Ephemeral	0	Custodial
20	Stout	03082	Ephemeral	0	Custodial
21	Walker Butte	06041	Ephemeral	0	Custodial
n/a	Wilson [4]	03092	n/a	0	n/a
Sub Total				0	
Total				17,541	
SDNM (Perennial and Perennial/Ephemeral)					
1	Beloat	03007	Perennial/Ephemeral	776	Maintain
2	Big Horn	03009	Perennial	2,812	Maintain
3	Conley	03018	Perennial	3,403	Custodial
4	Hazen	03042	Perennial/Ephemeral	886	Maintain
5	Lower Vekol	03053	Perennial/Ephemeral	826	Custodial
Sub Total				8,703	
SDNM (Ephemeral Only)					
1	Arnold	03004	Ephemeral	0	n/a
Sub Total				0	
Total				8,703	
SDNM (Allotments South of I-8 Unavailable Due to Proclamation)					

Allotment Name		Allotment Number	Allotment Classification	Permitted AUMs	Allotment Category
n/a	Big Horn	03009	Perennial	(3,144)	n/a
n/a	South Vekol	03080	Perennial/Ephemeral	(1,862)	n/a
n/a	Table Top	03083	Perennial/Ephemeral	(2,046)	n/a
n/a	Vekol	03085	Perennial/Ephemeral	(832)	n/a
n/a	Santa Rosa	05055	Ephemeral	0	n/a
Sub Total				7,884	Unavailable

[1] Allotments cross decision area boundaries between Lower Sonoran and SDNM

[2] Allotment crosses 2 district offices (Phoenix and Colorado River) and 3 field offices (Lower Sonoran, Hassayampa and Yuma)

[3] Formerly the Coyote Flat and Why allotments

[4] Ephemeral allotment no longer permitted; acreage unallocated but available

Appendix Q. Recreation Settings and Descriptions

Setting prescriptions are a way of describing the desired conditions for recreation resources in an SRMA's RMZs. The LSFO has indentified a spectrum of four generalized settings for this planning area, and uses the terms "community interface," "passage," "front country," and "back bountry" to describe them. Each setting is defined by nine components. The four setting definitions do not change from alternative to alternative, but the combination of settings and the amount of each is prescribed individually for each RMZ to achieve the desired outcomes of each alternative. To simplify the discussion below, only the four generalized settings are used to describe the setting prescription.

The following discussion explains the prescribed settings displayed on the allocation decision maps that follow. The four prescribed settings (community interface, front country, passage, and back country) represent different combinations of the nine components of recreation resource settings. Actions that take place within these settings can only be allowed if they remain within the criteria for each of the nine components.

Q.1. Community Interface

The Community Interface setting represents public lands bordering or surrounded by communities and their associated urban infrastructure. This setting will also include lands projected to be influenced by the increasing urbanization of the planning area over the next 15 to 20 years. The setting is generally natural in appearance, but the landscape is subject to change from intensive recreation activities and other land use authorizations.

Physical Conditions

Remoteness - Not remote, directly adjacent to urban and rural housing and communities.

Naturalness - This setting can be natural in appearance, but the landscape is subject to high evidence of human change.

Facilities - Degree of developed user facilities will be moderate to high. Rustic facilities at camping areas may expand outer limits of camping areas as needed to meet demand.

Social Conditions

Contacts - There is a moderate to high level of interaction among users. Visitors may encounter more than 150 people per day.

Group size - Up to 75 people, and associated equipment in existing, and/or designated, vehicle parking, staging, and camping areas that are large enough to accommodate the group size without increasing the footprint of the disturbance area, may be permitted and encountered. Large group events are generally appropriate to occur here. On case-by-case basis, larger groups may be authorized under SRP or at specific large group sites designated for that purpose.

Evidence of use - Impacts to soil and vegetation persist from year to year.

Administrative Conditions

Mechanized use - Motorized and mechanized use on designated routes. Motorized routes and non-motorized trails may be established based on recreation objectives.

Management controls - High management presence. Moderate to high on-site controls.

Visitor services - Visitor information provision levels are high.

Q.2. Front Country

The Front Country setting is where most locations for intensive resource-dependent recreation uses and facilities are found. The lands are generally natural in appearance and may see minor to moderate alterations over the life of the LUP due to land use authorizations and BLM management actions.

Physical Conditions

Remoteness - Not remote, within a one to two hour drive to urban and rural communities.

Naturalness - Mostly natural environment with low to high evidence of human changes.

Facilities - The extent of developed user facilities will be low to high. Rustic facilities at camping areas may expand outer limits of camping areas as needed to meet demand.

Social Conditions

Contacts - There is a moderate to high level of interaction among users. Visitors may encounter between 50 to 150 individuals singly or in groups per day.

Group size - Up to 75 people, and associated equipment in existing, and/or designated, vehicle parking, staging, and camping areas that are large enough to accommodate the group size without increasing the footprint of the disturbance area, may be permitted and encountered. On case-by-case basis, larger groups may be authorized under SRP or at specific large group sites designated for that purpose.

Evidence of use - Some impacts to soil and vegetation persist from year to year.

Administrative Conditions

Mechanized use - Motorized and mechanized use on designated routes. Motorized routes and non-motorized trails will be established based on recreation objectives and resource protection needs.

Management controls - Low to moderate management presence. Low to high on-site controls.

Visitor services - Visitor information levels are low to moderate.

Q.3. Passage

The Passage setting is found along a motorized travel and transportation corridor entering or traversing RMZs. The Passage setting coincides with and is centered on motorized travel routes designated for public use. The Passage setting is 200-feet wide (100 feet each side of the route centerline). Except for the route itself, the lands are generally natural in appearance and may see minor to moderate alterations over the life of the LUP due to land use authorizations and BLM management actions.

Physical Conditions

Remoteness - Remote setting, within a several hour drive from communities to access areas.

Naturalness - This setting is mostly natural with low to moderate evidence of human induced change.

Facilities - The degree of developed user facilities will be low to moderate. Facilities at camping areas will be rudimentary. Rustic or primitive sites may be developed for resource protection or public safety purposes.

Social Conditions

Contacts - There is a moderate level of interaction among visitors. Visitors may encounter between 25 to 75 individuals or groups per day and occasionally higher numbers particularly in the transitions to Front Country or Community Interface settings.

Group size - Up to 75 people, and associated equipment in existing, and/or designated, vehicle parking, staging, and camping areas that are large enough to accommodate the group size without increasing the footprint of the disturbance area, may be permitted and encountered. On case-by-case basis, larger groups may be authorized under SRP or at specific large group sites designated for that purpose.

Evidence of use - Some impacts to soil and vegetation persist from year to year. Resource changes are evident but harmonious with the natural environment.

Administrative Conditions

Mechanized use - Motorized and mechanized allowed on designated routes only. Non-motorized trailheads to trails transitioning into Back Country settings may be established. Existing motorized routes and non-motorized trails could be maintained; additional trails may established where they meet the desired recreational or resource protection objectives. Existing routes could be re-aligned to improve resource management or public safety. Routes in the Passage setting that are closed or reclaimed for any reason over the life of the plan will automatically reclassify as Back Country settings and with Back Country management prescriptions.

Management controls - Low to moderate management presence. Subtle on-site controls.

Visitor services - Visitor information levels are low to moderate.

Q.4. Back Country

Back Country

Back Country areas are large and natural landscapes. Noticeable human-induced modifications are uncommon. Designated motorized and mechanized travel routes entering or crossing Back Country Zones are allocated to the Passage RMZ. The landscapes are mainly natural in appearance.

Physical Conditions

Remoteness - Area is remote and primitive.

Naturalness - Predominantly natural environment of moderate to large size. Human modifications occasionally evident, but not intrusive.

Facilities - The degree of developed user facilities will be low to none. Typically no camping facilities.

Social Conditions

Contacts - There is a low level of interaction among visitors. Visitors encounter an average of 2-30 individuals singly or in groups per day on designated trails transitioning to Community Interface, Front Country, or Passage settings and 10 or fewer individuals singly or in groups per day in more remote off-trail settings.

Group size - Up to 25 people in areas managed to maintain wilderness characteristics, and up to 50 visitors in other Back Country settings, in areas large enough to accommodate the group without increasing the footprint of the disturbance area and for cross-country use in areas that are resilient enough to support that use. Larger groups may be encountered in this setting if authorized under SRP on case-by-case basis or at specific large group sites designated for that purpose.

Evidence of use - Most impacts to soil and vegetation recover yearly or are small areas, typically in areas of light and dispersed use such as desirable camping areas and trails.

Administrative Conditions

Mechanized use - Motorized use is not allowed. Mechanized use is allowed on designated trails. Existing non-motorized trails are maintained; additional trails are established where they meet the desired recreational setting. New motorized or mechanized routes could be designated in this setting, outside of closed OHV designation areas, to resolve public safety or resource protection needs, or to meet specific recreation objectives. These routes would be authorized through travel, transportation, public access, and OHV route planning and processes. If this happens, affected lands would reclassify as Passage settings with Passage management prescriptions.

Management controls - Low management presence. Minimum on-site controls.

Visitor services - Visitor information levels are low.

Q.5. Description Matrix

Table Q.1. Description of Recreation Management Settings for Lower Sonoran and SDNM

Setting Description	Community Interface	Front Country	Passage	Back Country
Setting Description	Community Interface represents public lands bordering or surrounded by communities and their associated urban infrastructure. This zone will also include lands projected to be influenced by the increasing urbanization of the planning area over the next 15 to 20 years.	Front Country offers the main setting and locations for intensive resource-dependent recreation uses and facilities. Motorized and mechanized vehicles must remain on existing or designated routes.	Passage setting provides a motorized travel corridor traversing the Back Country setting. This corridor is 200 feet wide (100 feet each side), centered on a motorized travel route designated for public use, and is available for management infrastructure in response to resource concerns and visitor demand.	Back Country areas are large and natural landscapes. Noticeable human-induced modifications are uncommon. Designated motorized and mechanized travel routes entering or crossing Back Country settings are allocated to the Passage setting.
	The zone can be natural in appearance, but the landscape is subject to change from intensive recreation activities and other land use authorizations.	The lands are generally natural in appearance and may see minor to moderate alterations over the life of the LUP due to land use authorizations and BLM management actions.	The lands are generally natural in appearance and may see minor to moderate alterations over the life of the LUP due to land use authorizations and BLM management actions.	The landscapes are mainly natural in appearance.
Prescribed Setting Character				
Physical Conditions				
Remoteness	Not remote, directly adjacent to urban and rural housing and communities.	Moderately remote, within a one to two hour drive from urban and rural communities.	Remote setting, within a several hour drive from communities to access areas.	Area is remote and primitive.
Naturalness	This zone can be natural in appearance, but the landscape is subject to high evidence of human change.	Mostly natural environment with low to high evidence of human changes at specific attractions.	This zone is mostly natural with low to moderate evidence of human induced change.	Predominantly natural environment of moderate to large size. Human modifications occasionally evident, but not intrusive.
Facilities	Degree of developed user facilities will be moderate to high.	The extent of developed user facilities will be low to high.	The degree of developed user facilities will be low to moderate.	The degree of developed user facilities will be low to none.
Social Conditions				

Contacts	Generally there is high level of interaction among users. Visitors may encounter more than 150 people per day.	Moderate to high level of interaction (average 25-150 individuals singly or in groups per day).	Generally the level of interaction among visitors is low (up to 25 individuals per day) but occasionally up to 150 individuals singly or in groups per day.	The level of interaction among visitors is low. Visitors encounter up to 25 individuals singly or in groups per day on designated trails or near Community Interface, Front Country, or Passage settings and 10 or fewer individuals singly or in groups per day in more remote off-trail settings.
Group Size	Generally the maximum group size would be up to 200 individuals.	Generally the maximum group size would be up to 75 individuals, but groups of up to 200 may be encountered under permit.	Generally up to 25-50 individuals with the occasional group size reaching 200 individuals.	Generally a maximum group size up to 50 individuals.
Evidence of Use	In local areas (1-5 acres or less) moderate impacts to soil and vegetation persist from year to year.	In local areas (1 acre or less) minor impacts to soil and vegetation persist from year to year.	In local areas (1 acre or less) minor impacts to soil and vegetation persist from year to year.	Impacts to soil and vegetation recover yearly or are negligible in extent (.1 acre).
Social Conditions				
Contacts	Generally there is high level of interaction among users. Visitors may encounter more than 150 people per day.	Moderate to high level of interaction (average 25-150 individuals singly or in groups per day).	Generally the level of interaction among visitors is low (up to 25 individuals per day) but occasionally up to 150 individuals singly or in groups per day.	The level of interaction among visitors is low. Visitors encounter up to 25 individuals singly or in groups per day on designated trails or near Community Interface, Front Country, or Passage settings and 10 or fewer individuals singly or in groups per day in more remote off-trail settings.
Group Size	Generally the maximum group size would be up to 200 individuals.	Generally the maximum group size would be up to 75 individuals, but groups of up to 200 may be encountered under permit.	Generally up to 25-50 individuals with the occasional group size reaching 200 individuals.	Generally a maximum group size up to 50 individuals.

Evidence of Use	In local areas (1-5 acres or less) moderate impacts to soil and vegetation persist from year to year.	In local areas (1 acre or less) minor impacts to soil and vegetation persist from year to year.	In local areas (1 acre or less) minor impacts to soil and vegetation persist from year to year.	Impacts to soil and vegetation recover yearly or are negligible in extent (.1 acre).
Administrative Conditions				
Mechanized Use	Motorized and mechanized use on designated routes.	Motorized and mechanized use on designated routes.	Motorized and mechanized on designated routes.	Motorized use is not allowed. Mechanized use is allowed on designated trails.
Management Controls	High management presence.	Moderate to high management presence.	Low to moderate management presence.	Low management presence.
Visitor Services	Visitor information provision levels are high.	Visitor information levels are moderate to high.	Visitor information levels are low to moderate.	Visitor information levels are low.
Management Actions and Allowable Uses				
Dispersed, Undeveloped Camping and Parking	Vehicle-based day use is primary use.	Vehicle-based day and overnight use occur.	Vehicle-based day and overnight use occur.	No vehicle-based camping.
	Vehicle-based parking and camping must occur within 100 feet of road or along the immediate route shoulder where parking will not damage vegetation, unless otherwise limited.	Vehicle-based parking and camping must occur within 100 feet of road or along the immediate route shoulder where parking will not damage vegetation, unless otherwise limited.	Vehicle-based parking and camping must occur within 100 feet of road or along the immediate route shoulder where parking will not damage vegetation, unless otherwise limited.	N/A
	Non-vehicle-based camping may occur anywhere across the landscape unless otherwise limited.	Non-vehicle-based camping may occur anywhere across the landscape unless otherwise limited.	Non-vehicle-based camping may occur anywhere across the landscape unless otherwise limited.	Non-vehicle-based camping may occur anywhere across the landscape unless otherwise limited.
	Certain areas may be closed to camping or parking or restricted to designated sites for resource protection.	Certain areas may be closed to camping or parking or restricted to designated sites for resource protection.	Certain areas may be closed to camping or parking or restricted to designated sites for resource protection.	Certain areas may be closed to camping or restricted to designated sites for resource protection.

Designated Camping Areas	Established in areas with high volumes of use, high levels of impacts, and at recreation destinations.	Established in areas with high volumes of use, high levels of impacts, and at recreation destinations.	Established in areas with high volumes of use, high levels of impacts, and at recreation destinations.	Designated camping areas or single-party campsites established when needed to maintain recreation setting or for resource protection.
	Moderate to high on-site controls, rustic facilities at camping areas may expand outer limits of camping areas as needed to meet demand.	Low to high on-site controls, rustic facilities at camping areas may expand outer limits of camping areas as needed to meet demand.	Subtle on-site controls, rudimentary facilities at camping areas.	Minimum on-site controls, typically no facilities.
Developed Campgrounds	Established in areas with demand for facilities or services, high volumes of use, high levels of impacts, and at recreation destinations.	Established in areas with demand for facilities or services, high volumes of use, high levels of impacts, and at recreation destinations.	Rustic or primitive sites may be developed for resource protection or public safety purposes. The number of campsites installed will be limited to the minimum needed to achieve resource protection and public safety goals.	No developed campgrounds.
Day and Overnight Group Use (non-commercial and non-competitive)	Unless otherwise limited, up to 75 people, and associated equipment in existing, and/or designated, vehicle parking, staging, and camping areas that are large enough to accommodate the group size without increasing the footprint of the disturbance area.	Unless otherwise limited, up to 75 people, and associated equipment in existing, and/or designated, vehicle parking, staging, and camping areas that are large enough to accommodate the group size without increasing the footprint of the disturbance area.	Unless otherwise limited, up to 75 people, and associated equipment in existing, and/or designated, vehicle parking, staging, and camping areas that are large enough to accommodate the group size without increasing the footprint of the disturbance area.	Unless otherwise limited, up to 50 people and associated animals in areas large enough to accommodate the group without increasing the footprint of the disturbance area and for cross-country use in areas that are resilient enough to support that use. Up to 25 people and associated animals in areas managed to maintain wilderness characteristics.
	Large group events are generally appropriate and larger groups will be authorized under SRP or at specific large group sites designated	Larger groups authorized under SRP or at specific large group sites designated for that purpose on case-by-case basis.	Larger groups authorized under SRP or at specific large group sites designated for that purpose on case-by-case basis.	Larger groups authorized under SRP or at specific large group sites designated for that purpose on case-by-case basis.

	for that purpose on case-by-case basis.			
	Group size limits and use areas may be adjusted based on monitoring to maintain desired setting, protect resources, and manage changing uses.	Group size limits and use areas may be adjusted based on monitoring to maintain desired setting, protect resources, and manage changing uses.	Group size limits and use areas may be adjusted based on monitoring to maintain desired setting, protect resources, and manage changing uses.	Group size limits and use areas may be adjusted based on monitoring to maintain desired setting, protect resources, and manage changing uses.
Commercial, Competitive, and Vendor Use (in addition to SRP requirements)	Commercial, competitive, and vendor use are generally encouraged to use this zone and permits will be authorized on a case-by-case basis	Commercial, competitive, and vendor use will be authorized on a case-by-case basis.	Commercial, competitive, and vendor use will be authorized on a case-by-case basis.	Commercial and competitive non-motorized permits issued on case-by-case basis. Motorized uses are not allowed and no vendor permits are issued. In addition, in wilderness areas, only commercial services such as guiding for hunting and outfitting are allowed.
	Permit users must use designated portals to public lands.	Permit users must use designated portals to public lands.	Permit users must use designated portals to public lands.	Permit users must use designated portals to public lands.
	Commercial non-motorized (repetitive) permits required to remain on existing trails (no cross-country travel).	Commercial non-motorized (repetitive) permits required to remain on existing trails (no cross-country travel).	Commercial non-motorized (repetitive) permits required to remain on existing trails (no cross-country travel).	Commercial non-motorized (repetitive) permits must remain on existing trails (no cross-country travel).
Firewood collection (dead, down, and detached only)	Firewood collection is prohibited. Campfires are allowed if wood is brought from off-site, unless otherwise prohibited. Monitor disturbances and temporarily or permanently suspend campfires to prevent resource damage.	Collection of a reasonable amount of dead, down, and detached wood for on-site campfire use is allowed, unless otherwise prohibited. Monitor vegetation use and disturbance and temporarily or permanently suspend such use to prevent resource damage.	Collection of a reasonable amount of dead, down, and detached wood for on-site campfire use is allowed, unless otherwise prohibited. Monitor vegetation use and disturbance and temporarily or permanently suspend such use to prevent resource damage.	• Collection of a reasonable amount of dead, down, and detached wood for on-site campfire use is allowed, unless otherwise prohibited. Monitor vegetation use and disturbance and temporarily or permanently suspend such use to prevent resource damage. • Collection of firewood and use of campfires is prohibited in the

				Sierra Estrella Wilderness Area.
Recreational Target Shooting	Permitted except where otherwise prohibited. See also Standard Operating Procedures.	Permitted except where otherwise prohibited. See also Standard Operating Procedures.	Permitted except where otherwise prohibited. See also Standard Operating Procedures.	Permitted except where otherwise prohibited. See also Standard Operating Procedures.
Motorized Routes and Non-motorized Trails	Motorized routes and non-motorized trails will be established based on recreation demand.	Motorized routes and non-motorized trails will be established based on recreation demand and resource protection needs.	• Non-motorized trailheads to trails in the Back Country RMZ are established. Existing motorized routes and non-motorized trails could be maintained; additional trails are established where they meet the desired recreational setting or meet resource protection needs. • Existing routes could be re-aligned to improve resource management or public safety. • Routes closed or reclaimed in the Passage • RMZ for any reason over the life of the plan will automatically revert to the Back Country RMZ and its associated management prescriptions.	• Existing non-motorized trails are maintained; additional trails are established where they meet the desired recreational setting. • New motorized or mechanized routes could be designated in this zone, outside of closed OHV designation areas, to resolve public safety or resource protection needs, or to meet specific recreation objectives. These routes would be authorized through travel, transportation, public access, and OHV route planning and processes. Affected lands would re-allocate to Passage RMZ and its associated management prescriptions.

Appendix R. Benefits Based Recreation Worksheets

Recreation Management Zone (RMZ) worksheets are used to develop and document the objective(s), targeted opportunities and outcomes, prescribed setting character, and activity planning framework for zones of management within designated Special Recreation Management Areas. The worksheets are concise outlines of management direction intended for a particular area, as well as of the steps that will be taken to achieve those objective(s). From these worksheets, land-use- and activity-plan-level management actions are developed. Following are the RMZ worksheets for the nine alternative SRMAs of the planning areas.

RMZ Worksheets – Lower Sonoran Planning Area

Ajo Special Recreation Management Area (Alt B, C & E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Community	**Ajo residents and seasonal visitors**	
Ajo Desert Recreation Management Zone		
RMZ Market Niche: Visitors seeking to enjoy self-directed, unstructured recreational opportunities to discover Sonoran Desert resources and natural landscapes. **RMZ Management Objective:** Through the life of the plan, at least 85% of sampled visitors indicated they were satisfied with a recreational use activity in which they were able to participate.		
Targeted Opportunities & Outcomes		
Primary Activities:OHV driving, Hiking, Equestrian, Hunting, Backpacking, Sightseeing, Touring, Photography, Hunting, Orienteering, Wildlife Observation, Nature and Cultural Study.	**Experiences:** Savoring the total sensory (sight, sound and smell) experience of a natural landscape; enjoying risk-taking adventure; enjoy going exploring on our own, being in control of things that happen.	**Benefits:**Greater sensitivity to/awareness of outdoor aesthetics, nature's art and its elegance. Community awareness and appreciation of cultural and natural heritage. Increased awareness and protection of natural resources. Increased desirability as a place to live or retire.
Prescribed Setting Character		
Physical: FC, BC, P	**Social:** FC, BC, P	**Administrative:** FC, BC, P
Activity Planning (Implementation) Framework		
Marketing: Emphasize resource values through public outreach, education and signing.	**Monitoring:** Periodic visitor satisfaction surveys will be conducted.	
Management: The designated travel system would predominately consist of roads maintained at levels 1 to 3. Major access roads and pullouts could be maintained at level 5. A maximum camping stay would be established of seven (7) days per party. Persons may occupy any one site or multiple sites within a 25 mile radius on public lands not closed or otherwise restricted to camping for a total period of not more than seven (7) days within a 28 day period. When the seven (7) day limit has been reached, the party must move 25 miles from site of last occupation, or off of public land. The authorized officer may give written permission for extension of the seven (7) day limit. Competitive motorized speed events would not be authorized.	**Administrative:** Permit users must use designated access sites to public lands. Continue partnership with the International Sonoran Desert Alliance.	

Ajo Special Recreation Management Area (Alt B, C & E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Community	**Ajo residents and seasonal visitors**	
Gateway Recreation Management Zone		
RMZ Market Niche: Visitors seeking to enjoy local attractions and opportunities that enhance the community and promote public lands. **RMZ Management Objective:** Through the life of the plan, at least 85% of sampled visitors indicated they were satisfied with a recreational use activity in which they were able to participate.		
Targeted Opportunities & Outcomes		
Primary Activities: Hiking, Equestrian, Sightseeing, Touring Photography, Hunting Orienteering, Wildlife Observation, Nature and Cultural Study	**Experiences:** Enjoy having easy access to natural landscapes; feeling good about how natural resources and facilities are being managed. Savoring the total sensory -- sight, sound, and smell -- experience of a natural landscape.	**Benefits:** Improved understanding of this community's dependence and impact on public lands. Community awareness and appreciation of cultural and natural heritage. Improved soil, water, and air quality, reduced litter, reduced vegetative trampling. Increased desirability as a place to live or retire.
Prescribed Setting Character		
Physical: CI	**Social:** CI	**Administrative:** CI
Activity Planning (Implementation) Framework		
Marketing: Emphasize resource values through public outreach, education and signing. **Management:** The designated travel system would predominately consist of primitive roads maintained at levels 1 to 3, with up to 5% (6 to 9 miles) of the route network maintained at level 5 to provide access for dispersed camping and motorized sightseeing and hiking opportunities. Visitor and management infrastructure would generally be moderate in scope and scale, but may include developed facilities which would include a system of primitive roads and trails that meets the desired recreation setting. A 40-acre "open" area to accommodate motorized opportunities such as unrestricted motocross bike riding would be established with the provision that local partners would be sought to monitor and provide on-site management and educate users in environmental stewardship. The Ajo Scenic Loop would be established to interpret and educate local and seasonal visitors on adjacent public lands with the provision that local partners would be sought to monitor and provide on-site management and educate users in environmental stewardship. Competitive motorized speed events would be authorized in the 40 acre open area. The 40-acre open use motocross site would be closed to mineral material sales and recommended for withdrawal from mineral location. The 40-acre open use motocross site would be open to all non-renewable leasable minerals actions, but any lease would contain a No Surface Occupancy stipulation with no exceptions, waivers, or modifications. This includes geothermal resources and sodium.	**Monitoring:** Periodic visitor satisfaction surveys will be conducted. **Administrative:**Permit users must use designated access sites to public lands. Continue partnership with the International Sonoran Desert Alliance. Group size limits and use areas may be adjusted based on monitoring to maintain desired setting, protect resources, and manage changing uses.	

Ajo Special Recreation Management Area (Alt B, C & E)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
Community	**Seasonal visitors**
Gunsight Wash Recreation Management Zone	
RMZ Market Niche: Seasonal visitors seeking a remote winter camping experience and portal to adjacent public lands. **RMZ Management Objective:** Through the life of the plan, 90% of sampled visitors report satisfaction with a self-directed recreational experience.	

Ajo Special Recreation Management Area (Alt B, C & E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Community	**Seasonal visitors**	
Targeted Opportunities & Outcomes		
Primary Activities: RV camping, Hiking, Picnicking, Equestrian, Photography, Nature and Cultural Study, Wildlife Observation.	**Experiences:** Enjoying having easy access to natural landscapes; Enjoy going exploring on my own; Enjoying participating in group outdoor events.	**Benefits:**Greater freedom from urban living. Enlarged sense of community dependency on public lands. Increased awareness and protection of natural landscapes. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: FC	**Social:** FC	**Administrative:** FC
Activity Planning (Implementation) Framework		
Marketing: Emphasize resource values through public outreach, education and signing.	**Monitoring:** Visitor satisfaction surveys will be conducted to determine responsible use.	
Management: The Gunsight Wash area (T14S, R5W, sections 2-4 and 9-11; approximately 2,500 acres) would be developed as a managed campground offering standard and expanded amenities and fees established as needed per the FLREA. The designated motor vehicle travel system would predominantly consist of roads suitable for two-wheel-drive recreational vehicle access and maintained at levels 3 to 5. The designated motor vehicle travel system, level and type of infrastructure provided, and length of camping stay limit would be determined in coordination with considerations for other resources uses, particularly wildlife concerns related to the Sonoran Pronghorn.	**Administrative:** Manage the area with local communities, state and county agencies. Provide vehicle route connections to the Maricopa Trail System and nearby county parks.	

Arlington Special Recreation Management Area (Alt B & E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Destination	**Residents from Maricopa and Pinal Counties**	
Arlington Recreation Management Zone		
RMZ Market Niche: Visitors seeking a dispersed or family-oriented motorized recreation experience in a remote Sonoran Desert landscape. **RMZ Management Objective:** Through the life of the plan at least 80% of visitors will indicate that they are very satisfied sustainable, motorized outdoor activities in a natural setting.		
Targeted Opportunities & Outcomes		
Primary Activities: Motorized driving, Hiking, Camping, Photography, Sightseeing and Hunting.	**Experiences:** Enjoying having easy access to natural landscapes; Enjoy going exploring on my own; Enjoying participating in group outdoor events.	**Benefits:** Greater freedom from urban living. Enlarged sense of community dependency on public lands. Increased awareness and protection of natural landscapes. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: FC	**Social:** FC	**Administrative:** FC
Activity Planning (Implementation) Framework		

Arlington Special Recreation Management Area (Alt B & E)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
Destination	**Residents from Maricopa and Pinal Counties**
Marketing: Emphasize resource values through public outreach, education and signing.	**Monitoring:** Visitor satisfaction surveys will be conducted to determine responsible use.
Management: The designated motor vehicle travel system would consist of primitive roads maintained at level 1 with up to 10% of the network (19 miles) maintained at level 3 and up to 30% (60 miles) maintained at level 5 to allow for two-wheel-drive access. Up to 25 miles of new roads may be constructed as needed to connect loop routes to provide opportunities for a family riding experience. Existing roads could be re-aligned to improve resource management or public safety. Up to 2 staging areas would be developed with standard amenity facilities and limited to a maximum of 10 acres each.	**Administrative:** Manage the area with local communities, state and county agencies. Provide vehicle route connections to the Maricopa Trail System and nearby county parks.

Buckeye Hills Trails Special Recreation Management Area (Alt B)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Community	**Active Residents from Western Maricopa County**	
East Recreation Management Zone		
RMZ Market Niche: Local visitors who want motorized recreation opportunities adjacent to the communities of Buckeye, Avondale, and Goodyear. **RMZ Management Objective:** Through the life of the plan, 85% of sampled visitors will respond to a visitor survey that they were satisfied with a recreational use activity in which they were able to participate.		
Targeted Opportunities & Outcomes		
Primary Activities: OHV driving, hiking, equestrian, picnicking, camping, photography, target shooting, sightseeing.	**Experiences:** Enjoy the natural open space; how to use and appreciate natural resources; taking moderate risks.	**Benefits:** Enhanced awareness and understanding of nature. Community and social exposure of outdoor lifestyles. Greater community ownership and stewardship of natural resources. Increased local tourism revenue.
Prescribed Setting Character		
Physical: CI	**Social:** CI	**Administrative:** CI
Activity Planning (Implementation) Framework		
Marketing: Emphasize resource values through public outreach, education and signing.	**Monitoring:** Conduct periodic visitor satisfaction surveys.	
Management: The RMZ would be established as a Special Management Area (SMA) and an Individual Special Recreation Permit (ISRP) program may be established to allow for special management and protection of the SMA in partnership with Maricopa County and the Arizona Game and Fish Department. Through a Cooperative Management Agreement, partners would be authorized to share in the collection and management of fees. The designated travel system would predominately consist of roads maintained at levels 1 to 3. Access roads could be maintained at level 5. Up to six staging/parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables and fire rings (up to 30 acres). Up to 2 large staging areas could be developed not to exceed a total of 10 acres each. Primitive roads or trails, especially connector and loop routes, would be developed for a diversity of users.	**Administrative:** Coordinate planning partnerships with communities adjacent to the area to produce a collaborative recreation management plan. Provide trail and route connections to the Maricopa County Trail System and nearby county parks.	

Buckeye Hills Trails Special Recreation Management Area (Alt C & E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Community	**Active Residents from Western Maricopa County**	
East Recreation Management Zone		
RMZ Market Niche: Local visitors seeking a balanced mix of motorized and non-motorized recreation opportunities adjacent to the communities of Buckeye, Avondale, and Goodyear. **RMZ Management Objective:** Through the life of the plan, 85% of sampled visitors will respond to a visitor survey that they were satisfied with a recreational use activity in which they were able to participate.		
Targeted Opportunities & Outcomes		
Primary Activities: OHV driving, hiking, equestrian, picnicking, camping, photography, target shooting, sightseeing.	**Experiences:**Enjoy the natural open space; how to use and appreciate natural resources; taking moderate risks.	**Benefits:** Enhanced awareness and understanding of nature. Community and social exposure of outdoor lifestyles. Greater community ownership and stewardship of natural resources. Increased local tourism revenue.
Prescribed Setting Character		
Physical: CI, FC	**Social:** CI, FC	**Administrative:**CI, FC
Activity Planning (Implementation) Framework		
Marketing: Emphasize resource values through public outreach, education and signing.	**Monitoring:** Conduct periodic visitor satisfaction surveys.	
Management: The RMZ would be established as a Special Management Area (SMA) and an Individual Special Recreation Permit (ISRP) program may be established to allow for special management and protection of the SMA in partnership with Maricopa County and the Arizona Game and Fish Department. Through a Cooperative Management Agreement, partners would be authorized to share in the collection and management of fees. The designated travel system would predominately consist of roads maintained at levels 1 to 3. Access roads could be maintained at level 5. Up to six staging/parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables and fire rings (up to 30 acres). One large staging area could be developed not to exceed 10 acres. Primitive roads or trails, especially connector and loop routes, would be developed for a diversity of users.	**Administrative:**Coordinate planning partnerships with communities adjacent to the area to produce a collaborative recreation management plan. Provide trail and route connections to the Maricopa County Trail System and nearby county parks.	

Buckeye Hills Trails Special Recreation Management Area (Alt D)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Community	**Active Residents from Western Maricopa County**	
East Recreation Management Zone		
RMZ Market Niche: Local visitors who want non-motorized recreation opportunities adjacent to the communities of Buckeye, Avondale, and Goodyear. **RMZ Management Objective:** Through the life of the plan, 85% of sampled visitors will respond to a visitor survey that they were satisfied with a recreational use activity in which they were able to participate.		
Targeted Opportunities & Outcomes		
Primary Activities: OHV driving, hiking, equestrian, picnicking, camping, photography, target shooting, sightseeing.	**Experiences:** Enjoy the natural open space; how to use and appreciate natural resources; taking moderate risks.	**Benefits:** Enhanced awareness and understanding of nature. Community and social exposure of outdoor lifestyles. Greater community ownership and stewardship of natural resources. Increased local tourism revenue.
Prescribed Setting Character		
Physical: FC	**Social:** FC	**Administrative:** FC

Activity Planning (Implementation) Framework	
Marketing: Emphasize resource values through public outreach, education and signing.	**Monitoring:** Conduct periodic visitor satisfaction surveys.
Management: The RMZ would **not** be established as a Special Management Area (SMA) and an Individual Special Recreation Permit (ISRP) program **would not** be established to allow for special management and protection of the SMA in partnership with Maricopa County and the Arizona Game and Fish Department. The designated travel system would predominately consist of roads maintained at levels 1 to 3; however, up to 50 percent of existing, inventoried primitive roads (approximately 63 miles) would be converted to non-motorized trails. New trails could be developed to provide connector and loop opportunities for non-motorized users. Up to four staging/parking areas may be developed with standard amenity facilities such as gravel surface, picnic tables, and fire rings (up to 20 acres).	**Administrative:** Coordinate planning partnerships with communities adjacent to the area to produce a collaborative recreation management plan.

Buckeye Hills Trails Special Recreation Management Area (Alt B, C & E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Community	**Active residents from Maricopa County**	
Buckeye Hills West Recreation Management Zone		
RMZ Market Niche: Visitors to the Buckeye Hills Regional Park seeking motorized and non-motorized recreation opportunities on adjacent public lands. **RMZ Management Objective:** Through the life of the plan, at least 80% of visitors will indicate that they are very satisfied with the sustainable motorized outdoor activities in a natural setting.		
Targeted Opportunities & Outcomes		
Primary Activities: Motorized trail use (OHV driving, hunting, photography, wildlife viewing, and sightseeing).	**Experiences:** Enjoying having easy access to natural landscapes. Enjoy going exploring on my/our own. Gaining a greater sense of self-confidence.	**Benefits:**Greater freedom from urban living. Enlarged sense of community dependency on public lands. Maintenance of distinctive recreation setting character. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: FC, BC	**Social:** FC, BC	**Administrative:** FC, BC
Activity Planning (Implementation) Framework		
Marketing: Emphasize resource values through public outreach, education and signing.	**Monitoring:** Conduct periodic visitor satisfaction surveys.	
Management: The RMZ would be established as a Special Management Area (SMA) and an Individual Special Recreation Permit (ISRP) program may be established to allow for special management and protection of the SMA in partnership with Maricopa County and the Arizona Game and Fish Department. Through such a Cooperative Management Agreement, partners may be authorized to share in the collection and management of fees. Fees may be established as needed to meet activity or business plan objectives in accordance with the FLREA. The designated travel system would predominately consist of roads maintained at levels 1 to 3. Primitive roads or trails, especially connector and loop routes, would be developed for a diversity of users.	**Administrative:** Enter into a Cooperative Management Agreement with Maricopa County, Arizona Game and Fish Department to jointly manage the RMZ. Provide non-motorized trail and vehicle route connections to the Maricopa County Trail System and nearby county parks.	

Buckeye Hills Trails Special Recreation Management Area (Alt D)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Community	**Trail enthusiasts from Maricopa County**	
Buckeye Hills West Recreation Management Zone		
RMZ Market Niche: Local visitors seeking dispersed, non-motorized back country recreation experiences. **RMZ Management Objective:** Through the life of the plan, at least 80% of visitors will indicate that they are very satisfied with the sustainable motorized outdoor activities in a natural setting.		
Targeted Opportunities & Outcomes		
Primary Activities: Non-Motorized trail use (Hiking, Mountain Biking, Equestrian, Hunting, Equestrian, Photography, and Wildlife Viewing.	***Experiences:*** Enjoying having easy access to natural landscapes. Enjoy going exploring on my/our own. Gaining a greater sense of self-confidence. Learning more about things here.	***Benefits:*** Greater freedom from urban living. Improved skills for outdoor enjoyment. Enlarged sense of community dependency on public lands. Maintenance of distinctive recreation setting character. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical*:* BC	***Social:*** BC	***Administrative*:** BC
Activity Planning (Implementation) Framework		
Marketing: Emphasize resource values through public outreach, education and signing.	***Monitoring:*** Conduct periodic visitor satisfaction surveys.	
Management: An SMA and ISRP program would not be established. The designated travel system would predominately consist of primitive roads maintained at level 1.	***Administrative:*** Provide non-motorized trail connections to the Maricopa County Trail System and nearby county parks.	

Gila Bend Mountains Special Recreation Management Area (Alt B, C & E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Undeveloped	**Trail users from Maricopa and Yuma Counties**	
Gila Bend Mountains Recreation Management Zone		
RMZ Market Niche: Visitors seeking primitive non-motorized and semi-primitive motorized recreation opportunities in a remote and undeveloped landscape. **RMZ Management Objective:** Through the life of the plan, at least 85% of visitors will respond to a visitor survey that they are very satisfied with the easy access and the opportunities for non-motorized trail experiences in this area.		
Targeted Opportunities & Outcomes		
Primary Activities: Non-Motorized activities (Hiking, Backpacking, Equestrian, Mountain biking, Camping, Orienteering, Photography, Wildlife Viewing, and Hunting).	**Experiences:** Enjoying going exploring on my/our own; Enjoying risk-taking adventure; Feeling good about solitude, being isolated, and independent.	**Benefits:** Greater environmental awareness and sensitivity. Increased independence and autonomy. Increased awareness and protection of natural landscapes. Enhanced ability for visitors and residents to find areas providing wanted recreational experiences and benefits.
Prescribed Setting Character		
Physical: FC, BC	**Social:** FC, BC	**Administrative:**FC, BC
Activity Planning (Implementation) Framework		

Gila Bend Mountains Special Recreation Management Area (Alt B, C & E)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
Undeveloped	**Trail users from Maricopa and Yuma Counties**
Marketing: Emphasize resource values through public outreach, education and signing.	**Monitoring:** Periodically conduct visitor satisfaction surveys.
Management: To provide a rugged and primitive motorized experience, 90% of the designated motor vehicle travel system (324 – 465 miles) would consist of primitive roads maintained at level 1, but up to 3% (11-16 miles) could be maintained at level 3-5 to allow for two-wheel-drive access. Standard camping amenities, interpretive displays, and improved access would be constructed at the Sundad public use site to facilitate visitation. Unplanned areas of disturbance greater than 2 acres would be rehabilitated back to natural condition and group limits may be established to prevent further resource degradation.	**Administrative:** Manage recreation use in concert with local communities, state and county agencies.

Lower Gila Historic Trails Special Recreation Management Area (Alt B,C,D,E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Destination	**Regional and national visitors/historical trail enthusiasts**	
Gila River Recreation Management Zone		
RMZ Market Niche: Regional and national visitors seeking to discover, tour, and learn about the Juan Bautista de Anza National Historic Trail, Arizona history, and natural history of the Sonoran Desert. **RMZ Management Objective:** Through the life of the plan, at least 85% of sampled visitors indicate they were satisfied with a recreational use activity in which they were able to participate and have an increased appreciation of the area's natural and cultural history.		
Targeted Opportunities & Outcomes		
Primary Activities: Learning about area history & natural history. Touring by off-highway vehicle on primitive roads. Touring by hiking, bicycling, and / or horseback. Camping.	**Experiences:** Increased appreciation of area's cultural history. Contemplating man's relationship with the land. Being able to tell others about the trip. Feeling good about how natural and cultural resources are being managed.	**Benefits:** Improved ability to relate to local cultures. Enhanced awareness and understanding of nature. Greater household awareness of and appreciation for our cultural heritage. Maintenance of distinctive recreation setting character. Greater protection of area historic and archaeological sites. Increased awareness and protection of natural landscapes. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical:FC	**Social:** FC	**Administrative:** FC
Activity Planning (Implementation) Framework		

Lower Gila Historic Trails Special Recreation Management Area (Alt B,C,D,E)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
Destination	**Regional and national visitors/historical trail enthusiasts**
Marketing: Educational and interpretive materials, including signs, maps, and brochures, would focus on the history and prehistory of the area, and the Sonoran Desert landscape.	**Monitoring:** Visitation numbers and experiences will be tracked by standard counting and surveying techniques.
Management: When designated, the motor vehicle travel system would consist primarily of primitive roads maintained at levels 1 to 3, with up to 10% of the route network (approximately 16 miles) maintained at level 5 to provide two-wheel-drive passenger car access to public use cultural sites, day-use, and camping facilities. Visitor and management infrastructure would respond to demand for facilities and access to the Juan Bautista de Anza National Historic Trail, Butterfield Overland Stage route and other cultural properties designated for public use. Visitor and management infrastructure would generally be modest in scope and scale, but may include fully developed facilities with paved access, water, and sewer. Camping, vehicles, and group sizes would be limited to designated sites and lengths of stay; types and speeds; and numbers as deemed necessary to provide access in balance with conservation of natural and cultural resources.	**Administrative:** All commercial, competitive, and vendor activities would be permitted on a case-by-case basis, consistent with the market niche and outcome objectives of the RMZ.

Painted Rock Special Recreation Management Area (Alt B)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Undeveloped	**Residents from Maricopa and Yuma Counties**	
Painted Rock Mountains Recreation Management Zone		
RMZ Market Niche: Visitors seeking diverse activities with emphasis on family-oriented, landscape-dependent motorized experiences. **RMZ Management Objective:** Through the life of the plan, at least 85% of sampled visitors indicate that they are satisfied with vehicle-related activities in which they were able to participate.		
Targeted Opportunities & Outcomes		
Primary Activities: OHV Driving, Sightseeing/Touring, Hunting, Photography, Wildlife Viewing, and Camping.	**Experiences:** Developing your skills and abilities. Enjoying participating in group outdoor events. Enjoying the closeness of friends and family. Enjoying exploring on my/our own.	**Benefits:** Improved outdoor knowledge and self-confidence. Increased independence and autonomy. Increased awareness and protection of natural landscapes. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: FC	**Social:** FC	**Administrative:** FC
Activity Planning (Implementation) Framework		
Marketing: Emphasize resource values through public outreach, education and signing. **Management:** The designated motor vehicle travel system would consist primarily of primitive roads maintained at levels 1 to 3, but up to 5 percent of the route network could be maintained at level 5 to provide two-wheel-drive passenger car access to public use cultural sites, day-use, and camping facilities. One parking / staging area, not exceeding 5 acres in size, would be constructed.	**Monitoring:** Conduct periodic visitor satisfaction surveys. **Administrative:** Signing, regulations and brochures will be provided as needed.	

Saddle Mountain Special Recreation Management Area (Alt B)		
SRMA PRIMARY MARKET STRATEGY		**SRMA MARKET**
Community		**Residents from Western Maricopa County**
Saddle Mountain Recreation Management Zone		
RMZ Market Niche: Visitors seeking motorized and non-motorized recreation opportunities. **RMZ Management Objective:** Through the life of the plan, at least 85% of visitors will respond to a visitor survey that they are very satisfied with the easy access and the opportunities for non-motorized trail experiences in this area.		
Targeted Opportunities & Outcomes		
Primary Activities: OHV Driving, Mountain Biking, Hiking, Equestrian, Picnicking, Equestrian, Camping, Outdoor Education.	**Experiences:** Enjoy self-directed recreation and adventure activities; Enjoying risk-taking adventure. Feeling good about solitude, being isolated, and independent. Enjoying having easy access to natural landscapes.	**Benefits:**Improved outdoor knowledge and self-confidence. Lifestyle improvement/ maintenance and an enlarged sense of community dependency on public lands. Increased awareness and protection of natural landscapes. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: CI, FC, BC	**Social:** CI, FC, BC	**Administrative:** CI, FC, BC
Activity Planning (Implementation) Framework		
Marketing: The Saddle Mountain area geology, wildlife, and vegetation would be interpreted at various identified sites. **Management:** The designated travel system would predominately consist of primitive roads maintained at levels 1 to 3 with up to 5% maintained at level 5 (approximately 5 miles) to provide access for motorized recreation opportunities. Primitive roads and trails would be developed to provide sustainable opportunities for motorized and non-motorized trail opportunities.	**Monitoring:** Periodically conduct visitor satisfaction surveys. Visitation numbers and experiences will be tracked by standard surveying techniques. **Administrative:**Access to the area from state and private lands will be limited to designated access sites. New access sites may be established after RMP implementation through site planning. Provide non-motorized trail and route connections to the Maricopa County Trail System and nearby county parks. Signing, regulations and brochures will be provided as needed. Restrict or close route/area to ensure PM-10 requirements are met. Continue/expand a partnership with the Friends of Saddle Mountain.	

Saddle Mountain Special Recreation Management Area (Alt C & E)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
Community	**Residents from Western Maricopa County**
Saddle Mountain Recreation Management Zone	
RMZ Market Niche: Visitors seeking non-motorized recreation opportunities. **RMZ Management Objective:** Through the life of the plan, at least 85% of visitors will respond to a visitor survey that they are very satisfied with the easy access and the opportunities for non-motorized trail experiences in this area.	
Targeted Opportunities & Outcomes	

Saddle Mountain Special Recreation Management Area (Alt C & E)		
SRMA PRIMARY MARKET STRATEGY		**SRMA MARKET**
Community		**Residents from Western Maricopa County**
Primary Activities: Non-motorized trail use (mountain biking, hiking, equestrian), Picnicking, Equestrian, Camping, Outdoor Education	**Experiences:** Enjoy self-directed recreation and adventure activities; Enjoying risk-taking adventure. Feeling good about solitude, being isolated, and independent. Enjoying having easy access to natural landscapes.	**Benefits:** Improved outdoor knowledge and self-confidence. Lifestyle improvement/ maintenance and an enlarged sense of community dependency on public lands. Increased awareness and protection of natural landscapes. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: CI, FC, BC	**Social:** CI, FC, BC	**Administrative:** CI, FC, BC
Activity Planning (Implementation) Framework		
Marketing: The Saddle Mountain area geology, wildlife, and vegetation would be interpreted at various identified sites. **Management:** The designated travel system would emphasize primitive access to non-motorized trail opportunities. Roads would predominately be maintained at level 1 with up to 10% maintained at level 3 (approximately 9 miles). Non-motorized trails would be developed, or converted from motorized roads, to meet demand for hiking, equestrian, and mountain biking. Primitive roads would only be developed if needed to redirect motorized use from the Saddle Mountain. Vehicle-based camping would be limited to existing or designated sites. SRPs would not be authorized for motorized or non-motorized competitive events. Motorized technical and specialized uses, such as rock-crawling and rock-hopping, would be prohibited.	**Monitoring:** Periodically conduct visitor satisfaction surveys. Visitation numbers and experiences will be tracked by standard surveying techniques. **Administrative:** Access to the area from state and private lands will be limited to designated access sites. New access sites may be established after RMP implementation through site planning. Provide non-motorized trail and route connections to the Maricopa County Trail System and nearby county parks. Signing, regulations and brochures will be provided as needed. Restrict or close route/area to ensure PM-10 requirements are met. Continue/expand a partnership with the Friends of Saddle Mountain.	

San Tan Mountains Special Recreation Management Area (Alt B)		
SRMA PRIMARY MARKET STRATEGY		**SRMA MARKET**
Community		**Residents from Eastern Maricopa and Western Pinal Counties**
San Tan Mountains Recreation Management Zone		
RMZ Market Niche: Visitors seeking a developed park setting for access to non-motorized recreation opportunities. **RMZ Management Objective:** Through the life of the plan at least 90% of sampled visitors indicated they were satisfied with recreational use activity in which they were able to participate.		
Targeted Opportunities & Outcomes		
Primary Activities: Hiking, Equestrian, Mountain Biking, Picnicking, Camping, Sightseeing.	**Experiences:** Enjoying having easy access to natural landscapes; Enjoying having a wide variety of environments with a single park or recreation area; Feeling good about how natural resources and facilities are being managed.	**Benefits:** Greater freedom from urban living. More informed citizenry about where to go for different kinds of recreation experiences and benefits. Reduced negative human impacts such as litter, vegetative trampling, and unplanned trails. Increased local tourism revenue.
Prescribed Setting Character		
Activity Planning (Implementation) Framework		

San Tan Mountains Special Recreation Management Area (Alt B)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
Community	**Residents from Eastern Maricopa and Western Pinal Counties**
Marketing: Allow Maricopa County Parks and Recreation Department to take the lead in providing for all interpretive and outreach programs in the park. The Lower Sonoran Field Office will participate in joint events if appropriate and/or beneficial to the BLM's mission.	**Monitoring:** If needed, assist Maricopa County Parks and Recreation Department in monitoring the San Tan Mountains Regional Park in regard to the Cooperative Recreation Management Agreement.
Management: The RMZ would be established as a Special Management Area (SMA) and an Individual Special Recreation Permit (ISRP) program would be established to allow for special management and protection of the SMA in partnership with Maricopa and Pinal Counties. Through a Cooperative Management Agreement, partners would be authorized to share in the collection and management of fees. Fees would be established as needed to meet activity or business plan objectives in accordance with the FLREA. The designated travel system would predominately consist of roads maintained at levels 3 to 5 based on visitor expectations.	**Administrative:** The Cooperative Recreation Management Area agreement may be revised or renewed by approval between BLM and Maricopa County Parks and Recreation.

Extensive Recreation Management Areas (ERMA) (Alternatives B, C, D, E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
N/A	**N/A**	
Ajo ERMA		
Management Objective: Through the life of the plan, manage visitation and recreation uses in the Cuerda de Lena ACEC to preserve and enhance the population of the endangered Sonoran Pronghorn.		
San Tan Mountains ERMA		
Management Objective: Through the life of the plan, maintain and update the cooperative management agreement with Maricopa County for the management and administration of the San Tan Mountains Regional Park.		
Sentinel Plain Lava Flow ERMA		
Management Objective: Through the life of the plan, all visitors participate in educational training on the human-caused factors affecting safety in the area (unexploded ordnance) and acquire a free "Barry M. Goldwater Air Force Range entry and public safety permit" prior to entry.		
Lower Sonoran Un-Allocated Public Lands ERMA		
Management Objective: Through the life of the plan, manage recreation opportunities and amenities of Lower Sonoran Field Office public lands that are not allocated as Special Recreation Management Areas (including the Ajo, Arlington, Gila Bend, Painted Rock Mountains, Rainbow Valley, Saddle Mountain, San Tan Mountains, and Sentinel Plain areas in various alternatives) such that threats to visitor safety, conflicts between various uses and users, and impacts to other resources are minimized to the extent possible.		
Targeted Opportunities & Outcomes		
N/A	N/A	N/A
Prescribed Setting Character		
Physical:N/A	**Social:** N/A	**Administrative:**N/A

Extensive Recreation Management Areas (ERMA) (Alternatives B, C, D, E)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
N/A	**N/A**
Activity Planning (Implementation) Framework	
Management: Public lands within the Cuerda de Lena ACEC would be closed to public access for all recreation uses, including SRP's, during March 15-July 15 or as determined by the Sonoran Pronghorn Recovery Team. The San Tan Mountains area would be managed as a park managed for recreation resources by Maricopa County. The Sentinel Plain would be established and managed as a special management area (SMA). Public access to the Sentinel Plain would require an Individual Special Recreation Permit, the "Barry M. Goldwater Air Force Range entry and public safety permit." The designated travel system would predominately consist of primitive roads maintained at levels 1 to 3, but major access roads and pullouts could be maintained as level 5 roads.	**Administrative:**All standard operating procedures for the BLM Recreation program as set forth in regulation, manual, and handbook sections, and by instruction memoranda.

RMZ Worksheets – Sonoran Desert National Monument Planning Area

Sonoran Desert National Monument Special Recreation Management Area (Alt B, C, E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Destination	**Regional / National**	
Juan Bautista de Anza Recreation Management Zone		
RMZ Market Niche: Visitors seeking to discover, tour, and learn about the Juan Bautista de Anza National Historic Trail, Arizona history, and natural history of the Sonoran Desert. **RMZ Management Objective:** Upon entry, all visitors realize they are in an important natural and historic landscape; and upon exit, all visitors have an increased appreciation of the area's natural and cultural history.		
Targeted Opportunities & Outcomes		
Primary Activities: Learning about area history & natural history. Touring by off-highway vehicle on primitive roads. Touring by hiking, bicycling, and / or horseback.	**Experiences:** Increased appreciation of area's cultural history. Contemplating man's relationship with the land. Being able to tell others about the trip. Feeling good about how natural and cultural resources are being managed.	**Benefits:** Increased appreciation of area's cultural history. Enlarged sense of personal accountability for acting responsibly on public lands. Greater household awareness of and appreciation for our cultural heritage. Maintenance of distinctive recreation setting character. Greater protection of area historic and archaeological sites. Increased awareness and protection of natural landscapes. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: FC, BC	**Social:** FC, BC	**Administrative:**: FC, BC

Sonoran Desert National Monument Special Recreation Management Area (Alt B, C, E)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
Destination	**Regional / National**
Activity Planning (Implementation) Framework	
Marketing: Educational and interpretive materials, including signs, maps, and brochures, would focus on the Juan Bautista de Anza expedition and the Sonoran Desert landscape through which it passed. Visitor services provided in partnership with local communities would emphasize area history and natural history. **Management:** Physical, social, and administrative settings would be established to accommodate motorized recreation access and opportunities, with Front Country comprising up to 60% of the management zone. Visitor and management infrastructure would be developed to accommodate visitation in balance with protection of monument objects; would be modest in scope and scale; and would be designed to blend with the dominant features of the landscape. The designated travel system would consist primarily of primitive roads maintained at levels 1 to 3, but up to 12 miles of road (approximately 20% of total route network) maintained at level 5 may be allowed to provide two-wheel drive passenger car access to educational, day-use, and camping facilities. Collection of native vegetation as firewood would be prohibited in the Front Country and Passage RMZ's. Recreational target shooting may be prohibited. Competitive motor sports would not be allowed. All commercial, other competitive, and vendor activities would be permitted on a case-by-case basis if monument objects are protected.	**Monitoring:** Impacts resulting from recreation use would be measured and monitored with a Limits of Acceptable Change methodology and the scope and scale of impacts to monument objects resulting from recreation use would not exceed 2001 levels. **Administrative:** Camping and other activities, vehicles, and group sizes would be limited to designated sites and lengths of stay; types and speeds; and numbers as deemed necessary to provide access in balance with conservation of natural and cultural resources. All commercial, competitive, and vendor activities would be permitted on a case-by-case basis, consistent with the market niche and outcome objectives of the RMZ.

Sonoran Desert National Monument Special Recreation Management Area (Alt B, C, E)		
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**	
Destination	**Regional / National**	
Desert Back Country Recreation Management Zone		
RMZ Market Niche: Visitors seeking an undeveloped, back country experience for resource-dependent activities such as hunting, camping, hiking, sightseeing, and four-wheel-drive touring. **RMZ Management Objective:** Upon exit, all visitors indicate that natural and cultural resources are being managed appropriately, and / or express an increased awareness of the natural and cultural values for which the monument was established.		
Targeted Opportunities & Outcomes		
Primary Activities: Touring by off-highway vehicle on primitive roads. Touring by hiking, bicycling, and / or horseback. Learning about area history & natural history.	**Experiences:** Savoring the total sensory—sight, sound, and smell—experience of a natural landscape. Contemplating man's relationship with the land. Being able to tell others about the trip. Feeling good about how natural and cultural resources are being managed.	**Benefits:** Enlarged sense of personal accountability for acting responsibly on public lands. Increased appreciation of area's cultural history. Greater household awareness of and appreciation for our cultural heritage. Increased awareness and protection of natural landscapes. Greater protection of area historic and archaeological sites. Maintenance of distinctive recreation setting character. Enhanced ability for visitors to find areas providing

Sonoran Desert National Monument Special Recreation Management Area (Alt B, C, E)		
SRMA PRIMARY MARKET STRATEGY		**SRMA MARKET**
Destination		**Regional / National**
		wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: FC, BC	**Social:** FC, BC	**Administrative:** FC, BC
Activity Planning (Implementation) Framework		
Marketing: Educational and interpretive materials, including signs, maps, and brochures, would focus on the natural history of the Sonoran Desert landscape. Visitor services provided in partnership with local communities would emphasize area history and natural history. **Management:** Physical, social, and administrative settings would be established to accommodate motorized recreation access and opportunities, with Front Country comprising up to 20% of the management zone. Visitor and management infrastructure would be developed to accommodate visitation in balance with protection of monument objects; would be modest in scope and scale; and would be designed to blend with the dominant features of the landscape. The designated travel system would consist primarily of primitive roads maintained at levels 1 to 3, but up to 25 miles of road (approximately 5% of total route network) maintained at level 5 may be allowed to provide two-wheel drive passenger car access to educational, day-use, and camping facilities. Collection of native vegetation as firewood would be prohibited in the Front Country and Passage RMZ's. Recreational target shooting may be prohibited. Competitive motor sports would not be allowed. All commercial, other competitive, and vendor activities would be permitted on a case-by-case basis if monument objects are protected.		**Monitoring:** Impacts resulting from recreation use would be measured and monitored with a Limits of Acceptable Change methodology, and the scope and scale of impacts to monument objects resulting from recreation use would not exceed 2001 levels. **Administrative:** Camping and other activities, vehicles, and group sizes would be limited to designated sites and lengths of stay; types and speeds; and numbers as deemed necessary to provide access in balance with conservation of natural and cultural resources. All commercial, competitive, and vendor activities would be permitted on a case-by-case basis, consistent with the market niche and outcome objectives of the RMZ.

Sonoran Desert National Monument Special Recreation Management Area (Alt D)	
SRMA PRIMARY MARKET STRATEGY	**SRMA MARKET**
Undeveloped	**Regional / National**
Sonoran Desert National Monument Recreation Management Zone	
RMZ Market Niche: Visitors seeking an undeveloped, back country experience along a historic trail, and for resource-dependent activities such as hunting, camping, hiking, sightseeing, and four-wheel-drive touring. **RMZ Management Objective:** Upon exit, all visitors indicate that natural and cultural resources are being managed appropriately, and / or express an increased awareness of the natural and cultural values for which the monument was established.	
Targeted Opportunities & Outcomes	

Sonoran Desert National Monument Special Recreation Management Area (Alt D)		
SRMA PRIMARY MARKET STRATEGY		**SRMA MARKET**
Undeveloped		**Regional / National**
Primary Activities: Touring by off-highway vehicle on primitive roads. Touring by hiking, bicycling, and / or horseback. Learning about area history & natural history.	**Experiences:** Savoring the total sensory—sight, sound, and smell—experience of a natural landscape. Contemplating man's relationship with the land. Being able to tell others about the trip. Feeling good about how natural and cultural resources are being managed.	**Benefits:** Enlarged sense of personal accountability for acting responsibly on public lands. Increased appreciation of area's cultural history. Greater household awareness of and appreciation for our cultural heritage. Increased awareness and protection of natural landscapes. Greater protection of area historic and archaeological sites. Maintenance of distinctive recreation setting character. Enhanced ability for visitors to find areas providing wanted recreation experiences and benefits.
Prescribed Setting Character		
Physical: FC, BC	**Social:** FC, BC	**Administrative:** FC, BC
Activity Planning (Implementation) Framework		
Marketing: Educational and interpretive materials, including signs, maps, and brochures, would focus on the natural history of the Sonoran Desert landscape. Visitor services provided in partnership with local communities would emphasize area history and natural history. **Management:** Physical, social, and administrative settings would be established to accommodate motorized recreation access and opportunities, with Front Country comprising up to 5% of the management zone. Visitor and management infrastructure would be placed on non-monument lands, where possible. Visitor and management infrastructure would not be developed to accommodate visitation; imbalances between visitation and protection of monument objects would be addressed through administrative actions such as permitting, stay restrictions, closure, etc. The designated travel system would consist primarily of primitive roads maintained at levels 1 to 3, but up to 20 miles of road (approximately 3% of total route network) maintained at level 5 may be allowed to provide two-wheel drive passenger car access to educational, day-use, and camping facilities. Collection of native vegetation as firewood would be prohibited in the Front Country and Back Country RMZ's. Recreational target shooting may be prohibited. Competitive motor sports would not be allowed. All commercial, other competitive, and vendor activities would be permitted on a case-by-case basis if monument objects are protected.	**Monitoring:** Impacts resulting from recreation use would be measured and monitored with a Limits of Acceptable Change methodology and the scope and scale of impacts to monument objects resulting from recreation use would not exceed 2001 levels. **Administrative:** Camping and other activities, vehicles, and group sizes would be limited to designated sites and lengths of stay; types and speeds; and numbers as deemed necessary to provide access in balance with conservation of natural and cultural resources. All commercial, competitive, and vendor activities would be permitted on a case-by-case basis, consistent with the market niche and outcome objectives of the RMZ.	

Appendix S. Route Evaluation Methodology & Impact Analysis

S.1. Route Evaluation Methodology

The evaluation of routes for the Lower Sonoran Field Office is the sum of route and resource inventories, the BLM specialists' input, and the public's input. The process of developing recommended route designations is part of a larger effort to use the best management techniques in an ever-changing environment. The action of designating specific routes as open, closed or limited is an implementation level action which tiers from the RMP level decisions which would include OHV Area Allocations, which determine how travel is to be administered on an area-wide basis. As the population of Arizona grows, trends must be identified and anticipated in order to best achieve the goals of successful land management and the protection of sensitive resources. Designating and managing a route system is a key component of those goals.

S.1.1. Route Inventory

The roads, primitive roads and trails in the field office area were mapped using GPS. Areas were systematically reviewed by an inventory team comprised of government employees or contract employees. The team was tasked with driving each route and recording its location, condition and uses. Public route submissions received by BLM were given to the inventory team to objectively verify and record to BLM standards using high quality GPS units meeting national mapping standards. The route inventory was displayed at public scoping meetings. All areas were complete at the time of public scoping with exception of the Gila Bend Mountains and outlying parcels east of Phoenix.

S.1.2. Route Evaluation

Evaluating routes on the merits of their uses, values, and impacts is a difficult task. The method used by Lower Sonoran Field Office for evaluating each route is the Route Evaluation Process. Using the route inventory collected by BLM, geographic areas were reviewed by applying the Route Evaluation Process. This methodology systematically guides the evaluator through a series of questions that helps to assess the relationship of routes to sensitive resources and as well as to commercial and public access needs, both individually route by route, as well as collectively or cumulatively as a route network. Background data from state and federal agency inventories and Agency resource specialists, as well as the public, provides the basis for evaluation. In accordance with 43 CFR 8342.1, this methodology of evaluating and making recommended route designations considers and addresses as part of its evaluation, the means by which to minimize potential and known impacts of motorized use to a number of sensitive resources including but not limited to threatened, endangered and sensitive species, and their habitat, as well as cultural and historic resources, wilderness characteristics, various other users and adjoining land uses. These potential and known impacts are jointly evaluated in the context of providing reasonable commercial and recreational public access as provided for and/or required by several State and Federal acts. Each route is systematically evaluated by taking into account the best information available, as well as any other pertinent guidance (e.g. Monument and RMP objectives).

Ultimately, recommended route designations are recorded (Open, Closed, or Limited) to create a recommended route network.

As specified in 43 CFR 8342.1, four designations are considered through the identification of standardized or specific mitigations at the time of evaluation. These criteria, listed as subparts a-d, direct BLM to:

a. Minimize damage of off-road vehicles on sensitive resources such as soil, watershed, vegetation and air.

b. Minimize disruption of wildlife habitats including threatened and endangered species.

c. Minimize conflicts between off-road vehicle use and other recreational activities.

d. Not locate off-road vehicle use areas and trails in designated wilderness or primitive areas.

e. Locate trails in natural areas only if the use will not adversely affect the values for which these areas were established.

When the questions in the evaluation tree are answered by taking into account the best information available and RMP objectives, a route designation code is established and recorded. Routes are determined to be Open, Closed or Limited.

As the evaluation/designation process progresses, specific reasoning on each recommended route designation is documented. Additional management requirements (e.g. maintenance, mitigation, adaptive management monitoring) are incorporated into the recommended route designations and ultimately become a part of implementing the Travel Management Plan. Route designations are considered implementation decisions, which is in contrast to land use decisions (e.g. RMP decisions) and are therefore appealable.

The process for reviewing inventoried routes, proposing new routes, both motorized and non-motorized, and adding routes to the route inventory for consideration in the route designation process, is outlined below in six steps. Public participation will be requested during the scoping phase of the route designation process. Comments will be accepted on the draft plan.

All routes, inventoried or proposed will be integrated and evaluated as follows:

1. Locations submitted by the public will be mapped or located using accepted global positioning system devices and presented to the BLM office for consideration as both a gps file and hardcopy map. Locations of route proposals off existing motorized routes must be mapped by hiking or horseback to avoid cross country travel. The route proposal submitted to BLM will include a description of the route including its width, its proposed use(s) and a rationale for its need.

2. The route location will be analyzed for potential conflicts such as, but not limited to: wildlife habitats, cultural resources, visual resources, other recreation uses, mining claims or leases, grazing facilities, rights-of-way, and proximity to other jurisdictions such as private land. A structured process such as the one described above will be used to evaluate and document the known or foreseeable route conditions.

3. If the route has few conflicts identified during analysis, an on-the-ground review may be initiated. At this stage, the proposed route must be flagged and staked on the ground by

the public for BLM review. If a route has irresolvable conflicts, it may be removed from further consideration.

4. Pending favorable on-the-ground review, a conflict assessment would lead to possible mitigation actions or alternative locations or design.

5. An environmental assessment (EA) would be prepared to determine the environmental effects of the proposal on the proposed route system and any alternatives and mitigation suggested. In the case of new route proposals brought forth during the initial route designation period, all routes will be analyzed together in the same EA.

6. A decision identifying the route system and mitigations will be issued by the authorized officer based on the Land Use Plan compliance, resource objectives and environmental impacts.

To assist the resource specialists in analyzing impacts related to designating route systems within the SDNM, the Monument was divided into 18 site specific sample areas. These sample areas were identified by the BLM travel specialist's as areas where there are known travel issues and public use concerns. Each resource specialist selected sample areas representative of the objects managed by their program and analyzed impacts from the designation of individual routes as opened, closed, and limited within selected sample areas. A more detailed description of each of these site specific sample areas is displayed below (refer to Map 4-1 for area locations).

S.2. Impact Analysis

Methodology for Determining Adequate Protection of Monument Objects

Effects to monument objects, the natural resources and use conflicts were considered by identifying the issues using an interdisciplinary team approach while applying Best Management Practices and site specific knowledge to reduce human effects.

Each of the 18 study areas in SDNM have a unique assemblage of monument objects requiring different management techniques to adequately ensure monument object protection. By identifying the objects that occur in each area and what could affect each object, a management regime can be developed and an assessment of human impacts completed.

The eight monument objects were identified where they existed in the 18 monument areas. An excel spreadsheet table was devised to display the assessed level of impact to that object for the given plan alternative and corresponding route alternative. A justification for the assessed level of impact accompanies the impact determination. The combination of route alternatives and management actions for each alternative create the management framework for protecting monument objects and following the four designation criteria in 43 CFR 8342.1.

Each travel route and RMP alternative potentially has negligible, minor, moderate or major impacts on monument objects. "Adequate Protection" means impacts on monument objects by travel management designation from specific open routes and the range of alternatives is either moderate, minor or negligible. Impacts in the moderate range would need to be mitigated to reduce them to that of minor.

By assessing the impacts and confirming that none of the action alternatives rise above a Minor assessment after mitigation, a "Finding of Adequate Protection" can be issued for each RMP alternative.

Table S.1. Description of SDNM Site-Specific Sample Areas

Area	Area Description
1	Anza/Butterfield Trail: This historic trail corridor is in the center of the monument and receives the highest amount of visitor use. This are corresponds to the Juan Bautista de Anza NHT, an NLCS unit, and traverses a valley bottom with soft loamy soils. The vegetation community is primarily Creosote-Bursage. This corridor is representative of the mixed use recreation areas within the monument.
2	Butterfield Pass: This historic trail corridor is in the center of the monument and receives the highest amount of visitor use. This are corresponds to the Juan Bautista de Anza NHT, an NLCS unit, and traverses a valley bottom with soft loamy soils. The vegetation community is primarily mixed-cacti / Palo Verde. This corridor is representative of the mixed use recreation areas within the monument.
3	Campsites at Gap Well, North of State Route (SR) 238: This area contains numerous campsites in the most heavily visited area of the monument. The area vegetation community is Creosote-Bursage. This area is representative of concentrated visitor use areas and the most easily accessible area of Anza NHT.
4	North SDNM access from Pipeline road: This area is representative of SDNM urban interface where high levels of use occur including target shooting and dumping. The area contains Espanto Mountain, a popular destination.
5	Margie's Cove West Loop Road: This area is representative of a popular area for wilderness trailhead access and semi-primitive roaded settings for backcountry vehicle touring. The area is accessed for many uses including hunting, hiking, camping, sight-seeing using primitive roads. Upgrading the road to make trailhead accessible may be proposed during the lifespan of this plan.
6	Access to North side of South Maricopa Wilderness: This area is representative of access to areas within SDNM where both physical and legal access is very limited although not very far from a paved road. Use is low and the route conditions limit access to a large area of designated wilderness.
7	Johnson Well to Papago Indian Chief Mine, south of Javelina Mountain: This area is representative of remote, pristine and lightly used areas of SDNM that are difficult to access without aid of high clearance or specialized vehicles.
8	Bighorn Station and Proposed Access Road: This area is representative of an easily visible historic area with physical, but not legal access and serves as a major access point to SDNM. A new access road is proposed in two alternatives to resolve the legal access issue.
9	Vekol Valley Road to Johnson Well/Homestead: This area represents easily accessible campsites from a main road. Camp trailer access is common and the area receives heavy use during winter and lighter, yet consistent, use during the hot season. It provides access to the southern area of SDNM.
10	Access to Javelina Mountain: This area is representative of a destination mountain range in SDNM where vehicle access occurs from all sides. Use level is low to moderate depending upon season.
11	Sand Tank Wash, all branches inside Area A: This area is representative of remote areas of the SDNM where the only available vehicle routes are in sand washes. This area is considered to be some of the best desert wash habitat in SDNM. Wash travel inside Area A was prohibited by previous Air Force land use plan. Designating these routes as primitive roads is being considered.
12	Bender Wash, all branches west of Getz well: This area is representative of remote areas of SDNM where vehicle routes exist in sand washes and use prior to monument proclamation is well known. This area is outside the area A permit area.
13	Vekol Valley Grasslands: This area is representative of areas with sensitive species, rare grassland, and existing routes in highly erodible soils. This area has been closed to vehicles for many years.
14	Wilderness areas: These areas are representative of protected areas where vehicle use is prohibited. Routes may exist along boundaries or inside as 'cherry stem routes', approved through congressional action at the time of wilderness designation.
15	Creosote-Bursage Flats: This area is representative of large areas where the vegetation community is Creosote-Bursage and routes exist, varying in use level from light to heavy. Soils are silty and erodible and similar to soils in the PM_{10} nonattainment area.
16	Sand Tank Mountains: This area is representative of large mountainous areas with few routes and good habitat and primitive recreation opportunity. The area is fairly pristine.

Area	Area Description
17	Wilderness Characteristics: These areas are under consideration for allocation as wilderness characteristic areas. These areas may be managed for solitude and recreational opportunities.
18	Remaining areas of the Monument that tend to be lower in elevation, are lightly visited, and have fewer access routes.

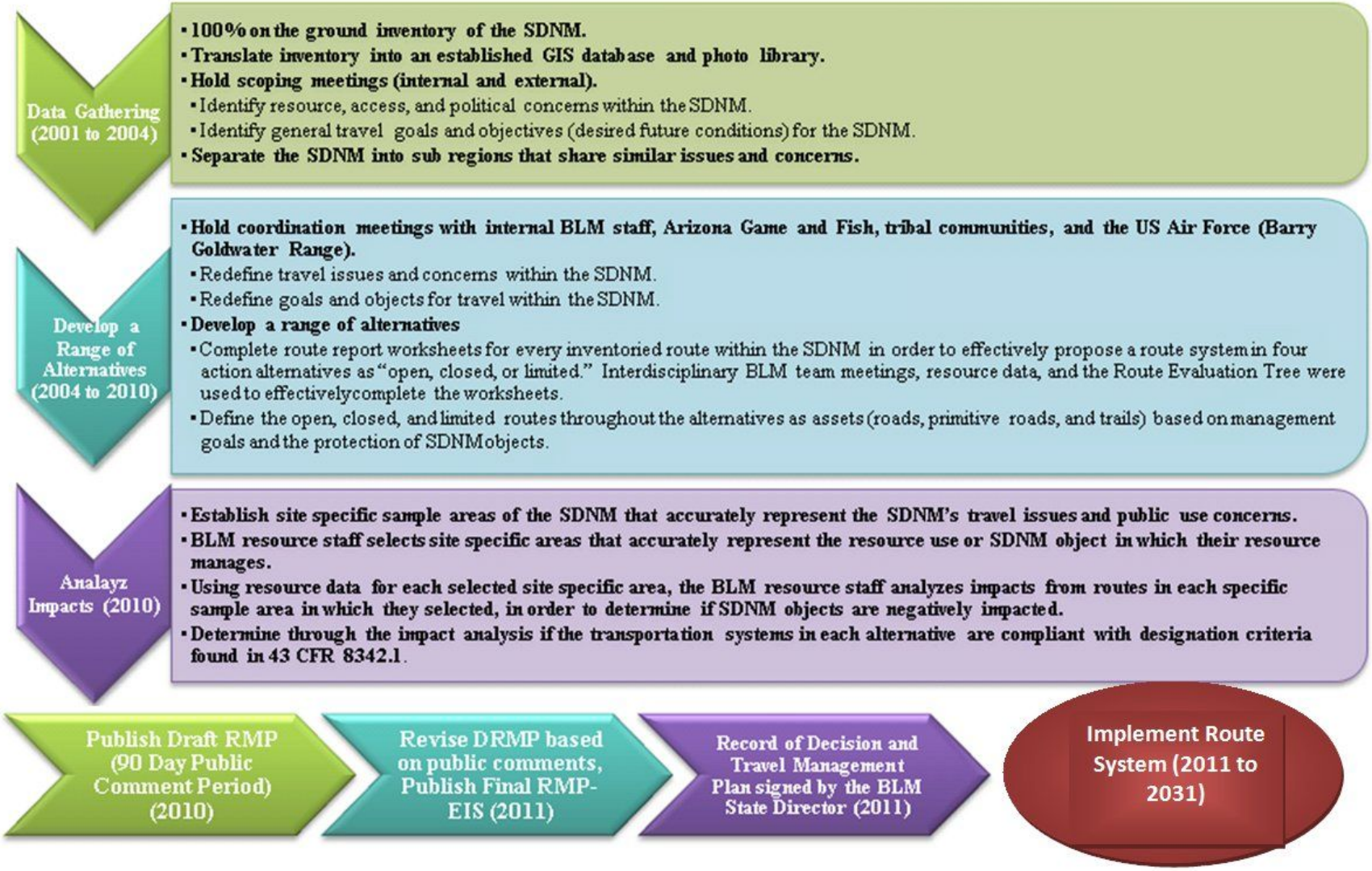


Figure S.1. SDNM Route Evaluation Process Flow Chart

Main Features Include:

1. Logical, standardized, balanced and repeatable approach to route evaluation.
2. Systematic questions to assess compliance with a variety of pertinent statutory requirements including:
   - Valid existing rights and other vested rights or permitted uses
   - Degree of potential impact or degradation to specially protected resources, such as species protected by the Federal Endangered Species Act (ESA), cultural, historic and scientific objects protected by the Historic Preservation and Antiquities Acts (e.g. Monument Proclamations, Section 106) and wilderness values as protected by the Wilderness Act.
   - Implementation of Agency Organic Acts and their charge to balance the public's need/desire for access to Federal lands with resource protection through a philosophy of management for "multiple use". Such consideration includes recognizing the value of providing a range of recreational opportunities and treating those opportunities in accordance with the Organic Acts as a resource worthy of protection.
3. Systematic consideration of access opportunities and resource protection needs on both a narrowly focused route by route assessment, as well as a broad-based cumulative assessment of the total network's effect.
4. Systematic consideration of mitigation and/or limited designation as a means by which to ameliorate resource impacts. Recommended designation options include a range from open to closed, and a number of intermediate actions as a means by which to balance access needs and resource protection.
5. Systematic recordation of data allowing for future retrieval and review/updating of evaluation information as needed (i.e. evaluation pathways are numerically coded).
6. Systematic ability to assess a route's recommended designation status based upon the management goals of each individual alternative.

How does the Tree Work?

1. The region or management area in which the route is located is thoroughly evaluated. Resource protection, recreation and commercial access concerns pertinent to route are identified. The patterns of these identified uses and concerns, as well as their trends are also noted. Other related issues such as law enforcement, route maintenance and user conflicts are further identified.
2. The desired future condition and management goals of each proposed alternative are identified and reviewed.
3. Each route is systematically numbered. This both allows for tracking the evaluation process and enables the public to make comment on specific routes.
4. Each route is systematically assessed by sequentially answering the questions in the Evaluation Tree. Specifically, the questions are assessed and answered in the context of the regional concerns identified in step #1 and the management goals identified in step #2 for each of the alternatives.
5. The recommendation of a designation for each route under each alternative is dictated by addressing the management goals for that alternative.
6. The specific answers to each question for each route are recorded by the final coded answer.
7. Detailed information that may have been critical to the answer of any question(s) or in the determination of the final outcome is recorded as part or the individual route evaluation record.

Route Evaluation Tree®

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Recommended Route Designations

Close 01 — **Close:** A route that is recommended for permanent closure to all use. Physical closure may include restoring the route to the degree possible to blend with surrounding landscape, as well as installation of physical barriers and signing at the original departure point, if necessary.

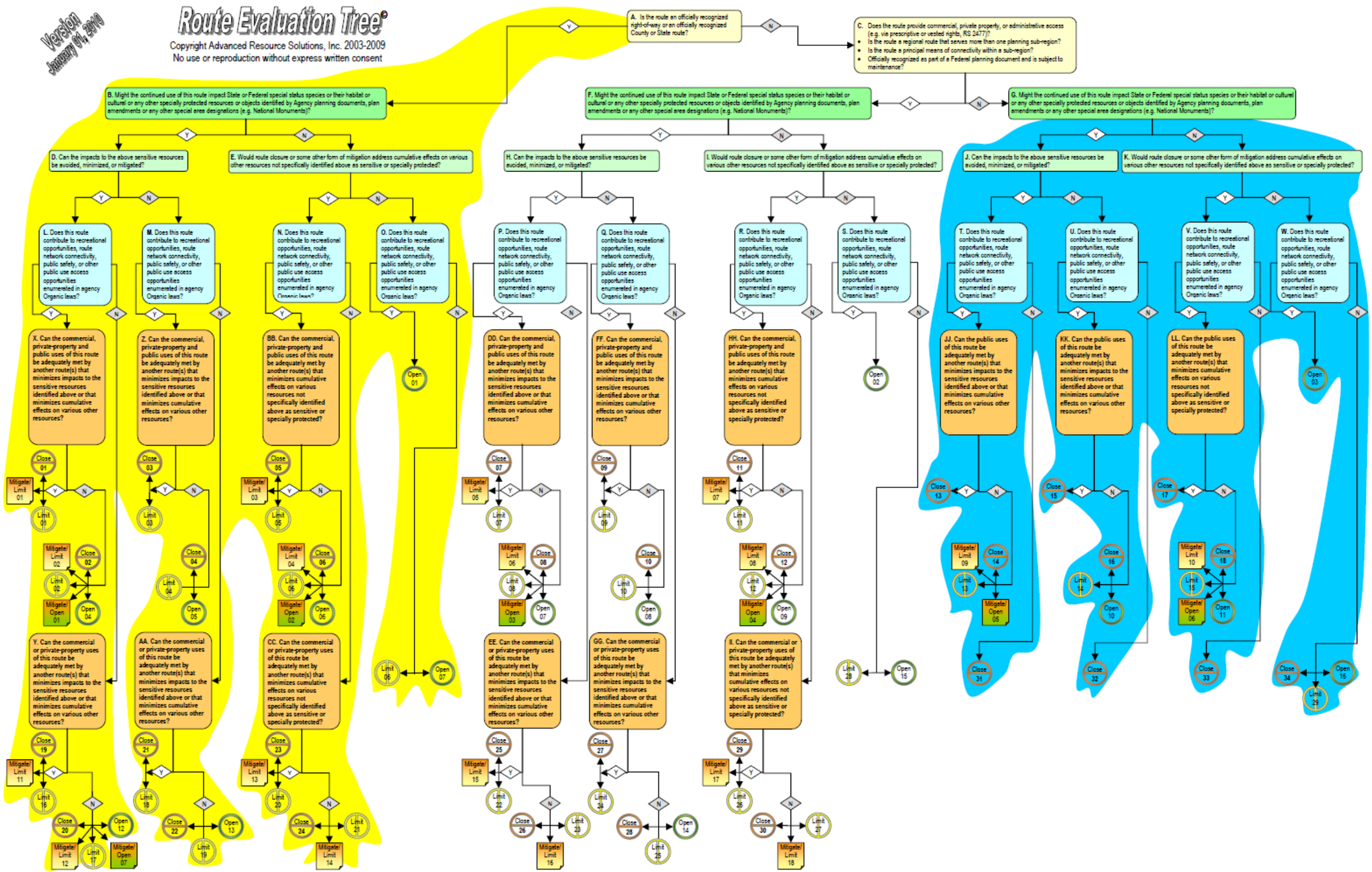
Mitigate/Limit 09 — **Mitigate/Limit:** A route that is recommended for limited use by certain parties or entities with valid, vested, or implied rights of access, or to certain vehicle types, seasons of use, etc., following mitigation action(s) aimed at avoiding, minimizing or mitigating certain estimated impacts identified during the route evaluation process.

Limit 05 — **Limit:** A route that is recommended for limited use by certain parties or entities with valid, vested, or implied rights of access, or to certain vehicle types, seasons of use, etc.

Mitigate/Open 05 — **Mitigate/Open:** A route that is recommended open for all uses, following mitigation action(s) aimed at avoiding, minimizing or mitigating certain estimated impacts identified during the route evaluation process.

Open 02 — **Open:** A route that is recommended open for all uses.

Figure 2: Route Evaluation Tree©


Version January 01, 2010
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A. Is the route an officially recognized right-of-way or an officially recognized County or State route?
B. Might the continued use of this route impact State or Federal special status species or their habitat or cultural or any other specially protected resources or objects identified by Agency planning documents, plan amendments or any other special area designations (e.g. National Monuments)?
C. Does the route provide commercial, private property, or administrative access (e.g. via prescriptive or vested rights, RS 2477)?
Is the route a regional route that serves more than one planning sub-region?
Is the route a principal means of connectivity within a sub-region?
Officially recognized as part of a Federal planning document and is subject to maintenance?
D. Can the impacts to the above sensitive resources be avoided, minimized, or mitigated?
E. Would route closure or some other form of mitigation address cumulative effects on various other resources not specifically identified above as sensitive or specially protected?
F. Might the continued use of this route impact State or Federal special status species or their habitat or cultural or any other specially protected resources or objects identified by Agency planning documents, plan amendments or any other special area designations (e.g. National Monuments)?
G. Might the continued use of this route impact State or Federal special status species or their habitat or cultural or any other specially protected resources or objects identified by Agency planning documents, plan amendments or any other special area designations (e.g. National Monuments)?
H. Can the impacts to the above sensitive resources be avoided, minimized, or mitigated?
I. Would route closure or some other form of mitigation address cumulative effects on various other resources not specifically identified above as sensitive or specially protected?
J. Can the impacts to the above sensitive resources be avoided, minimized, or mitigated?
K. Would route closure or some other form of mitigation address cumulative effects on various other resources not specifically identified above as sensitive or specially protected?
L. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
M. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
N. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
O. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
P. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
Q. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
R. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
S. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
T. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
U. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
V. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
W. Does this route contribute to recreational opportunities, route network connectivity, public safety, or other public use access opportunities enumerated in agency Organic laws?
X. Can the commercial, private-property and public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
Y. Can the commercial or private-property uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
Z. Can the commercial, private-property and public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
AA. Can the commercial or private-property uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
BB. Can the commercial, private-property and public uses of this route be adequately met by another route(s) that minimizes cumulative effects on various resources not specifically identified above as sensitive or specially protected?
CC. Can the commercial or private-property uses of this route be adequately met by another route(s) that minimizes cumulative effects on various resources not specifically identified above as sensitive or specially protected?
DD. Can the commercial, private-property and public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
EE. Can the commercial or private-property uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
FF. Can the commercial, private-property and public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
GG. Can the commercial or private-property uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
HH. Can the commercial, private-property and public uses of this route be adequately met by another route(s) that minimizes cumulative effects on various resources not specifically identified above as sensitive or specially protected?
II. Can the commercial or private-property uses of this route be adequately met by another route(s) that minimizes cumulative effects on various resources not specifically identified above as sensitive or specially protected?
JJ. Can the public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
KK. Can the public uses of this route be adequately met by another route(s) that minimizes impacts to the sensitive resources identified above or that minimizes cumulative effects on various other resources?
LL. Can the public uses of this route be adequately met by another route(s) that minimizes cumulative effects on various resources not specifically identified above as sensitive or specially protected?
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Mitigate/ Limit 11
Mitigate/ Limit 12
Mitigate/ Open 07
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Mitigate/ Limit 14
Mitigate/ Limit 15
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Mitigate/ Limit 17
Mitigate/ Limit 18

Appendix T. Route Mitigations

Table T.1. Nature of the conflict with routes and use of routes

Conflict	Typical mitigation (in order of possible implementation, not all mitigation measures may be used)
Resource issues	
Human use associated with a route is degrading xeroriparian (desert wash) condition	1. Place information signs to request positive behavior (i.e. no wood cutting, do not drive up wash banks, etc) 2. Place additional route markers to define one route 3. Reroute the route to allow strata condition to improve 4. Fence the area or place barriers to manage people 5. Close the route and make a plan for reclamation
Human use associated with a route is degrading desired plant communities	1. Place additional signs directing vehicles to stay on routes 2. Conduct public outreach regarding noxious weeds and conserving vegetation 3. Fence the area or place barriers to manage people 4. Develop a program to improve desired plant community 5. Close the route and make a plan for reclamation
Human use associated with a route is degrading water quality	1. Review the situation, determine the source of degradation, monitor to determine severity 2. Place water control measures on the route 3. Take reasonable measure to further harden/stabilize the route 4. Reroute the route 5. Close the route if no suitable mitigation is possible
Human use on a route is determined to significantly degrade a particular habitat	1. Request certain behavior from route users through signs and other information 2. Place limitations of use on the route (time or season of use, type of use, number of users, behavioral requirements) 3. Reroute the route 4. Replace habitat to offset problems caused by human use a. Augment food/water sources b. Place barriers along route to protect specific habitat features c. Relocate or expand reproduction sites to be away from the route 5. Close route if no suitable mitigation is possible, make plan for reclamation

Conflict	Typical mitigation (in order of possible implementation, not all mitigation measures may be used)
Dust caused by human use along a route violates county and state dust regulations	1. Determine a short term solution a. Monitor situation and determine severity of the problem b. Close the route or area temporarily to stop dust generation c. Stabilize the route using a county approved method d. Place signs requesting a certain behavior (i.e. no wheel spin, reduce speed) 2. Determine a long term solution a. Change formal maintenance interval on route consistent with use level b. Develop a localized outreach program c. Implement new technology as part of an area wide plan d. Close route if suitable dust control is not possible, make plan for reclamation
Human use associated with a route is causing unnatural erosion rates	1. Review the route to determine cause and monitor to determine severity 2. Place water control measures on the route 3. Take reasonable measure to further harden or stabilize the route 4. Reroute the route 5. Close the route if no suitable mitigation is possible
Human use associated with a route is causing damage to a cultural resources	1. Determine the legality of the human activities occurring 2. Implement a public exclosure method such as fencing 3. Determine an appropriate treatment method to protect cultural resources. 4. Close route on an emergency basis or permanently if no suitable treatment can be achieved.
Social Issues:	
Speed differential causes conflict between recreationists and/or local residents	1. Place signs to raise awareness of lawful uses of the area. 2. Monitor situation on the ground and request law enforcement support if necessary 3. Conduct public outreach in an attempt change behavior 4. Review terrain and improve sight distances if possible 5. Redesign traffic flow by separating uses or limit by type or time of use
Sound level causes conflict between recreationists and/or local residents	1. Place signs to raise awareness of sound issues/laws 2. Monitor situation on the ground and request law enforcement support as necessary to enforce existing law 3. Conduct public outreach in an attempt change behavior 4. Implement "Quiet Time" use restrictions 5. Reroute traffic to minimize conflict 6. Place sound reducing barriers as necessary 7. Close route if no suitable mitigation is possible

Appendix U. Definition of Transportation Asset Type, Functional Class, Maintenance Intensity

Transportation Asset Type

The Transportation Asset Types of Road, Primitive Road and Trail are established by the Roads and Trails Terminology Report issued in April 2006. The report was an attachment to Instruction Memorandum No. 2006-173.

Definitions:

Road: A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.

Primitive Road: A linear route managed for use by four-wheel drive or high-clearance vehicles. These routes do not normally meet any BLM road design standards.

Trail: A linear route managed for human-powered, stock or off-highway vehicle forms of transportation or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

BLM Functional Classifications

Definitions:

Collector Road: These Bureau roads normally provide primary access to large blocks of land, and connect with or are extensions of a public road system. Collector roads accommodate mixed traffic and serve many uses. They generally receive the highest volume of traffic of all the roads in the Bureau road system. User cost, safety, comfort and travel time are primary road management considerations. Collector roads usually require application of the highest standards used by the Bureau. As a result, they have the potential for creating substantial environmental impacts and often require complex mitigation procedures.

Local Road: The Bureau roads normal serve a smaller area than collectors, and connect to collectors or public road systems. Local roads receive lower volumes, carry fewer traffic types and generally serve fewer uses. User cost, comfort and travel time are secondary to construction and maintenance cost considerations. Low volume local roads in mountainous terrain, where operation speed is reduced by effort of terrain, may be single land roads with turnouts. Environmental impacts are reduced as steeper grades, sharper curves, and lower design speeds than would be permissible on collector roads are allowable.

Resource Road: These Bureau roads normally are spur roads that provide point access and connect to local or collector roads. They carry very low volume and accommodate only one or two types of use. Use restrictions are applied to prevent conflicts between users needing the road and users attracted to the road. The location and design of these roads are governed by environmental compatibility and minimizing Bureau costs, with minimal consideration for user cost, comfort, or travel time.

Maintenance Intensity

Level 0:

Maintenance Description:

- Existing routes that will no longer be maintained and not longer be declared a route. Routes identified as Level 0 are identified for removal from the Transportation System entirely.

Maintenance Objectives:

- No Planned annual maintenance
- Meeting identified environmental needs
- No preventive maintenance or planned annual maintenance activities

Maintenance Funds:

- No annual maintenance funds

Level 1

Maintenance Description:

- Routes where minimum (low intensity) maintenance is required to protect adjacent lands and resource values. These roads may be impassable for extended periods of time.

Maintenance Objectives:

- Low (minimal) maintenance intensity
- Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing or slide removal is not performed unless route bed drainage is being adversely affected, causing erosion.
- Meet identified resource management objectives.
- Perform maintenance as necessary to protect adjacent lands and resource values
- No preventive maintenance
- Planned maintenance activities limited to environmental and resource protection
- Route surface and other physical features are not maintained for regular traffic

Maintenance Funds:

- Maintenance funds provided to address environmental and resource protection requirements. No maintenance funds provided to perform preventive maintenance.

Level 3

Maintenance Description:

- Routes requiring moderate maintenance due to low volume use (e.g. seasonally or year-round for commercial, recreation, or administrative access). Maintenance Intensities may not

provide year-round access but are intended to generally provide resources appropriate to keep the route in use for the majority of the year.

Maintenance Objectives:

- Medium (Moderate) maintenance intensity
- Drainage structures will be maintained as needed. Surface maintenance will be conducted to provide a reasonable level of riding comfort at prudent speeds for the route conditions and intended use. Brushing is conducted as needed to improve sight distance when appropriate for management uses. Landslides adversely affecting drainage receive high priority for removal; otherwise, they will be removed on a scheduled basis.
- Meet identified environmental needs
- Generally maintained for year-round traffic
- Perform annual maintenance necessary to protect adjacent lands and resource values
- Perform preventive maintenance as required to generally keep the route in acceptable condition

Maintenance Funds:

- Maintenance funds provided to preserve the route in the current condition, perform preventive maintenance activities on a scheduled basis, and address environmental and resource protection requirements.

Level 5

Maintenance Description:

- Routes for high (Maximum) maintenance due to year-round needs, high volume traffic, or significant use. Also may include routes identified through management objectives as requiring high intensities of maintenance or to be maintained open on a year-round basis.

Maintenance Objectives:

- High (Maximum) maintenance intensity
- The entire route will be maintained at least annually. Problems will be repaired as discovered. These routes may be closed or have limited access due to weather conditions bur are generally intended for year-round use.
- Meet identified environmental needs
- Generally maintained for year-round traffic
- Perform annual maintenance necessary to protect adjacent lands and resource values
- Perform preventive maintenance as required to generally keep the route in acceptable condition
- Planned maintenance activities should include environmental and resource protection efforts, annual route surface
- Route surface and other physical features are maintained for regular traffic

Maintenance Funds:

- Maintenance funds provided to preserve the route in the current condition, perform planned preventive maintenance activities on a scheduled basis, and address environmental and resource protection requirements.

Appendix V. Areas of Critical Environmental Concern (ACEC) Evaluations

Area Considered:*Coffee Pot-Batamote*	
General location	T.11S. R.6, 5, 4 & 3W. (portions of) T.12S. R.4 W. (portions of)
General description	Sonoran desert ecosystem. Contains many wooded washes and boulder areas for candidate species. Contains foraging areas for endangered lesser long-nosed bat. Contains significant cultural artifacts.
Acreage	63,400 acres
Values considered	Wildlife, Natural process or system, Cultural resources

Identification Criteria

To be considered as a potential ACEC and analyzed in RMP alternatives, an area must meet the criteria of relevance and importance, as established in 43 CFR 1610.7-2.

Relevance: *There shall be present a "significant" historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:*

Relevance Value	Yes/No	Rational for Determination
A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	The area is of significant cultural importance as it is adjacent to the Tohono O'odham Nation and is part of their traditional homelands. In addition, a broad variety of cultural sites dating from the Middle Archaic period, thousands of years ago, to the late 19th century are represented in this area. The density of sites is greater in these areas than in the surrounding areas. One of the most important prehistoric obsidian sources for tool materials is located in this area.
A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species; or habitat essential for maintaining species diversity).	Yes	Area contains habitat for the Sonoran desert tortoise. All three habitat types are within the ACEC. Category I, II, and III. Also contains habitat for the sensitive species cactus ferruginous pygmy owl and foraging habitat for the endangered lesser long-nosed bat.
A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relict plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).	Yes	• Acuna cacti are Restricted to well drained knolls and gravel ridges between major washes in Sonoran desertscrub habitat. Acuna cacti are found on granite substrates on rounded small hills at elevations ranging from 397 to 610 m (1300-2000 ft). Elevation is a limiting factor. • The area also contains all three habitats for the desert tortoise as well as habitat for the cactus ferruginous pygmy owl.
Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.	No	No natural hazards are known to occur.

Importance Criteria

Importance: The value, resource, system, process, or hazard described above must have substantial *significance and values to satisfy the "importance" criteria. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.*

Importance Value	Yes/No	Rationale for Determination

Area Considered: *Coffee Pot-Batamote*		
Has more than locally significant qualities, which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area is of significant cultural importance as it is adjacent to the Tohono O'odham Nation and is part of their traditional homelands. In addition, a broad variety of cultural sites dating from the Middle Archaic period, thousands of years ago, to the late 19th century is represented in this area. The density of sites is greater in these areas than in the surrounding areas. One of the most important prehistoric obsidian sources for tool materials is located in this area.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The Coffee Pot-Batamote Area is an important part of a larger intact wildlife habitat area, which spans the Sand Tanks area of the Barry M. Goldwater Range and Sonoran Desert National Monument. This entire area provides important opportunities to maintain quality habitat for a wide variety of wildlife, particularly for populations requiring large ranges. It also contains Category I desert tortoise habitat which BLM is committed to maintain at no net loss and habitat for the maintenance and recovery of the candidate cactus-ferruginous pygmy owl and Acuña cactus. Stands of saguaro cactus provide foraging habitat for the endangered lesser long-nosed bat. Washes located within the proposed ACEC contains suitable habitat for the candidate cactus ferruginous pygmy-owl.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	BLM is mandated to protect threatened, endangered, and candidate species and their habitats under the ESA.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	No qualities were identified.
Poses a significant threat to human life and safety or to property.	No	No threats have been identified.

Area Considered: *Cuerda de Lena*		
General location	T.13S. R. 6 & 5 W. (portions of) and T14S. R.6 & 5 W. (portions of)	
General description	Sonoran desert ecosystem	
Acreage	59,300 acres	
Values considered	Wildlife, Natural process or system, Cultural resources	
Identification Criteria		
To be considered as a potential ACEC and analyzed in RMP alternatives, an area must meet the criteria of relevance and importance, as established in 43 CFR 1610.7-2.		
Relevance: There shall be present a "significant" historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:		
Relevance Value	**Yes/No**	**Rational for Determination**
A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	The area is of significant cultural importance as it is adjacent to the Tohono O'odham Nation and is part of their traditional homelands. In addition, a broad variety of cultural sites dating from the Middle Archaic period, thousands of years ago, to the late 19th century are represented in this area. The density of sites is greater in these areas than in the surrounding areas. One of the most important prehistoric obsidian sources for tool materials is located in this area.

Area Considered: *Cuerda de Lena*		
A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species; or habitat essential for maintaining species diversity).	Yes	The area is only area within the Lower Sonoran Field Office that is managed for the endangered Sonoran pronghorn antelope. There are currently Sonoran pronghorn that take up residence on public lands within the proposed bounds of the ACEC. The proposed ACEC also contains suitable and occupied habitat for the Candidate species Cactus ferruginous pygmy-owl.
A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relict plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).	Yes	The area contains Saguaro cactus forest situations which are foraging habitat for the endangered lesser long-nosed bat. The proposed ACEC also contains suitable and occupied habitat for the Candidate species Cactus ferruginous pygmy-owl. The proposed ACEC contains important fawning, breeding, loafing and foraging habitat for the Sonoran pronghorn.
Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.	No	No natural hazards are known to occur.

Importance Criteria		
Importance: The value, resource, system, process, or hazard described above must have substantial *significance and values to satisfy the "importance" criteria. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.*		
Importance Value	**Yes/No**	**Rationale for Determination**
Has more than locally significant qualities, which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	The area is of significant cultural importance as it is adjacent to the Tohono O'odham Nation and is part of their traditional homelands. In addition, a broad variety of cultural sites dating from the Middle Archaic period, thousands of years ago, to the late 19th century is represented in this area. The density of sites is greater in these areas than in the surrounding areas. One of the most important prehistoric obsidian sources for tool materials is located in this area.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	The proposed Cuerda de Lena ACEC contains significant wildlife resources, including priority habitat for three endangered (priority) species - Sonoran pronghorn, lesser long-nosed bat, and the cactus ferruginous pygmy-owl. The area is identified was proposed as critical habitat for the cactus ferruginous pygmy-owl and includes a proposed recovery area for the cactus ferruginous pygmy-owl. The area provides important fawning habitat for the Sonoran pronghorn. Several large washes provide suitable cactus ferruginous pygmy owl habitat. The area provides foraging habitat for the endangered lesser long nosed bat and includes habitat for special status (priority) species including the Sonoran desert tortoise and rosy boa. There is a strong cultural resource component associated with this area because the area is part of the traditional Tohono O'odham homeland and contains much important information about prehistoric settlement and subsistence. The area is popular with local residents and seasonal winter visitors from around the United States and Canada for dispersed recreation including camping and sightseeing.

Area Considered: *Cuerda de Lena*		
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	BLM is mandated to protect threatened, endangered, and candidate species and their habitats under the ESA.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	No qualities were identified.
Poses a significant threat to human life and safety or to property.	No	No threats have been identified.

Area Considered: *Gila River Terraces and Lower Gila Historic Trails*	
General location	T.05S. R.9, 8, 7, 6, 5, 4 & 3W. (portions of) T.04S. R.9, 8, 7, 6, 5, 4 W. (portions of) T.03S. R. 5, 4 W. (portions of) T.02S. R. 5 W. (portions of) T.01S. R. 5, 4, 3, 2 W. (portions of) T.04S. R. 1, 2 W. (portions of)
General description	Historic trails and petroglyphs along the lower Gila River to Yuma County
Acreage	63,400 acres
Values considered	Cultural, Archaeological, Historic Trails

Identification Criteria		
To be considered as a potential ACEC and analyzed in RMP alternatives, an area must meet the criteria of relevance and importance, as established in 43 CFR 1610.7-2.		
Relevance: There shall be present a "significant" historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:		
Relevance Value	**Yes/No**	**Rational for Determination**
A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	• The trails and associated landscapes in this area have national significance as they are part of an important story about the peoples that have lived in, traveled through, and influenced the trail area. As well, the trails and landscapes inform us about the broader story of southwestern and transcontinental settlement, communications, and development. The cultural sites along the Gila River also have regional significance as they help to tell the story of the southwest's indigenous peoples. • Occupation and use of the Gila River terraces and trails spanned thousands of years evidenced by extensive prehistoric village sites and petroglyph sites, as well as associated canals, farmsteads, intaglios, small camp sites, and trails. Historic uses included dams, water diversion features, trails, graves, stage station, corrals, and historic mines. At least 250 sites have been recorded within the ACEC boundary and are managed under a variety of jurisdictions. • Humans occupied this area beginning in the Archaic Period, nearly 8,000 to 10,000 years ago as evidenced by the use of distinctive stone tools, including projectile points. By 300 B.C. the archaeological evidence begins to show the use of ceramic vessels and cultivation of corn. Along the Salt and Gila Rivers, the Hohokam tradition was born, and is now recognized by their high level of sophisticated canal systems, used for irrigated cultivation of corn, beans, squash, and cotton. Their pottery was often a buff color and decorated forms showed an exceptional artistry rendered in red on buff. Hohokam thrived in the area until the late

Area Considered: *Gila River Terraces and Lower Gila Historic Trails*		
		13th century, when they were forced to relocate to land with more abundant water supplies. ● The area of the Gila River within the proposed ACEC was located on the periphery of the core area of the Hohokam tradition, but happened to be situated where major travel corridors developed. ● People from the Yuma / lower Colorado River region, called the Patayan, began to appear in the area by the first millennium A.D. The Patayan did not practice irrigation, but can be recognized by their pottery, a thin, buff colored type fired harder and polished. First the Desert Archaic and then the Patayan and Hohokam cultures contributed to the petroglyphs. ● A variety of cultural sites are concentrated along the basalt mesas and terraces overlooking the Gila River. The area represents an unstudied instance: an amalgamation of elements from several archaeological cultures. ● In addition, the ACEC encloses an historic travel corridor with portions of the Juan Bautista de Anza National Historic Trail, Butterfield Overland Mail Route, Mormon Battalion Trail, and the Gila Trail following the same course along the Gila River floodplain. ● More recently, these trails and river corridors served explorers, emigrants, commercial mail and freight companies, and the military during the 18th and 19th century western expansion. In 1775, Captain Juan Bautista de Anza traveled from Tubac, Arizona to California. The Juan Bautista de Anza National Historic Trail commemorates this passage. In 1858, the Butterfield Stage Line travelled the area, preceded by the 1846 Mormon Battalion and California 49er gold rush traffic. ● While much of this ACEC has not been systematically studied, there are some recent archaeological investigations by recognized experts that support a long held supposition that this area along the Gila River terraces were occupied by a great many people over a long period of time. Henry D. Wallace (1989), writes, "For the western desert in particular, water plays a very important role in determining the patterning of prehistoric settlement and activities." ● One study, entitled An Archaeological Survey of Enterprise Ranch, Maricopa County, Arizona, was written in 2007 by Glen Rice, et al, a well-known expert on Hohokam archaeology. Dr. Rice's crew inventoried 2,740 acres of private land known as the Enterprise Ranch, which is adjacent to BLM lands. A total of 12 sites were recorded, eight of which have the characteristics which would make them eligible for the National Register of Historic Places (NRHP). Four sites are large, complex village sites with ballcourts, compound walls, trash mounds, houses, and plaza areas. Three sites are smaller residential sites or farmsteads with buried features. Three sites are prehistoric

Area Considered: *Gila River Terraces and Lower Gila Historic Trails*		
		work camps. One site has historic trash and possible historic flood control dam. The remaining sites are small, artifact scatters and possible camps. Almost all of the sites date to the Colonial and Sedentary Periods of Hohokam tradition, roughly AD 750-1150. Two petroglyph sites were recorded off the edge of this study area. ● Another important cultural resource investigation was documented in the report entitled Archaeological Investigations at Petroglyph Sites in the Painted Rock Reservoir Area, Southwestern Arizona, by Henry D.Wallace (1989), noted archaeologist specializing in rock art. This study focused on the petroglyph sites that occur within proximity of the Gila River between Gila Bend and the Painted Rock Dam. A total of 40 petroglyph sites were recorded in the area along the Gila River between Red Rock Canyon and Painted Rock Dam. The more than 53 known cultural sites in this particular study area along the Gila River range from petroglyph sites to prehistoric trail segments to artifact scatters. ● The research potential in this proposed ACEC is unmatched. This is a large body of unique cultural resource data because of the number and complexity of the sites present. ● The Gila River terraces and the historic trails along the Lower Gila River contain a significant collection of historic, cultural, archeological, and scenic values. Upon searching the archival map collection here in the Phoenix District Office, it is estimated that 250 cultural sites have been recorded to date within the ACEC boundary.
A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species; or habitat essential for maintaining species diversity).	No	● Small parts of this ACEC proposal provide dispersed habitat for quail, dove, deer, and a variety of other wildlife species. In 1954, a segregation order on the Fred J. Weiler Greenbelt withdrew a total of 62,735 acres under Public Land Order 1015 for wildlife habitat. ● The Gila River terraces corridor and trails area provides habitats for resident and migratory wildlife, but its overall contribution to habitat diversity and connectivity is minor. It does provide some connectivity to upland habitats and movement up and down the Gila River. ● Along riparian stretches of the corridor, mourning and white-winged doves, Gambel's quail, coyote, desert cottontail and black-tailed jackrabbit are found, along with javelina, mule deer, and bobcat. Resident songbirds include black and Say's phoebes, ash-throated flycatcher, loggerhead shrike, phainopepla, verdin, cactus, rock and canyon wrens, black-tailed gnatcatcher, crissal thrasher, Abert's towhee, and black-throated sparrow. In winter, species include sparrows and blackbirds. Birds of prey are present during the fall and winter.

Area Considered: ***Gila River Terraces and Lower Gila Historic Trails***		
A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relict plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).	No	Not applicable.
Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.	No	Not applicable.
Importance Criteria		
Importance: The value, resource, system, process, or hazard described above must have substantial *significance and values to satisfy the "importance" criteria. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.*		
Importance Value	**Yes/No**	**Rationale for Determination**
Has more than locally significant qualities, which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	• The ACEC's basalt boulder terraces contain extensive examples of petroglyphs in the region. These petroglyph panels are a unique and irreplaceable part of America's national heritage that requires increased protection to prevent looting and vandalism. • These river terraces and trails are part of important stories about prehistoric and historic development of the American nation. The trails were used prehistorically as important trade and travel routes for Native Americans. In historic times, these trails were used by explorers, emigrants, commercial mail and freight companies, and the military during the 18th and 19th century Anglo and Hispanic western expansion.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	• A wide diversity of significant prehistoric cultural sites are found along the Gila River, which supported robust cultures as a reliable source of water. The density of sites is higher than many surrounding areas, and includes extensive and important prehistoric petroglyph sites, village sites, canals, trails, and associated sites. The sites date from the Late Archaic, more than two thousand years ago, to the late 19th century. Many of these sites have the characteristics essential for a site to be eligible for the National Register of Historic Places. • Sites are at risk due to the increased urbanization and encroachment and associated increase in activities on the public lands. The area's cultural values are exceedingly delicate and vulnerable to impacts from other land uses such as recreational OHV, mineral material sales, mining and rights-of-way. Inundation, vandalism, boulder displacement, farmland encroachment, target shooting, erosion, trash accumulation, soil deposition, and unauthorized collection are some of the most common threats to these resources.

Area Considered: ***Gila River Terraces and Lower Gila Historic Trails***		
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	• FLPMA directs BLM to manage the public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." The relevance and importance of this ACEC proposal illustrates this area's extensive cultural resource values. The potential for impacts to the ACEC's archaeological features and the Fred J. Weiler Greenbelt, make this ACEC a BLM management priority. • The petroglyph panels and other cultural resource features are vulnerable to vandalism, looting, and impacts from other land uses. The ACEC's proximity to growing communities increases the likelihood of recreational damage occurring to cultural resources. • Increased use of the Gila River terraces and historic trails by indiscriminate OHV travel, target shooters, unauthorized collection of natural and cultural resources, vandalism, and rock and quarry saleable mineral material operations could disturb or destroy significant cultural sites and represent a major threat to the cultural and historic trail resources. For example, the use and ownership of OHVs in the Phoenix metropolitan area and throughout the terraces and trail corridors is expected to grow dramatically over the life of the plan. Moreover, over 100,000 new homes are platted near the area as communities southward (Gila Bend) and northward (Buckeye) look forward for rapid growth as economic expansion returns to the region.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Not applicable.
Poses a significant threat to human life and safety or to property.	No	Not applicable.

Area Considered: ***Saddle Mountain***		
General location	T.10N. R. 8 & 7 W. (portions of) and T.10S. R.8 & 7 W. (portions of)	
General description	A 55,000+ acre block of Sonoran Desert public lands in western Maricopa County, west of Phoenix	
Acreage	55,600 acres	
Values considered	Cultural, Wildlife, Scenic, Geology, Education, Sensitive Status Species	
Identification Criteria		
To be considered as a potential ACEC and analyzed in RMP alternatives, an area must meet the criteria of relevance and importance, as established in 43 CFR 1610.7-2.		
Relevance: *There shall be present a "significant" historic, cultural, or scenic value; a fish or wildlife resource or other natural system or process; or natural hazard. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following*:		
Relevance Value	**Yes/No**	**Rational for Determination**

Area Considered: *Saddle Mountain*		
A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	● Saddle Mountain is a volcanic landscape containing unique archaeological sites, wildlife habitat, interpretive geology, and dramatic scenery. Recognized by travelers for thousands of years, Saddle Mountain is a distinctive landmark located on the fringe of metropolitan Phoenix, Arizona--60 miles west of downtown. The mountain towers 2,000 feet above the Harquahala Plain at an altitude of 3,037 feet above sea level. ● The area contains a rich diversity of significant cultural sites. The density of sites is higher than many surrounding areas, and includes important prehistoric petroglyph, rock shelter, and geoglyph sites. The sites date from the Middle Archaic, several thousand years ago, to the middle of the 19th century. At least five sites have the characteristics essential for a site to be eligible for the National Register of Historic Places. Sites are at risk due to the increased urbanization and encroachment and associated increase in recreation and commercial activities on the public lands. ● Saddle Mountain and the Palo Verde Hills region share a history spanning thousands of years of prehistoric cultures that inhabited the deserts of western Arizona. Converging washes and uplands provided the Palo Verde Hills and Saddle Mountain area with an arboreal environment, creating stands of mesquite, ironwood, and Palo Verde trees. This environment provided sources of food and cover. Plus, both areas offered opportunities for hunting deer and bighorn sheep along with smaller game animals. An overview of cultures associated with this Saddle Mountain site stretch from Middle Archaic traditions of the Amargosa to the later Patayan, Hakataya, and Hohokam to more recent historic Yavapai and lastly, to the historic Anglo American. ● The volcanic upthrust of the mountain has created a highly visual and scenic example of geologic forces. Cliffs, spires, and buttes tinted by andesite, rhyolite, and basalt result in magnificent scenery. Colorful minerals scattered the northern skirt of the mountain. The mountain's pyroclastic rocks, distilled by eons of differential erosion account for the dramatic scenery and multicolored strata witnessed today. This scenery is viewed by thousands of motorists traveling on Interstate 10 each day.

Area Considered: *Saddle Mountain*		
A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species; or habitat essential for maintaining species diversity).	Yes	● This area provides habitat to a number of big game species, including big horn sheep, javelina and mule deer, habitat essential for maintaining species complexity and diversity. The area provides habitat for BLM sensitive species, including the Sonoran desert tortoise, and nesting habitat for a variety of raptor species. Much of the area is Category II desert tortoise habitat. ● The distinctive Saddle Mountain landform offers desert bighorn sheep habitat and an associated lambing area, augmented by a water tank developed through the cooperative efforts of the Desert Bighorn Sheep Society, the Arizona Game and Fish Department, and BLM. Foliage creates a habitat valuable to a range of wildlife in the Palo Verde Hills, including the aforementioned desert tortoise, and approximately 162 other species. Important or special status species within the area include Gila monster, kit fox, Cooper's hawk, and sharp-shinned hawk. Additionally, prairie falcons and golden eagles are found in the upper reaches of Saddle Mountain.
A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relict plants or plant communities which are terrestrial, aquatic, or riparian; or rare geological features).	Yes	The mountain's pyroclastic rocks, coupled with millenniums of erosion and weathering, account for good rock specimen hunting, a Saddle Mountain pursuit known throughout the southwest in rock collection circles. One result of Saddle Mountain's complex volcanic history has been the colorful minerals scattered the northern skirt of the mountain. However, the once plentiful fire agate, chalcedony, and calcite "desert roses" have become scarce due to over-collection. The mountain's pyroclastic rocks, distilled by eons of differential erosion, account for the multicolored strata that we see today. The mountain's pyroclastic rocks offer potential geological interpretation; nearly every type of volcanic and pyroclastic rock type can be located in the proposed ACEC.
Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action may meet the relevance criteria if it is determined through the resource management planning process that it has become part of a natural process.	No	There are no known natural hazards at this time.
Importance Criteria		
Importance: *The value, resource, system, process, or hazard described above must have* substantial *significance and values to satisfy the "importance" criteria. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.*		
Importance Value	**Yes/No**	**Rationale for Determination**

Area Considered: *Saddle Mountain*		
Has more than locally significant qualities, which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.	Yes	• The proposed ACEC contains bighorn sheep and desert tortoise, noteworthy priority wildlife species, outstanding scenery and vistas, visually exposed geologic forces, important cultural resources and outdoor education opportun9itiess. Paved and maintained dirt roads north and south of the area represent both a benefit for ensuring popular regional recreation visitation, and a threat from easy access, OHVs, and nearby urbanization. • The Saddle Mountain locale is the sole remaining and potentially useable corridor for wildlife movement north and south of Interstate 10. Consequently, the area represents a regionally important wildlife movement area between the Gila Bend Mountains to the south and the Harquahala/Belmont Mountains to the north. Moreover, future transportation mitigation could further improve opportunities for wildlife movement. Such wildlife movements are critical to maintain genetic diversity for wildlife populations over large tracts of public land north and south of Interstate 10. • Saddle Mountain's striking upthrust is a highly visible and educational example of volcanic geologic resources. A one-hour drive from downtown Phoenix, Saddle Mountain is a familiar regional landmark to community members, travelers, and urban recreationists over hundreds of square miles. • The area offers outstanding wildlife, cultural and geologic study and education opportunities if these resource values are maintained in good to excellent condition. In particular, the mountain's pyroclastic rocks account for both dramatic scenery and interpretive geologic values.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	• Contrasted by the surrounding area's rapid development, the Saddle Mountain area has long been noted for its conspicuous natural condition, wildlife habitat, geology, scenery and recreational opportunities. These values are all especially vulnerable to adverse change from increasing public use and commercial activities. • Saddle Mountain's easily assessable scenery and landscapes are a rarity in the locality. Most natural landscapes require difficult access and four wheel drive. Saddle Mountain has long been recognized for the quality and diversity of its recreation opportunities and its unusual assemblage of scenic, geologic and archaeological values. The area is noted by rock collectors for mineral specimens and is a popular camping and picnic area. Saddle Mountain is also noted for its remarkable springtime wildflower displays of poppies and other rare desert blooms. • Increased use of Saddle Mountain's public lands by indiscriminate OHV travel, target shooters, unauthorized collection of natural and cultural resources, and saleable mineral material operations

Area Considered: *Saddle Mountain*		
		likely will disturb or destroy wildlife habitat, scenic resources, and cultural landscapes. These uses represent a major threat. Use of OHVs is expected to increase as the population in of the Phoenix metropolitan area and surrounding communities near the mountain grow and sprawl into this area. Over 200,000 new homes are anticipated and platted north, west and east of Saddle Mountain the area over the next 20 years. ● Over the past quarter century, the area's natural conditions, wildlife habitat, scenic resources, and cultural values, have been steadily diminished and sometimes destroyed by peripheral road building, OHV travel, utility line construction, mining, arson, plant theft, target shooting, wire burning, cultural resource theft and vandalism, wildcat dumps and trash dumping, abandoned and stolen cars, and other activities. Over 13,000 acres have been damaged in this fashion. Active management of the area can both protect the geologic, biological, and cultural resources and provide excellent recreational opportunities based on these resources.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	● FLMPA mandates that the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental and archeological values; and where appropriate, BLM will preserve and protect certain public lands in their natural condition. Such lands will provide food and habitat for wildlife and provide for outdoor recreation. Additionally, FLMPA stated regulations and plans for the protection of public land areas of critical environmental concernwould be promptly developed. ● The Saddle Mountain area warrants protection to meet the mandates of FLPMA. Saddle Mountain's dramatic visibility and proximity to the Phoenix metropolitan area, along with the newly developing or growing communities surrounding near the mountain, have presented it avid public attention. The land use plan's scoping process revealed strong public interest in long-term protection and conservation of the area from citizens across the region. Local, regional and national citizen groups have proposed recreation SRMAs, ACECs, wilderness, wilderness character allocations, regional county park status, state park designation, and federal national monument designation over the past 30 years. ● The area offers outstanding wildlife, cultural, photography, geologic and outdoor education opportunities for youth, regional schools and universities, but only if the subject resource values are maintained in good to excellent condition. In particular, the mountain's pyroclastic rocks account for dramatic scenery, volcanic science, and potential geological interpretive values. Nearly every type of volcanic and pyroclastic rock type can be located in the area.

Area Considered: *Saddle Mountain*		
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	No qualities were identified.
Poses a significant threat to human life and safety or to property.	No	No threats have been identified.

Appendix W. Land Health Standards

In managing and implementing all resource programs, BLM must consider the Land Health Standards described in *Arizona Standards for Rangeland Health and Guidelines for Grazing Administration* (Rangeland Management). The Land Health Standards were developed, pursuant to 43 CFR 4180, through a collaborative process involving BLM's staff and the Arizona Resource Advisory Council (RAC). The Land Health Standards were approved by the Secretary of the Interior in April 1997. These standards have been developed to determine the characteristics of healthy ecosystems on public lands and management actions to promote them. When approved, the Land Health Standards became BLM Arizona policy, guiding the planning for and management of BLM-administered lands. The Land Health Standards, therefore, have been incorporated into both the Sonoran Desert National Monument and Lower Sonoran RMPs. Listed below are the standards that describe the conditions needed to encourage proper functioning of ecological processes and that have been adopted as the Land Health Standards applicable program wide to BLM Arizona.

W.1. Standard One: Upland Sites

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site). Criteria for Meeting Standard One Soil conditions support the proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including suitable amounts of vegetation cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the site's potential. Ground cover in the form of plants, litter, or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time. Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time. As indicated by such factors as:

- ground cover,
- litter,
- live vegetation (e.g., grass, shrubs, trees) amount and type,
- rock,
- signs of erosion,
- flow pattern,
- gullies, and
- rills and plant pedestaling.

Exceptions and exemptions (where applicable): None.

W.2. Standard Two: Riparian-Wetland Sites

Riparian-wetland areas are in properly functioning condition.

Criteria for Meeting Standard Two

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate the stream energy of high-water flows. Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetation, soil and erosion-deposition factors. BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as shown by the results of applying the appropriate checklist. The checklist for riparian areas is in Technical Reference 1737-9, Process for Assessing Proper Functioning Condition (BLM 1993d). The checklist for wetlands is in Technical Reference 1737-11, Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas (BLM 1994c). As indicated by such factors as the following:

- gradient,
- width/depth ratio,
- channel roughness and sinuosity of stream channel,
- bank stabilization,
- reduced erosion,
- captured sediment,
- ground water recharge, and
- dissipation of energy by vegetation.

Exceptions and exemptions (where applicable):

- Dirt tanks, wells, and other water facilities built or placed at a location to provide water for livestock or wildlife and not determined through local planning to provide for riparian or wetland habitat are exempt.
- Water impoundments permitted for construction, mining, or other similar activities are exempt.

W.3. Standard Three: Desired Future Conditions

Productive, diverse upland and riparian-wetland plant communities of native species exist and are maintained. Criteria for Meeting Standard Three Upland and riparian-wetland plant communities meet DPC objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species and the requirements of the Taylor Grazing Act (TGA); FLPMA; Endangered Species Act (ESA); Clean Water Act (CWA); and suitable laws, regulations, and policies. DPC objectives will be developed to assure that soil conditions and ecosystem function described in Standards 1 and 2 are met. These objectives detail a site-specific plant community, which when obtained, will assure rangeland health; State water quality standards; and habitat for endangered, threatened, and sensitive species. Thus, DPC objectives will be used as an indicator of ecosystem function and rangeland health. As indicated by such factors as the following:

- composition,
- structure, and
- distribution.

Exceptions and exemptions (where applicable): Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical are exempt.

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Appendix Z. References

American Community Survey. Accessed August 14, 2009.

Andereck, K. L., C. A. Voight, K. Larkin, and K. Freye. 2001. Differences between motorized and nonmotorized trail users. *Journal of Park and Recreation Administration* 19(3): 17-32.

Arcadis Geraghty & Miller, Inc. and SWCA, Inc. 1997. Cactus Survey Report on Portions of the Barry M. Goldwater Range. Report Prepared for Luke Air Force Base, 56 FW/RMO. Arizona.

Archer, Steven R., and Katherine I. Predick. 2008. "Climate change and ecosystems of the Southwestern United States." *Rangelands* (Society for Range Management), June: 23-28.

Arita, H.T. Spatial segregation in long-nosed bats, Leptonycteris nivalis and Leponycteris curasoae, in Mexico. Journal of Mammology. 79: 706-714.

Arizona Bat Resource Group. 2003. Arizona Bat Conservation Strategic Plan, Technical Report 213. K.E. Hinman and T.K. Snow, editors (August 2003)

Arizona Department of Commerce. 2003. Public Outreach, Local Plan Integration and Strategy Findings. Prepared for the Arizona Department of Commerce and the Commerce and Economic Development Commission by Elliott D. Pollack and Company Scottsdale, Arizona and Pat Schroeder, Practical Solutions Mesa, Arizona. http://www.azcommerce.com/doclib/PROP/SES%20Public%20Outreach%20exec%20summary.pdf (accessed June, 2010)

Arizona Department of Economic Security. 2005. "July 1, 2005 Population Estimates For Arizona's Counties, Incorporated Places And Balance Of County," Population Statistics Unit, Research Administration, Arizona Department of Economic Security.

Arizona Department of Environmental Quality (ADEQ). 2006. Air Quality Plans: NAA and AA with Maintenance Plans. Available at http://www.azdeq.gov/environ/air/plan/nonmeet.html (accessed on March 31, 2006).

_____. 2006. Arizona Climate Change Advisory Group Climate Change Action Plan. Accessed at http://www.azclimatechange.gov/download/O40F9347.pdf (accessed June, 2010)

_____. 2005. *2005 Air Quality Annual Report*. Available at http://www.azdeq.gov/function/forms/download/2005/aqd.pdf (accessed on March 31, 2006).

_____. 2004. *2004 Air Quality Annual Report*. Available at http://www.azdeq.gov/function/forms/download/2004/air.pdf (accessed on March 31, 2006).

_____. 2003. *2003 Air Quality Annual Report*. Available at http://www.azdeq.gov/function/forms/download/2003/aq.pdf (accessed on March 31, 2006).

_____. 2002. 2002 Air Quality Annual Report. Available at http://www.azdeq.gov/function/forms/reports.html#2002 (accessed on March 31, 2006).

_____. 2001. *2001 Air Quality Report*. Available at http://www.azdeq.gov/function/forms/reports.html#2001 (accessed on March 31, 2006).

_____. 2000. *Annual Report 2000: Appendix I Air Quality Report*. Prepared by the Air Quality Division.

_____. 1999. *1999 Air Quality Report: Appendix I to the 1999 Annual Report*. Prepared by the Air Quality Division.

_____. 1998. *Air Quality Report: Appendix I to the 1998 Annual Report*. Prepared by the Air Quality Division.

_____. 1996. *AP 42, Fifth Edition, Volume I Chapter 13: Miscellaneous Sources, Section 13.1: Wildfires and Prescribed Burning*. Available at www.azdeq.gov/function/forms/archives.html (accessed May 11, 2006).

Arizona Department of Mines and Mineral Resources. 2003. Arizona Mining Preliminary Review for 2002. Nyal Niemuth, Mining Engineer . http://www.mines.az.gov/Info/annual_production.html (accessed June, 2010)

Arizona Department of Water Resources (ADWR). 1999a. Phoenix Active Management Area 3rd Management Plan. Arizona Department of Water Resources on-line report. (accessed December 1, 2003). http://www.azwater.gov/AzDWR/Watermanagement/AMAs/ThirdManagementPlan3.htm#Phoenix

_____. 1999b. Pinal Active Management Area 3rd Management Plan. Arizona Department of Water Resources on-line report. http://www.azwater.gov/AzDWR/Watermanagement/AMAs/ThirdManagementPlan3.htm#Pinal (accessed June, 2010).

Arizona Game and Fish Department (AGFD). 2005. Wildlife Water Development Standards. Revised April 2005.

_____. 2003. Arizona Heritage Data Management System. Available at http://www.azgfd.gov/w_c/edits/hdms_species_lists.shtml (accessed June, 2010)

_____. 2003. The Economic Importance of Fishing and Hunting: Economic data on fishing and hunting for the State of Arizona and for each Arizona County. Prepared by Jonathan Silberman, PhD, Arizona State University West, School of Management. Available at http://www.gf.state.az.us/pdfs/w_c/FISHING_HUNTING%20Report.pdf

_____. 2003. *Hunt Arizona Survey: Harvest, and Hunt Data for Big and Small Game.* Phoenix Office, Phoenix, Arizona.

_____. 2002. Arizona Shooting Ranges, a Strategic Plan for the Development of Arizona Shooting Ranges.

_____. 2002. Arizona Shooting Ranges, a Strategic Plan for the development of Arizona Shooting Ranges. Draft for Public Review and Comment. September. http://www.basfaz.com/Strategic_Plan.htm (accessed June 2010)

_____. 2001a. Wildlife 2006. The Arizona Game and Fish Departments Wildlife Management Program Strategic Plan for the years 2001-2006. Approved by the AGFD Commission January 19, 2001. 91 pp. Available at www.azgfd.com.

_____. 2001. *Wildlife 2006, Wildlife Management Program Strategic Plan for the Years 2001-2006*.

_____. 1997. *Echinomastus erectocentrus* var. *acuñensis*. Unpublished Abstract Compiled and Edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, Arizona.

_____. 1996. *Wildlife of Special Concern in Arizona*. Draft Arizona Game and Fish Department Publication. Phoenix, Arizona. March 16.

Arizona Game and Fish Department and Arizona State Parks. 2003. The Economic Importance of Off-Highway Vehicle Recreation. Economic data on off-highway vehicle recreation for the State of Arizona and for Each Arizona County Study Prepared by Jonathan Silberman, PhD, Arizona State University West, School of Management. Available at http://www.gf.state.az.us/pdfs/w_c/OHV%20Report.pdf

Arizona Humanities Council. 2000. *Cultural Heritage Tourism, Practical Applications*. Available at http://www.azhumanities.org/pdf/chtwrkbk.pdf. September.

Arizona Interagency Desert Tortoise Team and Arizona Game and Fish Department. 1996. *Management Plan for the Sonoran Desert Population of the Desert Tortoise in Arizona*.

Arizona Interagency Desert Tortoise Team. 2000. R.C. Averill-Murray, ed. *Status of the Sonoran Population of the Desert Tortoise in Arizona: an Update*. Arizona Interagency Desert Tortoise Team and Arizona Game and Fish Department, Phoenix. 48pp.

Arizona Mining Association. 2002. Copper: An Economic Profile, 2002. Available at http://www.azcu.org/economicprofile/2002.html

Arizona Public Service (APS). 2006. APS Completes First Solar Trough Power Plant in Arizona; and the First Built in the U.S. in 17 Years. April 20. Phoenix, Arizona. Available at http://www.aps.com/main/news/releases/release_315.html

_____. 2003. *Arizona Public Service Company 2003-2012 Ten-Year Plan*.

_____. 2000. *Buckeye Conceptual Planning Final Report*. Prepared by BRW. Phoenix, Arizona. June.

Arizona Rock Products Association (ARPA). 2006. *Impact of the Rock Products Industry on the Arizona Economy*. Prepared by W.P. Carey School of Business, Arizona State University

Arizona State Drought Monitoring Technical Committee, Arizona Water Department. 2009. *Monthly Drought Status by Watershed.* Phoenix, Arizona, November 2, 2009.

Arizona State Land Department. 2003. *Conceptual Plan for Gila Bend*.

Arizona State Mine Inspector (ASMI). 2002. *Ninety-first Annual Report for the Calendar Year 2002.* Office of the Arizona State Mine Inspector. Douglas K. Martin. 37 pp. http://www.asmi.state.az.us/02annrpt.pdf

_____. 1998. *Eighty-seventh Annual Report for the Calendar Year 1998*. Douglas K. Martin. http://www.asmi.state.az.us/98Annrpt.pdf

Arizona State Parks. 2009. *Arizona Trails 2010: A Statewide Motorized & Non-Motorized Trails Plan*. Phoenix, Arizona.

_____. 2004. *Arizona Trails 2005: Statewide Motorized and Nonmotorized Trails Plan.* Phoenix Office, Phoenix, Arizona.

_____. 2003. *Statewide Comprehensive Outdoor Recreation Plan* (*SCORP*). October 2002. Phoenix Office, Phoenix, Arizona.

_____. 1999. *Arizona Trails 2000: State Motorized and Nonmotorized Trails Plan*. Phoenix Office, Phoenix, Arizona.

AZSITE Consortium. 2003. *AZSITE Cultural Resource Inventory.* Arizona State Museum, Arizona State University, Museum of Northern Arizona, State Historic Preservation Office. Electronic document, http://azsite.asu.edu (data acquired on 26 October 2003).

Belnap, J., J.H. Kaltnecker, R. Rosentreter, J. Williams, S. Leonard, and D. Eldridge. 2001. *Biological Soil Crusts: Ecology and Management*. U.S. Department of the Interior (USDI), Bureau of Land Management (BLM) Technical Reference 1730-2, 119.

Bent, A.C. 1940. Life histories of North American Cuckoos, Goastsuckers, Hummingbirds, and their allies. U.S. Natural Museum Bulletin. pp 176.

Bolen, W. P. 2001. Sand and Gravel, Construction. U.S. Geological Survey Minerals Yearbook 2001._____. 2002. Sand and Gravel, Construction. U.S. Geological Survey Minerals Yearbook 2002._____. 2003. Sand and Gravel, Construction. U.S. Geological Survey Minerals Yearbook 2003._____. 2004. Sand and Gravel, Construction. U.S. Geological Survey Minerals Yearbook 2004._____. 2005. Sand and Gravel, Construction. U.S. Geological Survey Minerals Yearbook 2005.

Brown, B.T. 1988. Breeding ecology of a willow flycatcher population in Grand Canyon. *Arizona. Western Birds* 19:25-33.

Brown, D. E. ed. 1994. *Biotic Communities: Southwestern United States and Northwestern Mexico*. Salt Lake City, Utah: University of Utah Press. 342 p.

Brown, D.E., and C. H. Lowe. 1980. Biotic Communities of the Southwest. General Technical Publication RM-78, U.S. Forest Service Rocky Mountain and Range Experimental Station.

Brown, D.E., C.H. Lowe, and C.P. Pace. 1979. A digitized classification system for the biotic communities of North America, with community (series) and association examples for the Southwest, J. Arizona-Nevada Acad. Sci., 14 (Suppl. 1), 1–16, 1979

Browning, M.R. 1993. Comments on the taxonomy of *Empidonax traillii* (willow flycatcher). Western Birds 24:241-257.

Bureau of Economic Analysis. 2005. "July 1, 2005 Population Estimates for Arizona's Counties, Incorporated Places and Balance of County," Population Statistics Unit, Research Administration. July 1.

Bureau of Land Management (BLM), US. Department of Interior (USDI). In Press. Phoenix District Fire Management Plan.

Bureau of Land Management (BLM), U.S. Department of the Interior (USDI). 2005. Analysis of the Management Situation for the Phoenix South and Sonoran Desert National Monument RMPS/EIS. Prepared for the Lower Sonoran Field Office. July 2005.

_____. 2005a. *Land Use Planning Handbook, H-1601-1.*

_____. 2005b. *Maricopa Complex Wilderness Management Plan: Five-Year Evaluation.* Phoenix Field Office.

_____. 2005. Personal communication between Myrna Galaz of BLM and Jaime Wood of URS regarding land disposal and acquisition and utility rights-of-way within existing corridors.

_____. 2004. Phoenix South and Sonoran Desert National Monument Resource Management Plans and Environmental Impact Statement Energy and Mineral Resource Potential Report. *Prepared by:* URS Corporation. April. Pp. 110.

_____. 2004a. Personal communication between Camille Champion and Jim Andersen of BLM and Jennifer Frownfelter of URS regarding utility rights-of-way within existing corridors. March 17.

_____. 2004a. News Release, BLM Budget Fact Sheet. Available at http://www.blm.gov/nhp/news/releases/pages/2004/040202_budget/pr040202_budget_FS.html February 2.

_____. 2004b. News Release. BLM Proposes $1.7 Billion for FY 2005 Budget to Enhance Multiple-Use Management through Conservation Partnerships. Available at http://www.blm.gov/nhp/news/ releases/pages/2004/pr040202_budget.htm. February 2.

_____. 2004. Final Energy and Mineral Resource Potential Report. Phoenix South and Sonoran Desert National Monument Resource Management Plans and Environmental Impact Statement. April.

_____. 2003a. Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management. Arizona State Office. Finding of No Significant Impact (FONSI) and Environmental Assessment. September.

_____. 2003. Telephone call from Danny Rakestraw, URS Corporation, to Byron Lambeth, BLM, Phoenix Field Office. December 16.

_____. 2003b. Final Energy and Mineral Potential Report. Phoenix South and Sonoran Desert National Monument Resource Management Plans and Environmental Impact Statement. 62 pp

_____. 2003. Instruction Memorandum No. 2003-275, Consideration of Wilderness Characteristics in Land Use Plans (Excluding Alaska). September 29.

_____. 2003. Woolsey Peak Wilderness and Signal Mountain Wilderness Management Plan, Environmental Assessment, Finding of No Significant Impact, and Decision Record, Phoenix Field Office. December.

_____. 2003c. Summary of October 8 RMP/EIS URS/BLM Interdisciplinary Team Field Trip. Recorded by Carol Wirth.

_____. 2003. GIS Generated Data (potential error ±0.05).

_____. 2003b. BLM Financial Management Information System, Arizona Labor/Operations Target Reports. For Fiscal Years 2001, 2002, and 2003. Dated November 4.

_____. 2003d. Recreation Management Information System data for the Phoenix Field Office, Sonoran Desert National Monument. October 21.

http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/cost_recovery.Par.62768.File.dat/ObtainingaROWPamphlet.ss04-08-05.pdf

_____. 2003g. Bureau of Land Management, Washington Office. Information Bulletin No. 2003-138, Annual Adjustment of Linear Right-of-Way (R/W) Rental Rates. September 12.

_____. 2003i. Tables, Payment in Lieu of Taxes, Total Payments and Total Acres by State/County, Entitlement Acreage by County and Agency, 1999 through 2003. Information obtained from: http://www.blm.gov/pilt. December 16.

_____. 2003. Phoenix Field Office. Surface Management Information.

_____. 2002b. BLM Instruction Memorandum No. 2002-164, Guidance to Address Environmental Justice in Land Use Plans and Related National Environmental Policy Act Documents.

_____. 2002c. Public Land Statistics 2002. http://www.blm.gov/natacq/pls02/

_____. 2002. *Sonoran Desert National Monument Current Management Guidance.* Phoenix Field Office, Phoenix, Arizona. May.

_____. 2002. Instruction Memorandum No. 2002-167, Social and Economic Analysis for Land Use Planning, May 2002. Henri R. Bisson, Assistant Director Renewable Resources and Planning.

_____. 2001. *National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands.* January 2001. Washington, D.C. Office, Washington, D.C.

_____. 2001. National Landscape Conservation System. Arizona Wilderness and Wilderness Study Areas. Map and listing by field office with acreage. Printed by the U.S. Government Printing Office. 763-079/43-5 Region No. 8.

_____. 2001. Integrating GIS Technologies with the Visual Resource Management Inventory Process. Technical Note 407. National Science & Technology Center, Denver, Colorado. November.

_____. 2000c. Bureau of Land Management, Lands and Realty Group, Washington, D.C. Land Use Authorizations-Leases and Permits. http://www.blm.gov/wo/st/en/prog/more/lands/land_use_authorizations.html

_____. 1997. *Arizona Standards for Rangeland Health and Guidelines for Grazing Administration.* Arizona State Office, Phoenix, Arizona.

_____. 1997. *Mining claims and sites on Federal lands*. BLM Solid Minerals Group brochure

_____. 1996. *Recreation and Public Purposes Act*. Washington, D.C.

_____. 1996b. Washington, D.C. *Obtaining a Right-of-Way on Public Lands.* United States Government Printing Office. 573-016/40510.

_____. 1995. *Maricopa Complex Wilderness Management Plan, Environmental Assessment, and Decision Record.* Lower Gila Resource Area, Phoenix.

_____. 1990. *Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona*. Bureau of Land Management, Arizona State Office, Phoenix. 19pp.

_____. 1990. Final Lower Gila South Resource Management Plan (Goldwater Amendment). Phoenix District Office, Phoenix, Arizona. 13 November.

_____. 1988. Desert Tortoise Habitat Management on the Public Lands: A Rangewide Plan. Bureau of Land Management, Washington, D.C. 23 pp.

_____. 1988. *Rangewide plan for managing habitat of desert bighorn sheep on public lands*. U.S. Department of the Interior, Bureau of Land Management, Washington, D.C. 41 pp.

_____. 1988. Record of Decision for the Lower Gila South RMP.

_____. 1988. BLM Manual section 1613 – Areas of Critical Environmental Concern

_____. 1986. H-8410-1. *Visual Resource Inventory*. Government Printing Office. Washington, D.C

_____. 1985. Final Lower Gila South Resource Management Plan Environmental Impact Statement. Phoenix District Office, Phoenix, AZ. August.

_____. 1984. Manual Section 8400. *Visual Resource Management*. Government Printing Office. Washington, D.C. 10

_____. 1983a. *Lower Gila North Management Framework Plan.* Phoenix District Office, Phoenix, Arizona. March.

_____. 1983b. *Lower Gila South Management Situation Analysis*. Phoenix District Office, Phoenix, Arizona.

_____. 1983c. *Phoenix Resource Area Management Situation Analysis*. Phoenix District Office, Phoenix, Arizona. March.

_____. 1980. *Wilderness Review, Arizona: Intensive Inventory of Public Lands Administered by Bureau of Land Management, Decision Report.* Arizona State Office, Phoenix.

Business Week online. 2006. "Copper's Golden Hue." By Mara DerHovanesian with Colin Barraclough. May 9.

Cameron, R.E. 1960. Communities of soil algae occurring in the Sonoran Desert in Arizona. *Journal of the Arizona Academy of Science* 1:85-88.

Carpenter, _____. 1999. "South-Central Arizona: Earth fissures and subsidence complicate development of desert water resources," In *Land Subsidence in the United States,* edited by D. Galloway, D.R. Jones and S.E. Ingebritsen. U.S. Geological Survey, Circular 1182, Pages 65-78.

City of Apache Junction. 1999. *Apache Junction General Plan*.

City of Goodyear. 2001. *City of Goodyear Parks, Trails, and Open Space Master Plan.*

City of Goodyear. 2003. *Goodyear General Plan Update 2003-2013*.

City of Phoenix. 2004. Aviation Department, Historical Traffic Statistics. Available at http://skyharbor.com/pdf/historic_statistics.pdf (accessed on 20 January).

_____. 2003. *Facility Plan, City of Phoenix SR 85 Landfill, Buckeye, Arizona*.

_____. 2001. *City of Phoenix General Plan*.

Clinton, William J. 2001. Proclamation 7397 – Establishment of the Sonoran Desert National Monument.

Cordy, G.E., J.A. Rees, R.J. Edmonds, J.B. Gebler, L. Wirt, D.J. Gellenbeck and D.W. Anning. 1998. *Water-Quality Assessment of the Central Arizona Basins, Arizona and Northern Mexico – Environmental Setting and Overview of Water Quality*. U.S. Geological Survey Water-Resources Investigation Report 98-4097.

Corman, T. 2005. Yellow-billed cuckoo. In: Arizona Breeding Bird Atlas. T. Corman and C. Wise-Gervais, eds. University of New Mexico Press, Albequerque, NM. 2pp.

DeLorme. 1999. Arizona Atlas and Gazetteer. Topo Maps of the Entire State. Public Lands. Back Roads. Third Edition.

Ehrlich, P.R., D. S. Dobkin and D. Wheye. 1988. The birder's handbook. Simon and Schuster, New York, p.286.

Eller, B.M. 1997. Road dust induced increase of leaf temperature. *Environmental Pollution* 13:99-107

Esque, T.C., C.R. Schwalbe, L.A. DeFalco, R.B. Duncan, and T.J. Hughes. 2003. Effects of desert wildfires on desert tortoise (Gopherus agassizii) and other small vertebrates. The Southwestern Naturalist 48(1): 103-111. Referenced in USDI, BLM. 2003. Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management. Arizona State Office. Finding of No Significant Impact (FONSI) and Environmental Assessment. September.

Esque, T.C., and C.R. Schwalbe. In Review. *Alien Annual Plants and Their Relationships to Fire and Vegetation Change In Sonoran Desertscrub. In Invasive Organisms in the Sonoran Desert. Tellman, B., and T. R. Van Devender, eds. Arizona-Sonora Desert Museum.* Publisher to be determined. Tucson, Arizona.

Farmer, A.M. 1992. The effects of dust on vegetation – a review. Environmental Pollution 79:63-75.

Federal Register. 2002. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Arizona Distinct Population Segment of the Cactus Ferruginous Pygmy-owl (*Glaucidium brasilianum cactorum*). Vol. 67, No. 229. 71032-71064.

Fleming, T.H., M.D. Tuttle, and M.A. Horner. 1996. Pollination biology and the relative importance of nocturnal and diurnal pollinators of three species of Sonoran Desert cacti. Southwestern Naturalist. 41:257-269.

Fleming, T.H., R.A. Nunez, and L.S.L. Steinberg. 1993. Seasonal changes in the diets of migrant and non-migrant nectarivorous bats as revealed by carbon stable isotope analysis. Occologia 94: 72-74.

Flesch, A.D., and R.J. Steidl. 2007. *Association between roadways and cactus ferruginous pygmy-owls in northern Sonora, Mexico.* Final Report for Arizona Department of Transportation , Environmental Planning Group, Phoenix: Arizona Department of Transportation.

Foti, P. and C. Patterson. 2003. *Sonoran Desert National Monument Recreation Impact Inventory Dispersed Sites.* Northern Arizona University. October.

Galliano, S. J. and G. M. Loeffler. 1999. Place Assessment: How People Define Ecosystems. U.S. Department of Agriculture, Forest Service, Pacific Northwest, Research Station; U.S. Department of the Interior, Bureau of Land Management. General Technical Report PNW-GTR-462. http://www.fs.fed.us/pnw/pubs/gtr_462.pdf. September.

GAO. 2007. *Climate Change: Agencies should develop guideance for addressing the effects on federal land and water resources.* Washington, D.C.: United States Government Accountability Office.

Garfin, G., M.A. Crimmins, and K. Jacobs. 2007. "Drought, Climate Variability, and Implications for Water Supply and Management." In *Arizona Water Policy: Management Innovations in an Urbanizing, Arid Region*, by B.G. Colby and K. (eds Jacobs, 61-78. Washington, D.C.: Resources for the Future.

Gellenbeck, D.J., and D.W. Anning. 2002. *Occurrence and Distribution of Pesticides and Volatile Organic Compounds in Groundwater and Surface Water in Central Arizona Basins, 1996-98, and Their Relation to Land Use*. Water-Resources Investigation Report 01-4144.

Gila County. 2003. *Draft Gila County 2012 Comprehensive Plan*.

Groschupf, K. 1987. Status of the yellow-billed cuckoo (*Coccyzus americanus occidentalis*) in Arizona and west Texas. Report prepared for the U.S. Fish and Wildlife Service, under contract no. 20181-86-00731. 34 pp.

Hann et al. 2008. Interagency and The Nature Conservancy Fire Regime Condition Class website. USDA Forest Service, USDA Department of the Interior, The Nature Conservancy and Systems for Environment Management [www.frcc.gov].

Hall, J.A., P. Comer, A. Gondor, R. Marshall and S. Weinstein. 2001. *Conservation Elements of and a Biodiversity Management Framework for the Barry M. Goldwater Range, Arizona*. The Nature Conservancy of Arizona, Tucson.

Hanson, R. 2006. E-mail communication with Ryan Rausch, URS, regarding recreation activities in SDNM, June 12, 2006.

Harp, A. J., N.R. Rimbey and T. D. Darden. 2001. Cohesion, Integration, and Attachment in Owyhee County Communities. Paper presented at the Annual Meeting of the Society for Range Management, Kailua-Kona, Hawaii, February 17-23.

Headwaters Economics. 2009. "Economic Profile System." Headwaters Economics, Bozeman, Montana.

Hubbard, J.P. 1987. The status of the willow flycatcher in New Mexico. Endangered Species Program, New Mexico Department of Fish and Game, Santa Fe, New Mexico. 29 pp.

Hunter, M.L., Jr. 1996. Fundamentals of conservation biology. Blackwell Science, Inc., Cambridge, MA.

Interagency Monitoring of Protected Visual Environments (IMPROVE). 2000. *Spatial and Seasonal Patterns and Temporal Variability of Haze and its Constituents in the United States: Report III*. Available at http://vista.cira.colostate.edu/improve/Publications/Reports/2000/2000.htm (accessed March 31, 2006).

Interagency Standards for Fire and Aviation Operations Task Group. 2010. Environmental Guidelines for Delivery of Retardant or Foam near Waterways.

IPCC. 2007. *IPCC Fourth Assessment Report.* Geneva: United Nations Environmental Programme.

Jacob, G. R. and R. Schreyer. 1980. Conflict in outdoor recreation: A theoretical perspective. *Journal of Leisure Research* 12(4): 368-380.

Johnson, R.R., L.T. Haight, and J.M. Simpson. 1987. Endangered habitats versus endangered species: a management challenge. Western Birds 18:89-96.

Justus, J.R., and S.R. Fletcher. 2007. *Global Climate Change.* Nova Acience Publishing, Inc.

Kade, A., and S.D. Warren. 2002. Soil and plant recovery after historic military disturbances in the Sonoran Desert, USA. *Arid Land Research and Management* 16: 231-243.

Katibah, E.F. 1984. A brief history of riparian forests in the Central Valley of California. Pages 23-29 *in* R.E. Warner and K.M. Hendrix eds. California Riparian Systems: Ecology, Conservation, and Productive Management. University of California Press, Berkeley, California.

Keith, S. B., D. E. Gest, E. DeWitt, N. W. Toll, and B. A. Everson. 1983. Metallic Mineral Districts and Production in Arizona. Arizona Bureau of Geology and Mineral Technology Bulletin 194, 58 pp.

Krausman, P.R., J.R. Morgart, L.K. Harris, C.S O'Brien, J.W. Cain III, and S.S. Rosenstock. 2005. Introduction: management for the survival of Sonoran pronghorn in the United States. *Wildlife Society Bulletin*. 33(1):5-7.

Maricopa. 2006. (City of Maricopa) Special Census 2005 Executive Summary. May 2. Phoenix, Arizona.

Maricopa Association of Governments (MAG) 2003. Interim Projections of Population, Housing and Employment by Municipal Planning Area and Regional Analysis Zone. July.

_____. 2003. Final Regional Transportation Plan. November 25. Available at http://www.mag.maricopa.gov/detail.cms?item=3082.

_____. 2000. *Desert Spaces Plan*. Available at http://www.mag.maricopa.gov/detail.cms?item=2560

Maricopa County. 2004. *Maricopa County Regional Trail System Plan*. August 16.

_____. 2003. *Maricopa County 2020 Eye To The Future Rainbow Valley Area Plan Update*. Maricopa County Planning and Development, Phoenix, Arizona. March.

_____. 2003. *Draft Rainbow Valley Area Plan*.

_____. 2003. *Draft State Route 85 Corridor Area Plan*.

_____. 2003. *White Tanks Grand Avenue Area Plan*.

_____. 2002. *Maricopa County Regional Trail System Plan Phase One*.

_____. 2002b. Maricopa County Regional Trail System. Presentation to the Phoenix Association of Realtors. http://www.maricopa.gov/trail/pdf/realtors.pdf.

_____. 2002. *Maricopa County 2020, Eye to the Future Comprehensive Plan*.

_____. 2002. *Tonopah/Arlington Area Plan*.

_____. 1992. *Grand Avenue Corridor Area Land Use Plan*.

_____. 1992. *Maricopa County Land Use Plan Queen Creek Planning Area*.

_____. 1991. Maricopa County Land Use Plan Mobile Planning Area.

Maricopa County Parks and Recreation. 2004. *San Tan Mountains Regional Park Master Plan Environmental Assessment*.

McFadden, L.D., E.V. McDonald, S.G. Wells, K. Anderson, J. Quade, and S.L. Forman. 1998. The vesicular layer and carbonate collars of desert soils and pavements: formation, age, and relation to climate change. G*eomorphology* 24:101-145.

Mine Safety and Health Administration. 2004. Mine Yearly Reported Production Information from 1983 to 2003 for Mine IDs 0201049, 0200112, 0202503, 0202416, 0202859, 0201136, 0202614, 0200156, and 0202798. Sum Average of Annual Employment data (totals). http://www.msha.gov/drs/drshome.htm.

Monson, G., and L. Sumner. 1980. *The Desert Bighorn: Its Life History, Ecology and Management*. The University of Arizona Press, Tucson.

Morrison Institute for Public Policy. 2000. *Hits and Misses: Fast Growth in Metropolitan Phoenix*. Copyright by the Arizona Board of Regents for and on behalf of Arizona State University and its Morrison Institute for Public Policy. http://morrisoninstitute.asu.edu/publications-reports/HitsAndMisses-FastGrowthMetroPhx/view?searchterm=hits%20and%20misses

Morrison, P.H., H.M. Smith IV and S.D. Snetsinger. 2003. *The Natural Communities and Ecological Condition of the Sonoran Desert National Monument and Adjacent Areas*. Winthrop, Washington: Pacific Biodiversity Institute.

Munzer, O.M., H.C. English, A.B. Smith, and A.A. Tudor. 2005. Southwestern willow flycatcher 2004 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 244. Arizona Game and Fish Department, Phoenix, Arizona.

National Oceanic and Atmospheric Administration (NASS). *National Weather Service*. Available at http://www.nws.noaa.gov.

National Weather Service Forecast Office. 2009. Phoenix Monthly Precipitation 1896 to Present. 2009. http://www.wrh.noaa.gov/psr/climate/ (accessed October 30, 2009).

National Plan of Integrated Airport Systems (2001-2005).

National Wildfire Coordinating Group (NWCG). 2008. *Glossary of Wildland Fire Terminology.* Available at http://www.nwcg.gov/pms/pubs/glossary/pms205.pdf.

Niemuth, Nyal J. 2006. Arizona's Metallic Resources, Trends and Opportunities 2006, Open File Report 06-23. Phoenix, Arizona. February.

_____. 2005. Arizona Department of Mines and Mineral Resources, Arizona 2004 Mining Review. Phoenix, Arizona.

_____. 2003. Copper production. Letter from Nyal Niemuth, Arizona Department of Mines and Mineral Resources, to Dennis Carlson, URS. August 25. 6 pp.

Okin. G.S., B. Murray, and W.H Schlesinger. 2001. Degradation of sand arid shrubland environments: observations, process modeling, and management implications. *Journal of Arid Environments* 47: 123-144.

Organ Pipe Cactus National Monument (OPCNM). 1999. *Ecological monitoring program annual report, 1996*. Organ Pipe Cactus National Monument, Arizona.

_____. 1998. *Ecological Monitoring Program Annual Report, 1995*. Organ Pipe Cactus National Monument, Arizona.

Phillips, K.. A., N. J. Niemuth and D.R. Bain. 2002. Active Mines in Arizona - 2001-2002. Arizona Department of Mines and Mineral Resources Directory 49, 34 pp.

Pima County. 2004. *Draft Pima County Multi-Species Conservation Plan*.

_____. 2004. *Sonoran Desert Conservation Plan*. Pima County, Tucson, Arizona.

_____. 2003. *Pima County Comprehensive Plan*. Pima County Development Services Department Planning Division, Tucson, Arizona. Adopted in 1992, revised in June 2003.

_____. 2002. Pima County, Arizona, Department of Finance. 2002. Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 2002.

Pinal County. 2001. *Pinal County Comprehensive Plan*. Pinal County Planning, Florence, Arizona. December.

Pollack, E. D. 2002. Arizona's Tourism Impact, Arizona Blue Chip. June. Available at http://www.arizonaeconomy.com/word_docs/azbc02-06.htm

P Plus Corporation. 2002. Second Biennial Transmission Assessment 2001-2011. Prepared for the Arizona Corporation Commission, Phoenix, Arizona. December.

Rosenstock, S.S., M.J. Rabe, C.S. O'Brien and R.B. Waddell. 2004. Studies of wildlife water developments in southwestern Arizona: wildlife use, water quality, wildlife diseases, wildlife mortalities and influences on native pollinators. Arizona Game and Fish Department Research Branch Technical Guidance Bulletin No. 8. Phoenix, 15 pp.

Saunders, S., C. Montgomery, T. Easley, and T. Spencer. 2008. *Hotter and Drier: The West's Changed Climate.* The Rocky Mountain Climate Organization, Natural Resources Defense Council.

Sheppard, Paul R., Andrew C. Comrie, Gregory D. Packin, Kurt Angersbach, and Malcolm K. Hughes. 2002. "The climate of the US Southwest." *Climate Research* 21 (July): 219-238.

Sogge, M.K. 1995a. Southwestern willow flycatcher (*Empidonax traillii extimus*) monitoring at Tuzigoot National Monument. 1995 progress report to the National Park Service. National Biological Service Colorado Plateau Research Station/Northern Arizona University, Flagstaff, Arizona. 20 pp.

Sogge, M.K. 1995b. Southwestern willow flycatchers in the Grand Canyon. Pages 89-91 *in* LaRoe, E.T., G.S. Farris, C.E. Puckett, P.D. Doran, and M.J. Mac, eds. 1995. Our living resources: A report to the nation on the distribution, abundance, and health of U.S. plants, animals, and ecosystems. U.S. Department of the Interior, National Biological Service, Washington, DC. 520 pp.

Sogge, M.K., B.E. Kus, S.J. Sferra, and M.J. Whitfield. 2003. Ecology and conservation of the southwestern willow flycatcher. Studies in avian biology 26. Cooper ornithological Society, Camarillo, California. 210 pp.

Soil Conservation Service (SCS). 1991. *Soil Survey for Pinal County, Arizona – Western Part*. U.S. Department of Agriculture, Soils Conservation Service (now Natural Resource Conservation Service

_____. 1977. *Soil Surveys for Maricopa County – Central Part*. U.S. Department of Agriculture (USDA), Soils Conservation Service (now Natural Resource Conservation Service. 117 p. plus maps.

_____. 1974. *Soil Survey for Eastern Maricopa and Northern Pinal Counties*. USDA Soils Conservation Service (now Natural Resource Conservation Service. 61 p. plus maps.

Sonoran Institute. 2003. Data and reports prepared by the Sonoran Institute for the Bureau of Land Management to contribute to planning for the Sonoran Desert National Monument. Including (1) reports on Socioeconomic Trends for Maricopa, Pima, and Pinal Counties; Ajo; Buckeye; Casa Grande; Gila Bend; Phoenix; Sells; and Tucson; and (2) Data Sets and Calculations for Civics, Education, Employment, Health and Safety, Housing, Income, Population, Resource and Land Use, and Transportation. May.

Southwick Associates. 2003. Economic Impact Analysis of Nonconsumptive Wildlife-Related Recreation in Arizona. Conducted for the Arizona Game and Fish Department by Southwick Associates in conjunction with the Responsive Management project, Arizona Residents' Attitudes Toward Nongame Wildlife. http://www.gf.state.az.us/pdfs/w_c/AZ%20County%20Impacts%20-%20Southwick.pdf. (accessed June, 2010).

Tepordei, V. V. 2001. Stone, Crushed. U.S. Geological Survey Minerals Yearbook 2001._____. 2002. Stone, Crushed. U.S. Geological Survey Minerals Yearbook 2002._____. 2003. Stone, Crushed. U.S. Geological Survey Minerals Yearbook 2003._____. 2004. Stone, Crushed. U.S. Geological Survey Minerals Yearbook 2004._____. 2005. Stone, Crushed. U.S. Geological Survey Minerals Yearbook 2005

Thompson, J.R., P.W. Mueller, W. Fluckiger, and A.J. Rutter. 1984. The effect of dust on photosynthesis and its significance for roadside plants. *Environmental Pollution (Series A)* 34: 171-190.

Tibbits, T.J., M.K. Sogge, and S.J. Sferra. 1994. A survey protocol for the southwestern willow flycatcher (*Empidonax traillii extimus*). National Park Service Technical Report NPS/NAUCPRS/NRTR-94/04. 24 pp.

Tucson Electric Power. 2006. Springerville Generating Station Solar System Description. Tucson, Arizona. January 1 update. http://greenwatts.com/pages/SolarStats/SolarDescr.html

_____. 2003. Tucson Electric Power Company Ten-Year Plan for Years 2003-2012. Prepared for the Arizona Corporation Commission. Phoenix, Arizona. January.

Unitt, P. 1987. *Empidonax traillii extimus*: an endangered subspecies. Western Birds 18:137-162.

URS Corporation. 2004. *Phoenix South and Sonoran Desert National Monument Resource Management Plans and Environmental Impact Statements Final Air Quality Baseline Report*.

U.S. Air Force. 1999. Renewal of the Barry M. Goldwater Range Land Withdrawal Final Legislative Environmental Impact Statement Volume 1. March.

_____. 1996. *Final Characterization Plan for the Munitions Residue Burial Site on the Barry M. Goldwater Range, Arizona*.

U.S. Departments of the Air Force, Navy, and Interior (Lead Agency) and Arizona Game and Fish Department. 2003. *Draft Environmental Impact Statement for a Proposed Integrated Natural Resources Management Plan for the Barry M. Goldwater Range*.

U.S. Departments of the Air Force, Marine Corps, and Interior. 2003. Draft Environmental Impact Statement *Proposed Integrated Natural Resource Management Plan for the* Barry M. Goldwater Range, Arizona. February.

U.S. Census Bureau. 2008. Annual New Privately-Owned Residential Building Permits http://censtats.census.gov/bldg/bldgprmt.shtml

_____. 2003a. New Privately Owned Housing Units Authorized - Top 20 CMSAs/MSAs: 2002 http://www.census.gov/const/www/02msawebchart.pdf 02. May 1.

_____. 2003b. Monthly New Privately-Owned Residential Building Permits, Cumulative to Date Estimates with Imputation, December 2000 for Pinal County (021) and Maricopa County (013). http://censtats.census.gov/bldg/bldgprmt.shtml

_____. 2003c. United States Census Bureau. 2003c. GCT-PH1-R-1 Table, Population, Housing Units, Area, and Density (geographies ranked by total population): 2000 for Arizona and Counties.

_____. 2003d. DP-1 Tables, Profile of General Demographic Characteristics: 2000 for Arizona and Maricopa, Pima, and Pinal Counties. Information obtained from:

_____. 2003e. GCT-PH1-R-1 Table, Population, Housing Units, Area, and Density (geographies ranked by total population): 2000 for Arizona and Counties.

_____. 2003f. Poverty in the United States: 2002. Poverty Thresholds in 2002 by Size of Family and Number of Related Children Under 18 Years. Issued September.

_____. 2003g. DP-3 Table, Profile of Selected Economic Characteristics: 2000. Information obtained from:

_____. 2003h. P6 Table, Race. Information obtained from:

_____. 2003i. QT-H10 Table, Units in Structure, Householder 65 Years and Over and Householder Below Poverty Level: 2000 for United States, Arizona and Counties. Information obtained from:

_____. 2003j. GCT-H5 Table, General Housing Characteristics: 2000 for Arizona and Counties.

_____. 2003k. H18 Table, Average Household Size of Occupied Housing Units by Tenure [3] – Universe: 2000 for United States, Arizona and Counties. Information obtained from:

_____. 2003l. Census 2000 Brief: *The Foreign-Born Population: 2000.* C2KBR-34. By Nolan Malone, Kaari F. Baluja, Joseph M. Costanzo, and Cynthia J. Davis. _____. 2003m. Census 2000 Special Reports, *State-to-State Migration Flows: 1995 to 2000*. CENSR-8. By Marc J. Perry.

_____. 2002a. Poverty Thresholds in 1999, by Size of Family and Number of Related Children Under 18 Years.

_____. 2002b. *The American Indian and Alaska Native Population: 2000*, Census 2000 Brief. C2KBR/01-15. http://www.census.gov/prod/2002pubs/c2kbr01-15.pdf. Issued February.

_____. 2001a. Census 2000 PHC-T-2. Ranking Tables for States: 1990 and 2000. Table 3. States Ranked by percent Population Change: 1990 to 2000. http://www.census.gov/population/cen2000/phc-t2/tab03.txt. Internet Release date: April 2.

_____. 2001b. *Population Change and Distribution, Census 2000 Brief.* C2KBR/01-2. Information obtained from http://www.census.gov/prod/2001pubs/c2kbr01-2.pdf. Issued April.

_____. 2001c. *The Hispanic Population, Census 2000 Brief.* C2KBR/01-3. Information obtained from http://www.census.gov/prod/2001pubs/c2kbr01-3.pdf. Issued May.

_____. 2001d. *Age:2000, Census 2000 Brief.* C2KBR/01-12. Information obtained from http://www.census.gov/prod/2001pubs/c2kbr01-12.pdf. Issued October.

_____. 2000a. Monthly New Privately-Owned Residential Building Permits, Cumulative to Date Estimates with Imputation, December 2000 for Pinal County (021) and Maricopa County (013). http://censtats.census.gov/bldg/bldgprmt.shtml

_____. 2000b. Land Area, Population, and Density for States and Counties: 1990. Table 1. Data are consistent with 1990 Summary Tape File 1C.Released: March 12, 1996; Revised: June 26, 2000 (Corrected population number for Alaska). Information obtained from http://www.census.gov/population/censusdata/90den_stco.txt

U.S. Department of Agriculture (USDA), National Agricultural Statistics Service (NASS). 2004. 2002 Census of Agriculture, Arizona State and County Data. Available online at http://www.agcensus.usda.gov/Publications/2007/Full_Report/Census_by_State/Arizona/index.asp

U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 1997. Soil Survey for the Gila Bend–Ajo Area. USDA Natural Resource Conservation Service. 257 p. plus maps.

_____. 1991. Soil Survey for the Gila River Indian Community, USDA, Natural Resource Conservation Service. 232 p. plus maps.

U.S. Department of Energy (DOE). 2003a. National Solar Radiation Database. Renewable Resource Data Center (RReDC), National Renewable Energy Laboratory website: http://www.nrel.gov/rredc/solar_resource.html.

_____. 2003b. Wind Energy Resource Atlas of the United States. Renewable Resource Data Center (RReDC), National Renewable Energy Laboratory website: http://www.nrel.gov/rredc/wind_resource.html.

U.S. Department of Homeland Security (DES) National Strategy for the Physical Protection of Critical Infrastructure and Key Assets. February 2003. Available at http://www.dhs.gov/xlibrary/assets/Physical_Strategy.pdf

U.S. Department of the Interior (USDI), National Park Service (NPS). 2003. Juan Bautista de Anza National Historic Trail Long Range Interpretive Plan. Information obtained from http://www.nps.gov/juba/parkmgmt/index.htm.

_____. 1998. *Organ Pipe Cactus National Monument Final General Management Plan Development Concept Plans Environmental Impact Statement*.

_____. 1996. Juan Bautista de Anza National Historic Trail Comprehensive Management and Use Plan Final Environmental Impact Statement. Information obtained from http://www.nps.gov/archive/juba/plan/anzaplan.htm. April.

_____. 1995. Economic Impacts of Protecting Rivers, Trails, and Greenway Corridors A Resource Book. Rivers, Trails, and Conservation Assistance. Fourth Edition. Revised.

U.S. Department of Interior. U.S. Geological Survey (USGS). 2007. Mineral Commodity Summaries 2007.

_____. 2007a. Mineral Industry Surveys.

U.S. Department of Transportation, Federal Aviation Administration. 2001. *Final Regional Transportation Plan*. Maricopa Association of Governments, 2003.

U.S. Department of Transportation (UDOT), Federal Aviation Administration (FAA). 2003. FAA Order 7400.2E. Procedure for Handling Airspace Matters. May 15.

U.S. Environmental Protection Agency (EPA). 2006. *Appendix G: Measures of Visibility Impairment and Light Extinction.* Available at http://www.epa.gov/ttncaaa1/t1/reports/pmspapg.pdf. (accessed March 31, 2006).

_____. 2003. *AP 42, Fifth Edition, Volume I Chapter 13: Miscellaneous Sources, Section 13.2.2: Unpaved Roads*. Available at http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf (accessed May 11, 2006).

U.S. Fish and Wildlife Service (FWS). 2006. Available at http://www.fws.gov/southwest/es/arizona/Threatened.htm#CountyList. Accessed March 30, 2006.

_____. 2005. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Southwestern Willow Flycatcher; Final Rule. Federal Register 70 (201): 60886-61009. October 19.

_____. 2004. Species Assessment and Listing Priority Form for Yellow-billed cuckoo, Western United States Distinct Population Segment. Available at: http://ecos.fws.gov/docs/candforms_pdf/r8/B06R_V01.pdf

_____. 2003a. Cactus Ferruginous Pygmy-owl Abstract. Species Abstract Compiled and Edited by the Arizona Ecological Services Field Office, United States Fish and Wildlife Service, Phoenix, Arizona.

_____. 2003b. Sonoran Pronghorn Abstract. Species Abstract Compiled and Edited by the Arizona Ecological Services Field Office, United States Fish and Wildlife Service, Phoenix, Arizona.

_____. 2003c. Revised Biological Opinion: Proposed and Ongoing Activities by the Marine Corps Air Station-Yuma (MCAS-Yuma) (02-21-95-F-0114R4).

_____. 2002. Southwestern willow flycatcher recovery plan. Albuquerque, New Mexico. i-ix +210 pp.

_____. 2001. Endangered and Threatened Wildlife and Plants; 12-month finding for a petition to list the yellow-billed cuckoo (*Coccyzus americanus*) in the western continental United States. Federal Register 66(143): 38611-38626.

_____. 1998. *Final Revised Sonoran Pronghorn Recovery Plan*. U.S. Fish and Wildlife Service, Albuquerque, NM.

_____. 1998. *Final Programmatic Environmental Assessment for the Future Management of Cabeza Prieta National Wildlife Refuge and Draft Comprehensive Conservation Plan*.

_____. 1997. Biological Opinion for Five Grazing Allotments in the Vicinity of Ajo, Arizona. U.S. Fish and Wildlife Service, Region 2, Albuquerque, New Mexico.

_____. 1995. Final rule determining endangered status for the southwestern willow flycatcher. Federal Register 60(38):10694-10715.

_____. 1995. *Lesser Long-nosed Bat Recovery Plan*. U.S. Fish and Wildlife Service, Albuquerque, New Mexico. *45* pp.

_____. 1993. Proposed Rule to list the Southwestern Willow Flycatcher as Endangered with Critical Habitat. Federal Register 58(40):39495-39522.

United States Global Change Research Program. 2010. *Regional Climate Information: Southwest.* http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/regional-climate-change-impacts/southwest (accessed March 26, 2010).

U.S. Immigration and Naturalization Service. 2003. Office of Policy and Planning, *Estimates of the Unauthorized Immigrant Population Residing in the United States: 1990 to 2000*. http://www.dhs.gov/xlibrary/assets/statistics/publications/Ill_Report_1211.pdf. January.

_____. 1996. Illegal Alien Resident Population. Available at http://www.dhs.gov/xlibrary/assets/statistics/illegal.pdf. October.

Van Devender, T.R., R.S. Felger, and A. Búrquez. 1997, Exotic Plants in the Sonoran Desert Region: Arizona and Sonora, California Exotic Pest Plant Council Annual Symposium.

Visibility Information Exchange Web System (VIEWS). 2006. Trends data for Tonto National Monument. Available at http://vista.cira.colostate.edu/DataWarehouse/IMPROVE/Data/SummaryData/group_means_nia_20060306.csv (accessed March 31, 2006).

Weiss, J.L., and J.T. Overpeck. 2005. "Is the Sonoran Desert losing its cool?" *Global Change Biology* 11, no. 12: 2065-2077.

Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam. 2006. "Warming and earlier spring increase western U.S. forest wildfire activity." *Science* 313, no. 5789, August: 940-943.

Western Regional Climate Center (WRCC). 2003a. *Arizona Climate Summaries*. Available at http://www.wrcc.dri.edu/summary/azF.html (accessed on March 31, 2006).

_____. 2003b. *Average Wind Speeds by State*. Available at http://www.wrcc.dri.edu/htmlfiles/westwind.final.html (accessed on March 31, 2006).

_____. 2003c. *RAWS Data*. Available at http://www.wrcc.dri.edu/wraws/az.html (accessed on March 31, 2006).

Whitfield, M.J. and C.M. Strong. 1995. A brown-headed cowbird control program and monitoring for the southwestern willow flycatcher, South Fork Kern River, California. California Department of Fish and Game, Bird and Mammal Conservation Program Report 95-4. Sacramento, California. 17 pp.

Wright, R.L., and J.C. deVos Jr. 1986. Final Report on Sonoran Pronghorn Status in Arizona. Arizona Game and Fish Department. Phoenix, Arizona. 132pp.

Yoakum, J.D. 1978. Pronghorn. In *Big game of North America: Ecology and management*, edited by J.L. Schmidt and D.L. Gilbert, Pp.103-121. Stackpole Books, Harrisburg, Pennsylvania.

Yuma County. 2001. *Yuma County 2010 Comprehensive Plan*.

Zalaznik, S. Wildlife Specialist, Game Branch. AGFD, Phoenix Office. October 2003 – Written communication regarding hunt use days for game management units within the Planning Area from 1993-1997.

Appendix AA. Abbreviations & Acronyms

ACEC	area of critical environmental concern	MAG	Maricopa Association of Governments
ADA	Americans with Disabilities Act	MDOT	Maricopa County Department of Transportation
ADEQ	Arizona Department of Environmental Quality	MIST	minimum-impact suppression tactics
ADOT	Arizona Department of Transportation	MLWA	Military Lands Withdrawal Act
ADWR	Arizona Department of Water Resources	MOU	memorandum of understanding
AGFD	Arizona Game and Fish Department	mph	miles per hour
AMA	active management area	NAAQS	National Ambient Air Quality Standards
ARS	analysis of the management situation	NAFTA	North American Free Trade Agreement
ATV	Arizona Revised Statute	NAGPRA	Native American Graves Protection and Repatriation Act
AUM	animal unit month	NEPA	National Environmental Policy Act
AWC	Arizona Wilderness Coalition	NF	national forest
BLM	Bureau of Land Management	NHPA	National Historic Preservation Act
BGR	Barry M. Goldwater Range	NHT	National Historic Trail
BMP	best management practice	NO2	nitrogen-dioxide
CEQ	U.S. Council on Environmental Quality	NPS	National Park Service
CFR	U.S. Code of Federal Regulations	NRCS	Natural Resource Conservation Service
CO	carbon-monoxide	NRHP	National Register of Historic Places
CO2	carbon-dioxide	NSPL	National System of Public Lands
DDT	dichlorodiphenyltrichloroethane	NWR	national wildlife refuge
DEIS	draft environmental impact statement	O	ozone
DFC	desired future condition	OHV	off-highway vehicle
DHS	Department of Homeland Security	ONA	outstanding natural area
DOI	Department of the Interior	ORV	off-road vehicle
DPC	desired plant community	PILT	payment in lieu of taxes
DRC	desired resource condition	PM10	particulate matter 10 microns in diameter or less
DRMP	draft range management plan	PM2.5	particulate matter 2.5 microns in diameter or less
EIS	environmental impact assessment	R&PP	recreation & public purposes
EPA	Environmental Protection Agency	RMP	resource management plan
ERMA	extensive recreation management area	RMZ	recreation management zone
ESA	Endangered Species Act	ROD	record of decision
FAA	Federal Aviation Administration	ROS	recreation opportunity spectrum
FAMS	facility and asset management system	ROW	right-of-way
FHWA	Federal Highway Administration	SCRMA	special cultural resource management area
FLPMA	Federal Land Policy Management Act	SDNM	Sonoran Desert National Monument
FWS	U.S. Fish and Wildlife Service	SHPO	State Historic Preservation Office
GHG	greenhouse gas	SRMA	special recreation management area
HMA	herd management area	SO2	sulfur-dioxide
HMP	habitat management plan	SR-85	State Route 85
I-8	Interstate 8	SRP	special recreation permit
I-10	Interstate 10	T&E	threatened and endangered
IFNM	Ironwood Forest National Monument	TMA	travel management area
IM	instruction memorandum	UDA	undocumented alien
IMPROVE	integrated monitoring of protected visual environments	USAF	United States Air Force (U.S. Air Force)
LAC	limits of acceptable change	USC	United States Code
LSFO	Lower Sonoran Field Office	USDA	U.S. Department of Agriculture
LTVA	long-term visitor area	USDOT	U.S. Department of Transportation
LUA	land us authorization	USFS	U.S. Forest Service
LUP	land use plan	USGS	U.S. Geological Survey

LWCs	lands with wilderness characteristics	UXO	unexploded ordnance
VIEWS	Visibility Information Exchange Web System	WSA	wilderness study area
VRM	visual resource management	WUI	wildland-urban interface
WHA	wildlife habitat areas	YPG	Yuma Proving Ground
WRCC	Western Regional Climate Center		

Index

- -

, xlviii

- A-

abandoned mines, lviii, lxiii, 78, 180, 212, 215, 269, 347, 347, 348, 348, 348, 348, 348, 352, 352, 379, 406, 445, 818, 822, 822, 822, 826, 826, 1222
air quality, lii, lii, lv, lix, lix, lix, 2, 42, 46, 48, 48, 48, 49, 49, 49, 49, 50, 50, 114, 188, 189, 202, 219, 221, 222, 224, 226, 227, 229, 230, 232, 234, 236, 239, 240, 241, 245, 246, 247, 248, 253, 254, 254, 254, 255, 255, 255, 256, 256, 257, 257, 258, 259, 374, 377, 377, 377, 385, 385, 386, 386, 387, 387, 388, 388, 388, 388, 391, 394, 396, 397, 399, 399, 543, 548, 550, 554, 557, 559
Ajo, 585, 586, 586, 598, 599, 629, 632, 645, 651, 668, 694, 707, 709, 709, 709, 716, 717
Ak-Chin Indian Community, lii, lxiv, 4, 7, 58, 199, 206, 346
Area of Critical Environmental Cocnern (ACEC), xlix, lvii, 37, 55, 60, 134, 182, 194, 389, 889
Arizona Department of Transportation (ADOT), lii, 8, 26, 98, 169, 200, 307
Arizona Game and Fish Department (ADOT), 1023, 1215, 1226, 1228, 1241, 1241, 1243, 1244, 1245
Arizona State Land Department, 4, 145, 318, 360, 361, 989

- B-

Back Country, 30, 32, 134, 170, 172, 176, 201, 416, 416, 461, 506
bighorn sheep, 20, 21, 65, 79, 267, 441, 460, 562
Buckeye Hills, lvii, 4, 165, 169, 187, 629, 1298, 1299
Bureau of Reclamation, 4, 311, 317, 323, 618
Burro, 12, 46, 67, 345, 949
Byway (Back Country, Scenic), 30, 32, 345, 671, 952

- C-

cactus ferruginous pygmy-owl, 71, 71, 77, 275, 1247, 1247, 1248, 1327, 1327
Cooperating agency, lii, 7, 219, 349, 954
critical habitat, 20, 81, 81, 83, 123, 218, 970, 1000
Cuerda de Lena, 34, 70, 72, 109, 155, 196, 1241, 1306

- D-

desert tortoise, liii, lx, 1, 10, 20, 63, 65, 67, 67, 68, 68, 68, 163, 274, 274, 957

- E-

endangered species, xlv, lii, liii, lxiii, 1, 8, 16, 22, 22, 25, 31, 45, 53, 63, 67, 81, 83, 89, 108, 109, 117, 118, 120, 123, 128, 128, 137, 164, 194, 271, 299, 321, 367, 368, 370, 961, 967, 982, 993, 1086, 1087, 1354
environmental justice, lviii

- F-

Federal Land Policy Management Act, xxxix
fee(s), 12, 46, 83, 114, 114, 114, 115, 116, 167, 168, 168, 211, 220, 223, 227, 228, 229, 1090, 1091, 1220, 1297, 1298, 1299, 1300
fire management, lxiii
Fred J. Weiler, 32, 33, 34, 36, 74, 92, 134, 134, 143, 155, 207, 207, 1027

front country, lvii, 3, 4, 5, 13, 70, 71, 72, 95, 126, 126, 127, 129, 129, 129, 131, 131, 132, 159, 166, 167, 168, 169, 169, 171, 171, 172, 173, 279, 291, 291, 292, 296, 301, 304, 310, 310, 310, 310, 311, 311, 1023, 1032, 1037, 1037, 1038, 1134, 1285, 1286, 1287, 1289, 1290

- G-

Gila Bend, xl
grazing allotment, 2, 32, 34, 37, 38, 40, 41, 83, 137, 137, 138, 139, 145, 219, 238, 271, 271, 275, 280, 280, 281, 321, 321, 322, 446, 452, 475, 499, 512, 514, 567, 584, 592, 594, 606, 614, 645, 650, 653, 655, 656, 657, 658, 662, 662, 663, 687, 696, 697, 799, 851, 916, 917, 917, 918, 927, 928, 929, 929

- H-

hazardous materials, lvii, lxiii, 47, 209, 209, 209, 209, 209, 211, 211, 211, 211, 211, 211, 215, 220, 222, 224, 1228, 1228, 1229, 1229, 1269, 1276
herd management area (HMA), 106, 107, 297, 297, 965, 965, 1257, 1258, 1259, 1259, 1260

- J-

Juan Bautista de Anza Trail, liii, 20, 116, 280, 473, 478, 483, 484, 544, 554, 575, 576, 624, 643, 720, 728, 734, 1051, 1073

- L-

Land Health Standards, 42, 43, 43, 86, 87, 89, 90, 91, 102, 137, 139, 145, 146, 146, 147, 188, 189, 190, 190, 191, 280, 319, 319, 319, 321, 991, 996
land tenure, lxii, lxii, 12, 41, 118, 122, 128, 129, 130, 135, 135, 307
land use authorizations, lxii
leasable minerals, xlviii, 56, 57, 72, 76, 77, 77, 80, 151, 151, 153, 155, 157, 167, 168, 326, 326, 1296
locatable minerals, xlviii, lvii, 57, 80, 151, 153, 154, 154, 156, 167, 169, 324, 324, 324, 325, 325, 326, 329, 360, 968

- M-

mineral materials, 72, 111, 112, 152, 156, 156, 196, 204, 324, 328, 328, 328, 328, 328, 329, 329, 329, 329, 360, 953, 962, 969, 969

- N-

National Environmental Policy Act (NEPA), xxxix, 1, 6, 6, 8, 16, 22, 22, 25, 29, 29, 30, 30, 31, 31, 53, 69, 86, 127, 152, 971, 1354
Natural Resource Conservation Service (NRCS), 93, 145, 1361, 1361, 1361
noxious weed(s), 89, 89, 89, 94, 117, 973, 973

- O-

off-highway vehicle (OHV), xlvii, 8, 30, 30, 180, 182, 183, 281, 299, 1089, 1302

- P-

prescribed fire (burning), 73, 94, 114, 115, 115, 116, 116, 116, 306, 306, 1217, 1226, 1226, 1244, 1246, 1246, 1247, 1247, 1247, 1247, 1249, 1249, 1249, 1249, 1250, 1250, 1250, 1250
Primitive Recreation, li, 34, 331, 976, 976, 1088, 1314
priority wildlife, xlviii, liii, lix, 32, 46, 63, 63, 63, 63, 65, 69, 69, 70, 221, 222, 223
Public Health and Safety, 17, 22, 209, 209, 210, 1347

- R-

Range Improvements, lxii, 147, 271, 323, 323, 352, 977, 1104
Record of Decision (ROD), 191, 215, 340
Recreation and Public Purposes (R&PP) Act, 13, 123, 124, 130, 135, 135, 1193
Recreation Management Zone (RMZ), 1295
renewable energy, xlvi, xlviii, xlix, lvi, lvi, lviii, 3, 196, 232, 235, 982
Right of Way (ROW), 119, 120, 128, 128, 271, 307, 316, 334, 334, 364, 1215, 1215, 1216, 1218, 1223
route desingnation, l, lxiii, 14, 31, 57, 87, 180, 180, 180

- S-

saleable minerals, 152, 1332, 1336
Salt River Pima-Maricopa Indian Community, lxiv, 4, 58, 199, 206, 346, 346, 346
sensitive species, 46, 63, 266, 267, 267, 278, 952, 988
Sonoran pronghorn, liii, 10, 11, 11, 20, 21, 34, 66, 70, 72
southwestern willow flycatcher, liii
Special Cultural Resource Management Area (SCRMA), xlviii, xlix, 33, 52, 56, 58, 987
Special Recreation Management Area (SRMA), xlviii, l, 32, 158, 159, 161, 331, 987

- T-

Tohono O'odham Tribal Nation, 1032, 1032, 1089, 1325, 1326

- U-

U.S. Fish and Wildlife Service, lii, 1, 4, 83, 127, 267, 951, 951, 952, 960, 985, 991, 1240, 1241, 1268

- V-

vegetation treatments, 24, 24, 73, 93, 97, 116, 1244, 1247, 1247, 1248, 1250, 1250, 1250, 1250
Vekol Valley, liv, lvii, lvii, 20, 37, 85, 87, 152, 194, 195, 198, 276, 281, 314, 320, 334, 344, 351, 1000, 1089, 1095, 1145, 1314

- W-

water quality, lv, 45, 87, 102, 102, 103, 104, 104, 104, 210, 211, 294, 294, 1142, 1213, 1246, 1254, 1340
wilderness characteristics, lv, lxi, 9, 9, 13, 32, 33, 34, 35, 36, 37, 38, 39, 40, 43, 46, 99, 108, 108, 109, 109, 109, 110, 110, 112, 134, 134, 154, 180, 185, 220, 221, 229, 230, 232, 299, 299, 300, 301, 301, 339
wilderness study area, 9, 43, 160, 180, 300, 339, 345, 1270
wildlife habitat management area (WHA), 33, 34, 35, 36, 37, 38, 39, 40, 63, 64, 64, 64, 64, 64, 70, 70, 71, 71, 71, 81, 99, 122, 154, 214
withdrawal, 12, 13, 25, 55, 72, 77, 80, 104, 105, 118, 124, 124, 124, 124, 125, 151, 153, 155, 155, 169, 207, 208, 285, 307, 316, 324, 1001, 1001, 1001, 1146, 1146, 1217, 1263

- Y-

yellow-billed cuckoo, liii, 70, 74, 74, 74, 269, 273, 273, 1031, 1032, 1035, 1035, 1036, 1036, 1236, 1249
yuma clapper rail, liii, 70, 74, 74, 74, 116, 269, 273, 273, 295, 1031, 1032, 1032, 1035, 1035, 1036, 1036, 1037, 1236, 1249, 1249, 1249