CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

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MAPS

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Note: Maps referenced in this chapter may be found in Volume 4, Map Book.

4-1 Planning Areas, Current Land Use Plans and Amendments

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 Proposed RMP. 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 US Department of the Interior, BLM, or other agencies; and information contained in pertinent, existing literature. Because the proposed resource management plan (PRMP) 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, the BLM developed an appropriate methodology for each program area (i.e., resource, resource use, special area designation, and social and economic condition)that included indicators and assumptions (see **Section 4.1.2**, Overall Assumptions). Indicators are simple measures based on laws, policies, and scientific studies that help the analyst report impacts on the resource or use and are unique to each resource/use. Since an environmental analysis can become very complex, indicators provide a more practical way to track the degree of change resulting from the actions in the alternatives than if the author attempted to record every possible variable and change. It keeps the analysis focused on the most relevant information. For example, destruction of an NRHP-eligible site is an indicator for a significant impact on cultural resources. Assumptions are provided to disclose and clarify any underlying presumptions in the analysis.

The baseline used for the impact analysis is the current condition or situation, as described in **Chapter 3**, Affected Environment. The analysis determined the degree of change that would likely occur to the resource or use, based on the actions put forth in each alternative (see **Chapter 2**, Alternatives); if an action would result in no change or minimal change to the resource, then "no impact" or "negligible impact" was noted.

When possible, the analysis quantified impacts to clearly demonstrate the amount of change from baseline. If quantifying impacts was not possible, a list of qualitative terms was created to describe the level of intensity an impact would have on that program; while most programs used the generic definitions, some programs developed their own definitions and these apply to the specific program analysis.

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, of the Lower Sonoran and SDNM PRMP/FEIS.
- All BLM management activities, which include all management decisions proposed by the alternatives in this PRMP/FEIS, 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.
- 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 on resources while protecting public health and safety.
- Short-term impacts are those that would last no more than five years after implementation of the action that triggers the impact. Long-term impacts are those that would persist longer than five 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 PRMP 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 AND 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.

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 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.

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. 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 for each program area.

4.1.6.1 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.

Table 4-1
Qualitative Terms for the Intensity of Impacts

Negligible	Minor	Moderate	Major
Lower Sonoran			
No known impacts on 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.
SDNM			
No known impacts on 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.	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

Table 4-1
Qualitative Terms for the Intensity of Impacts

Negligible	Minor	Moderate	Major
		Objects may be affected on site and in the vicinity of the activity, but are maintained within the Monument	altered on site, as well as affected over a larger portion of the Monument.

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 mile 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 US 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.

4.1.6.2 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 $PM_{2.5}$, PM_{10}, and fugitive dust. The regulation and limitation of public 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 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 and are shown on **Map 3-1**, Air Pollutant Nonattainment Areas in **Chapter 3**, Affected Environment. Air quality regulation boundaries for $PM_{2.5}$ and PM_{10} will likely expand to encompass the majority of the Decision Area, in parallel with population growth. Additionally, the EPA is reviewing several of the NAAQS, and adoption of more stringent standards may affect the future attainment status of some areas within the Planning Area.

4.1.6.3 Lands and 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.

According to the Solar Energy Development in Six Southwestern States Draft PEIS (DOE and BLM 2010), the estimated acres foreseen to be developed for solar energy facilities on BLM administered lands would be 21,816 acres in 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 Draft PEIS's preferred alternative within the next 20 years.

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 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), 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 under Alternative D to a maximum of 40,600 acres under Alternative B).

4.1.6.4 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 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.

4.1.6.5 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 to 50 acres, and large mines would disturb 100 to 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.

Saleable Minerals

Saleable 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 between 100,000 and 1,000,000 tons per year. Pits would disturb anywhere from 20 to 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.

4.1.6.6 Public Safety and 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.

4.1.6.7 Recreation Management in the Lower Sonoran

Ajo Extensive Recreation Management Area (ERMA)[1]

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 the BLM Travel and Transportation Manual 1626). 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, motocross bike riding and other motorized recreation activities will be provided on designated routes within a 40-acre OHV/all-terrain vehicle (ATV) recreation 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.

Gunsight Wash Special Recreation Management Area (SRMA)

In the Gunsight Wash SRMA, 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.

Buckeye Hills East SRMA

In the Buckeye Hills East SRMA, RFD scenario varies substantially by alternative. Under 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. Under Alternatives C and E, development would be directed toward a balance of motorized and nonmotorized recreation activities. The route

[1] The Ajo Recreation Management Area is identified as a SRMA under Alternative A (No Action) only; it is identified as an ERMA in the Action Alternatives B, C, and E.

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. Under 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).

Extensive Recreation Management Area

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. The typical Public Use Site in the Planning Area is less than 5 acres.

Saddle Mountain SRMA

Under 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. Under 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. Under Alternative D, no facilities would be constructed except to resolve conflicts with other resource uses.

Lower Gila Historic Trails SRMA

In this SRMA, 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 visitor trails (less than two 2 miles), 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.

Painted Rock SRMA

In the Painted Rock SRMA, 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 SRMA 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.

San Tan Mountains SRMA

Under 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.

4.1.6.8 Recreation Management in the SDNM

The typical Public Use Site in the Planning Area is less than 5 acres. 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 of these would be 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. Under 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.

4.1.6.9 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 could cause increased impacts on 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 to 50 miles of new low-maintenance roads and 300 to 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.

4.1.6.10 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 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.

4.1.6.11 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 scenario's 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 and Impact Analysis). 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 on request and are on file for public review at the Phoenix District Office.

4.1.6.12 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 and 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 to 50 miles of new low maintenance roads and 300 to 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.

4.1.6.13 Wild Horse and 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.

4.1.6.14 Wildlife and Special Status Species

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, using PVC pipes and netting, to help acclimate burrowing owls to suitable habitat.

Sonoran Desert Tortoise Habitat

Potential artificial housing for displaced Sonoran desert tortoises will be constructed.

4.1.7 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 PRMP/FEIS 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

In general, a qualitative comparison approach was selected for the analysis of impacts on air quality based on an understanding of the current air quality conditions within the Planning Area. Current air quality conditions are described in detail in **Section 3.2.1**, Air Quality, and are summarized as follows:

- The Planning Area includes some land within the Phoenix metropolitan nonattainment area for PM_{10}, O_3, and nonattainment with a maintenance plan for CO.
- The Planning Area includes Globe-Miami, which is categorized as a nonattainment area for PM_{10} and attainment with a maintenance plan for SO_2.
- The Planning Area includes Ajo, which is categorized as a nonattainment for PM_{10} and 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 could 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 measures affected by activities on public lands are PM_{10} and $PM_{2.5}$. While significant across the landscape, CO, NO_2, VOCs, SO_2, and O_3 are unlikely to be substantially changed by actions on public lands. Impacts on air quality are assessed for the different alternatives to attain the overall air quality goal that managing use in the Decision Areas is consistent with air quality standards.

The BLM must comply with applicable State and Federal air quality control regulations, as well as air quality administrative actions. Under Section 176(c)(1) of the CAA, the BLM is responsible for demonstrating that its actions do not interfere with state and local plans to bring an area into attainment with the NAAQS. The BLM contracted for a CAA general conformity analysis to determine whether the actions proposed under Alternative E of the RMP (the preferred alternative) are subject to and meet the requirements of the General Conformity Rule and whether those actions conform to the applicable state implementation plans (SIPs). This was to meet the implementing regulations for the CAA General

Conformity rule (40 CFR 51 Subpart W and 40 CFR 93 Subpart B). The results of this analysis have been included in **Section 4.2.7**, Alternative E (Preferred Alternative), of the PRMP/FEIS.

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 are 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 **Section 4.1.6**, Reasonably Foreseeable Development Scenarios, 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 on air resources management are anticipated for management actions relating to the following program areas:

- 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 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 SDNM is withdrawn from new mineral entry under all alternatives. The withdrawal was established in the proclamation that established the Monument. This withdrawal has a protective effect on air resources, as ground disturbance from exploration, prospecting, and other activities associated with mineral development would be generally prohibited, thereby reducing air pollutant emissions.

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 on the extent and intensity of ground disturbance, there may be minor air pollutant emissions resulting from dust particulates and vehicle exhausts. However, the BLM, as the owner/manager of the surface, would work with operators to mitigate impacts on air resources. Methods would likely include project design features or best management practices that reduce or eliminate dust particulates at the project site or lessen vehicle and equipment emissions.

4.2.3 ALTERNATIVE A (NO ACTION)

4.2.3.1 Both Decision Areas

No unique impacts are identified for either of the Decision Areas under Alternative A.

4.2.3.2 Lower Sonoran

From Lands and 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 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 existing allotments in the Lower Sonoran would be open for grazing, with the exception of the Cameron Allotment. Livestock movement would have a minor 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. It would also cause an associated short-term decline in air quality, but this would be unlikely to cause regional air quality thresholds to be exceeded. Impacts would be minor.

As discussed in **Section 4.6**, Impacts on Soil Resources, about 8 percent of the Lower Sonoran Decision Area where ephemeral or perennial/ephemeral grazing occurs has moderate to high potential for wind erosion. Fugitive dust emissions would occur, to the extent that livestock grazing causes the permanent removal of vegetation through trampling and disturbance of sensitive surface cover provided by desert pavement and cryptobiotic crusts. This would be particularly true around water developments and areas where livestock congregate. Exposure of fine material beneath the cover makes soils vulnerable to wind and water erosion. Impacts would be long term to the extent that an area remained disturbed. The level of impact would depend on the type of soil disturbed, the amount of disturbance, and localized wind conditions, but they would be unlikely to cause regional air quality thresholds to be exceeded. Impacts would be minor.

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 close 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, ozone precursor (NO_x and VOCs), and particulate matter emissions; 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 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 830,200 acres that are limited to existing roads and trails would contribute to CO, ozone precursor, and particulate matter emissions. As described in **Section 4.6**, Impacts on Soil Resources, over a third of the routes in this area are on soils with high wind erosion potential. Continuation of the current management would likely result in the expansion of nondesignated routes, increasing the amount of disturbed area and thus increasing fugitive dust emissions through wind erosion and OHV use of these routes. Impacts from OHV use would range from moderate to major.

Under Alternative A, some of the existing roads and trails that are available for motorized use would be within PM_{10} nonattainment areas. Continued use of these routes would result in an increase in PM_{10} emissions if the amount of OHV travel increased over current conditions with population increases or if the miles of routes increased through user creation of new routes. Impacts would range from moderate to major.

Dust emissions produced by use 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.

Maintaining the existing OHV designations of Limited to Existing and Trails would not minimize impacts on air quality since route proliferations would likely continue. New disturbance, by both motor vehicle use and nonmotorized uses, in high erosion potential soils would likely occur near residences in the Buckeye Hills East area.

From Visual Resource Management on Air Quality

Ensuring that projects, uses, and activities are compatible for management of visual resources under Alternative A 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 Class II areas. Alternative A would allocate 91,750 acres in VRM Class I and 115,050 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.

From Wildlife and Special Status Species 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. However, this 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.

4.2.3.3 Sonoran Desert National Monument

From Lands and 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. Three 1-mile-wide utility corridors traversing portions of the SDNM would be designated under Alternative A. 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 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 less extensive because Monument lands south of I-8 are closed to grazing. (See **Appendix E**, Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument.) Impacts in areas where grazing would be allowed in the SDNM would be as described 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, including 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, 325,200 acres would be limited to existing roads and trails, and 161,200 acres would be closed. Motorized travel on approximately 590 miles of existing routes would continue to contribute to CO, ozone precursor, and particulate matter emissions. Impacts would be minor to moderate.

Five miles of roads 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 SDNM.) Continued use of these routes would result in an increase in PM_{10} emissions if the amount of OHV travel increased over current conditions with population increases or if the miles of routes increased through user creation of new routes. Impacts would be minor to moderate.

Maintaining the existing OHV designations would not minimize effects on air quality since route proliferation would likely continue. Routes along the Komatke Gas Pipeline road would not be designated, and vagueness in where routes end or go could cause new disturbance and thus more particulates to be emitted.

Table 4-2
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

Table 4-2
Miles of Routes in PM_{10} Nonattainment Areas for the SDNM

Route Type	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Seasonally Limited	0	0	0	0	0
Administrative Use Only	0	0	0.6	0.6	0
Single-Track	0	0	0	0	0
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 157,700 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.

From Wildlife and Special Status Species on Air Quality

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

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 and Realty on Air Quality

Under Alternative B, 744,600 acres would be avoided and 145,000 acres would be excluded from utility-scale renewable energy. Additional LUA avoidance areas would total 520,900 acres, while exclusion areas would total 126,500 acres. Alternative B would designate ten 1-mile-wide utility corridors. Impacts from these actions would be less than Alternative A because of the greater amount of avoidance and exclusion areas and because specific decisions would be in place to manage and control surface-disturbing activities. This would lessen air quality impacts, including particulate matter release. Impacts would be minor to moderate.

From Livestock Grazing on Air Quality

Impacts on air quality from grazing would be less than described under Alternative A. Reduction of perennial stocking rates by 41 percent would reduce the area disturbed, thereby reducing fugitive dust impacts resulting from vegetation removal and surface disturbance. Adaptive monitoring and management of grazing would provide the opportunity to increase surface cover, reduce bare ground, and reduce impacts on areas of sensitive cryptobiotic crusts and desert pavement, thereby decreasing fugitive dust impacts from wind erosion on disturbed areas. Impacts would be minor.

From Recreation Management on Air Quality

When 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 of causing 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 Lower Sonoran.

From Travel Management on Air Quality

Motorized recreation would result in the same types of air pollutant emissions described under Alternative A. Under Alternative B, motor vehicles would be required to stay on designated routes on 839,060 acres of land within the Lower Sonoran, 91,100 acres would be closed to OHV use, and 40 acres would be open (compared with 830,200 acres being limited to existing roads and trails and 100,000 acres being closed to OHV use under Alternative A). While motorized travel on routes available for such use would result in CO, ozone precursor, and particulate matter emissions, impacts on air quality from travel management actions under Alternative B are likely to be reduced compared to Alternative A. By complying with the minimization criteria defined in 43 CFR 8342.1, the route designation process would consider potential impacts on air quality in deciding which routes to designate for motorized use. Route designation will be conducted after the Lower Sonoran RMP is signed and will involve designating routes as open, close, or limited for motorized use)

Under Alternative B, fewer routes within PM_{10} nonattainment areas would likely be open for public use, which would decrease PM_{10} emissions in the nonattainment areas compared to Alternative A. Dust mitigation measures, such as establishing speed limits, adding dust-reducing agents, or closing routes seasonally or year-round, would also minimize PM_{10} emissions, further reducing the potential for increased 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 winds. In order to ensure that the area maintains compliance with the air quality standards, dust mitigation measures, such as restrictions on use during dry or windy periods, restrictions on allowable speeds, and use of dust suppressants, would be implemented in this area, thus reducing the intensity of impacts. Designating this area as an OHV open area would also create an attraction that would reduce use in

other areas, causing a potential net reduction in new disturbance and thus minimizing impacts on air quality.

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 50,150. In addition, Alternative B would emphasize 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.

From Wildlife and Special Status Species on Air Quality

Impacts would be similar to those described under Alternative A. 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, while measures to protect sensitive species that call for avoidance of surface-disturbing activities could reduce air quality impacts. Overall impacts would remain negligible.

4.2.4.3 Sonoran Desert National Monument

From Lands and Realty on Air Quality

Impacts on air quality would be less than under Alternative A for SDNM. While Alternative B would have the same amount of LUA exclusion areas (164,900 acres) and corridor areas (32,900 acres), it would have a greater amount of avoidance areas (321,500 acres versus no avoidance areas for Alternative A). Measures to manage and control surface-disturbing activities would further reduce air quality impacts.

From Livestock Grazing Management on Air Quality

Impacts would be similar to those described under Alternative A. In addition to the area south of I-8, 8,500 acres north of I-8 would become unavailable to livestock grazing use, resulting in a minor decrease in potential fugitive dust emissions from livestock.

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

Under Alternative B in the SDNM, 328,700 acres would be limited to designated routes and 157,700 acres would be closed. Route designation follows the minimization criteria set forth in 43 CFR 8342.1, helping to reduce impacts on air quality. Motorized travel on approximately 520 miles of routes would contribute to CO, ozone precursor, and particulate matter emissions (70 miles fewer than under Alternative A). As described for Lower Sonoran Alternative B, impacts on air quality from travel management actions are likely to be reduced compared to Alternative A, as the route designation process considers potential impacts on air quality in deciding which routes to designate for motorized use. Impacts would be minor to moderate.

Under Alternative B, a similar amount of routes within PM_{10} nonattainment areas would be open for public use (4.7 miles versus 5 miles under Alternative A; see **Table 4-2**, Miles of Routes in PM_{10} Nonattainment Areas for the SDNM.) However, dust mitigation measures, such as establishing speed limits, adding dust-reducing agents, and closing routes seasonally or year-round, would minimize PM_{10} emissions, reducing these emissions as compared to Alternative A. Impacts would be minor.

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 126,400 acres. This would decrease 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 until the soil is stabilized, ensuring that 60 percent of the expected vegetation on the site is present and established, and ensuring 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.

From Wildlife and Special Status Species on Air Quality

Impacts would be the same as those described under Alternative B for the Lower Sonoran.

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 Lower Sonoran

From Lands and Realty on Air Quality

Under Alternative C, 639,900 acres would be avoided and 271,900 acres would be excluded from utility-scale renewable energy. Additional LUA avoidance areas would total 604,300 acres, while exclusion areas would total 126,500 acres. Alternative C would designate nine 1-mile-wide utility

corridors. Impacts from these actions would be less than under Alternative A because of the greater amount of avoidance and exclusion areas and reduction in corridor acreages. Overall impacts would also be reduced because specific decisions would be in place to manage and control surface-disturbing activities, thereby reducing air quality impacts, including particulate matter release. Impacts would be minor to moderate.

From Livestock Grazing on Air Quality

Impacts would be less than described under Alternative A. Adaptive monitoring and management of grazing would provide the same opportunities to reduce vegetation removal and surface disturbance, as described under Alternative B.

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, could reduce motorized recreation opportunities in the Lower Sonoran. This, in turn, could result in fewer localized air quality impacts related to such use, compared to Alternative A. Impacts from nonmotorized use (hiking and equestrian) would be similar to Alternative A, though slightly reduced due to the use of designated access points that would reduce the proliferation of user-created trails, which 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 because over seven times more acres are proposed for ACEC designation under Alternative C. While benefits would be more intense within the ACEC, overall beneficial impacts would remain negligible.

From Travel Management on Air Quality

Motorized recreation would result in the same types of air pollutant emissions described under Alternative A. Under Alternative C, motor vehicle operators would be required to stay on designated routes on 839,100 acres of land within the Lower Sonoran, and 91,100 acres would be closed to OHV use (compared with 830,200 acres being limited to existing roads and trails and 100,000 acres being closed to OHV use under Alternative A). In addition, access points would be reduced in number. While motorized travel on routes available for such use would result in CO, ozone precursor, and particulate matter emissions, impacts on air quality from travel management actions under Alternative C are likely to be reduced compared to Alternative A because travel would occur only on the designated route system and via fewer access points. By complying with the minimization criteria defined in 43 CFR 8342.1, the route designation process will consider potential impacts on air quality in deciding which routes to designate for motorized use. This process will be conducted after the Lower Sonoran RMP is signed, and will involve designating routes as open, closed or limited for motorized use.. Impacts would be minor to moderate.

Under Alternative C, fewer routes within PM_{10} nonattainment areas would likely be open for public use than under Alternative A, which would decrease PM_{10} emissions in the nonattainment areas compared to Alternative A. Dust mitigation measures, such as establishing speed limits, adding dust-reducing agents, and closing routes seasonally or year-round, would also minimize PM_{10} emissions, further reducing the potential for increased impacts. Impacts would be minor to moderate.

Impacts from a 40-acre ATV and motorcycle area would be less under Alternative C, as travel would be limited to designated routes. Fewer areas would be available for OHV races under Alternative C, thus reducing the extent of impacts. Alternative C would also close washes with suitable cactus ferruginous pygmy-owl habitat to OHV use for seven months of the year, which would reduce air pollutant emissions in this localized area. Impacts would range from minor to moderate.

From Visual Resources on Air Quality

Compared to Alternative A, 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 272,800 acres over Alternative A in the Lower Sonoran. Overall, impacts would remain negligible.

From Wildlife and Special Status Species on Air Quality

Allocating four WHAs totaling 425,900 acres and wildlife movement corridors would reduce air pollutant emissions. These allocations would include restrictions on surface-disturbing activities or would require additional mitigation measures for surface-disturbing activities. As a result, adverse impacts on air quality would decrease in these areas compared to Alternative A. 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.

4.2.5.3 Sonoran Desert National Monument

From Lands and Realty on Air Quality

Impacts on air quality would be less than under Alternative A for SDNM. While Alternative C would have the same amount of LUA exclusion areas (164,900 acres), it would have a greater amount of avoidance areas (321,500 acres versus no avoidance areas for Alternative A) and corridor areas (32,900 acres) and less corridor acreage (14,900 acres versus 32,900 acres for Alternative A). Measures to manage and control surface-disturbing activities would further reduce air quality impacts.

From Livestock Grazing on Air Quality

Impacts would be less than under Alternative A. In addition to the area south of I-8, 44,800 acres north of I-8 would become unavailable for livestock grazing use in areas that were found to be incompatible with the objects of the Monument due to current livestock use. Impacts would be minor.

From Recreation Management on Air Quality

Impacts would be similar to those described under Alternative C for Lower Sonoran and would range from minor to moderate.

From Special Designations on Air Quality

Impacts would be the same as described under Alternative B for the SDNM.

From Travel Management on Air Quality

Impacts would be similar under Alternative C as described for Alternative B in the SDNM because the same acreage would be limited to designated routes and closed. Motorized travel on approximately 380 miles of routes, with another 37 miles with seasonal limitations, would contribute to CO, ozone precursor, and particulate matter emissions (170 miles fewer than under Alternative A). Impacts on air quality from travel management actions are likely to be reduced compared to Alternative A, as the route designation process reduces the number of miles of routes and access points available for public use. Impacts would be minor to moderate.

Under Alternative C, 2.1 miles of routes within PM_{10} nonattainment areas would be open for public use (versus 5 miles under Alternative A), potentially reducing PM_{10} emissions. (See **Table 4-2**, Miles of Routes in PM_{10} Nonattainment Areas for the SDNM.) Dust mitigation measures such as establishing speed limits, adding dust-reducing agents, and closing routes seasonally or year-round, would minimize PM_{10} emissions, reducing these emissions as compared to Alternative A. Impacts would be minor.

From Visual Resources on Air Quality

Compared to Alternative A, 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 176,800 acres over Alternative A in the Lower Sonoran. Overall, impacts would remain negligible.

From Wildlife and Special Status Species on Air Quality

Impacts under Alternative C would be similar to those described under Alternative B. Adverse impacts from developing or maintaining wildlife waters would be reduced, as no new wildlife waters would be developed under Alternative C. Impacts would be negligible.

4.2.6 ALTERNATIVE D

4.2.6.1 Both Decision Areas

No unique impacts are identified for either Decision Areas under Alternative D.

4.2.6.2 Lower Sonoran

From Lands and Realty on Air Quality

Under Alternative D, 413,700 acres would be avoided and 511,500 acres would be excluded from utility-scale renewable energy. Additional LUA avoidance areas would total 328,600 acres, while exclusion areas would total 510,700 acres. Alternative D would designate seven 1-mile-wide utility corridors. Impacts from these actions would be the least compared to Alternative A because this

alternative has the greatest amount of avoidance and exclusion areas. Impacts would also be reduced because specific decisions would be in place to manage and control surface-disturbing activities to lessen air quality impacts, including particulate matter release. Impacts would be minor.

From Livestock Grazing on Air Quality

Under Alternative D, all allotments would be closed to grazing once current permits expire, and existing wildlife waters would be removed. As a result, Alternative D would result in the least amount of impact on air quality compared to the other alternatives. Impacts would be negligible.

From Recreation Management on Air Quality

Managing recreational uses under Alternative D for resource conservation and protection would result in the least motorized activity taking place in the Decision Area. Adverse impacts from recreation 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 significantly more acres in the Lower Sonoran would be under ACEC designation (267,100 acres versus 12,400 acres under Alternative A). Impacts would remain negligible.

From Travel Management on Air Quality

Motorized recreation would result in the same types of air pollutant emissions described under Alternative A. Under Alternative D, motor vehicle operators would be required to stay on designated routes on 587,500 acres of land within the Lower Sonoran, and 342,700 acres would be closed to OHV use (compared with 830,200 acres being limited to existing roads and trails and 100,000 acres being closed to OHV use under Alternative A). While motorized travel on routes available for such use would result in CO, ozone precursor, and particulate matter emissions, impacts on air quality from travel management actions under Alternative D are likely to be the least compared to Alternative A because of the high level of OHV closed areas and restriction to designated routes. By complying with the minimization criteria defined in 43 CFR 8342.1, the route designation process will consider potential impacts on air quality in deciding which routes to designate for motorized use. This process will be conducted after the Lower Sonoran RMP is signed, and will involve designating routes as open, closed or limited for motorized use. Impacts would be minor.

Under Alternative D, fewer routes within PM_{10} nonattainment areas would likely be open for public use than under Alternative A, which would decrease PM_{10} emissions in the nonattainment areas, compared to Alternative A. Dust mitigation measures such as establishing speed limits, adding dust-reducing agents, and closing routes seasonally or year-round, would also minimize PM_{10} emissions, further reducing the potential for increased impacts. Impacts would be minor to moderate.

Under Alternative D, the 40-acre ATV and motorcycle area would be closed and rehabilitated, reducing impacts on the nearby PM_{10} nonattainment area. Alternative D would also close washes with suitable cactus ferruginous pygmy-owl habitat to OHV use for seven months of the year, which would reduce air pollutant emissions in this localized area. Impacts would be 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.

From Wildlife and Special Status Species on Air Quality

Allocating one WHA totaling 255,700 acres and wildlife movement corridors would reduce air pollutant emissions. Alternative D would include the most restrictions on surface-disturbing activities in these areas. As a result, impacts on air quality would be the least under this alternative, compared to Alternative A. Adverse impacts from developing or maintaining wildlife waters described under Alternative A would be reduced because no new wildlife waters would be developed under Alternative D. Impacts would be negligible.

4.2.6.3 Sonoran Desert National Monument

From Lands and 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 by livestock grazing on air quality would be substantially reduced, compared to Alternative A, due to the elimination of grazing once current grazing permits expire. Impacts would be negligible.

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 B for the SDNM.

From Travel Management on Air Quality

Under Alternative D in the SDNM, 172,800 acres would be limited to designated routes, and 313,600 acres would be closed. Motorized travel on approximately 225 miles of routes would contribute to CO, ozone precursor, and particulate matter emissions (365 miles fewer than under Alternative A). Impacts on air quality from travel management actions would be least, compared to Alternative A. Impacts would be minor.

Under Alternative D, 1.1 miles of routes within PM_{10} nonattainment areas would be open for public use (versus 5 miles under Alternative A), potentially reducing PM_{10} emissions. (See **Table 4-2**, Miles of

Routes in PM_{10} Nonattainment Areas for the SDNM.) However, as use level increases over time, an increase in particulate emissions may result from more vehicles using fewer routes. Dust mitigation measures, such as establishing speed limits, adding dust-reducing agents, and closing routes seasonally or year-round, would minimize PM_{10} emissions, reducing these emissions, as compared to Alternative A. Impacts would be 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 Wildlife and Special Status Species on Air Quality

Impacts related to wildlife water development would be the same as those described under Alternative C for the Lower Sonoran.

4.2.7 ALTERNATIVE E (PROPOSED RMP)

4.2.7.1 Both Decision Areas

No unique impacts are identified for either Decision Areas under Alternative E.

4.2.7.2 Lower Sonoran

From Lands and Realty on Air Quality

Under Alternative E, 511,100 acres would be avoided and 380,800 acres would be excluded from utility-scale renewable energy. Additional LUA avoidance areas would total 310,200 acres, while exclusion areas would total 380,100 acres. Alternative E would designate eight 1-mile-wide utility corridors. Impacts from these actions would be less than under Alternative A, given the greater amount of avoidance and exclusion areas. Impacts would also be reduced because specific decisions would be in place to manage and control surface-disturbing activities to lessen air quality impacts, including particulate matter release. Impacts would be minor to moderate.

From Livestock Grazing Management on Air Quality

Impacts from grazing in the Lower Sonoran would be the same as described under Alternative A.

From Recreation Management on Air Quality

Alternative E would balance production of commodities with conservation and protection of natural resources, resulting in potentially fewer impacts, compared to Alternative A, from measures put in place to minimize air quality impacts from surface-disturbing activities.

From Special Designations on Air Quality

Beneficial impacts from ACEC designations in the Lower Sonoran would be similar to those described under Alternative D. Approximately 198,400 acres would have an ACEC designation. Impacts would remain negligible.

From Travel Management on Air Quality

Motorized recreation would result in the same types of air pollutant emissions described under Alternative A. Under Alternative E, motor vehicle operators would be required to stay on designated routes on 777,400 acres in the Lower Sonoran, and 91,100 acres would be closed to OHV use (compared with 830,200 acres being limited to existing roads and trails and 100,000 acres being closed to OHV use under Alternative A). While motorized travel on routes available for such use would result in CO, ozone precursor, and particulate matter emissions, impacts on air quality from travel management actions under Alternative E would be less than under Alternative A. Impacts would be minor to moderate. Under Alternative E, fewer routes within PM_{10} nonattainment areas would likely be open for public use than under Alternative A, which would decrease PM_{10} emissions in the nonattainment areas. The high level of areas closed to OHV use or where such use is restricted to designated routes would cause the least amount of disturbed soils, leading to the lowest PM_{10} and fugitive dust emissions of all alternatives. Dust mitigation measures, such as establishing speed limits, adding dust-reducing agents, and closing routes seasonally or year-round, would also minimize PM_{10} emissions, further reducing the potential for increased impacts. Impacts would be minor to moderate.

Impacts from a 40-acre ATV and motorcycle area would be less than under Alternative A, as travel would be limited to designated routes. Alternative E would close washes with suitable cactus ferruginous pygmy-owl habitat to OHV use for seven months of the year, which would reduce air pollutant emissions in this area. Impacts would range from minor to moderate.

From Visual Resources on Air Quality

Impacts from ensuring that 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 44,300 more acres to VRM Class II. Overall impacts would remain negligible.

From Wildlife and Special Status Species on Air Quality

Impacts from designation of one WHA in the Lower Sonoran would be similar to those identified under Alternative D. 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, while measures to protect sensitive species that call for avoidance of surface-disturbing activities could reduce air quality impacts. Overall impacts would remain negligible.

4.2.7.3 Sonoran Desert National Monument

From Lands and 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 similar to those described under Alternative A from eliminating grazing south of I-8. In addition to this area, 95,290 acres north of I-8 would become unavailable for livestock grazing use in areas that were found to be incompatible with the objects of the Monument due to current livestock use. In addition, reduction of livestock AUMs by 5,589 AUMs should reduce the number of livestock using the Monument and therefore reduce air emissions resulting from trailing and other actions that raise fugitive dust.

From Recreation Management on Air Quality

Impacts would be the same as those described under Alternative E for the Lower Sonoran.

From Special Designations on Air Quality

Impacts would be the same as those described under Alternative B for the SDNM.

From Travel Management on Air Quality

Impacts would be similar under Alternative E, as described for Alternatives B and C in the SDNM, because the same acreage would be limited to designated routes and would be closed. Motorized travel on approximately 348 miles of routes, with another 26 miles with seasonal limitations, would contribute to CO, ozone precursor, and particulate matter emissions (215 miles fewer than under Alternative A). While overall use on routes is not likely to decline in this alternative, impacts on air quality from travel management actions are likely to be reduced compared to Alternative A. This is because the route designation process considers potential impacts on air quality in deciding which routes to designate for motorized use. Impacts would be minor to moderate.

Under Alternative E, 1.7 miles of routes within PM_{10} nonattainment areas would be open for public use (versus 5 miles under Alternative A), potentially reducing PM_{10} emissions. (See **Table 4-2**, Miles of Routes in PM_{10} Nonattainment Areas for the SDNM.) Dust mitigation measures such as establishing speed limits, adding dust-reducing agents, and closing routes seasonally or year-round, would minimize PM_{10} emissions, reducing these emission as compared to Alternative A. Impacts would be minor.

From Visual Resources on Air Quality

In the SDNM, Alternative E would allocate 157,700 acres in Class I and 252,400 acres in Class II. Alternative E would thus decrease the likelihood of particulate emissions from erosion and dust in SDNM, compared to Alternative A, because it would allocate 160,800 more acres to VRM Class II. Impacts would be negligible.

From Wildlife and Special Status Species on Air Quality

Impacts would be the same as those described under Alternative E for the Lower Sonoran.

Clean Air Act Conformity Analysis

As discussed in the introduction to **Section 4.2**, Impacts on Air Quality, the BLM is responsible for demonstrating that its actions do not interfere with state and local plans to bring an area into attainment with the NAAQS. The BLM contracted for a CAA general conformity analysis to determine whether the actions proposed under Alternative E of the RMP (the preferred alternative) are subject to and meet the requirements of the General Conformity Rule and whether those actions conform to the applicable SIPs. **Table 4-3**, Summary of Net Emissions for Conformity Evaluation, summarizes the results of the conformity evaluation for activities in the Proposed RMP that are anticipated to result in increased emissions.

Table 4-3
Summary of Net Emissions for Conformity Evaluation

Planning Area	Activity Location	Description	CO	NO_x	SO_2	VOC	PM_{10}
Construction (tons)							
LSDA	Buckeye Hills East RMZ	Construct staging areas: five 6-acre and one 10-acre, total 40 acres	25.98	21.52	0.02	2.94	24.79
		Construct road: 4 miles, 30-foot width	6.07	5.13	0.0046	0.69	3.94
		Construct trails: 5 miles of single-track	0.04	0.01	0.0001	0.001	0.0003
SDNM	Anza NHT RMZ	Construct pulloffs: 3 acres total	6.20	5.07	0.004	0.71	0.79
		Improve existing staging areas: two 1.5-acre areas	0.09	0.09	0.0002	0.01	0.26
Total construction			38.38	31.82	0.02	4.36	29.78
Recurring Activities (tons/year)							
LSDA	Buckeye Hills East RMZ	Increased visitation	2.94	0.40	0.003	0.31	7.37
		OHV races	0.84	0.05	0.001	0.54	9.75
SDNM	Anza NHT RMZ	Increased visitation	0.42	0.08	0.00	0.01	2.77
		Increase road maintenance: 12 miles	0.84	0.05	0.00	0.54	9.75
Total recurring activities			5.45	1.55	.005	1.01	24.92
Total Emissions and Comparison to Conformity Thresholds							
Sum of construction and recurring emissions (tons, if all activities occur in one year)			43.83	33.37	0.03	5.36	54.70
Applicable general conformity thresholds (tons/year)			100	100	100	100	70

Source: BLM 2012
Notes: PM_{10} emissions include both fugitive and exhaust PM. $PM_{2.5}$ emissions were not quantified because no net emissions increases attributable to the Proposed RMP would occur in the West-Central Pinal $PM_{2.5}$ NAA.

As indicated in **Table 4-3** (above), the general conformity evaluation demonstrates that the net emissions increases attributable to the Proposed RMP (Alternative E), compared to Alternative A (No Action), would be less than the applicable general conformity thresholds. Accordingly, the proposed

action conforms to the applicable SIPs. As a result, no further conformity evaluation is necessary, and a conformity determination is not required.

4.3 IMPACTS ON CLIMATE CHANGE

Management activities that can affect climate change include those that emit greenhouse gases (GHGs; especially carbon dioxide [CO_2] and methane) and those that sequester GHGs. Proposed vegetation, wildland fire, livestock grazing, mineral resources, recreation, and travel management actions could emit GHGs in the Planning Area, while proposed vegetation and wildland fire management actions that create healthy vegetation and soils could sequester GHGs.

Because climate change is a global condition, it is impossible to link a specific BLM action to a specific climate change-related impact. Emission of GHGs from proposed BLM actions would be small in the context of broader spatial-scale emissions, and the duration of most BLM actions would be shorter than predicted changes in climatic conditions. Short-term direct and indirect impacts on climate from any of the alternatives would be negligible. However, over the long term, GHG emissions from actions on public lands do contribute to total global emission levels. These, in turn, could contribute to future long-term, anticipated climate changes to a very minor degree. Overall, the contribution would be a very small portion of the total from other sources of a regional and global nature.

4.3.1 COMMON TO ALL ALTERNATIVES

4.3.1.1 Both Decision Areas

From Vegetation Management on Climate Change

Vegetation management would require the use of vehicles, chainsaws, and other equipment powered by nonrenewable fuels, which results in GHG emissions. Vegetation treatment using fire generates smoke and releases carbon from plants. At the same time, treatments that improve vegetative communities in the long term could increase rates of GHG sequestration, thus mitigating climate change effects. Impacts on climate change from vegetation management would vary by alternative, based on the type and extent of vegetation treatment proposed to be applied. Alternatives that increase frequency of fire use could result in increased GHG emissions in the short term, and alternatives that create healthier vegetative communities in the long term could result in decreased GHG emissions.

From Visual Resource Management on Climate Change

Management actions to improve and protect visual resources could reduce GHG emissions through limitations on surface-disturbing activities. Such limitations would reduce GHG emissions from construction and would maintain vegetative communities that could act as GHG sinks. Impacts from visual resource management on climate change would vary by alternative, based on the number of acres allocated to each VRM class. Alternatives that increase acreage allocated as VRM Class I or II could result in decreased GHG emissions.

From Wilderness Characteristics on Climate Change

Lands managed to protect wilderness characteristics would have more restrictions on use, resulting in reduced motor vehicle use and reduced surface disturbance. Reduction in motor vehicle use would decrease GHG emissions, and reduction in surface disturbance could both decrease GHG emissions from construction and increase GHG sequestration by leaving vegetative communities intact. Impacts from wilderness characteristics on climate change would vary by alternative, based on the number of acres managed to protect such characteristics. Alternatives proposing increased amounts of lands managed to protect wilderness characteristics could result in decreased GHG emissions.

From Wildland Fire Management on Climate Change

Any use of wildland or prescribed fire to meet the goals and objectives of wildland fire management, such as to restore fire frequency and intensity regimes and to reduce hazardous fuel buildup, would emit GHGs into the atmosphere. Conversely, wildland fire management that results in healthier vegetative communities could increase rates of GHG sequestration, thus mitigating climate change effects. Impacts on climate change from wildland fire management would vary by alternative, based on the extent to which wildland or prescribed fire is proposed to be used. Alternatives that increase frequency or duration of fire use could result in increased GHG emissions, at least in the short term.

From Lands and Realty Management on Climate Change

Land disposal is expected to increase equipment emissions of GHGs by opening up land to potential development. This could also result in loss of vegetative sinks for carbon emissions. Impacts on climate change from lands and realty vary by alternative, based on the acreage of land proposed for disposal. Alternatives proposing to dispose of greater amounts of land could result in increased GHG emissions.

From Livestock Grazing on Climate Change

Cattle operations on BLM-administered lands generally require gas-powered equipment that emits GHGs. Also, studies have shown that livestock emit methane, which is a GHG; however, most of these studies relate to feedlot livestock. It is assumed that range livestock produce fewer emissions because they exert more energy and eat grasses that result in fewer methane emissions. Changes in AUMs in the Planning Area are not expected to decrease overall GHG emissions because livestock would likely be moved to other lands to meet demand.

From Minerals Management on Climate Change

Mineral development leads to emissions from equipment and, in the case of oil and gas development, emissions of GHGs from well development. Development would also reduce vegetative GHG sinks by removing ground cover in portions of developed areas. Impacts from mineral resource management on climate change vary by alternative, based on the acreage open or closed to mineral development and on surface disturbance limitations in areas open to mineral development. Alternatives proposing more acreage open to mineral development could result in increased GHG emissions.

From Special Designations on Climate Change

Special designations are expected to reduce GHG emissions because these areas would have increased use restrictions, in comparison with lands without special designations. For example, motor vehicle use restrictions in areas with special designations would decrease GHG emissions from motor vehicles; also, surface disturbance limitations in such areas would decrease GHG emissions from construction activity and would increase GHG sequestration by leaving vegetative communities intact. Impacts from special designations on climate change would vary by alternative, based on the acreage proposed for special designation. Alternatives with increased acreage as special designations could result in decreased GHG emissions.

From Recreation Management on Climate Change

Recreation results in GHG emissions from vehicles and wood-burning campfires. Recreation sites may also contribute to GHG emissions through removal of GHG sinks where vegetation is damaged or eliminated. Impacts from recreation management on climate change vary by alternative, based on the acreage open or closed to recreation and on development of recreation facilities. Alternatives increasing the acreage open to recreation or calling for development of more recreation facilities could result in increased GHG emissions.

From Travel Management on Climate Change

Increasing the acreage open to vehicle use would result in increased GHG emissions from motorized vehicles in the Decision Areas. Further restricting vehicle use, in comparison with current management, could result in decreased GHG emissions from motorized vehicles if such restrictions actually decrease motor vehicle use within the Decision Areas. Impacts from travel management on climate change vary by alternative, based on the miles of open or closed routes. Alternatives that decrease the acreage open to motorized travel could result in reduced GHG emissions, while alternatives that increase the acreage open to motorized travel could result in increased GHG emissions.

4.4 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 could contain caves and cave resources. In addition, two lava tubes 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 on caves and cave resources may take various forms. The discovery of new caves may generate recreation opportunities for spelunking or for development as tourist attractions. 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.

Because limited caves and cave resources have been identified in the Planning Area, the impacts on them 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.

4.5 IMPACTS ON CULTURAL AND HERITAGE RESOURCES

In assessing potential impacts within the alternatives, the degree of potential impacts is contingent on a number of conditions, including:

- Prehistoric and historic land use patterns
- The number of previously recorded cultural resources
- The eligibility status of previously recorded cultural resources
- The location of development

The primary concerns regarding impacts on cultural resources are the loss of scientifically significant sites and their contextual data and loss of historic integrity. Two types of impacts could affect cultural resources: physical impacts from ground disturbance and visual intrusions on the landscape.

A physical impact on cultural resources is considered potentially significant and therefore an indicator if it would result in a loss of or inaccessibility to scientifically significant archaeological resources. A primary concern for cultural resources is that direct damage to or destruction of buried cultural material or features would result in the loss of important scientific information. It is possible that important archaeological resources could be encountered during ground disturbance, such as grading. Likewise, visual intrusions are considered potentially significant and therefore an indicator if they would result in a loss of integrity to a property's historic cultural setting. Moreover, improved access and increased visibility could lead to unauthorized collection or vandalism.

All identified cultural resources would be assessed for their potential eligibility for listing on the NRHP. Potential site types include archaeological sites, structures, buildings, landscapes, spiritual and sacred places, districts, and objects that may be included in the NRHP if they meet the criteria specified in the NRHP's Criteria for Evaluation (36 CFR 60.4). Cultural resources are subject to a discovery process, so additional cultural resources may be found on public lands; however, quantity and quality cannot be properly evaluated until they are discovered. The impacts described below would occur only if cultural resources were 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 listing on the 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 Wildlife and Special Status Species, 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, to protect or stabilize soils, or to 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 on cultural resources. Many uses, e.g., LUAs and livestock facilities, may have secondary effects because they create new vehicle access. This often leads to inadvertent damage from vehicle traffic and increases the threat of vandalism on 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 could 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.

4.5.1 METHODS OF ANALYSIS

4.5.1.1 Indicators

The assessment of impacts on cultural and heritage resources is based on specific indicators that allow specialists 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 on cultural and heritage resources that diminish or destroy integrity:

- Impacts on site integrity: These impacts on surrounding conditions result from circumstances or events that affect the site's context:
    - Arrangement or structure of features disturbed
    - Artifacts missing or rearranged
    - Site elements rearranged
    - Ground surface disturbed
    - Subsurface cultural deposits disturbed
- Impacts on site setting/visual integrity (these types of site damage affect relationships of artifacts or features within a site):
    - Damage to physical environment of site
    - Damage to historic sense of a particular period or feeling of site's context

4.5.1.2 Assumptions

This impact analysis focuses on the extent of changes in site integrity associated with the alternatives detailed in **Chapter 2**, Alternatives, and their potential to modify the risk of impacts on cultural resources. The assumptions that follow, 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, laws and regulations 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. 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 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 near 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, 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.

4.5.1.3 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) elsewhere in this chapter. In addition to the definitions/thresholds identified for the SDNM, impacts specific to cultural and heritage resources are 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.

4.5.1.4 Program Areas with No Impacts on Cultural Resources

No impacts on 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

4.5.2 COMMON TO ALL ALTERNATIVES

4.5.2.1 Both Decision Areas

From Hazardous Materials and Public Safety on Cultural and Heritage Resources

Fencing and filling abandoned mine shafts and drift features could directly affect sites' integrity because many historic mines contain closely related features, such as adits and associated aboveground processing areas. The setting of historic mining sites also may be affected when mining structures are sealed and remediated. Planning for these remediation projects would enable the development and

implementation of mitigation actions, where warranted. In some cases, these actions could result in moderate impacts on sites and Monument objects. These may be mitigated to minor impact through the development and implementation of treatment plans.

Emergency hazardous material cleanups 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 cleanups 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 benefit 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 pursuing 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, would 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 on cultural resources from implementing management actions in accordance with the VRM classes would depend 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 NRHP 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. This could be 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. It would do this 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 NRHP 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 have 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. Fires alter the settings of some kinds of cultural resources visually and remove the vegetation that may allow soil erosion to damage or destroy the site components. Fire suppression 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. Planned fuels treatment projects in the Decision Areas usually involve mechanical and perhaps chemical treatment. This would require that Section 106 obligations are been met and that projects are designed to avoid sites before implementation. Impacts on site integrity and setting would, 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 would ensure that direct effects of fire itself on 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 would ensure that otherwise moderate impacts on site integrity from ground disturbance would be reduced to minor.

4.5.2.2 Lower Sonoran

From Lands and 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 would 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 of level terrain that is free of vegetation would have major impacts on 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 were on 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 has been designated enjoy additional protections due to the closure to mineral entry and other restrictions of this designation. Impacts on 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 short term.

4.5.2.3 Sonoran Desert National Monument

From Lands and Realty on Cultural and Heritage Resources

Impacts would be the same as those described for All Alternatives for the Lower Sonoran; however, 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 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 under 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 may still be developed. Depending on 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, would work with operators to mitigate impacts on affected sites and Monument objects and to reduce impacts 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.

4.5.3 ALTERNATIVE A (NO ACTION)

4.5.3.1 Both Decision Areas

From Cultural and Heritage Resources on Cultural and Heritage Resources

Management of cultural resources is usually a nondisturbing activity that involves inventorying, site monitoring, and occasionally installing 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. Preproject 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 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 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.

Seasonal wildlife closure areas would 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 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 NHPA. At most, impacts would be expected to be moderate, with the opportunity to reduce them to minor with mitigation measures (including avoidance, project redesign, or data collection).

From Wildlife and Special Status Species on Cultural and Heritage Resources

Improvements to 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. They would have indirect impact 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.

4.5.3.2 Lower Sonoran

From Livestock Grazing on Cultural and Heritage Resources

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 at a minor to moderate level of intensity in localized areas; site integrity may be affected 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 unleased would have a protective effect on the cultural resources over the long term, since livestock would be excluded from gathering on and trampling sites. Under Alternative A, this condition would remain unchanged and would have negligible impact on site integrity.

From Minerals Management on Cultural and Heritage Resources

Currently, 713,300 acres of the Lower Sonoran are available for mineral development, whether locatable, leasable, or salable. Depending on the extent and intensity of ground disturbance and production for mineral exploration and development, there may be direct effects on cultural resource site integrity at a moderate level. However, mitigation of impacts on affected sites is expected to reduce the impacts 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

Construction, operation, and maintenance of new recreational developments may have a direct effect on cultural resources and Monuments in a localized area, due the installation of parking areas, interpretive media, and other amenities using heavy equipment. However, before approval, the project must be in compliance with all applicable cultural resource laws and regulations. Impacts, if identified, would be mitigated to the negligible or minor level using standard cultural resources impact mitigation, 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 may affect them indirectly by increased erosion brought about by increased traffic.

Dispersed camping 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 by attracting large numbers of vehicles and visitors; this could lead to increased vandalism and unauthorized collection. All of the impacts from SRP's are minor in impact.

Increased vehicle-based recreation has led to an increase of off-road vehicle use, which may have a minor direct impact on cultural resources and Monument objects due to vehicle operators driving over site features and artifacts.

From Special Designations on Cultural and Heritage Resources

The 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 would 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 would have no effect on the cultural resources. The Coffeepot Botanical ACEC closure to OHV use would ensure negligible impacts on 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 routes may have direct minor impacts 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 routes may indirectly impact cultural resources and Monument objects by allowing access into sensitive sites 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 could 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-administered land. Mitigation measures, including route redesign and avoidance would ensure that impacts on site integrity would be negligible to minor. Indirect impacts from opening new areas with improved recreation access would include impacts on 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

Authorizing 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 for the short term due to the use of heavy equipment that 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.

4.5.3.3 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 level.

Within areas south of I-8, livestock grazing has been discontinued. This would continue to have a protective effect on the cultural resources over the long term, since livestock would be excluded from gathering and trampling sites. Under Alternative A, this condition would remain unchanged and would have negligible impact on site integrity.

Refer to **Section 4.25.4**, Implementation-Level Analysis for Vegetation Monument Objects, 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.

Within the SDNM, there are 233 sites that could be impacted by target shooting. Direct impacts from firearm projectiles are negligible. BLM trailhead cultural facilities, including interpretive signs, register boxes, and restrooms, have been impacted and would continue to be directly impacted by firearm projectiles to a moderate level of intensity for the long term. Other impacts include 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 at minor to moderate intensity levels. Petroglyph sites could be impacted directly by firearm projectiles striking panels. If unchecked, this type of damage would continue over the long term. This target shooting is associated with large accumulations of trash, excessive human trampling and climbing over the rocks with petroglyphs, and vegetation mashing. This activity can displace rock panels and boulders and result in erosion, which would continue in the long term at a minor to moderate intensity level.

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 on 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 4-23**, Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects, for impacts related to route designations with the SDNM.

From Visual Resources on Cultural and Heritage Resources

Under Alternative A, allocation of VRM Class IV could affect qualities that contribute to the eligibility of cultural resource sites for the NRHP. 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.

4.5.4 ALTERNATIVE B

4.5.4.1 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 that 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 under 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 on 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 under Alternative A. These protective measures would present minor levels of impacts.

Increased monitoring of sites over the level performed under 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 Wilderness Characteristics on Cultural and Heritage Resources

Impacts would be the same as Alternative A for both Decision Areas.

From Wildlife and Special Status Species on Cultural and Heritage Resources

Improvements to 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.

4.5.4.2 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

Under Alternative B, 9,400 acres would be recommended for withdrawal from development of locatable minerals (703,900 acres open); 7,000 acres would be closed to leasable minerals development (713,100 open); and 20,100 acres would be closed to mineral development (700,000 acres open). Several of the areas to be closed were selected based on the sensitivity of the cultural and historic resources known to be present. This would provide a protective effect over that provided under Alternative A. Depending on 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 on affected sites is expected to reduce the impacts 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 would be divided into two types of management areas: ERMAs and SRMAs. Under Alternative B, the ERMA area would be managed as under Alternative A (both Decision Areas) and, in those areas, the effects would be similar. The three SRMAs under Alternative B would be managed to promote a vehicle-based recreational experience.

In the west section of the Buckeye Hills West SRMA, 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.

Dispersed camping 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 Buckeye Hills East SRMA, 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, backcountry 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 dispersed camping 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 is structured could

have direct impacts on cultural resources from unauthorized collection, but this is expected to be negligible. In the backcountry, it is expected that dispersed camping 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 Trails 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. Dispersed camping 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 ERMA, the area is largely proposed as backcountry, with a few areas of front country along the main access routes. It is expected that dispersed camping 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 ERMA, 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 would 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. Dispersed camping 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 SRMA, vehicle-based, front country route exploration 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.

In the Ajo ERMA, a combination of community interface and front country and backcountry management are anticipated. Community interface areas those where camping and day use are designated and activity 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 backcountry, it is expected that dispersed camping may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts. This would be at a negligible to minor level of intensity for short durations in localized areas. In the backcountry, it is expected that dispersed camping 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 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. dispersed camping 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 and ERMAs would be negligible to minor, compared to the management of these areas under 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, impacts on cultural resources are expected to be greater than that expected under Alternative A. The impact would be at the moderate level.

Under Alternative B, ACEC allocation is similar to Alternative A. Impacts would be of the same intensity.

Under 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 Areas, 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 five 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 on sites. Areas where a proposed designation would shift, concentrate, or expand motorized travel into areas where properties are likely to be affected; an inventory would be required before designation to stay in compliance with Section 106 of the National Historic Preservation Act. These and known sensitive areas would be considered in determining which roads would 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 on 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 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 laws and regulations 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 under Alternative B from an allocation of 442,500 under Alternative A. Class III is increased under Alternative B to 551,900 acres from 279,600 under Alternative A. This is likely to result in less impact than under Alternative A for those sites for which setting is integral to their eligibility for the NRHP.

4.5.4.3 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 (244,000). According to the Grazing Compatibility Analysis (**Appendix E**, Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument), 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 4-23**, Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects, in **Section 4.25**, Implementation-Level Analysis, 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 ERMA with two RMZs. 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 ERMA, the majority of the lands would be allocated to backcountry. In the backcountry, it is expected that dispersed camping 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 would 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. Dispersed camping 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.

Under this alternative, there are 47 sites that could be impacted from target shooting, one of which has characteristics that may make it eligible for the NRHP. Impacts would be the same as Alternative A, except to a lesser degree, as 80.3 percent of the Monument would be closed to target shooting. Limiting target shooting to designated areas, which primarily occur within the Creosote Bush-Bursage, Desert Grassland, and the Desert Wash communities, could limit potential direct loss of vegetation and allow for continued vegetative diversity and a functioning desert ecosystem. Areas excluded form 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 SDNM. Impacts from target shooting would be expected to range from negligible to minor.

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 4-23**, Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects, within **Section 4.25**, Implementation-Level Analysis.

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.

4.5.5 ALTERNATIVE C

4.5.5.1 Both Decision Areas

From Wildlife and Special Status Species 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.

4.5.5.2 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 interpretive media displays. Impact on site integrity would be negligible to minor compared to Alternative A as facilities necessary to visitor safety and site protection would be placed to maximize protection of site integrity and setting. This alternative would 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

Under Alternative C, 2,350 acres would be recommended for withdrawal from locatable minerals development (710,950 acres open); 250 acres would be closed to leasable minerals development (713,300 open); and 157,300 acres would be closed to minerals materials development (528,500 acres open). Several of the areas to be closed were selected based on the sensitivity of the cultural and historic resources known to be present. This alternative would have much more protective effect than under Alternative A on sites that could be affected due to mineral materials (salables) development.

Depending on 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 on affected sites is expected to reduce the impacts 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 laws and regulations.

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

In the ERMA, impacts would be the same as under Alternative A. Under Alternative C, there would be more emphasis on resource protection overall than under Alternative A.

In the Buckeye Hills West ERMA, 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 under Alternative C, unless specifically authorized.

In the Saddle Mountain SRMA, a combination of front country experiences and limited upland areas for backcountry primitive experiences is 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 dispersed camping 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 backcountry, it is expected that dispersed camping may affect the integrity of cultural resources at a negligible to minor level of intensity for the short term.

In the Gila Bend Mountains ERMA, the area is largely proposed as backcountry, with a few areas of front country along the main access routes. It is expected that dispersed camping 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 ERMA, 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. Dispersed camping 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 ERMA, a combination of community interface management close to town, backcountry 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 backcountry and front country settings, it is expected that dispersed camping 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 directly affect 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 on cultural resources are expected to be slightly less than those under Alternative A.

Allocation of the Coffeepot Botanical ACEC would have no impact on cultural resource integrity and setting. The prescriptions would limit disturbance and access. Development in the area would be limited.

The designation of Agua Caliente Road as a Backcountry Byway would have the effect of increasing the public visitation levels because byways are advertised and promoted. This increase in visitation may indirectly affect 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 is possible, with a minor effect on site integrity, compared to 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 five 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 on sites. Where a proposed designation would shift, concentrate, or expand motorized travel into areas where historic properties are likely to be affected, an inventory is required before designation to stay in compliance with Section 106. These and known sensitive areas would be considered in determining which roads would be designated as routes.

Impacts on 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

Under 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 ensure 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 on 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. The 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.

4.5.5.3 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 interpretive media displays. Impact on site integrity would be negligible to minor under Alternative C, as facilities necessary to ensure visitor safety and site protection would be installed to maximize protection of site integrity and setting. This alternative would include additional evaluation of the suitability of sites for public use. Evaluation of suitability would be conducted to ensure that important characteristics and values of a site could 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 under 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. Approximately 10 acres around the North Tank on the Anza NHT would also be fenced off to livestock.

Refer to **Table 4-23**, Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects, in **Section 4.25**, Implementation-Level Analysis.

From Recreation Management on Cultural and Heritage Resources

In the SDNM ERMA, 429,000 acres of land allocated to backcountry ensure that anticipated impacts on 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 backcountry use. In the backcountry, it is expected that dispersed camping 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 under Alternative A.

Generally, impacts from target shooting 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. Should cultural resources be discovered in any area allocated for target shooting, the impacts would be the same as those described under Alternative A.

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 impacts on 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 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 4-23**, Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects, 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) would 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 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.

4.5.6 ALTERNATIVE D

4.5.6.1 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 were used to remove livestock management structures and facilities or to restore developed water sites. Overall impacts would be negligible.

From Wildlife and Special Status Species on Cultural and Heritage Resources

Impacts would be the same as those described under Alternative B for both Decision Areas.

4.5.6.2 Lower Sonoran

From Cultural and Heritage Resources on Cultural and Heritage Resources

Under 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 interpretive media displays. Impact on site integrity would be negligible to minor under Alternative D as facilities necessary for visitor safety and site protection would be 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

Under Alternative D, 373,800 acres more than Alternative A would be recommended for withdrawal from locatable minerals development (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 on the sensitivity of the cultural and historic resources known to be present. This alternative would have the most protective effect of any alternative, substantially more than under 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 two SRMAs. For the ERMA, impacts would be the same as Alternative A. Two SRMA units are proposed under 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.

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 under Alternative C for the Lower Sonoran.

The Coffeepot Batamote, Saddle Mountain, and Cuerda De Lena ACECs would have numerous restrictions on allowable activities. The result would 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 have been 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 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 five years of RMP completion. Until designation, travel would be limited to existing roads and trails. While existing routes would not generally be inventoried for cultural or historic resources, known sites have been identified during the road inventory. These and known sensitive areas would be considered in determining which roads would be designated as routes.

Alternative D would close the greatest number (777 versus 15 under 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

Under 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 under 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 protection than Alternative A.

4.5.6.3 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 ERMA, the majority of this unit would be allocated to backcountry use. In the backcountry, it is expected that dispersed camping may affect the integrity of cultural resources and Monument objects directly by vehicle incursions and 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 under Alternative A due to a reduced likelihood of vehicle incursions onto cultural sites and Monument objects.

Because the entire SDNM would be closed to target shooting, there would be no impact on cultural resources from target shooting.

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 on 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 4-23**, Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects, 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 under Alternative A. Impacts on Monument objects would 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 under Alternative C for the Lower Sonoran, except that an increase in acreage (40,800 acres) managed under this allocation would benefit more sites. Impacts on site integrity would be negligible, and this would provide more protective effect than Alternative A.

4.5.7 ALTERNATIVE E (PROPOSED RMP)

4.5.7.1 Both Decision Areas

From Wildlife and Special Status Species on Cultural and Heritage Resources

Impacts would be the same as those described under Alternative B for both Decision Areas.

4.5.7.2 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

Under Alternative E, 2,350 acres would be recommended for withdrawal from locatable minerals development (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 on the sensitivity of the cultural and historic resources known to be present. This alternative would have much more protective effect than under Alternative A on sites that could be affected due to leasable and saleable (mineral materials) development. Depending on 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 on affected sites is expected to reduce the impacts to minor. Methods to reach a minor impact outcome would likely include project redesign or data collection in compliance with existing laws and regulations.

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 would be divided into six ERMAs and three SRMAs. Impacts from the ERMAs and SRMAs are detailed below.

In the Buckeye Hills West SRMA, vehicle-based, front country, two-track route exploration would impact cultural resources on a negligible to minor level. This would be for a short duration and in localized areas and would be due to vehicle incursions causing damage to sites. Dispersed camping 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 Buckeye Hills East SRMA, 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 ERMA, there would be a combination of front country experiences, backcountry 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 is structured, there would be negligible or no impact on cultural resources. In the front country or backcountry, it is expected that dispersed camping 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. This would be for short durations and 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 ERMA, vehicle-based, front country, two-track, route exploration would impact cultural resources on a negligible to minor level. This would be for a short duration and in localized areas and would be due to route proliferation and vehicle incursions onto sites causing damage. Dispersed camping 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 ERMA, the area is largely proposed as backcountry, with a few areas of front country along the main access routes. It is expected that dispersed camping may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts. This would be at a minor level of intensity for short durations in localized areas. Impacts are expected to be similar to Alternative A.

In the Lower Gila Historic Trails ERMA, 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 retracing 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. Dispersed camping may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts. This would be 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 Ajo ERMA, a combination of community interface management close to town, backcountry 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 backcountry, it is expected that dispersed camping may affect the integrity of cultural resources directly by vehicle incursions, trampling, and possible exposure to the threat of unauthorized collection of artifacts. This would be at a negligible 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 under 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 five years of RMP completion. Until designation, travel would be limited to existing roads and trails. While existing routes would not generally be inventoried for cultural or historic resources, known sites have been identified during the road inventory. These and known sensitive areas would be considered in determining which roads would 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 under Alternative B for the Lower Sonoran.

From Wilderness Characteristics on Cultural and Heritage Resources

Impacts would be the same as those described under 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 under 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 under Alternative A.

4.5.7.3 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 under 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 interpretive media displays. Road access would have to be designed and constructed to enable safe public access off of I-8. Impact on site integrity would be negligible to minor under Alternative E as facilities necessary to visitor safety and site protection would be installed to maximize protection of site integrity and setting. Due to more intensive management, overall protection for Big Horn Station should be greater than under 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 under Alternative C for the SDNM. Because the entire SDNM would be open to target shooting, impacts from recreational target shooting are expected to be the same as described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational

target shooting should be greatly decreased. If that werer to happen, impacts would be negligible to minor.

From Livestock Grazing on Cultural and Heritage Resources

Alternative E reflects the allotment classifications and corresponding impacts as described under 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 157,210 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 under 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 under Alternative D for the SDNM.

From Travel Management on Cultural and Heritage Resources

Refer to **Table 4-23**, Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects, 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 under Alternative C for the SDNM.

From Wilderness Characteristics on Cultural and Heritage Resources

Impacts would be the same as those described under Alternative C for the SDNM.

4.6 IMPACTS ON GEOLOGIC AND PALEONTOLOGICAL RESOURCES

In the Lower Sonoran and SDNM, the Sentinel Plain lava flow is considered geologically significant. No other geologically significant areas have been identified in the Decision Areas, but locally significant areas may be present. These include geologic formations or outcrops having unique or unusual features of scenic value, that may contain important geologic characteristics, or that contain scientific or educational significance. In the event significant geologic resources are discovered within the Decision Areas, management actions to protect these resources would be implemented.

Paleontological resources include any fossilized remains, traces, or imprints of organisms preserved in or on the earth's crust that are of scientific interest and that provide information about the history of life on earth. BLM policy is to manage paleontological resources for scientific, educational, and recreational values and to protect or mitigate these resources from adverse impacts. To accomplish this goal,

paleontological resources must be professionally identified and evaluated, and paleontological data should be considered as early as possible in the decision making process.

An impact on paleontological resources is considered potentially significant if it would result in a loss of or inaccessibility to scientifically significant paleontological resources. The primary concern regarding impacts on paleontological resources is that direct damage to or destruction of fossils would result in the loss of important scientific information. It is possible that ground disturbance, such as grading, could encounter important paleontological resources. In addition, other potential impacts associated with construction are a concern. For example, fossils could be subject to damage or destruction by erosion accelerated by construction disturbance. Improved access and increased visibility as a result of construction could cause fossils to be damaged, destroyed, or subjected to unauthorized collection or vandalism. However, not all impacts of construction are adverse to paleontology. Excavation can and often does reveal significant fossils that would otherwise remain buried and unavailable for scientific study. In this manner, excavation can result in beneficial impacts. Such fossils can be collected properly and catalogued into the collection of a museum repository so that they can be available for scientific study.

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. Since the areal extent of each alternative differs, certain rock units or outcrops having recreational, scientific, or educational significance or containing fossil-bearing rock formations could be impacted.

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. Conversely, decisions that restrict or prohibit ground-disturbing activities would promote the preservation of unique geologic and paleontological resources. 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.

Because limited paleontological and geological resources have been identified on the lands 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 would be implemented.

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 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. As noted in **Chapter 3**, detailed site-specific soil information is lacking for much of the planning area. General impacts on sensitive soils are discussed by resource. Site-specific analysis would be conducted before on-the-ground project implementation.

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. Indicators include the following:

- 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 would improve infiltration and aeration, fertility, and microbial populations.
- Soil and vegetation resources would 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, would 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 would 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 would be positive. These positive impacts would 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 would be available to ensure that the necessary monitoring and enforcement occurs.

4.7.1.3 Program Areas with No Impacts on Soil Resources

There would be no impacts on soils from actions proposed under the following resource management programs:

- Air resources
- Cave resources
- Cultural and heritage resources
- Paleontological and geological resources
- 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 be 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 would 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 would be slow to recover once it had been reduced by erosion.

4.7.2.1 Both Decision Areas

From Hazardous Materials and 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 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 is not discussed under each alternative. Additional discussion of impacts of water on soil is included by alternative in **Section 4.9**, Impacts on Water Resources.

From Wildland Fire Management on Soil Resources

Suppression of wildfires in the Sonoran Desert ecosystem would reduce overall impacts on 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.

4.7.3 ALTERNATIVE A (NO ACTION)

4.7.3.1 Lower Sonoran

From Lands and 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 would have measurable, widespread effects 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 to disrupt drainage patterns, and cause surface disturbance and soil compaction over a large 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 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 have been made under Alternative A, which would 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 no livestock or 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. 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. 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 Decision Area				
Short-term	38,900	2,000	8,600	273,800
Perennial	200	0	0	151,800
Perennial/Short-term	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 from mineral entry or closed to mineral leasing under Alternative A. Impacts of mineral development on soil resources include potential disturbances such as soil displacement and loss or burial of upper soil horizons. Soil disturbance would result in reduced water-holding capacity (possibly permanently), leading to potential loss of vegetation and increased erosion. 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. Mitigation measures, including project design features, stipulations, and best management practices, would reduce the intensity and duration of impacts on soil resources, such as requiring soils to be salvaged when a project has ground disturbance. Salvaging and replacing or otherwise establishing a growth medium as part of the reclamation process would have a financial impact on the minerals' developers.

From Recreation Management on Soil Resources

Under Alternative A, recreation uses would continue to be distributed throughout the Decision Area, with 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. The concentrated activity in the SRMAs increases the probability of impacts on soils, such as erosion from increased stormwater runoff, due to impervious or compacted surfaces in parking areas, structures, and trails. These impacts would be limited in extent and would be 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 on many of the individual disturbed sites would be minor. Dispersed recreation 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 would be used for short periods and would 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 stormwater runoff exists in the designated camping areas. Increasing the stay limit to establish an LTVA could increase impacts if the area of the campground were 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 centerline. 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 are not numerous. However, there is a high probability that activity would occur, leading to an increased area of disturbance along the 1,688 miles of road in the Lower Sonoran.

Alternative A does not address the risk of lead contamination in soils from bullets and the buildup of shooting debris and lacks 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 Lower Sonoran. 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. Impacts would be moderate.

From Special Designations on Soil Resources

The Coffeepot Botanical ACEC is the only ACEC under Alternative A. An existing management decision closes the existing roads to all recreation, which would greatly reduce the risk of unauthorized travel, widening of existing roads, and most other additional surface disturbance.

From Travel Management on Soil Resources

Motor vehicle use is currently limited to existing or designated routes, with less than three 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). Current management would have a minor to moderate effect on soils as the current route system is not clearly marked or delineated for the public, resulting in an expansion of nondesignated routes. This continued expansion would result in loss of vegetative cover, thus destabilizing soils and 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. 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. Increased road density increases the risk of rill and gully erosion, as described below. In addition, higher road density increases bare soil-reducing infiltration and increases wind erosion. 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 stormwater 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 reenter 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, in particular, through the emission of small particles of dust that could lead to an increase in PM_{10} levels. 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 3-5). In addition, routes on soil types with high silt content are often more susceptible to wind erosion. Although other factors can impact erosion potential, soils with silt content over 50 percent have high susceptibility to particle emission, and over 80 percent can have a very high susceptibility (MacDougall et al. 2001). Site-specific analysis of soil type and silt content would occur before project implementation.

Potential for water erosion is substantially greater on roads where stormwater 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 would be widespread in the areas of relatively high density of open roads under 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 increase 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.

From Wildlife and Special Status Species 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 under 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 nonpriority species. Such actions would reduce the impacts of livestock management and would otherwise maintain more vegetative cover, reducing the potential for soil erosion.

4.7.3.2 Sonoran Desert National Monument

From Lands and 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 on 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 revegetate areas, 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, but some indirect impacts on soil and water resources on the SDNM could occur in the southeast section of the SDNM (southern Vekol Valley) from developments. Impacts include increased stormwater runoff and flow and 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 would be discontinued south of I-8, since those permits have expired. No additional impacts on soils would occur in this area due to livestock grazing. The closures would end

surface disturbance due to grazing with particular benefit to soils vulnerable to wind erosion in the Vekol Valley.

North of I-8, grazing would continue at current preference levels. The Land Health Evaluation for the SDNM allotments has shown negligible to minor impacts from grazing on soil resources. (See **Appendix F**, Arizona Land Health Evaluation for the Sonoran Desert National Monument.) Therefore, grazing impacts are expected to be minor and similar to those analyzed under Alternative A for the Lower Sonoran. Minor impacts are potentially due to the effects of grazing on the soils most sensitive to erosion.

From Minerals Management on Soil Resources

The SDNM is withdrawn from new mineral entry and closed to leasing under all alternatives. The withdrawal and closure was established in the proclamation that established the Monument and would have a protective effect on soil resources as ground disturbance from exploration, prospecting, and other activities associated with mineral development would be generally prohibited.

There are a few parcels (totaling 25,800 acres) within SDNM where the surface is owned by the United States, the subsurface is owned by a non-Federal entity, and minerals development may still occur. Depending on the extent and intensity of ground disturbance, there may be direct effects on soil resources to a moderate level. However, the BLM, as the manager of the surface, would work with operators to mitigate impacts on affected areas and reduce impacts to minor. Methods to reach a minor impact outcome would likely include project design features or mitigation measures that reduce soil erosion, compaction, or runoff potential.

From Recreation Management on Soil Resources

Alternative A has a 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 on soil resources would increase as additional miles of hiking, biking, and equestrian trails are constructed, exposing disturbed soils to wind and stormwater erosion and as 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.

Alternative A does not address the risk of lead contamination in soils from bullets and the buildup of shooting debris and lacks 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 SDNM. 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. Impacts would be moderate.

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.

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 ACEC and 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 dry riverbed 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.

In addition:

- Restricting travel to existing routes would 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 and loamy and often have calcareous layers (containing calcium carbonate). 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 under Alternative A, vegetation damage, surface disturbance, increase in total unsurfaced 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 would 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 would 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 would usually be moderate, based mostly on 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 would affect the level of impact on a specific section of road.

- Roads that are designated as open would have a tendency to widen as the 200-foot parking corridor is disturbed.

- Roads in use would 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 would slowly stabilize as vegetation recovers and no new disturbances occur.

- Roads that are closed could 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.

From Wildlife and Special Status Species on Soil Resources

Impacts from wildlife species and habitat management would be very similar to those described in the Lower Sonoran discussion above. The impacts from water developments would be negligible to minor. The actions planned in earlier LUPs to protect, maintain, and improve priority and nonpriority species habitat would reduce the impacts of livestock management, and otherwise maintain more vegetative cover, as in the Lower Sonoran Decision Area.

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 and generally increase the potential for soil erosion, sedimentation, and reduced soil stability. Although mitigation would 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 and Realty on Soil Resources

In the Lower Sonoran under Alternative B, the multiuse corridors would be the same as those described under Alternative A. As under 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 on 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 under Alternative A, but permitted use would be approximately 40 percent of 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 under 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. Overall impacts on soil resources would be minor.

From Minerals Management on Soil Resources

Impacts from mineral development would be similar to those described under Alternative A. The exception includes RMZs (Painted Rock RMZ, Gunsight Wash Campground), which are proposed for mineral withdrawal. Impacts on soil resources in these areas would be reduced due to lack of surface disturbance.

From Recreation Management on Soil Resources

Recreation allocations in the Lower Sonoran would include five ERMAs and SRMAs. The effects of ERMAs and SRMAs on soil resources are dependent on the proposed recreation uses and are described under Alternative A. Impacts on soils from ERMAs and SRMAs under Alternative B are increased due to

the additional management areas. All Lower Sonoran RMAs under Alternative B allow motorized travel. Motorized travel within dry washes can destabilize banks, particularly where vehicles enter and exit the washes, and damage dry-riverbed 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 on soil resources. The Buckeye Hills East SRMA, Arlington ERMA, and Ajo ERMA emphasize motorized recreation. In these RMAs, erosion from stormwater runoff concentrated on roads would be moderate. This impact is likely to occur to a lesser extent in all RMAs due to the emphasis on motorized recreation under Alternative B. 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 under Alternative B would 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 described under Alternative A.

From Travel Management on Soil Resources

Effects on air quality from travel on sensitive soils would be the same as described under Alternative A. Effects 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 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 under 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 would 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 would occur wherever routes are closed. In those specific areas where the road closures are concentrated, the impact on soil would decline from moderate to minor. However, even with the 25 percent reduction in road miles under Alternative B, the overall impact of travel on the indicators of soil condition in the Lower Sonoran would remain moderate. Alternative B includes plans for only five acres with new roads, which would 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, reduce 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 would also provide a proper proportion of bare ground and increase the probability that erosion would not be accelerated. Sufficient vegetative cover would increase infiltration of stormwater, reducing runoff and subsequent rill and channel erosion. Specific objectives under Alternative B and all action alternatives would reduce wind and water erosion. These include objectives to increase cover, plans to minimize surface-disturbing activity in priority plant species habitat, as well as individual plant community composition objectives and plans to rehabilitate surface disturbances on sites most likely to be responsive. All of these objectives would increase cover and reduce surface disturbance, which leads to erosion. Impacts include a moderate improvement of soil conditions over the long term and potential for major improvement in currently disturbed areas.

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.

From Wildlife and Special Status Species 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 would relocate or remove some existing waters in the Lower Sonoran to meet wildlife habitat and distribution objectives. These actions could cause a slight drawdown of groundwater and impounding of stormwater. These impacts would be negligible. Existing roads required to provide 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.

4.7.4.2 Sonoran Desert National Monument

From Lands and 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

Alternative B proposes to reduce permitted use by approximately 40 percent. Positive impacts of the change would be similar to those described for Alternative B for Lower Sonoran, and the overall impact on soils would remain minor. Elimination of grazing south of I-8 would result in slow improvement in surface cover, and a slow recovery of surface disturbance caused by livestock movements. Reductions in grazing would continue and would result in minor impacts on soils overall. Discontinued grazing on 8,500 acres of the Monument north of I-8 would result in improvement of soil resources over the long term within those areas of the SDNM.

From Minerals Management on Soil Resources

Impacts from mineral development would be the same as described under Alternative A.

From Recreation Management on Soil Resources

In the SDNM, the entire Monument would be established as an ERMA. Within the Decision Area, two RMZs would be established: The Desert Back County RMZ with 433,600 acres and the Juan Batista de Anza National Historic Trail RMZ with 52,800 acres. An objective of the Monument is to keep recreation impacts on Monument objectives from exceeding 2001 levels. This would restrict new recreational facility development, so few impacts on soils from compaction or surface disturbance are likely to occur. Most roads would 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 ACEC in 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 under Alternative B. Since Vekol Valley Grassland is the only special designations in the SDNM, the overall impact throughout the SDNM of its removal under Alternative B would be minor.

From Travel Management on Soil Resources

Decisions under 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 likely 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 under Alternative B (and all other action alternatives). About 70 miles would be Closed, which is comparable to the miles of closures under 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 under 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:

- Local areas of higher road density in Buckeye Hills, the land around Ajo, and the area north of Signal Mountain
- 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
- Where roads intersect washes and the amount of disturbed fine-textured soil is present

From Vegetation Resources on Soil Resources

Impacts on soil would be the same as those described for Alternative B for the Lower Sonoran.

From Wildlife and Special Status Species on Soil Resources

Impacts on soils from wildlife management plans under Alternative B for the SDNM are similar to impacts described for the Lower Sonoran with similar positive impacts. Wildlife management in the SDNM would 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 offset by route closures, resulting in a net negligible impact.

4.7.5 ALTERNATIVE C

4.7.5.1 Lower Sonoran

From Lands and Realty on Soil Resources

In the Lower Sonoran under Alternative C, multiuse utility corridors would be reduced to nine multiuse corridors. As under 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 on 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, 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 under Alternatives A and C are the same, but supplemental ephemeral grazing allowed under Alternative A would not occur under C. The reduced perennial grazing under Alternative B would result in less impact compared to C, even in years when ephemeral grazing was allowed under Alternative B, due to the limited duration of ephemeral spring grazing. The additional impacts under 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 ephemeral grazing under Alternative B and still higher intensity under 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 under 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 that the Painted Rock RMZ and Gunsight Wash Campground are proposed for mineral entry 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 Recreation Management on Soil Resources

Four SRMAs would be allocated in the Lower Sonoran under Alternative C, with total acreage of 107,900 acres. Managing recreation use areas for a more even balance between motorized and nonmotorized uses would decrease the likelihood of impacts on soils by trampling, rutting, and erosion. Alternative C would have SRMAs with a larger proportion of acres in the backcountry RMZ (423,100 acres), which focus on providing for nonmotorized dispersed activities, compared to community interface (19,900 acres) and front country (186,300 acres). Reduced motorized travel within dry washes and on sensitive soils would decrease the likelihood of altering surface flow, exacerbating bank erosion, and damaging dry-riverbed vegetation. Proposed management actions in the Gila Bend Mountains ERMA to restore natural conditions of disturbed areas greater than two acres would reduce the impacts on soils in those areas by increasing cover and reducing the risk of accelerated erosion from roads and campgrounds. Overall impact of Alternative C recreation management on the Lower Sonoran Decision Area would 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. Impacts would be negligible.

From Travel Management on Soil Resources

Effects on air quality from travel on sensitive soils would be the same as described under Alternative A. A decision to allocate OHV area designations with 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, would have minor effect on soils. There would be no Open area near Ajo under this alternative, thus the impacts on 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 effects 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 Wilderness 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 additional route closures, seasonally closed roads, and roads closed to public use. Many miles of those closures are to enhance lands managed to protect wilderness characteristics 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 would 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. As a result of road closures, less rill and gully erosion, surface and vegetation disturbance, and wind and water erosion would occur. In addition, road ruts would not deepen and disturbance alongside roads due to parking and detours to avoid obstacles would not occur. However, the probability of stormwater flow being concentrated on unsurfaced roads and resulting in erosion on and off the road would persist, even on closed roads. Despite the 32 percent reduction in road miles under Alternative C compared to Alternative A, the overall impact of travel on the indicators of soil condition in the Lower Sonoran would remain moderate. Alternative C includes plans for only 25 miles with new roads, which would be a negligible impact on soil indicators.

About 25 percent of the open roads designated under 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, an increased risk of rill and gully erosion during stormwater 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.

From Wildlife and Special Status Species 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.

Impacts from many planned wildlife management actions are the same as those under Alternative B, including wildlife corridors and protection of pygmy-owl habitat. Restrictions on surface-disturbing activities and goals to improve cover for habitat, would increase infiltration of stormwater, would reduce runoff, and, therefore, would reduce water and wind erosion and maintain sensitive surfaces with cryptobiotic crusts and desert pavement. Limits on some recreation in pronghorn habitat would contribute to similar protections for soil resources.

Four WHAs totaling 425,900 acres would limit surface disturbance in the following areas: 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 impact on soils due to reduced compaction, vegetation consumption, and exposure of bare soil. Limiting these soil impacts would improve infiltration of stormwater and would reduce runoff and erosion.

4.7.5.2 Sonoran Desert National Monument

From Lands and 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. In addition, communication sites would be prohibited within SDNM, eliminating surface-disturbing activities associated with construction of such sites that can cause impacts on water resources and soils.

From Livestock Grazing on Soil Resources

Impacts of Alternative C on soils in the SDNM are very similar to impacts of Alternative C described above for the Lower Sonoran. The potentially larger perennial herd under Alternative C would result in increased impacts on soil resources, but they would likely be minor. Excluding livestock from 44,800 acres as proposed would improve soil conditions in the exclosed areas. Impacts would include less compaction of soils around water sources and in washes, increased vegetation and litter cover, improved permeability, and less pedestaling and rilling. Impacts would be minor in most areas but moderate near water developments where pressure on soils and vegetation would be removed.

From Minerals Management on Soil Resources

In SDNM, impacts from mining would be the same as for Alternative A.

From Recreation Management on Soil Resources

The entire SDNM would be an ERMA, consisting of the Desert Back Country RMZ and the Juan Batista de Anza National Historic Trail RMZ. Although the Anza RMZ is likely to attract increased visitation, two-thirds of that RMZ and nearly 90 percent of the Desert backcountry RMZ would be managed for undeveloped recreation. The undeveloped recreation includes four-wheel drive touring, which would have characteristic impacts on soils. But overall impacts of Monument recreation are expected to be minor. Management of SDNM recreation under Alternative C would be more active than Alternative A. Recreation is likely to increase, but most of the Monument would be managed for undeveloped backcountry recreation. Therefore, the impacts on soils would be similar to Alternative A and minor.

Groups would be limited in size, competitive motor sports would 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 would reduce damage to the unsurfaced road prism, would reduce risk of further impact from stormwater on the road, and would reduce the impact on soil erosion near the road. All of these positive impacts would offset the minor impacts that could be caused by increased recreation.

From Special Designations on Soil Resources

No special designations are planned for the SDNM under Alternative C. Impacts would be the same as those described under Alternative B.

From Travel Management on Soil Resources

Effects of acres allocated as Closed OHV Areas under this alternative would be the same as described under Alternative B. There would be no Open area near Ajo in this alternative, thus the impacts on soils would be greatly reduced due to having designated routes instead allowing of cross-country travel.

Overall, impacts on soils would be slightly less than under Alternative A but would still remain at a moderate level.

Approximately 150 miles would be closed under Alternative C. Route designation under Alternative C 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. This is because Alternative C would include a framework for vehicle and travel management that should over time decrease the effects 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 is 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 would have the effect of mitigating the impacts on soils from travel, assuming they are implemented. However, numerous illegal roads have been used by motorized vehicle operators 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 from travel is expected to be moderate.

From Vegetation Resources on Soil Resources

Impacts of vegetation resources on soils in the SDNM under Alternative C are similar to impacts described for Alternative B. However, with 44,800 acres removed from livestock grazing, vegetation cover is expected to increase, providing positive impacts on soils, such as increased vegetation canopy and litter cover, and less wind and water erosion.

From Wildlife and Special Status Species on Soil Resources

As under Alternative B, wildlife corridor protection benefits soil resources, due to reduced road speed limits, limits on disturbance near washes, and limits on road density. Under Alternative C, an additional 117,300-acre wildlife corridor that connects the Sierra Estrella Mountains to the South Maricopa and Sand Tank Mountains in the Monument is added. None of the WHAs are located in the Monument, but the three wilderness areas limit motorized disturbance within their borders, thereby indirectly reducing the driving related impacts on the soil surfaces and the vegetation cover. 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 impacts apply to all the action alternatives.

4.7.6 ALTERNATIVE D

Alternative D would result in elimination or reduction of many land use activities that result in soil erosion. Therefore, overall impacts of this alternative would protect soil resources and improve soil conditions over time.

4.7.6.1 Lower Sonoran

From Lands and Realty on Soil Resources

Land available for disposal under Alternative D is about 26,200 acres, 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 is eventually used. Land available for disposal is less under Alternative A (18,900 acres), but the impact would 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). Eliminating grazing would reduce impacts on 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 or intensity of fire in these nonfire adapted ecosystems, resulting in the potential increase in soil erosion. Potential impacts on soils could vary from minor to major in intensity, based on the size of the burn area.

From Minerals Management on Soil Resources

Alternative D would recommend substantial acreage for withdrawal from locatable mineral development and closure to leasable and saleable minerals development. The restrictions on mineral development would decrease the potential for erosion, soil compaction, and displacement associated with mineral development activities.

From Recreation Management on Soil Resources

The overall difference between Alternative D and other alternatives is the reduced number of RMAs under Alternative D. In SRMAs, management actions that are in conflict with recreation are generally resolved in favor of recreation management. Recreation allocations under Alternative D would establish two SRMAs: Buckeye Hills East and Painted Rock. The effects of SRMAs on soils are dependent on the proposed recreation uses and are described under Alternative A. The extent of the impacts from SRMAs under Alternative D are reduced from those under Alternative A due to fewer acres of SRMAs and a different recreational opportunity emphasis. Recreation in the Buckeye Hills East SRMA would emphasize nonmotorized and dispersed recreation in the Buckeye Hills West ERMA. 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 ERMA would emphasize a greater level of development and more extensive motorized travel than the Buckeye Hills East ERMA. Increased development of facilities in this area would result in negligible increases in runoff, erosion, and sedimentation. Management of other recreation in the Lower Sonoran would be similar to other alternatives. Management decisions intended to control motorized vehicle use and to manage vehicle-based camping, recreational target shooting, and other intensive recreation uses would help to mitigate impacts on water resources. Fewer RMAs 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 ACECs under 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 aboveground utility transmission line construction. Overall, impacts from special designations under Alternative A, particularly ACECs, on soils would limit 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. The balance of 551,900 acres of routes would be allocated as Limited to Designated Routes. As under Alternative C, there would be a 40-acre open area near Ajo; thus, impacts on soils would be greatly reduced through the management of designated routes. Alternative D would keep only 47 percent (about 800 miles) of the total number of existing routes (1,687 miles) open, compared to 99 percent of the roads open under Alternative A, 74 percent of the routes open under Alternative B, and 68 percent open under Alternative C. Road density under Alternative D is 0.75 mile of open road per section, a relatively low value. Potential for water erosion is substantially greater on roads where stormwater 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 under Alternative D, but it is expected to remain moderate.

From Vegetation Resources on Soil Resources

Under Alternative D, the impacts from planned vegetation management actions would be similar to the impacts under Alternative C. However, the combination of eliminating cattle grazing across the planning area and the designation of 263,700 acres of ACECs would allow an increase in vegetative cover over time. Increased cover would increase stormwater infiltration and reduce runoff and erosion (both wind and water). In addition, decrease surface disturbance would further reduce the risk of erosion.

From Wildlife and Special Status Species on Soil Resources

Surface-disturbing activities would be excluded from the Gila Bend Mountains Wildlife Habitat Area, pronghorn 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 on water and hydrologic conditions in the watersheds of the Lower Sonoran.

Motorized travel within pygmy-owl habitat would be prohibited from February through July. This would reduce the impact on most routes, especially in washes where channel banks and dry-riverbed vegetation are susceptible to damage that causes sedimentation in downstream drainages.

New wildlife waters would be installed only in higher elevations under Alternative D. Water development for livestock and wildlife would be limited under Alternative D, thereby reducing overall impacts with less ground disturbance associated with construction of these developments.

4.7.6.2 Sonoran Desert National Monument

From Lands and 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 under Alternative D, new impacts on soils would be negligible. Additional limitations for desert tortoise habitat would be implemented specifically to reduce surface disturbance, providing additional protection for soil resources. Continued use of existing multiuse corridors could result in surface disturbance and associated erosion risks. Those would be moderate but limited in areal 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). Eliminating grazing would reduce impacts on soil resources by decreasing ground disturbance and allowing additional vegetation cover to develop over time.

From Minerals Management on Soil Resources

Impacts from mining in the SDNM would be the same as under Alternative A.

From Recreation Management on Soil Resources

Under Alternative D, the entire SDNM would be managed as primarily suited for undeveloped recreation. Ninety percent of the Monument would be managed as backcountry. The resulting impact on soils is likely to be a lower level of disturbance throughout the Decision Area, but there would be a wider area of disturbance. All routes would be primitive and designated from among existing roads. The impacts characteristic of roads include channeling of stormwater on erodible surfaces leading to rills, gullies, and sedimentation in natural drainages. The impacts would be locally moderate, if designations are followed, but would be minor overall throughout the SDNM, compared to Alternative A. The lower level of impacts would result from the large proportion of the Monument that would 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 under 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

Under Alternative D, 41 percent of the area would be closed to public vehicle use and the building of any public use roads. As under Alternative B, Areas Limited to Designated Routes would limit cross-country travel and would confine soil impacts on linear routes. Overall, impacts on soils would 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. 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 under this alternative, moderate impacts would still 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 stormwater 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 impacts from vegetation resources would be the same as the impacts described for Alternative D for Lower Sonoran.

From Wildlife and Special Status Species on Soil Resources

Of all the alternatives, Alternative D is the most restrictive on management activities that disturb soil surfaces and reduce vegetative cover. Restrictions and exclusions for pronghorn, pygmy-owl, and desert tortoise are all broader under Alternative D. Area in wildlife corridors is greatest under 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.

4.7.7 ALTERNATIVE E (PROPOSED RMP)

4.7.7.1 Lower Sonoran

From Lands and 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. Under Alternative E, 36,800 acres or less than 4 percent of the Decision Area would be available for disposal. Land available for exchange under Alternative A is not available under

Alternative E. The impact on soils in the Decision Area is minor, and essentially the same as the impacts described under Alternative B.

Impacts due to land use authorizations would be similar to that describe under Alternative C. are essentially the same as Alternative C. Soil surface and vegetation disturbance and exposure of bare soil associated with LUAs, would be reduced due to LUA exclusion areas. 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 under 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 similar to that described under 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 Recreation Management on Soil Resources

Under Alternative E, approximately 646,000 acres would be designated as SRMAs. Impacts on soil resources in these areas would be similar to that described under Alternative B. Two SRMAs under Alternative B would not be designated under Alternative E. Less recreational activity would probably occur in the 48,100 acres in those two SRMAs. Not designating these areas would result in decreased visitation therefore 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.

Alternative E camping stay lengths and infrastructure would be 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 sedimentation into the wash. Impacts from management in the SRMAs would be negligible.

From Special Designations on Soil Resources

Alternative E proposes 247,400 acres for ACEC designation. Alternative E would result in major protection of on soils by increasing restrictions on motorized travel, resource use, and development restrictions.

From Travel Management on Soil Resources

Under Alternative E, Closed OHV area designations would occur on 152,800 acres and 777,360 acres would be classified as Limited to Designated Routes. Open OHV area would cover 40 acres.

Travel management areas identified for future travel management planning are the same size under 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. However, Alternative E proposes approximately 55,400 more acres of closed roads than under Alternative B. This would reduce the impact of roads under Alternative E as the additional closed roads begin to recover, re-establish vegetation, and erosion caused by stormwater 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.

Overall impacts on soils from travel on over 1,100 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 under 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 stormwater runoff all increase. Impact on soils from wind erosion would be moderate due to the limited roaded area on areas highly susceptible to wind erosion (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 with varying degrees of grazing pressure.

From Wildlife and Special Status Species on Soil Resources

Impacts on soils from protecting wildlife habitat through retention and acquisition of public land, limitations on LUAs, and travel restrictions would minimize soil disturbance, retain vegetative cover, and ensure consistent, long-term protective management of important habitat.

Under Alternative E, Gila Bend Mountain WHA is an avoidance area for surface disturbance and management recommendations require a high level of mitigation for mineral leasing activities, therefore the soil impacts from WHA implementation and management would be negligible.

Wildlife corridors include 195,900 acres under Alternative E that extend across both Lower Sonoran and SDNM. Additional protective measures would be taken in the corridors that would 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 under Alternative A, which has no habitat areas or corridors proposed.

Surface-disturbing activities, and, therefore, disturbance of sensitive cryptobiotic and desert pavement soil surfaces would be avoided under Alternative E in desert tortoise Category I habitat, but allowed in Categories II and III. In addition, under Alternative E, case-by-case review of mineral lease applications would provide some additional protection against soil disturbance.

4.7.7.2 Sonoran Desert National Monument

From Lands and Realty on Soil Resources

Impacts on soils from use authorizations under Alternative E would improve soil conditions in the long term since the SDNM would be a LUA exclusion area except in established corridors. Otherwise, the impacts would be essentially the same as those described under Alternative C.

From Livestock Grazing on Soil Resources

Grazing impacts on soils would 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 would be the same as Alternative C, with similar closures proposed. 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.

From Recreation Management on Soil Resources

The entire SDNM would be managed as an ERMA under all action alternatives. Under Alternative E, most of the Decision Area would be managed as backcountry, which means undeveloped recreational activity.

Management plans would provide protective measures for soil resources. Such measures include restoration of areas damaged by recreation, limits on group sizes, special actions to control invasive weeds, . These actions would result in lower impacts on soils than are likely to occur in SRMAs in the Lower Sonoran. Impacts on soils would be minor, and similar to the other action alternatives. Since dispersed recreational target shooting throughout the Monument would continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if

Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

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. Approximately 632 miles 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. These impacts generally would be moderate in the SDNM under Alternative E.

From Vegetation Resources on Soil Resources

The impacts on soil of management actions in the SDNM would be the same as those described under Alternative C, with the 44,800 acres becoming unavailable for livestock grazing. New surface disturbance would be restored and stabilized by available rehabilitation practices. Control measures for invasive species would be implemented. In contrast, Alternative A includes objectives to achieve desired plant communities throughout both Decision Areas, but lacks reference to specific ecological sites and the objects of the Monument. Alternative E establishes specific goals for restoration for disturbed sites, and protecting and improving soil conditions. Impacts from Alternative E are likely to be minor in most areas, and moderate in areas around water sources within the exclosed areas.

From Wildlife and Special Status Species on Soil Resources

Impacts on soils from wildlife management would be similar to Alternative D and to Alternative E for the Lower Sonoran. For the SDNM total acreage of WHAs and WMCs under Alternative E would be only about one third the area designated under Alternative D. Therefore, except the long term benefits to soil conditions due to the avoidance and mitigation of surface and vegetation disturbance would be reduced under Alternative E.

4.8 IMPACTS ON VEGETATION RESOURCES

The goals established for the proposed Lower Sonoran and SDNM RMP provide 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 on vegetative resources as they relate to resource conflicts with other management programs within the Lower Sonoran and SDNM Planning Area are:

- 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 on soils or water supply and water quality)
- Introduction and spread of invasive weed species

4.8.1.2 Assumptions

- All surface-disturbing activities would include mitigation and adaptive management to reduce impacts on 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.
- Weed prevention actions and measures would be incorporated into all project plans and as terms and conditions in contracts and special use permits and authorizations.

4.8.1.3 Program Areas with No Impacts on Vegetation Resources

No impacts on vegetation resources are anticipated for management actions relating to:

- Air quality
- Cave resources
- Paleontological resources
- Public safety and hazardous materials
- Water resources
- Wild horse and 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 DFCs. 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 DFCs 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 (such as, 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 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 on 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 Areas to maintain naturalness would limit activities and reduce surface disturbance and therefore would limit minor impacts on 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 that have high wind or water erosion potential could reduce impacts on vegetation and invasive weed introduction or spread by limiting projects. The intensity of the impact 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 waterways and in a manner that avoids changing natural water flow or watershed dynamics could restrict the impact on vegetation communities, either directly from limiting the loss of vegetation or from reducing the impact on 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, or seeps or decrease water availability at existing wells would 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 on some localized areas of vegetation; impacts would vary depending on which vegetation community was 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 nonpoint source pollution would reduce impacts from pollution on downstream vegetation to negligible or minor.

- 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 composed of nonfire-adapted vegetation. The level of impact would vary depending on the size of the area burned. Fire in Sonoran Desert plant communities that are not fire adapted could have moderate to major impacts on those communities in the long term by removing vegetation over large areas or introducing invasive plant species, such as red brome, buffelgrass, and Sahara mustard. Suppression of wildfires in the Sonoran Desert Ecological Zone would emphasize MIST tactics, which would primarily result in localized short-term impacts. Suppression actions could also have long-term impacts on 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 using prescribed fire and mechanical, chemical, and biological fuels treatments to meet resource objectives. These objectives are:

- Improving vegetation, wildlife habitat, or watershed conditions
- Maintaining nonhazardous levels of fuels
- Reducing the hazardous effects of unplanned wildland fires
- 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 nonfire-adapted vegetation communities in the vicinity. When applying fuels treatment methods, BLM policies, procedures, and plans would 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 DFCs and protect endangered, threatened, or special status plants would reduce the intensity of impacts associated with activities or would require projects to relocate. These requirements would also help to reduce the likelihood for invasive weed introduction and spread. The intensity of the impact would vary by the size of the project and the restrictions imposed.

Vegetation treatments, including thinning, burning, seeding, transplanting, watering, and imposing 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. These include reducing invasive weed species, 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 on the vegetation on those sites and would reduce invasive weed species, ranging from minor to moderate, based on size. Allowing the use of mechanical, chemical, and biological treatment methods to remove invasive plants, such as tamarisk, in the Fred J. Weiler Green Belt to restore ecological conditions and function and reduce fuel hazards could have moderate impacts on 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

The SDNM is withdrawn from new mineral entry and closed to leasing and saleable mineral development under all alternatives. The withdrawal was established in the proclamation that established the Monument. This withdrawal will have a protective effect on vegetation resources, as ground disturbance from exploration, prospecting, and other activities associated with mineral development would be 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 on the extent and intensity of ground disturbance, there may be moderate direct effects on vegetation resources. However, the BLM, as the manager of the surface, would work with operators to mitigate impacts on affected areas and Monument objects and reduce impacts to minor. Methods to reach a minor impact outcome would likely include project design features or application of best management practices.

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. The BLM is mandated to achieve or make significant progress toward achieving land health standards and to work toward achieving DFCs in vegetation communities. To reduce impacts on the native vegetation, the BLM would require surface-disturbing activities, such as OHV use, livestock grazing, right-of way permits, and fire suppression, to minimize, mitigate, and ensure protection of the vegetative objects of the Monument. These requirements would also help to reduce the likelihood for invasive weed introduction and spread, which typically occur when the surface is disturbed. 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 Wilderness Characteristics on Vegetation Resources

No lands managed to protect wilderness characteristics would be allocated under Alternative A for both Decision Areas.

From Wildlife and Special Status Species on Vegetation Resources

Wildlife management actions that serve to support wildlife populations by closing or restricting areas to activities, such as recreation, mining, or livestock grazing, would generally limit impacts to minor levels by limiting direct loss of vegetation and impacts on soils. The intensity of the impact would vary by the area restricted by the action.

4.8.3.2 Lower Sonoran

From Lands and Realty on Vegetation Resources

Currently, the management does not have any guiding actions related to renewable energy development, which would be approved on a case-by-case basis. Development of renewable energy projects, mainly solar, would have impacts on vegetation communities, ranging from minor to major, 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 LUAs 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. This, in turn, would lead 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 LUAs, such as utility-scale renewable energy developments.

The designation of 10 one-mile-wide utility corridors could result in minor impacts on 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 on the vegetation communities in general.

From Livestock Grazing on Vegetation Resources

Research has not definitively identified impacts on Sonoran Desert vegetation or soils from year-long light to moderate use by livestock or periodic use, as occurs during ephemeral grazing. However, potential impacts identified from sustained heavy livestock grazing on vegetation include reduced plant vigor, alteration of vegetation community composition or structure, reduction in plant cover, reduction of individual plants, including desirable forage species, introduction or spread of invasive weed species, and increased soil instability, leading to erosion and soil compaction. Proper grazing management attempts to distribute livestock across an allotment or pasture to avoid heavy sustained impacts on vegetation. However, areas of livestock concentration, such as around permanent water sources, would inevitably experience prolonged use by livestock and wildlife. Impacts from livestock on vegetation in the immediate vicinity of these sources (within a quarter-mile) would continue to be major under Alternative A but would decrease with distance from the water source.

Through the land health evaluation process, any impacts that are identified from livestock grazing on vegetation and soils that result in land health standards not being achieved would require adjustments to grazing practices. In order to make progress toward meeting land health standards, adjustments to grazing could include adjustments in grazing timing, season, and duration or adjustments to livestock numbers and implementation of grazing management systems (rest rotation, 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 six acres on average. Larger water developments may have minor impacts at up to a quarter-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 on vegetative resources on a larger scale (allotment wide).

The potential introduction or spread of invasive weed species through livestock grazing could result in changes in vegetation communities or could increase the incidence of wildland fire in nonfire-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 grazing 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 over the foreseeable future as years without ephemeral use would allow for rest and recovery of any impacts in these areas.

The remaining allotments would continue to be managed as perennial or perennial/ephemeral grazing allotments, resulting in more continuous year-round impacts on vegetation that would vary from negligible to minor. On the perennial/ephemeral allotments, similar impacts could occur, as described above for ephemeral-only allotments, when ephemeral applications are permitted. Moderate impacts could occur during drier periods if the BLM were not to implement the drought policy in a timely manner or if livestock operators do not voluntarily make appropriate management changes. In general, livestock operators in the Planning Area cooperate with the BLM to 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 available for development could impact vegetation by disturbing surfaces, introducing or spreading invasive weeds, and increasing the direct loss of vegetation. Creation and expansion of material pits, roads, and ancillary facilities would result in impacts. Mining operations would be expected to disturb an average of between 40 to 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, are most likely to occur in the Ajo block and the Globe-Miami area where the potential for development is higher.

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 recreation, such as OHV travel and vehicle camping, could result in minor impacts due to the loss of vegetation, introduction or spread of invasive weeds, and impacts on soils. The areas outside SRMAs would be allocated as ERMAs (550,800 acres), which would be managed to custodial standards and do not generally provide structured recreation. ERMAs and semiprimitive motorized ROS areas would not typically include the proactive development of facilities or specific management actions that could increase recreation, such as OHV use, resulting in minor impacts due to the loss of vegetation and impacts on soils. Semiprimitive Nonmotorized and Primitive ROS areas emphasize 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 on the vegetation communities.

Soil compaction through recreation, 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 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, 1,871 miles of routes would remain open (183 within desert washes) and 16 miles (one 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 on 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 used trails within the desert washes could have minor impacts by bank and channel alteration of soils, introduction or spread of invasive weeds, 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 on 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 on soils and vegetation resources in these areas to minor. 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 limit the impacts on vegetation by reducing the disturbed area of projects. Impacts would be negligible. The intensity of the impact 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 could increase the size of disturbance of projects and the vegetation affected. The expectation is that these restrictions would generally lead to only minor changes to projects and would 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 would reduce impacts to negligible.

4.8.3.3 Sonoran Desert National Monument

From Lands and Realty on Vegetation Resources

The designation of three one-mile-wide utility corridors north of I-8 could result in minor impacts on 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 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 or ephemeral use, in accordance with grazing permits. Potential impacts identified from heavy livestock grazing on vegetation are reduced plant vigor, alteration of vegetation community composition or structure, reduction in plant cover, reduction of individual plants including desirable forage species, introduction or spread of invasive weed species, increased soil instability leading to erosion, and soil compaction. However, light to moderate use of most forage species can promote growth and vigor and can aerate soils for increased infiltration of moisture.

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 six acres on average. Larger water developments may have minor impacts at up to a quarter-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 on vegetative resources on a larger scale (allotment wide).

The potential introduction or spread of invasive weed species through livestock grazing could result in changes in vegetation communities or increase the incidence of wildland fire in nonfire-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 **Section 4.26.4**, Impacts from Implementation-Level Decisions on Vegetation Monument Objects, 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. However, within the SRMA, the increase in recreation, 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, introduction or spread of invasive weeds, and the direct loss of vegetation. Most 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 recreation, such as OHV use, generally resulting in less concentrated use and therefore negligible impacts due to the direct loss of vegetation, introduction or spread of invasive weeds, and impacts on 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 potential for 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 could have impacts on vegetation communities that range from negligible to moderate, based on the type of invasive species, how severely the vegetation community is altered, and the increased potential for wildfire. This could lead to moderate impacts on vegetation.

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.

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 ACEC could 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 stabilizing soils.

From Travel Management on Vegetation Resources

Refer to **Section 4.26.4**, Implementation-Level Analysis for Vegetation Monument Objects, 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 limit the impacts on the vegetation by reducing the disturbed area of a project. Impacts would be negligible to minor. 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 on vegetation.

4.8.4 ALTERNATIVE B

4.8.4.1 Both Decision Areas

From Wilderness Characteristics on Vegetation Resources

No lands managed to protect wilderness characteristics would be allocated under Alternative B for either Decision Area.

From Wildlife and Special Status Species on Vegetation Resources

Wildlife management actions that close or restrict areas to surface-disturbing activities would generally limit impacts to negligible or minor levels. Examples of these actions are limiting new surface disturbance within 300 feet of the edge of desert washes and restricting the maintenance of utility corridors to the existing authorized LUA corridor only. They would be effective by limiting direct loss of vegetation, limiting the introduction or spread of invasive weeds, and limiting impacts on soils. This includes actions for wildlife movement corridors and T & E species management.

Developing additional wildlife waters and relocating existing wildlife waters would have a negligible impact on vegetation due to surface disturbance and direct loss of vegetation.

4.8.4.2 Lower Sonoran

From Lands and 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 LUAs 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 LUAs (such as utility-scale renewable energy development), depending on which vegetation community is impacted. 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 minor.

From Livestock Grazing on Vegetation Resources

Under Alternative B there would be an approximate 40 percent reduction in permitted use on perennial and perennial/ephemeral allotments. In addition, season of use adjustments would be considered: 65 percent of permitted use would be winter/spring (October 1 to April 30); 35 percent would be summer/fall season (May 1to September 30).

Impacts would be the same as those described under Alternative A for the Lower Sonoran, although impacts would not be as widespread or in some cases as intense due to the 40 percent reduction of AUMs. This reduction would have minor to moderate impacts on vegetation resources. On allotments where livestock utilization has historically been and is currently moderate to heavy, a 40 percent

reduction in AUMs would have a moderate impact on plant vigor and production. However, on allotments where livestock utilization has been slight to moderate, impacts of a 40 percent reduction of livestock on vegetation may not be apparent. Reduction of livestock AUMs would reduce the likelihood of invasive weed introduction or spread in these areas.

Similar impacts would occur with season of use adjustments. As considered under Alternative B, 65 percent of the permitted AUMs would occur from October 1to April 30, and 35 percent would occur from May 1to September 30. Impacts from these season of use changes would likely be minor to moderate and would include increased use of annual forbs and grasses during the winter and decreased grazing pressure on perennial forage species throughout the year. Ephemeral authorizations during productive ephemeral years would likely have negligible effects on perennial forage. Standard operating procedures are in effect to ensure minimal utilization of perennial forage during ephemeral authorizations (see **Appendix H**).

From Minerals Management on Vegetation Resources

Impacts would be the same and would have the same general intensity, as those described under Alternative A, except impacts would be slightly more widespread, as 38,300 more acres would be open to mineral entry.

From Recreation Management on Vegetation Resources

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 on 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. These are within portions of the Ajo (two RMZs), Buckeye Hills West, Lower Gila Historic Trails and the Arlington ERMAs, and the Buckeye Hills East SRMA. The increased motorized activity and new facilities in the 192,300 acres of these RMAs could result in minor to moderate impacts from direct loss of vegetation, introduction or spread of invasive weeds, soil disturbance, and the potential introduction and establishment of noxious and invasive weeds from trails and camping areas and during construction. Providing a mix of motorized and nonmotorized recreation opportunities on 73,300 acres in certain RMAs within portions of the Saddle Mountain and Buckeye Hills East SRMAs could have impacts on vegetation similar to but at a lesser extent than those described under the SRMAs above with intensive use areas. Impacts would be minor. 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 on the vegetative communities.

The remaining 381,000 acres in RMAs within the Ajo, Gila Bend Mountains, Lower Gila Historic Trails ERMAs, and the San Tan Mountains and San Tan Mountains SRMAs would all emphasize nonmotorized and primitive recreation 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.

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 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 recreation areas and access roads. Recreation management of the remaining areas as backcountry and passage settings 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 the front country setting 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 on adjacent areas could be reduced if users were 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 under Alternative A. Impacts from authorizing individuals to remove one cord of wood annually would be the same as under 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 ACEC would the same as Alternative A.

Managing the Agua Caliente road as a Backcountry Byway could increase traffic in the area, resulting in minor impacts on 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. However, it would be slightly less widespread because approximately 429 fewer miles of routes would be open to the public, thereby minimizing impacts under Alternative B. In addition, impacts on vegetation could be reduced on 180 miles of routes with seasonal closures and eight 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 on 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 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 on vegetative communities. The expectation is that these restrictions would generally lead to only minor changes to projects and would have a negligible or minor impact on vegetation resources.

4.8.4.3 Sonoran Desert National Monument

From Lands and Realty on Vegetation Resources

Impacts would be the same as those described under Alternative A for the Monument, except management toward surface-disturbing activities would be slightly more restrictive. The entire Monument would be designated as a LUA Avoidance area, and the I-8 multiuse corridor would narrow to 0.5 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 the same as described for Alternative B, Lower Sonoran. However, in addition to the impacts described for Lower Sonoran, approximately 8,500 acres in the SDNM would become unavailable to livestock through direct fencing. This would result in increased vegetation cover, reduced likelihood for invasive weed introduction or spread, and improved land health conditions in the areas that are not currently meeting Standard 3 (upland health).

For further impact analysis from livestock grazing on specific vegetative communities on the SDNM, please refer to **Section 4.26.3**, Implementation-Level Analysis for Wildlife and Special Status Species Monument Objects.

Refer to **Section 4.26.4**, Implementation-Level Analysis for Vegetation Monument Objects, 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 Juan Batista de Anza National Historic Trail RMZ would likely be similar to those from the roaded natural ROS settings under Alternative A. Impacts from backcountry and passage zones would be most similar to semiprimitive motorized and semiprimitive nonmotorized ROS settings under Alternative A. Managing the entire SDNM as an ERMA would restrict development of recreation facilities and would emphasize nonmotorized access and natural landscapes, resulting in negligible impacts on vegetation by reducing surface disturbance.

Impacts related to target shooting 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 on vegetation would be expected to decrease as compared to Alternative A. Impacts from target shooting would be expected to range from negligible to minor.

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 **Table 4-26**, Impacts from Implementation-Level Decisions on Vegetation Monument Objects, 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 and Realty on Vegetation Resources

Development of new energy projects under Alternative C would have the same impacts as Alternative B, although less acreage would be available for projects (274,000 acres). The intensity of the impact would still likely be moderate to major.

Impacts from LUAs, 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 LUAs (such as utility-scale renewable energy development), depending on which vegetation community would be impacted. 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, all perennial/ephemeral allotments would change to perennial only. This would reduce the impacts associated with ephemeral grazing identified under Alternative A on those allotments. On perennial-only allotments, utilization on perennial forage may increase because permittees who had rarely run full numbers because of AUMs authorized during ephemeral years would likely need to make up the lost income by increasing their perennial AUMs to the full preference. Season of use adjustments would be considered to help mitigate the impacts on perennial forage during the summer. There would be no proposed changes in AUMs. Impacts from this alternative on ephemeral-only allotments would be negligible and would be similar as described under 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 would require mitigation and would not allow surface occupancy. This would reduce the likelihood for invasive weed introduction or spread. 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 Wildlife and Special Status Species on Vegetation Resources

Impacts would be the same as Alternative B; however, 425,900 acres would be allocated for WHAs, with additional restrictions on surface-disturbing activities. This would limit impacts on 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 on 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 on 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 RMAs would be retained and the impacts would be similar to Alternative B. The San Tan Mountains would be not managed as an ERMA, along with the Sentinel Plain. The impacts would be the same as described under Alternative B for these areas.

The areas allocated as community interface and front country settings would be reduced, and the areas allocated as backcountry 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 under 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, which would reduce potential minor impacts on vegetation resources by reducing surface disturbance and the loss of vegetation. Managing the Agua Caliente road as a Backcountry Byway could increase traffic in the area, resulting in minor impacts on 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 on 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 on 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 would have a negligible or minor impact on vegetation resources.

From Wilderness Characteristics on Vegetation Resources

Alternative C has 128,100 acres 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 and Realty on Vegetation Resources

Impacts would be the same as those described under Alternative A and B for the Monument, except management toward surface-disturbing activities would be 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 0.5 mile wide, and the BLM would allow only underground facilities. Restricting the corridor to underground facilities could result in increased impacts, as compared to Alternative B, from surface disturbance and the direct removal of vegetation. The intensity of the impact would be moderate, as approximately 13,000 acres could be disturbed from future projects.

From Livestock Grazing on Vegetation Resources

Impacts would be the same as described for Alternative C, Lower Sonoran. However, there would be a minor reduction in AUMs, based on allotment boundaries (no AUMs would be allocated for those portions of allotments in the SDNM south of I-8, in accordance with the Monument Proclamation). In addition, approximately 44,800 acres would be unavailable to livestock. This would have positive impacts, such as increased vegetation cover, reduced likelihood for invasive weed introduction and spread, and eventual achievement of land health standards, on vegetation within exclosure areas proposed under this alternative. 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 under Alternative C. This would eliminate the impacts associated with ephemeral grazing identified under Alternative A on those allotments. Allotments currently classified as ephemeral would remain the same and would have the same impacts as Alternative A. Impacts overall to vegetation would be minor.

Moreover, for further impact analysis from livestock grazing on specific vegetative communities on the SDNM, please refer to **Section 4.26.3**, Implementation-Level Analysis for Wildlife and Special Status Species Monument Objects.

Refer to **Section 4.26.4**, Implementation-Level Analysis for Vegetation Monument Objects, for impacts related to AUM allocations in the SDNM.

From Recreation Management on Vegetation Resources

Impacts from recreation would be similar to Alternative B; however, fewer areas would be impacted within the RMZs as the allocation of front country would decrease to 51,700 acres and backcountry 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 Desert Backcountry RMZ, except in wilderness areas, thereby reducing impacts, compared to Alternatives A and B.

Impacts from target shooting would be the same as described under Alternative A, 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 on vegetation would be expected to decrease as compared to Alternative A and B. Impacts on vegetation would be expected to be negligible.

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 on vegetation from an increase in localized disturbance to vegetation and soil.

From Transportation and Public Access Management on Vegetation Resources

Refer to **Section 4.26.4**, Implementation-Level Analysis for Vegetation Monument Objects, 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 on 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.

From Wildlife and Special Status Species on Vegetation Resources

Impacts would be the same as those described under Alternative B for both Decision Areas.

4.8.6 ALTERNATIVE D

4.8.6.1 Both Decision Areas

No unique impacts are identified for either Decision Area under Alternative D.

4.8.6.2 Lower Sonoran

From Lands and Realty on Vegetation Resources

Development of new energy projects under Alternative D would have the same impacts as Alternative C, although less acreage would be available for projects (141,900 acres). The intensity of the impact would likely be minor to moderate.

Impacts from LUAs 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 LUAs (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 seven multiuse utility corridors would be allocated.

From Livestock Grazing on Vegetation Resources

Implementation of Alternative D would result in eliminating livestock grazing in all currently open grazing allotments, which would remove grazing impacts on vegetation and soil resources. Types of impacts are described under Alternative A (No Action); how extensive these impacts become is determined by the amount of vegetation in any given area of the Lower Sonoran Decision Area. In areas with scarce vegetation, these impacts would be negligible. In areas with more vegetative cover, impacts from livestock grazing would be more noticeable. Removing grazing in these areas would result in more noticeable regrowth of heavily used vegetation, reduced likelihood for invasive weed introduction or spread, and reestablishment of vegetation around watering facilities and heavily used livestock trails. During years of increased winter rainfall, vegetation would increase and, in turn, would not be subject to reduction from livestock grazing; this could result in increased frequency or intensity of fire in these nonfire-adapted ecosystems. Therefore, potential impacts on the vegetative communities could vary from minor to moderate.

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 would be recommended for withdrawal from locatable mineral development and closed to leaseable and saleable mineral development. This would restrict surface disturbance and limit impacts to negligible.

From Recreation Management on Vegetation Resources

Under 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 on vegetation communities, which would be less than those identified under Alternative A.

Fewer RMAs would be allocated under this alternative. Impacts would be the same as those described under Alternative B for SRMAs but with only 100,200 acres allocated. Impacts would be the same as those described under Alternative B. The type of impacts would be the same as Alternative A; however, the areas allocated as SRMAs would be reduced from Alternative A. This would lead to fewer impacts, generally negligible to minor, on vegetation from Alternative D as the remaining acres would be managed as ERMAs.

No additional extended stay campgrounds would be established under Alternative D, reducing vegetation impacts to negligible. Dispersed camping impacts could be greater than those identified under 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 8282,500 acres as the Gila River Terraces/Sonoran Desert Historic Trails ACEC would place limits on surface-disturbing activities. It also would reduce impacts on 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 on 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 would have seasonal closures or would be open to administrative use only. Most of the routes in desert washes would be closed (163 of the 183 miles), which could reduce impacts from vegetation loss, invasive weeds, and soil disturbance.

Impacts on vegetation, as it pertains to ATV and motorcycle use within the 40-acre parcel in the Ajo Block, would not occur as the parcel would not be allocated under 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 on vegetation communities by requiring mitigation or reducing the scope of projects. Impacts would be negligible.

From Wilderness Characteristics on Vegetation Resources

As under Alternative C, allocating lands managed to protect wilderness characteristics would limit impacts on vegetation to negligible. Impacts, however, would be limited as more acres (276,500 acres) would be allocated.

From Wildlife and Special Status Species on Vegetation Resources

Impacts would be the same as Alternative C for WHAs, even though fewer acres (255,700 acres) would be allocated for WHAs. This is because the acres not allocated to WHAs would be allocated as ACECs, would have the same restrictions on activities, and would limit impacts on vegetation.

4.8.6.3 Sonoran Desert National Monument

From Lands and Realty Management on Vegetation Resources

Impacts on vegetation from Lands and Realty under Alternative D would be negligible, as the entire Monument would be designated as a LUA Exclusion Area, and thus prohibited from any utility-scale renewable energy developments.

From Livestock Grazing on Vegetation Resources

Impacts from Alternative D on the SDNM would be the same as described for Alternative D for Lower Sonoran. Refer to **Section 4.26.4**, Implementation-Level Analysis for Vegetation Monument Objects, for impacts related to AUM allocations in the SDNM.

From Recreation Management on Vegetation Resources

The SDNM would not be managed as a ERMA as under the other Alternatives, with Alternative D limiting impacts on 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 in the SDNM. This would reduce impacts to negligible by reducing the potential for soil disturbance, invasive weed introduction and spread, and vegetation loss.

Impacts from target shooting would be negligible, as the SDNM would be closed 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 on vegetation from increase localized vegetation and soil disturbance.

From Transportation and Public Access Management on Vegetation Resources

Refer to **Section 4.26.4**, Implementation-Level Analysis for Vegetation Monument Objects, 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 on 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.

From Wildlife and Special Status Species on Vegetation Resources

Impacts would be the same as those described under Alternative B for both Decision Areas.

4.8.7 ALTERNATIVE E (PROPOSED RMP)

4.8.7.1 Both Decision Areas

No unique impacts are identified for either Decision Area under Alternative E.

4.8.7.2 Lower Sonoran

From Lands and Realty on Vegetation Resources

Impacts from eight multiuse utility corridors, utility-scale renewable energy projects (296,400 acres available), and LUAs (360,800 acres of avoidance and 253,700 acres of exclusion areas) on vegetation in the Decision Area would be similar to Alternative D. This would be 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 acres) that would be available for disposal, the majority of which lie within the creosote-bursage community.

From Livestock Grazing on Vegetation Resources

Impacts from livestock grazing under Alternative E would be similar to those described for Alternatives A and C. Any impacts on vegetation due to changes in perennial or ephemeral designations, reductions in AUMs, or season of use adjustments would be considered and analyzed during the permit renewal/rangeland health evaluation process under site-specific NEPA review.

From Minerals Management on Vegetation Resources

Impacts would be the same as those described under Alternative C but would be more widespread, as 35,800 more acres would be available for mineral development.

From Recreation Management on Vegetation Resources

Impacts on vegetation from management of RMAs would be the same as Alternative C, with the exception of the Saddle Mountain area managed as an ERMA and the Arlington Trials ERMA managed under the Gila Bend Mountains ERMA. Impacts on 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 under 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 Backcountry 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 miles) and closed vehicle routes.

Alternative E would designate the same 40 acres in the Ajo area 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 on vegetative communities. The expectation is that these restrictions would generally lead to only minor changes to projects and would 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 on vegetation; however, impacts could occur on more acres in the Planning Area under Alternative E (55,400 acres allocated), as compared to Alternative C (128,100 acres). The impact would likely be minor in intensity.

From Wildlife and Special Status Species on Vegetation Resources

Impacts would be the same as those discussed under Alternative D for the Lower Sonoran.

4.8.7.3 Sonoran Desert National Monument

From Lands and Realty on Vegetation Resources

Impacts from multiuse utility and LUAs would be the same as under Alternative D.

From Livestock Grazing on Vegetation Resources

Impacts would be similar to those described for Alternatives B and C. Adjustments in AUMs and season of use would reflect those proposed under Alternative B, and closures of approximately 44,800 acres would reflect those proposed under Alternative C. Additionally, the Conley Allotment within the SDNM boundaries would become unavailable to livestock grazing. Impacts of these proposals would improve vegetation resources, would reduce the likelihood of invasive weed introduction and spread, would increase vegetative cover, vigor, and diversity, and would, in the long term, and would achieve Desired Future Conditions and land health standards. Overall impacts would be negligible to minor on all allotments except Conley. On the Conley allotment, elimination of grazing would reduce pressure on vegetation resources, resulting in significant progress toward achieving land health standards (see **Appendix E**, Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument and **Appendix F**, Arizona Land Health Evaluation for the Sonoran Desert National Monument for more

details). For further impact analysis from livestock grazing on specific vegetative communities on the SDNM, please refer to **Section 4.26.3**, Implementation-Level Analysis for Wildlife and Special Status Species Monument Objects, and **Section 4.26.4,** Implementation-Level Analysis for Vegetation Monument Objects, for impacts related to AUM allocations in the SDNM.

From Recreation Management on Vegetation Resources

Impacts on vegetation from management of the ERMA would be the same as Alternative C. Impacts on vegetation from management of recreation settings would be similar to Alternative C, but with an increase of 23,300 acres in front country and 20,500 fewer acres in the backcountry, increasing the potential for minor impacts on vegetation and soils from increased recreation.

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 impacts on vegetation would be the same as under Alternative D.

Because the entire SDNM would be open to target shooting, impacts from recreational target shooting are expected to be the same as described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

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 **Section 4.26.4**, Implementation-Level Analysis for Vegetation Monument Objects, 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, but 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.

From Wildlife and Special Status Species on Vegetation Resources

Impacts would be the same as those discussed under Alternative B for both Decision Areas.

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 or contrasts in 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, greater surface disturbance results in greater change to the landscape.

4.9.1 METHODS OF ANALYSIS

Indicators

This impact analysis and conclusions were based on the visual resources inventory (VRI), knowledge of resources and the Planning Area, reviews of 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.

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 would 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 to conform to the area's assigned VRM objective. Mitigation activities could include painting, facility design, and placement.

Program Areas with No Impacts on Visual Resources

No impacts on visual resources are anticipated for management actions relating to:

- Air quality
- Cave resources
- Cultural and heritage resources
- Paleontological resources
- Wildlife and special status species
- Special designations
- Vegetation resources
- Water resources
- Soil resources
- Wild horse and burro management
- Wilderness characteristics
- Hazardous materials and public safety

Qualitative Intensity Scale

Impacts on visual resources are assessed by analyzing the impact of proposed actions on the existing visual resource conditions, expressed through the VRI classification of an area. In addition, the allowable level of change to the visual landscape is assessed by comparing the existing visual resource conditions, expressed through the VRI classification, of an area to the proposed VRM classification of the same area. The VRM class objectives provide criteria for determining the level of disturbance that an area can support, while meeting visual resource objectives. **Section 3.2.8**, Visual Resources details the BLM's VRI classification process and VRI Classification acreages for the planning area are shown in **Table 3-5**, Extent of VRI Class Assignments.

Applying VRM Class I objectives to any VRI classification would preserve the existing character of the landscape. In other words, the VRI classification would be expected to remain the same, so impacts would be negligible. Therefore, applying anything but VRM Class I objectives could result in some level of change if activities that would contrast with the landscape are permitted in the area. However, lands classified as VRI Class IV are able to absorb more landscape modifications than lands assigned higher VRI classifications due to the low level of scenic quality and lower sensitivity of the area. On the other hand, lands classified as VRI Class I or II are less able to absorb new landscape modifications due to the high level of scenic quality and sensitivity. As such, lands classified as VRI Class I or II would see a greater impact from VRM Class III or IV management than lands classified as VRI Class III or IV. Because lands classified as VRI Class I are considered special areas by the BLM, applying anything less than VRM Class I objectives would result in at least moderate impacts.

The following discussion of impacts on visual resources therefore is discussed in qualitative terms that describe the potential for changes to the landscape based on the proposed VRM classification and how that could impact the existing character of the landscape.

The intensities of impacts are described using the following definitions:

- Negligible. No known impacts on resources. Any change is undetectable. Activities create very low visual contrast. Where VRM Class I objectives would be applied to any VRI classification, impacts would be considered negligible. In addition, impacts from applying VRM Class I, II, or III objectives to lands classified as VRI Class IV would be considered negligible, as well as impacts from applying VRM Class I or II objectives to lands classified as VRI Class III.

- 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. Impacts would be considered moderate where VRM Class II objectives would be applied to lands classified as VRI Class II; VRM Class III objectives would be applied to lands classified as VRI Class III; or VRM Class IV objectives would be applied to lands classified as VRI Class IV.

- 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. Impacts would be considered moderate where VRM Class II objectives would be applied to lands classified as VRI Class I; VRM Class III objectives would be applied to lands classified as VRI Class II; or VRM Class IV objectives would be applied to lands classified as VRI Class III.

- 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. Impacts would be considered major if the allowable level of change to the landscape could result in the reclassification of lands to a lower VRI class. Where VRM Class III or IV objectives would be applied to lands classified as VRI Class I or where VRM Class IV objectives would be applied to lands classified as VRI Class II, impacts would be considered major.

The intensities of impacts anticipated as a result of applying certain VRM classifications to certain VRI classifications, discussed in text above, is displayed in the table below.

	VRM Class			
VRI Class	**Class I**	**Class II**	**Class III**	**Class IV**
Class I	Negligible	Moderate	Major	Major
Class II	Negligible	Minor	Moderate	Major
Class III	Negligible	Negligible	Minor	Moderate
Class IV	Negligible	Negligible	Negligible	Minor

Because the scenic values in the Monument are not considered a Monument object, qualitative terms used for assessing impacts on visual resources from 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. Furthermore, surface-disturbing activities permitted in scenic quality A- and B-rated areas could change the scenic quality of the rating unit due to changes in the factors of scenic quality (i.e., landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications). About 36 percent of BLM-administered lands that were assessed for scenic quality rated as A or B, so impacts would be localized in those areas, about one-third of which are located in the SDNM. In addition, actions that would increase development in background and seldom seen distance zones could cause these zones to shift to foreground/middleground distance zones, potentially making them visible to a greater number of people for longer periods and with more frequency. This type of change could lead to a change in VRI class over the long term. About one-third of lands in the background and seldom seen distance zones are within designated wilderness areas, where the type of development that would push the areas into the foreground/middleground distance zone is unlikely. As noted in **Section 3.2.9**, Visual Resources, the inventory was conducted by Otak, Inc., from October to December 2009.

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, and impacts would be anticipated to range from negligible to major, depending on the condition of the landscape.

Table 4-5, VRM Classes by Alternative, shows the acreages of the four VRM classes in each alternative, with Alternative A representing the current situation. In this Decision Area, visual impacts could stem from valid and existing rights and activities associated with mining, land use authorization, and recreation facilities. When considering impacts, part of the determination was made by comparing the VRI class of an area to the proposed VRM class of the same area for each alternative. This was done to determine the degree of potential change from the current condition of an area to the level of landscape modification allowed by the area's assigned VRM class.

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	64,800	387,800	622,400	65,500
VRM III	279,600	551,000	385,600	192,000	554,800
VRM IV	442,500	222,600	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	218,000	268,400	28,500	252,400
VRM III	116,400	110,700	60,300	0	76,300
VRM IV	119,700	0	0	0	0
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, but, 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. The fast running nature of wildfires usually means that burning out from existing fuel breaks (such as roads or wide sandy washes) is the most successful suppression technique. Fire suppression techniques could 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 would 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 and Realty on Visual Resources

Utilities, communication facilities, and energy facilities, as well as their ancillary facilities and structures, 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 such facilities as those for producing solar energy, which are typically closer to the ground, may more directly affect middle-distance viewing. By requiring LUAs to conform to assigned VRM classes, most developments are expected to have minor to moderate effects 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. Most parcels for disposal in the Lower Sonoran are isolated and 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, impacts on the visual landscape are expected to be minor.

From Minerals Management on Visual Resources

Locatable and saleable mineral development could represent a major impact on 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.

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, if they are located in scenic quality A- or B-ranked areas or areas with high or moderate sensitivity levels.

The oil and gas and sodium potential beneath the majority of BLM-administered land is low, but moderate potential exists beneath BLM-administered land in the Batamote Mountains area, north of Woolsey Peak Wilderness in the southern portion of the field office and north of the SDNM. These areas range from moderate to high visual sensitivities and have scenic quality rankings of either B or C. Overall, these areas are at a lower risk for impacts, so changes from oil and gas and sodium development are anticipated to be no more than moderate.

The majority of BLM-administered lands have a moderate potential for geothermal resource development, with some high potential for low-temperature geothermal resources north of Signal Mountain Wilderness, north of the SDNM, and in the Little Ajo Foothills area. Because the low-temperature resource is considered suitable only for residential or commercial space heating,

greenhouse use, aquaculture, or heated swimming pools and spas, any geothermal development would be on a small scale and would not likely impact the scenic quality to the extent that it would change in these areas.

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, which are visible from long distances. In addition, uses that disturb a larger area, such as cross-country motorized travel as compared to motorized travel on designated routes, 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 can affect scenic quality; examples are restrooms, fences, information kiosks, and ramadas, as well as potential long-term visitor areas and extended stay or short-term camping areas. Although recreation is inherently temporary, the impacts of these activities can be long lasting and could have moderate to major impacts on the scenic quality of an area, particularly if they involve uses such as recreational target shooting and paintball. If Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor. Target shooting, allowed outside of developed areas, often leaves behind targets, shells, and trash. It also can 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, to address visitor health and safety or user conflicts, or to resolve conflicts with other resources. Most of these public lands, including unallocated areas, 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 an experience in a natural 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 and mining facilities, or from the proliferation of unauthorized recreational routes over time. In either case, the route design 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.

Generally, any attempt to manage a transportation network would 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 would also reduce its visual intrusiveness if the routes chosen for closure were selected because of their visual characteristics and if they were carefully reclaimed. Impacts would range from negligible to minor.

4.9.2.3 Sonoran Desert National Monument

From Lands and 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. Impacts on the visual landscape are expected to be negligible to minor throughout the Monument. 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 would be removed, allowing recovery of natural appearing landscapes. North of Interstate 8, Developments associated with livestock grazing management (e.g., fences, windmills, wells, earthen dams, corrals, access roads, and stock tanks) would be required to meet VRM objectives. Impacts from livestock grazing are expected to be minor.

From Minerals Management on Visual Resources

The SDNM is withdrawn from new mineral entry and closed to leasable and saleable mineral development under all alternatives. The withdrawal and closures were established in the proclamation that established the Monument. The withdrawal and closures will have a protective effect on visual resources, as ground disturbance from exploration, prospecting, and other activities associated with mineral development would be 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 may still be developed. Depending on the extent and intensity of ground disturbance, there may be direct moderate to major effects on visual resources. However, the BLM, as the owner/manager of the surface, would work with operators to mitigate impacts on Monument objects and reduce impacts to moderate or minor. Methods to reach a minor impact outcome would likely include project design features and best management practices to reduce or mitigate effects on meet the visual resource management objective.

From Recreation Management on Visual Resources

In 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, because recreation is not a Monument object, all recreation activities are constrained by the requirement to protect 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 impacts on the visual landscape.

From Transportation Management on Visual Resources

In the SDNM, management of travel and transportation may have the greatest impact on visual resources of all management activities on the Monument. The continued existence of routes in the Vekol Valley area is expected to have a negligible impact on 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 would improve the visual landscape; however, it is anticipated that the change would be minor in most cases.

4.9.3 ALTERNATIVE A (NO ACTION)

4.9.3.1 Lower Sonoran

From Lands and 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 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 on visual resources could occur from 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 on 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 4-6**, Comparison Between VRM and VRI under Alternative A in the Lower Sonoran.

Table 4-6
Comparison Between VRM and VRI under Alternative A in the Lower Sonoran

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	91,750	91,800	0	0	0
Class II	166,850	0	54,900	46,300	64,400
Class III	290,700	0	29,000	105,500	153,300
Class IV	380,900	0	31,000	124,800	220,000

Under Alternative A, all lands inventoried as Class I would be managed as Class I. This would likely have a negligible impact on Class I inventoried lands. An additional 184,800 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 30 percent of lands in the Lower Sonoran.

Approximately 380,400 acres (41 percent) of lands in the Lower Sonoran could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Approximately 199,600 acres (22 percent) of lands in the Lower Sonoran could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, approximately 64,400 acres (7 percent) of lands in the Lower Sonoran could experience major impacts from landscape modifications allowable under the proposed VRM objectives.

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 an allocation of limited to existing roads, trails, and washes, has led 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 off-road use, which 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

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 4-7**, Comparison Between VRM and VRI under Alternative A in the SDNM.

Table 4-7
Comparison Between VRM and VRI under Alternative A in the SDNM

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	157,700	157,700	0	0	0
Class II	158,600	0	69,200	76,000	12,500
Class III	169,900	0	21,800	39,900	107,000
Class IV	200	0	100	0	100

In the SDNM, all lands inventoried as Class I would be managed as Class I. This would have a negligible impact on Class I inventoried lands. An additional 21,900 acres of lands inventoried as a Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 37 percent of lands in the SDNM.

Approximately 109,200 acres (23 percent) of lands in the SDNM could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Approximately 183,000 acres (38 percent) of lands in the SDNM could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, approximately 12,500 acres (3 percent) of lands in the SDNM could experience major impacts from landscape modifications allowable under the proposed VRM objectives.

From Livestock Grazing on Visual Resources

Areas of livestock concentration where vegetation is removed and soil has been compacted 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, which could contrast with the natural setting. However, because these facilities tend to be localized and difficult to see from a long distance, impacts on the visual landscape are expected to be minor.

4.9.4 ALTERNATIVE B

4.9.4.1 Lower Sonoran

From Lands and Realty on Visual Resources

Under Alternative B, the majority of the Decision Area would be either exclusion or avoidance areas for LUAs. Aside from Alternative A, this alternative has the most potential for LUAs to impact visual resources if utilities were authorized in areas with higher visual quality or sensitivity. Utility-scale renewable energy development would be almost entirely excluded or avoided, so potential impacts from

that type of development are small. VRM classes generally shift from classes IV and II into Class III. For areas formerly Class IV, this would 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

Facilities to support recreation would be more prevalent under this alternative, which would include the most areas of developed and intensively managed recreation. While the opportunity for degrading visual resources 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 4-8**, Comparison Between VRM and VRI under Alternative B in the Lower Sonoran.

Table 4-8
Comparison Between VRM and VRI under Alternative B in the Lower Sonoran

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	91,750	91,800	0	0	0
Class II	166,850	0	25,300	118,600	22,500
Class III	290,700	0	11,800	213,600	63,800
Class IV	380,900	0	27,700	216,700	135,000

Under Alternative B, all lands inventoried as Class I would be managed as Class I. This would likely have a negligible impact on Class I inventoried lands. An additional 256,200 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 38 percent of lands in the Lower Sonoran.

Approximately 373,900 acres (40 percent) of lands in the Lower Sonoran could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Approximately 182,400 acres (20 percent) of lands in the Lower Sonoran could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, approximately 22,500 acres (2 percent) of lands in the Lower Sonoran could experience major impacts from landscape modifications allowable under the proposed VRM objectives.

4.9.4.2 Sonoran Desert National Monument

From Travel Management on Visual Resources

The designated route network under Alternative B would reduce visual impacts in many areas. 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 4-9**, Comparison Between VRM and VRI under Alternative B in the SDNM.

Table 4-9
Comparison Between VRM and VRI under Alternative B in the SDNM

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	157,700	157,700	0	0	0
Class II	158,600	0	129,600	28,300	0
Class III	169,900	0	89,000	79,900	0
Class IV	200	0	200	0	0

In the SDNM, all lands inventoried as Class I would be managed as Class I. This would have a negligible impact on Class I inventoried lands. An additional 89,200 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 51 percent of lands in the SDNM.

Approximately 209,500 acres (43 percent) of lands in the SDNM could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Approximately 28,300 acres (6 percent) of lands in the SDNM could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, no lands in the SDNM would be managed as VRM Class III or IV, therefore major impacts on visual resources would not be expected.

From Livestock Grazing on Visual Resources

The nature and type of impacts would the same as those described under Alternative A. The additional closures may require more fencing to keep livestock out of the closed areas than under Alternative A. If

visible to Monument visitors, it could be perceived as a visual impact. However, fencing and other structures would be required to meet VRM Class objectives, possibly mitigating some impacts.

4.9.5 ALTERNATIVE C

4.9.5.1 Lower Sonoran

From Lands and Realty on Visual Resources

Under Alternative C, almost 80 percent of the Decision Area would be avoidance or exclusion areas for LUAs. More lands would be managed as VRM Class II, resulting 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 would reduce the contrast in line, color, form, and texture, which visually degrade the landscape. However, most lands without LUA restrictions would be managed as VRM Class III or IV. Lands with higher visual quality or sensitivity could be impacted if LUAs change the elements of landform, vegetation, water, color, scarcity, or cultural modifications from the existing condition. Visual impacts due to development in this alternative would be minor.

From Recreation Management on Visual Resources

In contrast to Alternative B, less acreage and fewer facilities would be managed for recreation as the primary land use under Alternative C but more than under 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 on visual resources may see a slightly reduced likelihood of visual degradation from recreational use, 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 4-10**, Comparison Between VRM and VRI under Alternative C in the Lower Sonoran.

Under Alternative C, all lands inventoried as Class I would be managed as Class I. This would likely have a negligible impact on Class I inventoried lands. An additional 468,600 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 61 percent of lands in the Lower Sonoran.

Approximately 283,800 acres (61 percent) of lands in the Lower Sonoran could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Table 4-10
Comparison Between VRM and VRI under Alternative C in the Lower Sonoran

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	91,750	91,800	0	0	0
Class II	166,850	0	99,400	54,900	0
Class III	290,700	0	129,400	145,200	13,800
Class IV	380,900	0	156,500	182,700	39,200

Approximately 68,700 acres (8 percent) of lands in the Lower Sonoran could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, no lands in the Lower Sonoran would be managed as VRM Class III or IV, therefore major impacts on visual resources would not be expected.

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 4-11**, Comparison Between VRM and VRI under Alternative C in the SDNM.

Table 4-11
Comparison Between VRM and VRI under Alternative C in the SDNM

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	157,700	157,700	0	0	0
Class II	158,600	0	148,400	9,600	0
Class III	169,900	0	119,900	49,000	0
Class IV	200	0	200	0	0

In the SDNM, all lands inventoried as Class I would be managed as Class I. This would have a negligible impact on Class I inventoried lands. An additional 120,100 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 57 percent of lands in the SDNM.

Approximately 197,400 acres (41 percent) of lands in the SDNM could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Approximately 9,600 acres (2 percent) of lands in the SDNM could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, no lands in the SDNM would be managed as VRM Class III or IV, therefore major impacts on visual resources would not be expected.

From Livestock Grazing on Visual Resources

The nature and type of impacts would be the same as those described under Alternative A. The additional closures may require more fencing to keep livestock out of the closed areas than under Alternative A. If visible to Monument visitors, it could be perceived as a visual impact. New fencing is proposed to tie into existing fencing and take advantage of natural topography so as to reduce the effects on visual resources. Fencing and other structures would be required to meet VRM Class objectives, possibly mitigating some impacts.

4.9.6 ALTERNATIVE D

4.9.6.1 Lower Sonoran

From Lands and Realty on Visual Resources

Under Alternative D, about 90 percent of the Lower Sonoran Decision Area would be avoidance or exclusion for LUAs, with the majority of the allocations being exclusion. Most lands managed as avoidance areas for LUAs would be allocated as VRM Class II; thus, if land uses were authorized in those areas, they would be required to meet higher visual resource objectives and to develop projects that generally follow the line, color, form, and texture of the existing landscape.

On the other hand, the small amount of land without LUA restrictions would largely be managed as VRM Class III or IV. In these areas, lands with higher visual quality or sensitivity could be impacted if LUAs were to change the elements of landform, vegetation, water, color, scarcity, or cultural modifications from the existing condition. Impacts would range from negligible to minor.

From Recreation Management on Visual Resources

In contrast to the other alternatives, Alternative D would have the fewest acres of areas managed and developed for recreation. A couple of areas would still include developed and intensively managed recreation, but most of the Decision Area would be managed for more primitive recreational experiences geared toward resolving conflicts. While visual resources 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 on visual resources may see a slightly reduced likelihood of visual degradation from recreation. 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 4-12**, Comparison Between VRM and VRI under Alternative D in the Lower Sonoran.

Table 4-12
Comparison Between VRM and VRI under Alternative D in the Lower Sonoran

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	91,750	91,800	0	0	0
Class II	166,850	0	14,600	19,700	800
Class III	290,700	0	230,800	52,900	5,300
Class IV	380,900	0	242,900	118,300	17,800

Under Alternative D, all lands inventoried as Class I would be managed as Class I. This would likely have a negligible impact on Class I inventoried lands. An additional 592,000 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 86 percent of lands in the Lower Sonoran.

Approximately 85,300 acres (11 percent) of lands in the Lower Sonoran could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Approximately 25,000 acres (3 percent) of lands in the Lower Sonoran could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, no lands in the Lower Sonoran would be managed as VRM Class III or IV, so major impacts on visual resources would not be expected.

4.9.6.2 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 in **Table 4-13**, Comparison Between VRM and VRI under Alternative D in the SDNM.

Table 4-13
Comparison Between VRM and VRI under Alternative D in the SDNM

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	157,700	157,700	0	0	0
Class II	158,600	155,700	2,300	0	0
Class III	169,900	143,100	26,200	0	0
Class IV	200	200	0	0	0

In the SDNM, all lands inventoried as Class I would be managed as Class I. This would have a negligible impact on Class I inventoried lands. An additional 325,200 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of nearly all lands in the SDNM.

Approximately 2,300 acres (less than 1 percent) of lands in the SDNM could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

No lands would be managed as VRM Class III or IV, so all impacts are expected to be negligible or minor.

From Livestock Grazing on Visual Resources

The nature and type of impacts would the same as those described under Alternative A. However, because the entire SDNM Decision Area would be closed to livestock grazing, a considerable amount of fencing could be required to keep livestock out of the Monument where topographic features do not act as natural barriers. Fencing and other structures would be required to meet VRM Class objectives, which are mostly Class I and II under this alternative, possibly mitigating the impacts.

4.9.7 ALTERNATIVE E (PROPOSED RMP)

4.9.7.1 Lower Sonoran

From Lands and 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 4-14**, Comparison Between VRM and VRI under Alternative E in the Lower Sonoran.

Table 4-14
Comparison Between VRM and VRI under Alternative E in the Lower Sonoran

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	91,750	91,800	0	0	0
Class II	166,850	0	38,200	105,700	22,500
Class III	290,700	0	23,900	202,800	62,500
Class IV	380,900	0	46,700	207,700	125,100

Under Alternative E, all lands inventoried as Class I would be managed as Class I. This would likely have a negligible impact on Class I inventoried lands. An additional 278,300 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 40 percent of lands in the Lower Sonoran.

Approximately 366,100 acres (39 percent) of lands in the Lower Sonoran could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Approximately 168,200 acres (18 percent) of lands in the Lower Sonoran could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, approximately 22,500 acres (2 percent) of lands in the Lower Sonoran could experience major impacts from landscape modifications allowable under the proposed VRM objectives.

4.9.7.2 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 4-15**, Comparison of VRM and VRI under Alternative E in the SDNM.

In the SDNM, all lands inventoried as Class I would be managed as Class I. This would have a negligible impact on Class I inventoried lands. An additional 11,200 acres of lands inventoried as Class III or IV would likely experience negligible impacts as a result of proposed VRM objectives, for a total of 44 percent of lands in the SDNM.

Table 4-15
Comparison Between VRM and VRI under Alternative E in the SDNM

VRI Class	Total VRI Class Acres	Acres of VRI Class by VRM Class			
		Class I	Class II	Class III	Class IV
Class I	157,700	157,700	0	0	0
Class II	158,600	0	143,300	14,700	0
Class III	169,900	0	11,000	59,100	0
Class IV	200	0	200	0	0

Approximately 202,400 acres (52 percent) of lands in the SDNM could experience minor impacts from landscape modifications allowable under the proposed VRM objectives.

Approximately 14,700 acres (4 percent) of lands in the SDNM could experience moderate impacts from landscape modifications allowable under the proposed VRM objectives.

Finally, no lands in the SDNM would be managed as VRM Class III or IV, therefore major impacts on visual resources would not be expected.

From Livestock Grazing on Visual Resources

The nature and type of impacts would the same as those described under Alternative A. The additional closures may require more fencing to keep livestock out of the closed areas than under Alternative A, similar to that described for Alternative C. If visible to Monument visitors, it could be perceived as a visual impact. However, fencing and other structures would be required to meet VRM Class objectives, possibly mitigating some impacts.

4.10 IMPACTS ON WATER RESOURCES

This section discusses the potential impacts on water resources from the proposed allocation decisions and management actions as noted in Chapter 2. 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-administered 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 stormwater runoff.

4.10.1 METHODS OF ANALYSIS

The methods to determine potential impacts on water resources included a review of relevant GIS data for the Planning Area. The GIS data were overlain with the actions found under each alternative, and

conclusions were drawn based on an understanding that these types of actions may affect known surface and groundwater resources. Impacts on water resources are evaluated only from the perspective of water availability and quality. Effects are quantified where possible; in the absence of quantitative data, best professional judgment was used.

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 close to (200 feet) 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 un-surfaced 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 ensure 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 and 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, stormwater 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, stormwater 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, stormwater 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, stormwater 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

4.10.2.1 Sonoran Desert National Monument

From Minerals Management on Water Resources

The SDNM is withdrawn from new mineral entry and closed to leaseable and saleable mineral development under all alternatives. The withdrawal and closures were established in the proclamation that established the Monument. This withdrawal and closures would have a protective effect on water resources, as 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 on the extent and intensity of ground disturbance, there may be moderate direct effects on water resources. Locatable mineral development could result in a variety of water resource impacts ranging from disruption of natural drainage conditions due to the development of pits, waste rock areas, leach pads, and roads, to substantial groundwater impacts from pumping as part of 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 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 bed elevations or disturbing channel banks which could result in head cutting. Each proposal would require site-specific assessment.

However, the BLM, as the owner/manager of the surface, would work with operators to mitigate impacts reduce them to minor. Methods to reach a minor impact outcome would likely include project design features and/or best management practices. Additionally, restoration activities could reduce impacts of past mining (sedimentation, heavy metal occurrence) over time.

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 would be washed into drainages during periods of stormwater 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 and Realty on Water Resources

Ten corridors for major linear LUAs would be designated under Alternative A through the Lower Sonoran. The designation of corridors would lead to localized impacts on water resources from surface disturbance associated with construction or maintenance activities. Containing these uses in the corridors would limit the areal extent and represent a minor impact if corridors are revegetated to stabilize disturbed soils, which would reduce runoff, erosion, and sedimentation.

LUAs for utility-scale renewable energy development would have measurable, widespread effects on water resources. Blading of large areas for solar energy facilities is estimated to exceed 150,000 acres over the life of the plan. LUAs would disrupt drainage patterns, 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 groundwater may be needed for renewable energy development and production, and would result in additional impacts on drainage patterns by causing subsidence in localized areas. Groundwater pumping would likely lower water table elevations and potentially impact neighboring wells. Pumping impacts would be mitigated in future solar developments by use of dry cooling technologies or by using systems with entirely different means of generating electricity. It is assumed that the solar energy development proposals built under this plan would consist of concentrated solar 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 would affect water resources, particularly if the proposed future land use involved surface disturbance or removal of vegetation, such as for a housing development or solar energy facility. Water resources could also be affected if development on these parcels increases groundwater pumping that could lower water table elevations. New surface water developments on these lands would require water rights and/or new groundwater 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, and would only occur under Alternative A. Impacts on 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 would be minor in terms of surface disturbance due to the small number of acres affected but potentially moderate in terms of groundwater impacts if water intensive facilities are constructed. Potential impacts would 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 ground surface covers such as desert pavement and cryptobiotic crusts would expose fine-grained sediments to erosion. Increased erosion of fine-grained sediments would increase transport and delivery to ephemeral washes and, ultimately, the intermittent and perennial reaches of the Gila River. Impacts on sensitive surfaces would be minimized by livestock stocking rates low enough to allow progress toward the desired plant community. This would 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 localized 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 on water resources vary by type of development. Locatable mineral development could result in a variety of water resource impacts ranging from disruption of natural drainage conditions due to the development of pits, waste rock areas, leach pads, and roads, to substantial groundwater impacts from pumping as part of 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 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 bed elevations or disturbing channel banks which could result in head cutting. Each proposal would require site-specific assessment. Impacts would range from negligible to moderate.

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 not be allocated as an RMA. Impacts on water resources would increase from the damage to soil resources that are expected to increase as recreation use increases throughout the Decision Areas in SRMAs. The increased concentration of activity in the SRMAs increases the probability of impacts on water resources due to erosion from increased stormwater runoff from impervious or compacted surfaces of parking areas, structures and trails. These impacts are limited in extent and would be considered to be minor. Mitigation and maintenance is planned for facilities and near historic sites. Dispersed recreation occurring in the Decision Area may be more numerous and impacts on individual disturbed sites would be minor. Dispersed recreation that occurs in the unaffected areas 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 would be used for short periods and be relatively small in size. Campers are encouraged to use existing sites. Only one established campground and two unimproved areas are currently used for camping in the Decision Areas. Alternative A includes the potential establishment of a LTVA. If any LTVAs are created in Ajo or elsewhere, they would be located 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 stormwater runoff and sedimentation exists from increased compaction, rutting, and bare ground within the designated camping areas. Increasing the stay limit to establish an LTVA could increase impacts if the footprint of the campground was also increased. Most impacts have occurred, so designating an existing camping area as an LTVA would be considered to 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 and would increase the probability of erosion on and near the road, which could lead 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 would occur leading to an increased area of disturbance along the 950 miles of roads in the Lower Sonoran, which would have potential to impact water resources.

From Special Designations on Water Resources

The Coffeepot Botanical ACEC is the only ACEC under Alternative A. An existing management decision closes existing roads to all recreational use. This would greatly reduce unauthorized travel, widening of existing roads, and most other additional surface disturbance. The special designations would have minor to negligible water resource impacts.

From Travel Management on Water Resources

A decision to maintain the current allocations for OHV Area designations would allow all inventoried routes to be used. This would 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 currently allocated, therefore there would be no effects 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.

Travel routes that are located close 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 a combination of 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 stream 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 three 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 1,670 would be closed in the Lower Sonoran. Roads concentrate and channel stormwater 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 during high flows. The 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. The continued use of these routes disturbs the bed and banks of these channels, damages, xeroriparian vegetation, and leads to greater sedimentation during stormwater runoff. Wash bottoms are a major source of groundwater recharge in the Decision Area. Use of wash bottoms as travel routes exposes surface and groundwater 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.

Streambeds in the Decision Area are typically composed of sand, and the affected areas are locally small, resulting in minor impacts on wash bottoms overall. There are enough intersections between roads and drainages to cause a moderate impact locally where the intersections occur, including moderate impacts on stream banks which can cause accelerated erosion head cutting.

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. Impacts would mainly be limited to the Ajo Block where a majority of wood harvesting occurs. 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.

From Wildlife and Special Status Species on Water Resources

Maintenance and redevelopment of existing wildlife waters, development of new wildlife waters and livestock waters would continue under Alternative A. Soil compaction and ground surface disturbance from increased wildlife activity around existing wildlife water developments would increase runoff and sedimentation. Impacts from wildlife water developments would be negligible compared to the increased runoff and erosion that occurs from soil compaction and vegetation removal near livestock waters, which are minor themselves due to their limited spatial extent. Any potential water resource impacts from wildlife sharing livestock water would be negligible.

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 and Realty on Water Resources

Three corridors for major linear LUAs would be designated under Alternative A in the SDNM. The designation of the corridors would result in moderate impacts on water resources from surface disturbances during construction and maintenance activities. Containing these uses in the corridors would maintain a moderate level of impact. 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. Revegetation, closures, restoration of temporary roads and other construction disturbances, and maintenance of natural drainage pathways would reduce impacts on water resources over time.

Alternative A does not provide for utility-scale renewable energy development in the SDNM. Indirect impacts on water resources in the SDNM could occur in the southeast section of the SDNM (southern Vekol Valley) from developments that increase stormwater runoff, cause 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 in accordance with the Monument Proclamation, the allotments or portions of south of I-8, within SDNM, were made unavailable to livestock grazing when the permits expired. Minor long term benefits to water resources would be expected from increases in vegetative ground cover and litter. Small decreases in soil compaction would be expected to increase water holding capacity and infiltration and reduce runoff, erosion, and sedimentation. The closures would 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 such as those with cryptogamic crusts, desert pavement, or around stock watering sites.

From Recreation Management on Water Resources

Alternative A has a SRMA that is intended to cover the portion of the Gila Trails SRMA that occurs within the SDNM. It has 143,900 acres which includes the Gila Trail, Butterfield Stage Route, Anza Trail, and other historical points. Impacts on water resources would increase as additional miles of hiking,

biking, and equestrian trails are constructed. Increased recreational use and additional trails would expose disturbed soils to erosion from surface disturbance.

Planned management actions would protect resource values and limit OHV use to designated routes. The sum of these offsetting actions is likely to be a minor impact. The remaining 342,500 acres of the SDNM would experience minor impacts similar to those described above for the Lower Sonoran Decision Area.

A number of recreational target shooting areas are located in the SDNM. 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 or the potential migration of that lead into surface and subsurface water systems. It also does not address the buildup of shooting debris and lacks specific management prescriptions for recreational target shooting, which could increase the risk of injury and detrimental effects to water 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 Area. 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. Impacts are expected to be moderate.

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 groundwater resource development 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 in local washes. Groundwater development could lower water table elevations in 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 325,200 acres as Limited to Existing Roads and Trails would have a minor effect on water resources since no riparian resources occur inside SDNM. Sixty five 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 occurrence 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, leaks of fuels, and oils into the groundwater system. This would lead to a minor level of impact on water resources, including an increase in sedimentation in drainages during periodic stormwater runoff events.

Restricting travel to existing routes would 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 would 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 and Realty on Water Resources

The number of multiuse corridors would be the same as those described under Alternative A. As under 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 on 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 Recreation Management on Water Resources

Recreation allocations in the Lower Sonoran would include five SRMAs and five ERMAs. The effects of RMAs on water resources are dependent on the proposed recreation uses and are described under Alternative A. The extent of impacts from RMAs is increased under 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 on 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 under Alternative B would 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 under Alternative A.

From Travel Management on Water Resources

Decisions to allocate OHV Closed Area designations on all designated wilderness areas, 101,800 acres, 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 resulting in an increase of infiltration rates. 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 would be moderate to major locally, but minor regionally. Motocross type of use would be expected to occur within the 40 acres designated as open. 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, 828,360 acres, 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 Alternative A, water resources would be expected to be less impacted due to the decision to have designated routes. Nearly all existing miles of roads are open under Alternative A (1,670 of the 1,688 miles in the Lower Sonoran). Only 1,241 miles are open under Alternative B. Impacts would decline in each alternative as miles of open routes are reduced. 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 would reduce the impacts on water resources. Reductions in rutting, surface, and vegetation disturbance and water erosion would occur wherever routes are closed. In those specific areas where the road closures are concentrated, the impact on water resources would decline from moderate to minor. However, even with the 12 percent reduction in road miles under Alternative B, the overall impact of travel on water resources in the Lower Sonoran would remain minor. Alternative B includes plans for only 5 acres with new roads, which would 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 under Alternative B from those under 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 under Alternative A to 126 miles of open and seasonally closed roads under 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 under Alternative A to 915 under 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 under Alternative A to 249 miles under 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 would maintain the small amount of litter available as cover, reducing runoff and sedimentation of stream channels.

From Wildlife and Special Status Species 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 groundwater is

developed to provide wildlife waters, there may be a negligible drawdown of groundwater elevations. Surface water developments would impound a small volume of stormwater 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.

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 and 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 under 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 on 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 Recreation Management on Water Resources

Compared to Alternative A, which only has 143,900 acres in a 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, backcountry recreation. Therefore, the impacts on water would be similar to Alternative A and minor. In the SDNM, one ERMA 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 on water resources in this portion of the SDNM as compared to Alternative A. The overall impacts from special designations in the SDNM under 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. Minor impacts on water quality in this area due to mitigation by creation of earthen water control structures on open routes could occur. 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 under Alternative B (and all other action alternatives). About 69 miles would be closed, which is comparable to the miles of closures under 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 under Alternatives A and B. Closing 69 miles of existing travel routes accounts for about 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 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 under Alternative B (and all other action alternatives). About 72 miles would be closed, which is about 65 more miles of closures than under Alternative A (6.6 miles closed). This would be a negligible change from existing conditions under 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 under Alternative A and B would be similar.

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 close to washes (hydraulically connected) changes from 114 miles under Alternative A to 106 miles under Alternative B, a 7 percent decrease. The net effect on water resources is negligible when compared to Alternative A. The overall effect of this alternative on water resources is minor 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 C would be the same as those under Alternative A.

From Lands and Realty on Water Resources

In the Lower Sonoran under Alternative C, the multiuse corridors would be the same as those described under Alternative A. As under 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 under Alternative C than under Alternative A. The reduced acreage available for utility-scale renewable energy development would reduce the potential for surface disturbance that would increase stormwater runoff and sedimentation and reduce the potential for withdrawal of groundwater that could lower water table elevations. Impacts on water resources would 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. 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 would be greater than the impact described under Alternative A, although the total impact would remain moderate. Land disposal has a negligible impact on water resources. The maximum potential impact from future development would be minor in terms of surface disturbance due to the small number of acres affected but 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. Perennial AUMs under Alternatives A and C are the same, but ephemeral grazing allowed under Alternative A would not occur under Alternative C. Alternative C could increase perennial stocking rates to full permitted numbers, causing concentration of use near water and gathering areas. Increased runoff and sedimentation from surface disturbance and compaction would also occur from Alternative C, although the impacts would remain minor. Current grazing intensity identified under Alternative A when combined with a potentially larger perennial herd would result in decreased water storage and surface water infiltration rates, and a reduction in residual litter associated with the lower use of ephemeral grazing identified under Alternative C. Impacts would be expected to be negligible to minor.

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 be major but would require site-specific assessments of mineral development proposals. Impacts would be expected to range from negligible to moderate.

From Recreation Management on Water Resources

Four ERMAs and four SRMAs would be allocated in the Lower Sonoran under Alternative C. 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 backcountry (423,100 acres) compared to community interface (19,900 acres) and front country (186,300 acres). 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 Alternative A. Proposed management actions in the Gila Bend Mountains ERMA to restore natural conditions of disturbed areas greater than 2 acres would 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 of recreation management would be minor, assuming planned road and campground maintenance actions are effectively implemented.

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 impacts on watershed conditions. Compared to Alternative A, the 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

Comparative to Alternative A, the decisions to allocate most areas to Limited to Designated Routes would have minor impacts on xeroriparian and riparian areas through less use of washes as travel routes.

Alternative C would include a framework for vehicle and travel management that would, over time, decrease the effects 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, 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 would 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 would occur wherever routes are closed.

In specific areas of concentrated road closures, impacts on water resources would decline from moderate to minor. Even with the 18 percent reduction in road miles under Alternative C compared to Alternative A, the overall impact of travel on water resource conditions in the Lower Sonoran would

remain minor. The probability that stormwater runoff would 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 would 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. The number of wash crossings decreases to 820, a 21 percent decrease from Alternative A. The number of miles of roads close to streams decreases to 218 miles, a 29 percent decrease from Alternative A. The net effect is a minor reduction in impacts from Alternative A 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 impacts under Alternative C would be the same as those described under Alternative A.

From Wildlife and Special Status Species 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 Alternative A (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 on water resources from those under Alternative A. Limiting the size of surface-disturbing activities in wildlife management corridors would also reduce water resource impacts.

Unlike Alternative A, 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 on soil and water resources due to maintaining and redeveloping existing waters. Overall impacts would be negligible.

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 and 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 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 Alternative A. 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 under 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 under Alternative A would not occur under Alternative 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. However, the elimination of grazing on 44,800 acres on the SDNM could help offset some of these impacts in those areas fenced off.

From Recreation Management on Water Resources

The entire SDNM is an ERMA consisting of the Desert Back Country RMZ and the Juan Batista de Anza National Historic Trail RMZ. Although the Anza RMZ is likely to attract increased visitation, two-thirds of that RMZ and nearly 90 percent of the Desert Back Country RMZ would 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 would be limited in size and competitive motor sports would not be allowed. These management actions would reduce damage to the unsurfaced road prism, and reduce the risk of impacts from stormwater runoff and erosion from the roads on nearby washes. These positive impacts would 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 under Alternative B.

From Travel Management on Water Resources

A decision to maintain the allocation of 157,700 acres as Closed OHV areas would have the minor effect of allowing xeroriparian areas to continue stabilization. The allocation of 328,700 acres as Limited to Designated Roads would have a minor effect on water resources since no riparian resources occur inside SDNM. There would likely be less impact on sedimentation of water resources as a result of travel management designations under Alternative C, when compared to Alternative A. Additional engineering, possibly including the use of dust suppressants to minimize effects on air quality and visual resources, and to accommodate higher use on fewer routes could offset these impact improvements. For this reason, impacts are still assessed as 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. The number of wash crossings would decrease to 285, a 13 percent decrease from Alternative A. The number of miles of roads close to streams decreases to 90 miles, a 21 percent decrease from Alternative A. These impacts represent a minor decrease from Alternative A 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 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 and Realty on Water Resources

The number of multiuse corridors would be reduced from 10 in Alterative A to seven under 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 925,200 acres of excluded and high sensitivity areas under Alternative D, 820,200 acres more than Alternative A. Approximately 19,400 acres are available for disposal under Alternative D. If disposal of all available land occurred, the impact would 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 would 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 on 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. Alternative D would have less impact on water resources when compared to Alternative A, due to the closure to grazing.

From Minerals Management on Water Resources

More areas would be excluded from mineral development under this alternative than Alternative A. Excluding these areas would reduce the potential for minerals-related impacts on water resources. 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 Recreation Management on Water Resources

Recreation allocations under Alternative D would include establishing two SRMAs and one ERMA; the Buckeye Hills East Trails and the Painted Rock SRMAs, and the Buckeye Hills West Trails ERMA. The effects of RMAs on water resources are dependent on the proposed recreation uses described under Alternative A. Extent of the impacts from RMAs under Alternative D are reduced from those under Alternative A, due to fewer acres of RMAs and a different recreational opportunity emphasis. Recreational use in the Buckeye Hills East Trails SRMA would emphasize nonmotorized recreation opportunities and dispersed recreational opportunities in the Buckeye Hills West Trails ERMA. Reduced emphasis on facility development and motorized recreation would result in reduced water resource impacts from those under Alternative A. 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 on water resources. Impacts would be negligible to minor.

From Special Designations on Water Resources

A total of 218,600 acres would be included in four areas designated as ACECs: Saddle Mountain, Coffeepot Batamote, Cuerda de Lena, and Lower Gila Terraces and Historic Trails. Management decisions would limit motorized travel, surface-disturbing activities, mineral development, utility-scale renewable energy development, and developed recreation sites in some or all of these areas.

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 restoration potential, effects on water resources would be moderate due to 342,700 more acres closed to motor vehicle use which is the primary cause of vegetation loss in washes. Alternative A would close 100,000 acres to motor vehicle use. 40 acres would not be allocated to open use under Alternative A or D. Alternative D would allocate 587,500 acres to Limited to Designated Routes, compared to 0 acres under Alternative A. Alternative D would allocate 0 acres of Limited to existing roads and trails, compared to 830,200 under Alternative A.

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 acuña 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.

From Wildlife and Special Status Species on Water Resources

Surface-disturbing activities would be excluded from the Gila Bend Mountains Wildlife Habitat Area, pronghorn habitat, Category I, II, and III desert tortoise habitat, and wildlife movement corridors. These exclusions would allow the recovery of vegetative ground cover in previously disturbed areas and by preventing future disturbance. This alternative would result in minor effects on water resource effects when compared to Alternative A.

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 and 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 on 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 on 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 under Alternatives A and D. Overall impacts would be negligible.

From Recreation Management on Water Resources

The entire Monument area would be designated as an ERMA with an emphasis on an undeveloped backcountry 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 reduction in the adverse effects of surface-disturbing activities on runoff, erosion and sedimentation. 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 on water resources in this portion of the SDNM as compared to Alternative A. The overall impacts from special designations in the SDNM under Alternative D would be minor.

From Travel Management on Water Resources

Under Alternative D, decisions to allocate 313,600 acres of OHV areas of Closed designation, as compared to Alternative A which would designate 161,200 acres as closed. Alternative D 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 on 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 a major change from existing conditions under Alternative A and would reduce impacts on 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 Alternative A. The number of miles of roads close to streams decreases to 31 miles, a 73 percent decrease from Alternative A. These impacts represent a moderate decrease from Alternative A 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 59 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 (PROPOSED RMP)

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 and Realty on Water Resources

Alternative E impacts on water resources from land tenure changes would be somewhat greater than Alternative A due to a larger number of acres available for disposal (30,500 acres versus 27,400 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 under Alternative E total 380,100 acres, compared to Alternative A with 105,100 acres. Compared to Alternative A, Alternative E impacts from surface disturbance associated with LUAs, would occur on about 275,000 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 under Alternative C. Alternative E would have 511,100 acres in areas of high sensitivity, reducing the probable future surface disturbance and potential for groundwater 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 on water resources from mineral development under Alternative E would be slightly less than under Alternative A, due to the Saddle Mountain ACEC and areas near petroglyphs in the Gila River Terraces and Southern Historic Trails ACEC being proposed for withdrawal from mineral entry and closed to leasable and saleable mineral development. 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 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 one SRMA designated under Alternative B would not be designated under Alternative E. This could provide a minor positive impact under E, since less recreational activity would probably occur in the 48,100 acres in the ERMA. The Saddle Mountain ERMA 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 Saddle Mountain ERMA 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 slightly positive impact of Alternative E.

Differences in impacts from management under Alternatives B and E in the Buckeye Hills East Trails SRMA and Buckeye Hills West Trails ERMA would be negligible.

From Special Designations on Water Resources

Alternative E proposes 198,400 acres for ACEC designation. Areas and designations are similar to Alternative D although limitations on disturbance under Alternative E are slightly less restrictive than those under Alternative D. Alternative E would result in minor impacts on water resources due to limitations on surface-disturbing activities and motorized travel. Net water resources impacts would be less than those under 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 91,000 acres, having the similar effects as Alternative A. This additional land is mostly unroaded and functions well hydrologically; therefore, the effects on water resources would be negligible.

From Vegetation Resources on Water Resources

Impacts would be similar to Alternatives B, C, and D.

From Wildlife and Special Status Species 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 on water resources would be similar to Alternatives A and B. Small amounts of stormwater runoff would be impounded and water rights would be necessary for new surface water developments. Well permits would be required for groundwater development. Net effect on water resources would be negligible.

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 and 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 under Alternative C and would be negligible.

From Livestock Grazing on Water Resources

Grazing impacts on water resources would be the same as Alternatives A and C, except that impacts on water resources within the 95,290 acres proposed to be closed would benefit other water resources to an even greater extent. Impacts are nevertheless expected to be negligible to minor.

From Recreation Management on Water Resources

The entire SDNM would be managed as an ERMA under all action alternatives. Under Alternative A only about ¼ of the Monument would be an ERMA. Under Alternative E, most of the Decision Area would be managed as backcountry, which means undeveloped recreational activity. Impacts on water resources would be negligible, and similar to the other action alternatives. Impacts are positive compared to Alternative A. Since dispersed recreational target shooting throughout the Monument would continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

From Special Designations on Water 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 Water Resources

Decisions to allocate OHV areas the same as Alternative B and would have similar effects. 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 under 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 close to streams increases from Alternative D to 78 miles under 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 AND 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 existed. The BLM currently manages this area with a zero horse and burro population. Previous decisions stated that the BLM was to manage this herd area for a "zero population" of wild horses and burros. These decisions were 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 target population of zero animals requires the BLM to remove all the wild

horses and burros from this herd area. Funding, however, has not been provided, and all of the wild horses and burros have not yet been removed. Nuisance horses and burros have been removed on a case-by-case basis.

Because 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 are 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, 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 from and the evidence of 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 on 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 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, wildlife and special status species, 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 unavailability, 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.

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.

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 are 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 and 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 and Public Safety on Wilderness Characteristics

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 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 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, nonnative 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 nonnative 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 ground and air-based firefighting organizations can minimize or eliminate the potential for adverse long-term effects of fire, including consequences on naturalness associated with large-scale mechanized firefighting and the severe long-term potential for nonnative ecosystem conversion. Overall, impacts would be negligible to major.

From Recreation Management on Wilderness Characteristics

Providing signs for visitor information, regulations, or interpretation could diminish 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 the retention of wilderness characteristics by providing opportunities for primitive unconfined recreation.

4.12.2.2 Lower Sonoran

From Recreation Management on Wilderness Characteristics

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 spent shells, targets, and 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 are influenced by the size and design of the firearm, terrain features, and weather.

From Special Designations on Wilderness Characteristics

Neither designating nor not designating the Agua Caliente Road as a 30-mile Backcountry Byway would impact wilderness characteristics.

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. 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 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's mineral estate. Where the BLM manages the surface overlaying non-Federal minerals, it has management discretion over if and how mining can occur. As such, the impacts stated above would occur only on non-BLM lands adjacent to the area with wilderness characteristics and could indirectly impact the wilderness characteristics on BLM land. 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 is not 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 Special Designations on Wilderness Characteristics

Neither maintaining nor not maintaining the Vekol Valley ACEC in the SDNM would impact lands with wilderness characteristics, as the ACEC does not contain wilderness characteristics.

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 under 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 the naturalness and solitude of lands with wilderness characteristics. Difficulty of access would relegate most site development or interpretation to the periphery of such areas. Impacts would be negligible.

From Livestock Grazing on Wilderness Characteristics

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.

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 the following

- Livestock-use adjustments with increased or fewer animals
- Changes to grazing management systems
- 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
- Construction or abandonment of rangeland developments

Such actions would degrade or enhance naturalness and opportunities for solitude and primitive unconfined recreation.

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 carbon monoxide, nitrogen dioxide, volatile organic compounds, and sulfur dioxide 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 on naturalness through deteriorated air quality.

From Lands and 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 used, 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 on 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 five years of the plan, with one or two additional plants constructed every five 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 could be exposed to major impacts from energy development. These impacts would be located in the lower elevations of Saddle Mountain, with the effects mainly occurring on the lower desert plains and bajadas (areas with five 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 Saddle Mountain area, with road corridors sited in less mountainous terrain and often overlapping on lands subject to the solar and energy developments described previously.

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 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 precisely assess impacts from locatable mineral development because these developments are driven by the location of mineral deposits. However, 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 Saddle Mountain area 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 on 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 were 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, and volcanic stone) is present in nearly all of 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 on naturalness and outstanding opportunities for solitude and primitive unconfined recreation would likely have major long-term impacts in localized areas. Both mountainous, wash, and bajada areas could be affected, depending on location, demand, and saleable mineral contracts. Over the life of the plan, areas such as Saddle Mountain and lands located near major county and state roads and communities could 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 Recreation Management on Wilderness Characteristics

Because Alternative A would not establish recreation standards and management prescriptions for visitation, facility development, or other recreation 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 could be managed under compatible ROS classifications, offering protection to wilderness characteristics. These remaining areas would experience negligible to no effects from the absence of wilderness characteristics management emphasis.

The Saddle Mountain, Ajo Trails, Gila Trails, and Sentinel Plain Lava Flow SRMAs would continue in the Lower Sonoran under Alternative A, overlapping 203,800 acres known to contain wilderness characteristics. (See **Table 4-16**, Acres of Lands with Wilderness Characteristics within SRMAs and inventoried ROS Settings, Alternative A). 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.

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 on wilderness characteristics on approximately 72,700 acres.

The existing inventoried ROS management classes would be implemented under Alternative A and would interact with wilderness characteristics as identified in **Table 4-16**, Acres of Lands with Wilderness Characteristics within SRMAs and Inventoried ROS Settings, Alternative A. 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.

Table 4-16
Acres of Lands with Wilderness Characteristics within SRMAs and Inventoried ROS Settings, Alternative A

	SRMA			
ROS	**Saddle Mountain**	**Sentinel Plain**	**Ajo Trails**	**Gila Trails**
Rural	0	0	0	2,400
Roaded Natural	2,100	2,700	13,600	9,200
Semiprimitive Motorized	34,400	4,300	88,200	38,500
Semiprimitive Nonmotorized	0	8,300	0	100
Primitive	0	0	0	0
Total Acres of Lands with Wilderness Characteristics	*36,500*	*15,300*	*101,800*	*50,200*

About 75 percent of wilderness characteristic acreage is located within semiprimitive motorized, semiprimitive nonmotorized, and primitive ROS classes. Semiprimitive 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. Semiprimitive 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 could 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.

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 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 smaller than prescribed in any other alternative.

From Visual Resources on Wilderness Characteristics

VRM classifications on wilderness characteristics are detailed in **Table 4-17**, Acres of Lands with Wilderness Characteristics but not Managed to Protect Those Characteristics within Visual Resources Management Classes. 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 4-17
Acres of Lands with Wilderness Characteristics but not Managed to Protect Those Characteristics within Visual Resource Management Classes

Alternative	Visual Resource Management Class			
	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 under Alternative A specifically intended to protect or restore native vegetation could impact naturalness from minor effects on 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 nonnative vegetation would contribute to increased size and intensity of wildfires, which in turn would destroy the nonfire-adapted native vegetation of the Sonoran Desert.

From Wilderness Characteristics on Wilderness Characteristics

Land use authorizations, visual resources, and other land uses would not be employed to protect or maintain wilderness characteristics. This is because alternative A would not allocate any lands managed to protect wilderness characteristics, future standards and management prescriptions established for visitation, facility development, and other recreation-related considerations. Overall, long-term loss, impairment, or diminishment of wilderness characteristics would be anticipated in localized areas, with

major impacts happening on about five 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.

From Wildlife and Special Status Species on Wilderness Characteristics

The lack of specific decisions 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 on 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.

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, consign protective measures for the Monument's objects and landscapes, joined with stipulated limitations on OHV travel.

From Lands and 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 used, 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 used and strict visual mitigation were applied.

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 ROS management classes would be implemented under Alternative A and would interact with wilderness characteristics, as identified in **Table 4-16**, Acres of Lands with Wilderness Characteristics within SRMAs and inventoried ROS Settings, Alternative A. Impacts from implementation of ROS classes would be the same as described previously for the Lower Sonoran. Wilderness characteristics would be maintained unchanged in semiprimitive nonmotorized areas and would experience minor impairment along the Anza Trail. Elsewhere, the condition of wilderness characteristics would mostly be unchanged over the life of the plan by maintaining current inventoried ROS classes.

Special recreation permits 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 (cross-country racing), and horseback riding would have negligible to no impacts on wilderness characteristics.

The use of firearms throughout the SDNM could diminish naturalness and opportunities for solitude where spent shells, targets, and trash or gunfire degrades the landscape. Target shooters damage rocks and destroy plants when they use them as targets or when the rocks and plants are 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.

From Special Designations on 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 vegetation 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 nonnative vegetation would reduce the size and intensity of wildfires that destroy native vegetation, representing additional protection for the Monument's nonfire-adapted plant communities.

From Visual Resource on Wilderness Characteristics

VRM classifications on areas that exhibit wilderness characteristics are identified in **Table 4-17**, Acres of Lands with Wilderness Characteristics but not Managed to Protect Those Characteristics within Visual Resources Management Classes. 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 on 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 five percent and minor impacts on four 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 due to the overarching protection established by the Monument Proclamation.

From Wildlife and Special Status Species 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, such as 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 on naturalness.

4.12.4 ALTERNATIVE B

Alternative B identifies the greatest extent of uses on public lands and provides opportunities for those uses, including motorized recreation 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. Naturalness would be maintained by implementing measures to control fugitive dust emissions, emphasize wildlife habitat connectivity, ensure use of native vegetation in restoration efforts, maintain native wildlife populations (especially sensitive species), and restrict motorized travel to a designated route system. 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 on naturalness from 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.

From Wildlife and Special Status Species 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 on wilderness characteristics, while the presence of new permanent structures would detract from naturalness in the long term.

Populations of native wildlife would be maintained under Alternative B by reintroducing, transplanting, and stocking supplemental native wildlife; by using existing earthen livestock waters as refugia for native wildlife where livestock grazing is no longer permitted; and by restricting or placing LUAs and fences to avoid adverse impacts on 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 would be enacted for endangered species, such as Sonoran pronghorn, and special status species, such as cactus ferruginous pygmy-owl. Such management decisions may result in long-term contributions to naturalness if native or sensitive wildlife species would be conserved.

From Livestock Grazing on Wilderness Characteristics

The prospective for improved forage or vegetation conditions from modified grazing practices and approximately 40 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 trails, cow waste, and trampled vegetation would be moderately reduced, enhancing wilderness characteristics. Impacts from livestock infrastructure management would be similar to those described under Alternative A.

4.12.4.2 Lower Sonoran

From Lands and 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 Minerals Management on Wilderness Characteristics

Impacts from mineral and energy management would generally be the same as under Alternative A.

From Recreation Management on Wilderness Characteristics

All areas with wilderness characteristics would be located within ERMAs, with the exception of the Sentinel Plain and Painted Rock Mountains areas. Alternative B would not manage SRMA or ERMA areas to protect wilderness characteristics. Because of this, 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 Ajo ERMA 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 such actions 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 inventoried ROS management classes would be replaced by backcountry, front country, and community interface settings under Alternative B. Approximately 76 percent of areas with wilderness characteristics would be allocated as backcountry, which are nonmotorized, dispersed recreation areas that would support protecting wilderness characteristics. Backcountry 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 semiprimitive 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. These areas 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 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. These wilderness characteristics would be foregone altogether in localized areas subject to development or on lands more heavily used by motorized users or by recreational target shooters. This could affect up to 24 percent of areas with wilderness characteristics. On the other hand, 76 percent of such lands would be managed as backcountry, 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.

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 selectively closing vehicle routes and rerouting 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 under 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 nonnative vegetation would also assist with decreasing the size and intensity of wildfires, and limiting ecosystem

conversions of the nonfire-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, which would tend to support continued naturalness. An additional 199,500 acres would be managed to VRM Class III standards and 11,700 acres would be managed to VRM Class IV standards (see **Table 4-17**, Acres of Lands with Wilderness Characteristics but not Managed to Maintain those Characteristics within Visual Resource Management Classes). Managing lands with wilderness characteristics as VRM Class III or IV could allow development that would impair the wilderness characteristics, particularly 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 (to combat light pollution) would help to protect wilderness and associated scenic characteristics under Alternative B.

From Wilderness Characteristics on Wilderness Characteristics

As under Alternative B, no lands would be allocated to protect 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 two 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 and Realty on Wilderness Characteristics

Three aboveground, one-mile-wide utility corridors would be allocated. These impacts would accrue along the periphery of areas with wilderness characteristics. 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.

Wildlife and Special Status From Recreation Management on Wilderness Characteristics

Under Alternative B, all areas with wilderness characteristics would be located within ERMAs. 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 inventoried ROS management classes would be replaced by recreation management settings under Alternative B. The principal advantage of ERMA allocations under Alternative B would be that wilderness characteristics would be managed subject to the RMZs displayed in **Table 4-17**, Acres of Lands Managed to Protect Wilderness Characteristics within ERMAs and Recreation Management Settings, Alternative C (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 have 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, but no impacts would occur along the Juan Bautista de Anza NHT, and 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. Selectively closing vehicle routes or rerouting others would constitute the 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 under 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 from 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 vehicle operators 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 be allowed to travel only 25 feet from the 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 (see **Table 4-17**, Acres of Lands with Wilderness Characteristics but not Managed to Maintain those Characteristics within Visual Resource Management Classes). 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 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 one percent and minor impacts on up to four 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 2-3c).

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 on 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.

The following activities would take place 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.
- 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 following would contribute substantially to maintenance or enhancement of naturalness:

- 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
- Enlargement of the Coffeepot - Batamote Botanical ACEC

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.

From Livestock Grazing on Wilderness Characteristics

Impacts would be the same as described under Alternatives A and B, except no ephemeral grazing would occur. This reclassification 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 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.

4.12.5.2 Lower Sonoran

From Lands and 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 characteristic 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 negligible.

From Minerals Management on Wilderness Characteristics

Impacts from management of mineral 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.

Impacts under Alternative C would be the same as under Alternative B from reintroducing, transplanting, and stocking supplemental native species using existing earthen livestock waters as refugia for native wildlife, where livestock grazing would no longer permitted; restricting or mitigating the placement LUAs; and installing fences to avoid adverse impacts on wildlife.

Alternative C there would be impacts due to restrictions placed on competitive and speed events authorized by SRPs in Category I and 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. Such management decisions may result in long-term contributions to naturalness on lands managed to protect wilderness characteristics. Sensitive native 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 resource measures under Alternative C would contribute to naturalness to a greater degree than would implementation of Alternatives A and B. This would come about by protecting core areas of wildlife habitat, emphasizing connectivity of wildlife habitat, removing ineffective wildlife water developments, lacking 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 ERMAs. Compared to Alternative B, with its focus on motorized recreation opportunities, recreation management under 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 ERMAs 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, backcountry, 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 backcountry. Allocated backcountry 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 backcountry settings, which would support protecting these characteristics, as identified in **Table 4-18**, Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative C.

Table 4-18
Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative C

SRMA or ERMA	Recreation Management Setting			Lands Managed to Protect Wilderness Characteristics
	Backcountry	Front Country	Community Interface	
Ajo ERMA	58,200	600	0	58,800
Saddle Mountain SRMA	14,700	3,200	0	17,900
SDNM ERMA	110,200	2,000	0	112,200

SRMA and ERMA allocations under Alternative C would substantially contribute to naturalness and opportunities for solitude and primitive unconfined recreation than would Alternatives A and B. Management of the Saddle Mountain SRMA and Ajo ERMA under Alternative C would be more compatible with protecting wilderness characteristics due to a greater focus on nonmotorized recreation.

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's and Alternative 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.

From Travel Management on Wilderness Characteristics

Alternative C would close, limit, limit seasonally, or administratively restrict up to 30 percent (an estimated 500 miles) of road than would be instigated under Alternative A, and an estimated 101 road miles limited or closed to public use than under Alternative B. Route closures in the Ajo ERMA 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. 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 from vegetation resources would be similar to those described under Alternative B. This would include 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 nonnative 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 4-19**, Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternatives C, D, and E. 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 Alternatives A and B, which do not contain lands managed to protect wilderness characteristics.

Table 4-19
Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternatives C, D, and E

Alternative	Class I	Class II	Class III	Class IV
Lower Sonoran				
Alternative C	0	128,100	0	0
Alternative D	0	250,000	0	0
Alternative E	0	91,200	0	0
SDNM				
Alternative C	0	112,200	0	0
Alternative D	154,800	0	0	0
Alternative E	0	107,800	0	0

On lands with wilderness characteristics not managed to protect those characteristics, 128,100 acres would be managed under VRM Class II standards, which would provide some protection to the naturalness of these areas by preventing development incompatible with VRM Class II objectives. The remaining 44,800 would be managed under VRM Class III or IV standards, which may allow development that could impact the naturalness of the areas.

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. This represents 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. This would come about 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 on areas of wilderness characteristics not allocated as lands managed to protect wilderness characteristics would be considered minor to major.

From Wildlife and Special Status Species 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 (61,000 acres) of lands managed to protect such characteristics, especially in the Ajo Block area.

4.12.5.3 Sonoran Desert National Monument

From Lands and Realty on Wilderness Characteristics

No new multiuse utility corridors and only underground LUA uses in the Gila Bend to Santa Rosa and I-8 corridor 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 to 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 Recreation Management on Wilderness Characteristics

Allocation of the entire SDNM as an ERMA 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 under 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 in the SDNM would consider naturalness and outstanding opportunities for solitude and primitive unconfined recreation.

Existing ROS management classes would be replaced by recreation management settings under Alternative C. Areas with wilderness characteristics not allocated as lands managed to protect wilderness characteristics would be managed as the recreation management settings displayed in **Table 4-18**, Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative C.

Most current forms of recreation use, with the exception of target shooting, would have negligible impacts on areas with wilderness characteristics, as described under 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 no impact on wildness characteristics. 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 and providing compatible public use and interpretive opportunities. Impacts on 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 be 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 under Alternative C represents considerably more protection for wilderness characteristics than provided by the travel management networks under Alternatives 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 recreation. Under this alternative, vehicle operators 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 aesthetics 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 4-19**, Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternatives C, D, and E. This VRM allocation would contribute toward naturalness of lands managed to protect wilderness characteristics, appreciably more so than under Alternatives A and B.

On lands with wilderness characteristics not managed to protect those characteristics, 40,800 acres would be managed under VRM Class II standards, which would provide some protection to the naturalness of these areas by preventing development incompatible with VRM Class II objectives.

From Wilderness Characteristics on Wilderness Characteristics

Naturalness, solitude, and the opportunities for unconfined and primitive recreation would be maintained and would receive priority management attention on 112,200 acres of lands managed to protect wilderness characteristics. This represents 72 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 42,600 acres, representing 28 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. This would be 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 4-17**, Acres of Lands with Wilderness Characteristics but not Managed to Maintain those Characteristics within Visual Resource Management Classes). 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 would be much greater visually than presented by Alternatives A and B because all acreage would be managed as VRM Class II.

From Wildlife and Special Status Species on Wilderness Characteristics

Overall, implementation of the ecological, biological, and vegetative resource measures under Alternative C would contribute to naturalness to a greater degree than would implementation of Alternatives A and B. This would come about by protecting core areas of wildlife habitat, emphasizing connectivity of wildlife habitat, removing ineffective wildlife water developments, lacking 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.

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. All areas with wilderness characteristics in both Decision Areas would be allocated as lands managed to protect wilderness characteristics under Alternative D, or approximately 404,800 acres (250,000 acres in the Lower Sonoran and 154,800 acres in the SDNM; see Map 2-3d). 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 404,800 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 in the citizens' proposal. It may not necessarily be the case, based on the BLM's knowledge of the Planning Area, that the entire citizens' proposal addressed under 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.

From Visual Resource Management on Wilderness Characteristics

Under Alternative D, all lands managed to protect wilderness characteristics would have 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 Wildlife and Special Status Species on Wilderness Characteristics

Under Alternative D, dispersed, undeveloped recreation 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 (30 percent) 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 under Alternative D would be similar to Alternatives B and C by reintroducing, transplanting, and stocking supplemental native wildlife; by using existing earthen livestock waters as refugia for native wildlife where livestock grazing is no longer permitted; and by restricting or placing LUAs and fences to avoid adverse impacts on wildlife. Overall, however, implementation of the ecological and biological resources decisions under Alternative D would detract from naturalness, in contrast to Alternatives B and C, due to the removal of all wildlife water catchments but would contribute to naturalness compared to Alternative A.

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, or olfactory evidence of large turnouts of livestock, creating more natural and undeveloped landscapes.

4.12.6.2 Lower Sonoran

From Lands and 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 Minerals Management on Wilderness Characteristics

Restrictions, prohibitions, exclusions, and closures on mining, leasing, saleables, and exploration would provide the maximum protection to all 250,000 acres managed to protect wilderness characteristics. Impacts could still occur from leasable and locatable minerals, but these would represent minor to moderate localized impacts and would be similar to those described under Alternatives B and C.

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. SRPs would not be issued for commercial, competitive, or vending under Alternative D, further enhancing solitude and primitive recreation.

Table 4-20
Acres of Lands Managed to Protect Wilderness Characteristics within Recreation Management Areas and Settings, Alternative D

	Recreation Management Setting			Lands Managed to Protect Wilderness Characteristics
SRMA or ERMA	**Backcountry**	**Front Country**	**Community Interface**	
LSFO	0	0	0	250,000
SDNM	0	0	0	154,800

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 (37 percent) managed to protect wilderness characteristics, thus contributing substantially to naturalness. Unlike Alternative A, ACEC management prescriptions under Alternative D would have a moderate to major effect on preserving lands managed to protect wilderness characteristics.

From Travel Management on Wilderness Characteristics

Closing an estimated 53 percent of motorized road network miles prescribed under Alternative A to motorized recreation 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 Alternatives B and C, including long-term contributions to naturalness from prohibiting wood harvesting, using native species in restoration projects, and controlling invasive species, which would limit the spread of nonnative vegetation and would reduce the size and intensity of wildfires.

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 would receive priority management attention on 250,000 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 and 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 would protect wilderness characteristics over the largest possible area.

From Recreation Management on Wilderness Characteristics

Compared with Alternative A, impacts on lands managed to protect wilderness characteristics from recreation management would be negligible.

Future standards established for visitation, facility development, and other recreation 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 spent shells, targets, and 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 widespread but localized target shooting impacts described under Alternative A.

From Special Designations on Wilderness Characteristics

Removing the Vekol Valley ACEC designation would not impact the area as the current National Monument designation would provide greater protection to Wilderness Characteristics. The Juan Bautista de Anza NHT would be managed with a priority on protecting cultural resources while providing some scientific research opportunities that are not ground disturbing, therefore resulting in negligible impacts on wilderness characterisicts. Impacts on 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

Closing over 62 percent of road miles within the SDNM to motorized recreation through travel management decisions, where routes traverse lands managed to protect wilderness characteristics, would eliminate impacts of motorized vehicles and human uses. 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 characteristics are the largest and most intact land areas brought forward in the range of action alternatives.

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 under Alternative D represents considerably more protection for lands managed to protect wilderness characteristics than provided by the travel management networks under Alternatives 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 recreation 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 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 would receive priority management attention on 154,800 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, whether through increased visitor use, increased motorized activity, or commercial or recreation uses.

All SDNM areas with wilderness characteristics would be 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 (PROPOSED RMP)

Under Alternative E, approximately 199,000 acres (91,200 acres in the Lower Sonoran and 107,800 acres in the SDNM) would be allocated as lands managed to protect wilderness characteristics (Map 2-3e). 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, all of the following would contribute substantially to safeguarding wilderness characteristics in areas not allocated to protect wilderness characteristics;

- 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 on or closures to motorized travel
- Designation of four ACECs

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 would be similar to Alternative C from cultural resource management, including an emphasis on resource protection, scientific research, and inventory, with some sites made available for public use, group use, and heritage sites.

4.12.7.2 Lower Sonoran

From Lands and Realty on Wilderness Characteristics

Impacts from decisions relating to utility-scale renewable energy development, multiuse utility corridors, LUAs, and other land uses would be similar to Alternative D on lands managed to protect wilderness characteristics. The impacts would be 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 (158,800 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). Impacts resulting from Alternative E are similar to Alternative A.

From Minerals Management on Wilderness Characteristics

Impacts from mineral management would be similar to Alternative C.

From Recreation Management on Wilderness Characteristics

Allocation of SRMAs and ERMAs would have moderate impacts on lands managed to protect wilderness characteristics as future standards established for visitation, facility development, and other recreation-related considerations would consider maintaining the settings for naturalness and outstanding opportunities for solitude and primitive unconfined recreation. The Saddle Mountain ERMA would help 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 ERMA would help maintain lands managed to protect wilderness characteristics by focusing intensive motorized recreation outside of these areas. In both ERMAs, backcountry recreation settings would maintain wilderness characteristics of lands managed to protect such characteristics (see **Table 4-21**, Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative E). In summary, impacts from SRMA and ERMA allocations under Alternative E are similar to Alternative A, except that the SRMAs and ERMAs under Alternative E are driven by recreational outcomes.

Table 4-21
Acres of Lands Managed to Protect Wilderness Characteristics within SRMAs and Recreation Management Settings, Alternative E

	Recreation Management Setting			Lands Managed to Protect Wilderness Characteristics
ERMA	**Backcountry**	**Front Country**	**Community Interface**	
Ajo ERMA	45,500	0	0	45,500
Saddle Mountain	17,540	0	0	17,540
SDNM	104,300	3,500	0	107,800

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.

All 91,200 acres allocated as lands managed to protect wilderness characteristics would be assigned to the backcountry, which could help protect wilderness characteristics. This is similar to Alternative A, where ROS-inventoried classifications were applied.

From Special Designations on Wilderness Characteristics

Under Alternative E, four ACECs would be designated. The Coffeepot Batamote-Sauceda ACEC and the Saddle Mountain ACEC would, respectively, overlap by 44,400 and 17,540 acres managed to protect wilderness characteristics. They also 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 the Black Mountain area, which 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.

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 than under Alternative A and 140 more miles than under Alternative B. It would open 10 more miles than under Alternative C and 260 more miles than under Alternative D.

Lands managed to protect wilderness characteristics, totaling 91,200 acres, would be limited OHV use areas, which would help protect naturalness and outstanding opportunities for solitude and primitive unconfined recreation. 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 under Alternative D but would be much more protected by a designated travel route network than 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. This last would limit the spread of nonnative 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 4-19**, Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes,

Alternatives C, D, and E. VRM allocations would support protecting wilderness characteristics on lands so managed, with all acres assigned to VRM II. Alternative E would provide less continuance to naturalness than under Alternatives C or D but more than under Alternatives A or B.

On lands with wilderness characteristics not managed to protect those characteristics, 91,200 acres would be managed under VRM Class II standards, which would provide some protection to the naturalness of these areas by preventing development incompatible with VRM Class II objectives. The remaining 158,800 acres would be managed under VRM Class III or IV standards, which may allow development that could impact the naturalness of the areas.

From Wilderness Characteristics on Wilderness Characteristics

Naturalness, solitude, and the opportunity for unconfined and primitive recreation would be maintained and would receive priority management attention on 91,200 acres, or 10 percent of Lower Sonoran public 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, increased motorized activity, or prohibited commercial uses.

A total of 158,800 acres, representing 64 percent of the area with wilderness characteristics in the Lower Sonoran, would not be managed to protect wilderness characteristics, which would not be a priority. 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.

From Wildlife and Special Status Species on Wilderness Characteristics

Impacts would be similar to all other action alternatives by reintroducing, transplanting, and stocking supplemental native wildlife; by using existing earthen livestock waters as refugia for native wildlife where livestock grazing is no longer permitted; and by restricting or placing LUAs and fences to avoid adverse impacts on wildlife. 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 to a greater degree than under Alternatives A, B, and D. This would be due to emphasizing connectivity of wildlife habitat, using native vegetation in restoration efforts, implementing measures to maintain populations of native wildlife, and not implementing measures to unnaturally manipulate native wildlife populations.

Development of wildlife waters on a case-by-case basis would have impacts on areas with wilderness characteristics similar to those described under Alternative A.

4.12.7.3 Sonoran Desert National Monument

From Lands and 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 (47,000 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 unavailable to wildlife. There would be sights, sounds, smells, and other impacts from large ephemeral turnouts on the SDNM, detracting from naturalness and hindering visitors seeking opportunities for primitive recreation in a more natural and untrammeled environment. However, ephemeral turnouts typically occur in only two or three years out of ten, so these impacts would be minor.

From a livestock grazing management perspective, implementation of Alternative E would contribute to naturalness to a greater degree than Alternatives A.

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 104,300 acres (or 97 percent) of backcountry and 3,500 acres of front country. In areas of wilderness characteristics that would not be managed to protect those characteristics, 1,600 acres would be assigned to the backcountry zone, which would tend to protect wilderness characteristics. About one percent of these wilderness characteristics would be allocated to the front country and thus would be 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.

Since dispersed recreational target shooting throughout the Monument would continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

From Special Designations on Wilderness Characteristics

Impacts from managing the Juan Bautista de Anza NHT would be the same as under Alternative D.

Designation of I-8 and State Route 238 as National Scenic Byways, of 30 miles and 18 miles length respectively, would have a slight protective effect due to prescriptions and management oversight of 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 under 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 on 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 4-19**, Acres of Lands Managed to Protect Wilderness Characteristics and VRM Classes, Alternatives C, D, and E. 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 and B.

On lands with wilderness characteristics not managed to protect those characteristics, 46,900 acres would be managed under VRM Class II standards, which would provide some protection to the naturalness of these areas by preventing development incompatible with VRM Class II objectives. The remaining 100 acres would be managed under VRM Class III or IV standards, which may allow development that could impact the naturalness of the areas.

From Wilderness Characteristics on Wilderness Characteristics

Naturalness, solitude, and the opportunities for unconfined and primitive recreation would be maintained and would receive priority management on 107,800 acres allocated to lands managed to protect wilderness characteristics. This represents 70 percent of Monument lands identified to possess wilderness characteristics. Impacts would be similar to those described under Alternative C, with only four 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, and the loss or degradation of solitude and primitive recreation opportunities, whether through increased visitor use, motorized activity, or commercial uses.

Areas with wilderness characteristics but not allocated as lands managed to protect wilderness characteristics total 47,000 acres, representing 30 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.

From Wildlife and Special Status Species 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.

4.13 IMPACTS ON WILDLAND FIRE MANAGEMENT

This section analyzes the impacts of 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. Nonnative plant establishment and spread can greatly increase the amount of fuels, the intensity and size of fires, and can shorten fire-return intervals. Short-term effects on fire and fuels management, which are defined as those lasting no more than five years, are important, but the more critical impacts are those that would endure throughout and past the life of the RMP. The largest factor contributing to increased desert wildland fires is the increased population growth of Metropolitan Phoenix. Fuel conditions fluctuate greatly based on annual precipitation levels and the presence of nonnative plants. Due to the establishment and spread of nonnative 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 would continue to increase human-caused fires. Military training operations over and adjacent to the Planning Area would also continue to be a 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 in pounds per acre.
- Fire frequency, measured by the change in the number of human-caused wildland fires. This indicator measures the effectiveness of preventative management actions such as education and restrictions on travel and use within and outside the wildland-urban interface (WUI). The number of human-caused starts is dependent on access and development.
- Fire Regime Condition Class (FRCC), which measures the effectiveness of fuels, emergency stabilization, 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 a historical reference condition as it pertains to both vegetation seral classes and fire frequency. The BLM policy requires current and desired resource conditions related to fire management to be described in terms of three FRCCs.

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 would carry fire, and an increase in invasive species would 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 an increased number of motor vehicle routes would result in an increased number of starts within the Planning Area.
- If non-fire adapted vegetative communities experience wildland fire, they would move into the CC 3 category.

4.13.1.3 Program Areas with No Impacts on Wildland Fire Management

There would be no impacts on 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. In terms of changes to a plant community, as described by FRCC, a negligible or minor impact would result in no change to condition class. A plant community currently in CC 1 would remain in CC 1 if it experienced a minor change. A moderate impact would be represented by a change in CC from CC 1 to CC 2 or a change from CC 2 to CC 3. A major impact would be represented by a change in CC from the current condition class to CC 3.

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 designated as nonattainment for PM_{10}. Within these areas, it may not be practical to use prescribed fire as a management tool. Following ADEQ smoke permitting requirements would ensure that impacts on 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 would require close cooperation with a cultural resources resource advisor during suppression operations. Fuels treatment activities would 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 would ensure that impacts on cultural and heritage resources are in most cases minor.

From Public Safety and Hazardous Materials on Wildland Fire Management

Public safety and hazardous materials considerations would have an impact on fire and fuels management activities in areas where known or suspected hazards are present. This would require close 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 would result in most impacts being minor, but in certain cases wildfire suppression operations would have to be indirect, allowing larger areas of desert plant communities to burn, and the impact would be major.

From Special Designations on Wildland Fire Management

Special designation areas would have an impact on fire suppression and fuels treatment activities. These activities would have to follow the restrictions for each area (Wilderness, ACEC, and NHT) and may have to 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 would mitigate the impacts on fire suppression activities and allow impacts to be relatively minor (e.g., with line manager approval the BLM can use aviation resources in a wilderness to keep a fire small).

From Soil Resources on Wildland Fire Management

Soil resources may have a 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 BLM's ability to conduct prescribed burns 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 would reduce the size and severity of wildfires within the Planning Area and would improve the FRCC rating for lands within the Planning Area. Prevention and mitigation activities would reduce the number of human-caused starts and thus maintain condition class rating for the lands within the Planning Area. A full suppression response would reduce the size of fires within the Planning Area. Fire and fuels management activities and treatments could damage resources by spreading weeds and creating soil disturbance, but, by following mitigation measures and close coordination with resource advisors, these impacts should remain minor.

From Wildlife and Special Status Species on Wildland Fire Management

Wildlife and Special Status Species may have an impact on fire and fuels management in areas where these resources are present. Management of this resource would require close cooperation with resource advisors and implementation of conservation measures where appropriate. Fuels treatment activities would need to be designed to avoid and mitigate damage to 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 would ensure that impacts on wildlife and special status species are 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 SDNM.

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 nonnative 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 would 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 nonnative 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 have year-long livestock use which would likely decrease fuel production. 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 would 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 species. This could decrease nonnative plant populations 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.

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), 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) 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 after wildland fire management to restore the scenic quality.

From Wilderness Characteristics on Wildland Fire Management

Under Alternative A, a lack of protection for wilderness characteristics would not limit activities that increase the potential for nonnative plant establishment and spread and, in the long-term, would likely lead to increases in fuel levels, intensity, size of areas burned, and human-ignited fires as well as shortened fire-return intervals.

From Wildland Fire Management on Wildland Fire Management

Impacts 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 would use MIST tactics 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 nonnative plant establishment and spread. Increased recreation would be expected in all areas, but particularly in SRMAs and ERMAs (totaling 379,400 acres in the Lower Sonoran) and along the Juan Bautista de Anza NHT.

Under Alternative A, recreation (e.g., user selected camping sites, campfires, and target shooting) and the lack of facilitated recreational management on designated access point requirements could increase the 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 could limit surface disturbance and nonnative 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 Decision Area, and approximately 110,700 acres of the Lower Sonoran would be closed to motorized-vehicle use. Off-road emergency and administrative uses, such as for fire suppression, would be authorized. These restrictions would limit increases in fuel levels from nonnative 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 nonnative 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 a SRMA in the Monument.

From Travel Management on Wildland Fire Management

The Vekol Valley Grassland 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 nonnative plant establishment. Under Alternative A, the current OHV-class designation and route system would generally remain in place. In the SDNM, approximately 325,200 acres would be limited to

existing or designated routes and 161,200 acres would be closed. Off-road emergency and administrative uses, such as for fire suppression, would be authorized. These restrictions would limit increases in fuel levels from nonnative 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 nonnative plant establishment.

4.13.4 ALTERNATIVE B

4.13.4.1 Both Decision Areas

From Lands & Realty on Wildland Fire Management

The impacts on fire and fuels from multiuse utility corridors and LUAs would be similar to those discussed under Alternative A. Utility-scale renewable energy sites and other land uses would impact fire and fuels in a manner similar to that discussed under Alternative A over the long term by increasing the potential for nonnative plant establishment and spread and increasing access for fire-suppression activities. Impacts of land use and disposal in the SDNM would be similar to those discussed under Alternative A.

From Livestock Grazing on Wildland Fire Management

Under Alternative B, fewer livestock would cause an increase in fuel load. Otherwise, impacts from livestock-utilization levels would be the same as discussed under Alternative A.

From Minerals Management on Wildland Fire Management

Impacts from mineral resource decisions would be the same as those described in 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 species. Compared to Alternative A, these actions could decrease sources of nonnative 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 create 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 increasing fuel levels associated with nonnative 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 nonnative plants that increase fuel loads.

From Wilderness Characteristics on Wildland Fire Management

Impacts would be the same as those described under Alternative A for both Decision Areas.

From Wildland Fire Management on Wildland Fire Management

Fire and fuels management decisions under 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 (like 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 nonnative grasslands. This, in turn would reduce the size of 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 protect areas from future fire occurrence.

4.13.4.2 Lower Sonoran

From Recreation Management on Wildland Fire Management

Impacts from SRMA and ERMA allocations in the Lower Sonoran would be the same as described under Alternative A but more widespread as 826,600 acres would be designated as SRMAs and ERMAs under Alternative B. As the recreation uses increase in the Decision Area, more widespread active management of recreation uses could 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 backcountry RMZ, which would limit activities that lead to increases in fuel levels from nonnative plant establishment in disturbed areas.

Community interface RMZs are the main settings for intensive resource-dependent recreational uses and would not be as conducive to limiting fuel levels and minimizing human-ignited fires over the long term as the backcountry 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 because 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. Alternative B

recommends designated access points for motorized and mechanized entry into public lands, particularly near metropolitan areas. Limiting motorized/mechanized uses would limit or contain the amount of surface disturbance and nonnative plant establishment.

In the Lower Sonoran, 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 critical situations. This would allow access to areas such as closed routes and would reduce the 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 nonnative plants, especially grasses that respond favorably to fire. Reducing the size of burned areas would lower the overall potential for nonnative plant establishment and spread, and would 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 ERMA under Alternative B, with 76 percent of the SDNM being allocated as backcountry RMZ and 22 percent allocated as front country. While the majority of the Decision Area would be in the backcountry setting, thus limiting activities that lead to increased fuel levels, Alternative B would allocate the largest area among the alternatives to the front country RMZ, where limits on activities that increase fuel levels would not exist.

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. Alternative B recommends designated access points for motorized and mechanized entry into public lands, particularly near metropolitan areas. Restricting motorized and mechanized uses would limit or contain the amount of surface disturbance and nonnative plant establishment. Seventy miles of routes would be closed in the SDNM, 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 critical situations. This would allow access to areas such as closed routes and would reduce the 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 nonnative plants, especially grasses that respond favorably to fire. Reducing the size of burned areas would lower the overall potential for nonnative plant establishment and spread, and would 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 those described in 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 those described in 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 occupy more than one 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 those described under Alternatives A and B. However, under Alternative C, supplemental ephemeral grazing would not be allocated on allotments that are presently classified as perennial/ephemeral. This would cause an increased fuel load during abundant ephemeral forage years.

From Minerals Management on Wildland Fire Management

Mineral resource management impacts would be the same as those described in 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

Under Alternative C, more acres in both decisions areas would be assigned to VRM Classes I and II than under Alternative A or B. Such increases in VRM Class I and/or Class II acreage would proportionally decrease overall changes to the vegetation communities from surface disturbing activities, thus decreasing the spread of nonnative plants that increases 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 allocations, combined with the backcountry RMZ designation, would minimize nonnative 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 are the same as described under Alternative B.

4.13.5.2 Lower Sonoran

From Recreation Management on Wildland Fire Management

In the Lower Sonoran, Alternative C would allocate 820,300 acres of SRMAs and ERMAs, which is slightly less than those allocated in Alternative B. Impacts due to the active management of recreation uses in SRMAs and ERMAs would be similar to, but less widespread than, impacts under Alternative B. Additionally, 66 percent of the SRMAs and ERMAs would be assigned to the backcountry setting 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 settings. Impacts from management of ERMAs in the Lower Sonoran under Alternative C would be similar in nature to those described under Alternative B.

From Travel Management on Wildland Fire Management

Under Alternative C, impacts from restricting motorized and 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 those 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 Alternative A, although more widespread, as 319 more miles of routes would be closed compared to Alternative A.. Impacts from allowing agencies involved in fire-suppression activities to drive off-road in 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 a SRMA; however, five percent more lands in the Monument would be assigned to the backcountry RMZ, which would slightly decrease the area exposed to a greater potential of increased fuel loads and human-ignited fires. Additionally, as management changed to emphasize Monument resources protection, decreased surface disturbance and opportunities for nonnative plant establishment would occur. 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 and 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 those described under Alternative B.

Impacts from encouraging designated access point use for entering public lands would be the same as those described under Alternative B.

Specific impacts from closing routes would be the same as under Alternative A, although more widespread as 252 more miles of routes would be closed compared to Alternative A. Impacts from allowing agencies involved in fire-suppression activities to drive off-road in critical situations would be the same as those 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 discussed 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 nonnative vegetation establishment and spread, resulting in fewer human-induced ignitions. Smaller test sites could be located within the ACECs that 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

Under Alternative D, 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 Classes I and II (77 percent in the Lower Sonoran and 100 percent in the SDNM) of all the alternatives. These allocations would minimize the potential for nonnative plant establishment and associated increases in fuel levels and fire intensities and would require restoration to a greater extent than under any other alternative.

From Wilderness Characteristics on Wildland Fire Management

Approximately 250,000 acres in the Lower Sonoran and 154,800 acres in the SDNM would be allocated as lands managed to protect wilderness characteristics, which would be the largest area protected under

these designations among the alternatives. These allocations would minimize the potential for nonnative 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 are the same as those under Alternative B.

4.13.6.2 Lower Sonoran

From Recreation Management on Wildland Fire Management

Alternative D would allocate a total of 57,500 acres of SRMAs and ERMAs, which is the smallest area allocated as SRMAs and ERMAs among the action alternatives. Impacts would be similar to Alternative B; however, impacts from allocating front country and community interface settings would be greatly contained due to 256,500 fewer acres devoted to these settings under Alternative D. These management prescriptions would greatly decrease nonnative plant establishment and associated increases in fuel levels, fire intensities, and shortened fire-return intervals. The remaining 872,700 acres not allocated as SRMAs or ERMAs in the Lower Sonoran would not be allocated. While general impacts would be similar in nature to those under Alternative B, the scope would be reduced under Alternative D because a greatly reduced route network would limit motorized access to these areas, 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 those described under all other action alternatives. Alternative D would close the most acres and the greatest number of miles among the alternatives, consequently causing the greatest decrease in surface disturbance and nonnative plant establishment in the Lower Sonoran. Impacts from allowing agencies involved in fire-suppression activities to drive off-road in critical situations would be the same as those described under Alternative B.

4.13.6.3 Sonoran Desert National Monument

From Recreation Management on Wildland Fire Management

Under Alternative D, none of the SDNM would be allocated as SRMAs or ERMAs. Impacts would include decreased nonnative plant establishment, leading to decreases in fuel levels and fire intensities and lengthening return intervals. Vehicle camping restrictions would reduce human-ignited fires from sparks, escaped fires, and firebrands because camping would be limited 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 (PROPOSED RMP)

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 those described in 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 those described in Alternative B. In the Lower Sonoran, Alternative E would designate eight corridors, thus decreasing impacts in comparison to Alternative A. In the SDNM, impacts from utility corridors, future LUAs, utility-scale renewable energy development sites, and other land uses would be similar to those under Alternative C with a few exceptions. The Gila Bend-Santa Rosa utility corridor would allow above-ground utility lines, with impacts on fires and fuels similar to those described for Alternative B.

From Livestock Grazing on Wildland Fire Management

Under Alternative E, effects from grazing would be similar to those described in Alternative B in both Decision Areas.

From Minerals Management on Wildland Fire Management

Mineral resource management impacts would be the same as those for 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 those described in Alternative C.

From Wilderness Characteristics on Wildland Fire Management

In the Lower Sonoran, 91,200 acres would be allocated as lands managed to protect wilderness characteristics, and 107,800 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 allocations would minimize nonnative 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 are the same as those described in Alternative B.

4.13.7.2 Lower Sonoran

From Recreation Management on Wildland Fire Management

Impacts from SRMA allocations would be most similar to those described in Alternative C. This would prevent an increase in nonnative plant establishment and associated increases in fuel levels and fire intensities and shortened fire-return intervals.

From Travel Management on Wildland Fire Management

The 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 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 impacts described in Alternative C. This would prevent an increase in nonnative plant establishment and the associated increases in fuel levels and fire intensities and shortened fire-return intervals.

As under Alternatives B, C, and D, the entire SDNM would be managed as one SRMA. Impacts would be similar to those described in Alternative C. Approximately 16 percent of the area would be allocated to the front country RMZ and 84 percent to backcountry RMZ. This would decrease nonnative plant establishment and associated increases in fuel levels and fire intensities and shortened-return intervals. Restrictions would be placed on recreational uses, including limiting camping to existing and designated sites. . These types of restrictions would decrease the likelihood of invasive species spread and human-ignited fires. Since dispersed recreational target shooting would be allowed to continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

From Travel Management on Wildland Fire Management

Impacts would be the same as those described under Alternative E for the Lower Sonoran, except that closing 194 miles of the routes in the SDNM would result in more area of impact compared to that under Alternatives A, B, and C, but a smaller area of impact compared to that under Alternative D.

4.14 IMPACTS ON WILDLIFE AND SPECIAL STATUS SPECIES

This section analyzes the impacts of management actions on wildlife and special status species. Each of the action alternatives provides for overall ecosystem health, diversity, maintenance and enhancement of native wildlife populations, and proper management of threatened and endangered species and their habitats. The wildlife and special status 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 on wildlife and special status species 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 on wildlife and special status 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, 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 special status 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 special status 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 on wildlife and special status 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 special status 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 on wildlife and special status 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. They 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 special status 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 to, immigrate to, or emigrate from a site following a disturbance.

The following resources are expected to impact wildlife and special status species: lands and realty management, livestock grazing management, minerals management, wildlife and special status species

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 PRMP/FEIS, public safety and hazardous materials have the potential to harm wildlife and special status species. Cleanup 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, recreation, special designations, travel management, and lands managed to protect wilderness characteristics would impact wildlife and special status species and habitat and are discussed below.

4.14.1 METHODS OF ANALYSIS

4.14.1.1 Indicators

Management actions described in the alternatives could result in impacts on the wildlife program. Indicators used to quantitatively assess management changes include the following:

- Degradation or improvement in wildlife habitat quality due to changes in vegetation abundance or quality.
- Changes in wildlife population numbers.
- Shifts in wildlife use of habitat due to the availability of movement from one area to another.

4.14.1.2 Assumptions

The following assumptions regarding wildlife and special status or plant species are made:

- Wildlife habitat would be managed for wildlife and migratory birds with an emphasis on special status species.
- Special status species habitat would be managed for the benefit of those species as a priority over other resource allocations and uses.
- All surface-disturbing activities would include mitigation and adaptive management to reduce impacts on special status 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 on different classes of wildlife would be similar and are not discussed separately.

Program Areas with No Impacts on Wildlife and Special Status Species

Management actions associated with the following program areas are expected to have no impacts on wildlife and special status species: air resources, caves and cave resources, cultural and heritage resources, paleontological resources, vegetation resources, visual resources, water resources, soil resources, wild horse and burro management, and hazardous materials and public safety. It is anticipated that these programs would have no impacts, and they are not be analyzed further in this document with respect to wildlife and special status species.

4.14.1.3 Qualitative Intensity Scale

The qualitative terms for intensity of impacts are generally the same as those adopted (see **Table 4-1**, Qualitative Terms for the Intensity of Impacts) in **Section 4.1.6**. In addition to the definitions and thresholds identified for the SDNM, impacts specific to wildlife and special status species are 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; and wildlife not being beleaguered during normal everyday routines such as loafing, feeding, or shading. Populations would be expected to remain at current levels or increase. Habitat connectivity would remain good; movements, seasonal or otherwise, would not be affected; and approximately 80 to 100 percent of the habitat is unfragmented. Overall change to wildlife populations, habitat quality, or habitat connectivity would 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 would occur 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; wildlife vacating the area over the long term or abandoning it altogether; or wildlife 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. As much as 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.

4.14.2 COMMON TO ALL ALTERNATIVES

4.14.2.1 Common to Both Decision Areas

From Wildland Fire Management on Wildlife and Special Status Species

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;

- 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. There are several treatment methods and standard operating procedures that would be used in a vegetation-treatment program. 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 current conditions.

From Wildlife and Special Status Species Management on Wildlife and Special Status Species

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 on raptors from these types of activities would be negligible to minor for all alternatives.

4.14.2.2 Lower Sonoran

No unique impacts have been identified for the Lower Sonoran Decision Area that would be common to all alternatives.

4.14.2.3 Sonoran Desert National Monument

From Special Designations on Wildlife and Special Status Species

All action alternatives would remove the Vekol Valley ACEC designation. The Vekol Valley ACEC is within the SDNM. The Monument's protections of Monument objects supersede those of the ACEC and justify its removal. Negligible impacts would be expected from the ACEC withdrawal.

From Minerals Management on Wildlife and Special Status Species

The SDNM is withdrawn from new mineral entry under all alternatives. The withdrawal was established in the proclamation that established the Monument. This withdrawal would have a protective effect on wildlife and special status species, 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 US and the subsurface is owned by a non-federal entity, minerals development may still occur. Depending upon the extent and intensity of a project and associated disturbance, there may be direct effects on wildlife and special status species, such as disturbance or mortality from collisions with vehicles or heavy equipment, destruction of occupied burrows, or noise. However, the BLM, as the owner/manager of the surface, would work with operators to mitigate impacts. Methods would likely include project design features or best management practices that reduce or eliminate impacts on the habitat at the project site.

4.14.3 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 wildlife and special species and 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.

4.14.3.1 Both Decision Areas

From Wildlife and Special Status Species Management on Wildlife and Special Status Species

No specific management objectives for special status species are specified in Alternative A; therefore, important habitat for special status 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 for wildlife and support distribution of wildlife in the long term. Implementation of use restrictions and conservation measures for special status species on a case-by-case basis 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 on 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 travel from one area to another, creating a minor to moderate improvement in 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 on wildlife. New wildlife waters could have a negligible 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 were removed, not maintained or allowed to go dry. The impact on wildlife could require that a species may have to vacate the area and find new water sources. A species could face mortality if unable to relocate.

Under Alternative A, the potential for disease introduction into native sheep habitats is reduced through use of the guidelines set forth in IM No. 98-140, including a restriction on permitting domestic sheep grazing within nine miles of wild sheep habitats. The impact of this action would have a minor effect on the persistence of wild sheep populations. Prohibiting domestic sheep grazing within nine miles of wild sheep habitat provides a minor improvement of habitats for other grazing wildlife species, such as mule deer, pronghorn, and Sonoran desert tortoise, since 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 on desert tortoises from other actions and uses would be reduced and could assist in maintaining or improving habitat and populations.

4.14.3.2 Lower Sonoran

From Lands & Realty on Wildlife and Special Status Species

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 would vary by area depending on whether the disposed-of parcels contained important wildlife habitat areas or resulted in a reduction of habitat available for wildlife use. However, most of the parcels identified for disposal are small, 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 on 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 and would cause the destruction of dens, nests, or burrows and the mortality of species in the area because solar development practices involve 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.

Designation of up to ten utility corridors through the Planning Area could lead to construction of 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 where 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 Wildlife and Special Status Species

Impacts on wildlife or special status species from livestock grazing are poorly documented in the scientific literature in the Sonoran Desert (Hall et al. 2005). In general, impacts from grazing could include competition for space, forage, cover, and water resources throughout the Decision Areas. In addition, livestock grazing may alter vegetation structure and composition, thus affecting wildlife habitat (Hall et al. 2005).

Research indicates that there is a high probability that 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 that 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. Impacts associated with grazing range from negligible to major.

From Minerals Management on Wildlife and Special Status Species

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 five 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 on 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, negating the impact by habituation on their own concurrence. If so, impacts could be minor on 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 on wildlife are expected to range from negligible to moderate under Alternative A.

From Recreation Management on Wildlife and Special Status Species

In the Lower Sonoran, current levels of recreation management do not adequately address impacts on wildlife and special status species. Informal unauthorized recreational use areas are developed continually and cause habitat loss and disturbance. The existing management identifies a recreation opportunity spectrum including 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 intermingled 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 Wildlife and Special Status Species

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 Acuña 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 occur within the ACEC, which could lead to further habitat fragmentation for the cactus. Impacts on the Acuña cactus are expected to range from negligible to moderate under current conditions of the ACEC.

From Travel Management on Wildlife and Special Status Species

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 on 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 special status species 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 that could range from negligible to moderate in the form of conflicts between wildlife and vehicles. 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 by vehicles, urban developments, roadways, livestock, equestrian users, and hikers, all of which could reduce native vegetation, alter vegetative composition, and reduce habitat suitability for some wildlife species. Some wildlife or special status 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 on 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 outlined in the Desert Tortoise Rangewide Plan (BLM 1988) and Strategy for Tortoise Management on Public Lands in Arizona (BLM 1990). Identification and management of OHV use under limited funding 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 Wildlife and Special Status Species

Because no lands managed to protect wilderness characteristics would be allocated under Alternative A, no impacts would occur.

4.14.3.3 Sonoran Desert National Monument

From Lands & Realty on Wildlife and Special Status Species

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 Wildlife and Special Status Species

Under Alternative A, 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, perennial/ephemeral, and ephemeral use, consistent with current permits. Within these open areas, wildlife would compete for space, forage, cover, and water resources. In addition, fences associated with grazing management can limit movement for large mammalian species, such as bighorn sheep, and contribute to habitat fragmentation (Hall et al. 2005). Plant community composition and wildlife or special status species populations would be maintained or decreased.

Construction of 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 could continue within the Monument, although currently there are no permits for these types of livestock. Impacts would be the same as described for Alternative A for the Lower Sonoran.

Refer to **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, for impacts related to AUM allocations in the SDNM.

From Recreation Management on Wildlife and Special Status Species

Recreation uses in the SDNM would be allowed to the extent they are consistent with protection of Monument objects. Overall impacts on wildlife are expected to be negligible to minor.

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 on 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 on wildlife in the immediate area.

From Special Designations on Wildlife and Special Status Species

Currently, there are 3,500-acres of public lands within the Vekol Valley Grassland ACEC, located within the SDNM. The Vekol Valley Grassland ACEC 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 alternatives except Alternative A, the Vekol Valley ACEC designation would be removed as the SDNM proclamation contains prescriptions that protect the area with more stringent conservation measures than the ACEC. Impacts of retaining the ACEC would range from negligible to minor based on current restrictions within the ACEC.

From Travel Management on Wildlife and Special Status Species

Refer to **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, for impacts related to travel management.

From Wilderness Characteristics on Wildlife and Special Status Species

Because no lands managed to protect wilderness characteristics would be allocated under Alternative A, no impacts on wildlife would occur.

4.14.4 ALTERNATIVE B

4.14.4.1 Common to Both Decision Areas

From Wildlife and Special Status Species Management on Wildlife and Special Status Species

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 on 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 on 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 nonnative 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 nonnative invasive species and creating areas that are void of plant structure as natural communities of riparian vegetation reestablish themselves. Impacts on the three species from habitat improvement projects would be expected to be minor to moderate.

Bat species populations 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 on bats are expected to be negligible to minor.

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 on 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 Range Wide Plan (BLM 1988). 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 on desert tortoise are expected to be minor to moderate under this alternative.

Wildlife movement corridors would be managed for habitat connectivity to improve habitat quality, increase local populations, and connect habitat areas for wildlife usage. Impacts on corridors would be mitigated to reduce effects of possible collisions with vehicles and human interactions. Impacts on corridors are expected to be 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 on wildlife from wildlife waters would be negligible to minor in both Decision Areas.

Nonnative invasive animal species would be prohibited unless peer-reviewed scientific literature stated that the introduced species would have no detrimental effects on 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 needed for the continued existence of native species, they could be introduced. Impacts on wildlife would negligible to minor in both Decision Areas.

4.14.4.2 Lower Sonoran

From Lands & Realty on Wildlife and Special Status Species

In general, impacts from utility corridors, energy projects and LUAs on wildlife habitat management would be similar to those described in Alternative A. However, development of new energy projects and allowance of 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 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 impacts described under Alternative A. However, more habitat could be impacted because approximately 36,300 acres would be available for disposal under Alternative B. Overall impacts from land tenure adjustment would be expected to range from negligible to moderate under Alternative B.

From Livestock Grazing on Wildlife and Special Status Species

Management of perennial grazing allotments with a reduction in the authorized grazing preference would have a minor impact on 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 would be 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 impacts would be 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.

The effect of changing grazing practices in Alternative B would have a negligible-to-minor impact on habitat connectivity, which would be a less significant impact than under Alternative A.

From Minerals Management on Wildlife and Special Status Species

Impacts associated with minerals management under Alternative B would be less than under Alternative A. Management of mineral development on wildlife habitat 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 special status species habitats. Overall impacts on wildlife are expected to range from negligible to moderate under Alternative B.

From Recreation Management on Wildlife and Special Status Species

Designation of SRMAs and ERMAs is intended to direct and control the amount of recreation uses to reduce conflicts with other resources. Recreation use in the front country setting 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 usage in this area could result in impacts on 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 actions would be implemented with BMPs and standard operating procedures to minimize impacts on wildlife resources.

Approximately 347,200 acres, or 45 percent of the Lower Sonoran, would be allocated in the backcountry setting. Impacts on wildlife resources are expected to be less in the backcountry. The 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 Wildlife and Special Status Species

Under Alternative B, impacts from special designations would be similar to those discussed under 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 Acuña cactus plants and avoid known populations of the cactus, thereby 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 range from negligible to moderate.

From Travel Management on Wildlife and Special Status Species

Under Alternative B, 101,800 acres would be closed to motor vehicle use, and 91,750 acres would be closed with the designation of two wilderness areas. Impacts are expected to be similar to those described in Alternative A. In Alternative B, routes would be limited to designated roads within the Coffeepot Botanical ACEC. This could result in minor to moderate impacts on 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.

On approximately 825,400 acres, motorized travel would be limited to designated roads and trails. Impacts on wildlife could range from minor to moderate based on specific route designations and location and type of use in special status species 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 minor impacts on 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 limiting the creation of multiple routes; reduction in soil erosion, compaction, and loss of vegetation as routes are controlled; and avoiding alteration or diversion of hydrologic flow. 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 special status species may be displaced or could face mortality as a result of human interaction and habitat alteration but fewer than in Alternative A. Impacts from interactions between humans and wildlife vary greatly from negligible to major.

Impacts under Alternative B would be similar to impacts under 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 on wildlife under Alternative B would be less than under Alternative A and are expected to range from negligible to moderate.

From Wilderness Characteristics Management on Wildlife and Special Status Species

Impacts would be the same as those discussed under Alternative A.

4.14.4.3 Sonoran Desert National Monument

From Lands & Realty on Wildlife and Special Status Species

Impacts from multiuse utility corridors, energy projects, and LUAs on wildlife habitat management would be similar to those described in Alternative A.

From Livestock Grazing on Wildlife and Special Status Species

Impacts would be similar to those described under Alternative A for the SDNM, except that fewer acres would be available for livestock grazing (244,000 acres), and more forage (3,382 AUMs) would become available for wildlife. However, the 83 miles of fencing required to exclude livestock would also cause habitat fragmentation and inhibit wildlife movement along the wildlife corridors in the area. Moreover, livestock waters within the 8,500 acres proposed to be fenced off may become unavailable to wildlife as well, resulting in reduction of habitat values for many species. Positive and negative impacts would likely cancel each other out under this alternative.

Table 4-25, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, for impacts related to AUM allocations in the SDNM.

From Minerals Management on Wildlife and Special Status Species

Impacts would be the same as those described under Alternative A for the SDNM.

From Recreation Management on Wildlife and Special Status Species

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 as front country, and approximately 377,600 acres (78 percent of the Decision Area) would be allocated as backcountry.

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 three 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 six-mile, nonmotorized trail through Butterfield Pass situated in the Anza RMZ. 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. Localized disturbance would occur but would be negligible to minor, which would be less impactful than Alternative A.

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 on 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.

From Special Designations on Wildlife and Special Status Species

Under Alternative B, impacts would be similar to those discussed under Alternative A except that the Coffeepot Botanical ACEC would be closed to OHV use, thereby reducing fragmentation and the possibility of crushing individual Acuña cactus plants. Mining activities would be required to be mitigated so as to not disturb individual Acuña cactus plants and to avoid known populations for the 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 cactus could be found. Overall impacts would be negligible.

From Travel Management on Wildlife and Special Status Species

Refer to **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, within **Section 4.26**, Implementation-Level Analysis.

From Wilderness Characteristics on Wildlife and Special Status Species

Impacts would be the same as those described for Alternative A.

4.14.5 ALTERNATIVE C

4.14.5.1 Common to Both Decision Areas

From Wildlife and Special Status Species Management on Wildlife and Special Status Species

Alternative C introduces Wildlife Habitat Areas (WHAs) in the Batamote Mountains, Cuerda de Lena, the Gila Bend Mountains, and Saddle Mountain. Impacts common to both Decision Areas from WHAs would include the following.

Retention of 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 on wildlife from 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 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 and use vegetation surrounding the utility corridors for other day-to-day activities. Through limitation of vegetation clearing to within the existing corridor, habitat fragmentation would be reduced to only the areas needed for the maintenance of utilities. Impacts on wildlife would be negligible to minor, less than under 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 on wildlife from transportation routes would be negligible to minor, less than under 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; impacts would be less than those under Alternative A.

All new roads or highways crossing public land would be designed to facilitate movement of wildlife, and impacts would be mitigated to minimize disturbance.

Special status species habitat areas would be maintained during road improvements (e.g., altering, upgrading, paving, and widening), and improvements would have to 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; impacts would be less than those under 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 on wildlife under Alternative C 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 and utility-scale renewable-energy development, would be avoided within WHAs. Uses would be concentrated in less sensitive resource areas or in previously disturbed areas. If no other options existed, impacts from activities would be mitigated and managed to ensure consistency with management objectives, including an emphasis on maintaining wildlife habitat and 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 were mitigated and managed to ensure consistency with management objectives and emphasized maintaining wildlife habitat and connectivity. Uses would be concentrated in less sensitive resource areas or in previously disturbed areas 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 materials on a case-by-case basis. All impacts from surface-disturbing activities affecting an area greater than 40 acres would have to be mitigated and managed to ensure consistency with management objectives and emphasize maintenance of wildlife habitat and connectivity. Impacts would be expected to range from negligible to moderate.

The construction of new routes would be allowed if they were consistent with natural resource objectives and did not conflict with wildlife management objectives. Closed roads could be converted for use as nonmotorized trails if they were 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 in the Batamote Mountains WHA that were found to contain occupied or suitable cactus ferruginous pygmy-owl habitat to protect pygmy-owls during the breeding, nesting, and dispersal season from April 15th to August 31st. 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 15th to July 15th, or as determined annually by the Sonoran pronghorn recovery team. The area would remain open to locatable mineral entry but closed to leasable and mineral materials 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-owl habitat during the breeding, nesting, and dispersal season from April 15th to August 31st. 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 on wildlife would be expected to range from negligible to moderate under Alternative C within the WHAs, resulting in fewer impacts than under Alternative A.

4.14.5.2 Lower Sonoran

From Lands & Realty on Wildlife and Special Status Species

In the Lower Sonoran, impacts from utility corridors, energy projects, and LUAs on wildlife habitat management would be similar to those discussed under Alternative B. Impacts from land tenure adjustment on wildlife habitat management would be greater than under Alternative A and similar to those under Alternative B because 36,300 acres would be available for disposal under Alternative C.

From Livestock Grazing on Wildlife and Special Status Species

Management of 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 1st to April 30th] and approximately 35 percent during summer season [May 1st to September 30th]) 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 minor to negligible for other species of wildlife that compete less with livestock. Domestic sheep and goat grazing would be prohibited within nine miles of bighorn sheep habitat, and effects would be the same as those discussed under Alternative A.

Allotments meeting or exceeding standards would be considered to be providing habitat for healthy sustainable wildlife populations. 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.

From Minerals Management on Wildlife and Special Status Species

Impacts from mineral development on wildlife habitat management would be similar to those described in Alternative B.

From Recreation Management on Wildlife and Special Status Species

Impacts would be similar to those described in Alternative B except that 186,300 acres (29 percent of the Lower Sonoran) would be allocated as front country and 423,100 acres (66 percent of the Lower Sonoran) as backcountry.

From Special Designations on Wildlife and Special Status Species

Under Alternative C, the Coffeepot Botanical ACEC would be replaced by the Coffeepot Batamote ACEC which Coffeepot 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 Acuña cactus. The cactus ferruginous pygmy-owl has been petitioned for listing under the ESA, and habitat is available for it within the ACEC. The ACEC contains 100 percent public lands, and it is recommended that those lands be retained under 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 were mitigated and minimization criteria were established during route designations. At the time of route designations, mitigation, adaptive management, and BMPs would be used to avoid harassment and long-term displacement of wildlife. By using these techniques, negligible to minor impacts on wildlife would be expected to occur.

Camping within the Coffeepot Batamote ACEC would be limited to dispersed and undeveloped sites. Minor impacts on wildlife are expected to occur from limiting camping in this manner. New utility, communication, transportation, and utility-scale renewable energy development would be avoided within the ACEC. Impacts on 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 used to avoid harassment and long-term displacement of wildlife. Impacts on wildlife would be expected to be negligible to minor. Nonmotorized trails would be permitted within the ACEC as long as their impacts were mitigated and adaptive management and BMPs were used to avoid harassment and long-term displacement of wildlife. 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 viewshed. 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 on wildlife. Mitigation, adaptive management, and BMPs would be used 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. Impacts on wildlife would be expected to be negligible to minor.

The Coffeepot Batamote ACEC would be closed to livestock grazing, and infrastructure associated with grazing would be removed. Once grazing is removed, impacts on wildlife would be expected to be negligible to minor; however, removing associated infrastructure could cause major impacts on wildlife, especially if water sources were 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 used for existing mineral rights to avoid harassment and long-term displacement of wildlife. Impacts on wildlife would be expected to be negligible to minor.

Overall impacts on wildlife would be expected to range from negligible to minor, less than impacts under Alternative A.

From Travel Management on Wildlife and Special Status Species

Under Alternative C, motorized use would be limited to designated routes, similar to limitations under 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. Under Alternative C, some routes (132 miles) would be closed seasonally to reduce conflicts in special status species habitats. These closures would reduce disturbance and human interactions during breeding, nesting, lambing, and fledging lifecycles. Under Alternative C, there would be approximately 12 miles of nonmotorized trails and approximately 358 miles of primitive roads where wildlife impacts would be 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. Under Alternative C, there would be approximately 25 miles of maintained roads where impacts would be expected to be moderate.

From Wilderness Characteristics on Wildlife and Special Status Species

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 benefit wildlife resources. Impacts on wildlife resources are expected to be negligible to minor.

4.14.5.3 Sonoran Desert National Monument

From Lands & Realty on Wildlife and Special Status Species

Impacts from utility corridors would be similar to those described in Alternative A but reduced due to the elimination of the Tucson Electric Power multiuse utility corridor and the reduction in size of the remaining two corridors to a 0.5 mile wide limit. Overall impacts on wildlife would be expected to range from negligible to minor.

From Livestock Grazing on Wildlife and Special Status Species

Impacts would be similar to those described under Alternative A for the SDNM, except that 44,800 acres north of I-8 would become unavailable for livestock grazing and the corresponding 1,611 AUMs would become available for wildlife forage. Although encompassing a much larger area than proposed under Alternative B, Alternative C would only require about 47 miles of new fences to restrict livestock because the fencing would tie into existing fences and topographic features, such as cliffs, gorges, and rocky outcrops. This proposed fence line would result in fewer impacts to habitat fragmentation and wildlife movement along the wildlife movement corridors in the area. Impacts from Alternative C for the SDNM would be moderate due to increased cover, space, and forage available within the areas closed to livestock.

In areas open to grazing, allotments would be reclassified as perennial only, which would further increase the amount of annual forage available to wildlife. 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, which would have a negligible impact because there are currently no permits for goats or sheep in the SDNM. Overall impacts of Alternative C on wildlife from livestock grazing would be minor to moderate.

Refer to **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, for impacts related to AUM allocations in the SDNM.

From Minerals Management on Wildlife and Special Status Species

Impacts from mineral development on wildlife habitat management would be similar to those described in Alternative A.

From Recreation Management on Wildlife and Special Status Species

In the SDNM, impacts would be similar to those discussed under Alternative B except 55,500 acres, or nine percent of the SDNM, would be allocated as front country and 383,500 acres, or 88 percent of the SDNM, as backcountry.

Impacts on 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.

From Special Designations on Wildlife and Special Status Species

There are no special designations proposed for wildlife in the SDNM. Thus, there would be no impacts.

From Travel Management on Wildlife and Special Status Species

Refer to **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, for impacts related to travel management.

From Wilderness Characteristics on Wildlife and Special Status Species

Approximately 112,200 acres of the SDNM would be allocated as lands managed to protect wilderness characteristics under Alternative C. Impacts on wildlife would be expected to be negligible in comparison to the level of protection prescribed in the proclamation.

4.14.6 ALTERNATIVE D

4.14.6.1 Common to Both Decision Areas

From Wildlife and Special Status Species Management on Wildlife and Special Status Species

Alternative D only addresses the proposal of the Gila Bend Mountains WHA. Impacts on the Gila Bend WHA would be similar to those described in 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 from all forms of mineral entry. Overall impacts on wildlife under Alternative D would be expected to range from negligible to minor, less than under Alternative A.

From Livestock Grazing on Wildlife and Special Status Species

Cessation of grazing throughout the Decision Areas under Alternative D would result in the greatest improvement to wildlife resources. 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-dependent species may decline locally. Such declines may in turn increase populations of species affected by nest parasitism, including the southwestern willow flycatcher.

On a case-by-case basis, up to 1,647 miles of fencing in the Lower Sonoran and 130 miles of fencing in the SDNM 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 for some wildlife species that have difficulty negotiating passage ways at fences. The effect of changing grazing practices in Alternative D would have a minor impact on habitat connectivity. Cessation of grazing in Alternative D would cause the greatest improvement to wildlife habitat in general than would occur in any other alternative, with minor to moderate impacts. Overall impacts from the cessation of livestock grazing in both Decision Areas would be expected to range from moderate to major.

4.14.6.2 Lower Sonoran

From Lands & Realty on Wildlife and Special Status Species

In the Lower Sonoran, impacts from utility corridors, energy projects, and LUAs on wildlife and special status species 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, because approximately 26,200 acres would be available for disposal under Alternative D. Impacts would be negligible to minor.

From Minerals Management on Wildlife and Special Status Species

Impacts from mineral development on wildlife and special status species would be similar to those described in Alternative B.

From Recreation Management on Wildlife and Special Status Species

This Alternative D would allocate approximately 78,100 acres as front country and approximately 21,600 acres as backcountry. There would be less management direction in areas outside of the management zones. Fewer SRMAs and RMZs would be allocated under this alternative, with impacts similar to Alternative A.

From Special Designations on Wildlife and Special Status Species

There are a total of four ACECs proposed under Alternative D. Under Alternative D the following ACECs would be designated: Coffeepot Batamote ACEC, Cuerda de Lena ACEC, Lower Gila Terraces and Historic Trails ACEC, and 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; and to protect life and provide safety from natural hazards.

Coffeepot Batamote ACEC. Under Alternative D, approximately 77,600 acres of public lands would be designated as the Coffeepot Batamote ACEC to protect habitat and populations of the endangered Acuña cactus.

All public lands within this 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. 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 were mitigated during route designation to minimize habitat fragmentation. Motorized vehicle use would be prohibited in washes that contain occupied or suitable cactus ferruginous pygmy-owl 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-owl habitat would afford 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 occurred to protect special status species habitat.

Desert washes (xeroriparian) within the ACEC would be closed to all camping from April 15th to August 31st 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 (e.g., corrals, etc.) related to grazing operations would be removed. Removal of these facilities would allow wildlife to move unencumbered within the ACEC; however, if water sources are removed, wildlife may vacate areas that have traditionally held water for livestock. The ACEC would be closed to all forms of mineral extraction; however, valid existing rights would be honored. Closing the ACEC to all forms of mineral extraction could retain habitat availability for wildlife.

Overall impacts on wildlife and special status species are expected to range from negligible to minor, which would be less than impacts under 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 and to protect habitat for other wildlife species, including the cactus ferruginous pygmy-owl. The 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.

Within the ACEC, surface-disturbing maintenance associated with LUAs would be limited to the authorized LUA grant. Mitigation, adaptive management, and BMPs would be used to avoid harassment and long-term displacement of wildlife. Impacts on wildlife would be expected to be minor.

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 newborn pronghorn the opportunity to wean without distractions, and allows male pronghorn the ability to seek females for procreation undisturbed. Closure of the area to public entry during this timeframe would be expected to result in negligible impacts on the Sonoran pronghorn. This closure would allow the lesser long-nose bat to forage without human disturbance and would allow the cactus ferruginous pygmy-owl to breed, hunt, and brood uninterrupted.

Camping within the ACEC would be limited to dispersed and undeveloped sites. Negligible to minor impacts on wildlife would be expected to occur. Overall impacts on wildlife and special status species within the ACEC would be expected to range from negligible to minor, which would be less than impacts described under Alternative A.

Lower Gila Terraces and Historic Trails ACEC. Under Alternative D, this proposed ACEC would encompass approximately 82,500 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 on wildlife by allowing interdisciplinary teams to evaluate and reduce the amount of roads, trails, and routes that would be in conflict with wildlife management goals and objectives. Overall impacts on wildlife would be expected to be negligible to minor, which would be less than impacts described under Alternative A.

Saddle Mountain ACEC. Under Alternative D, this 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 on wildlife by allowing interdisciplinary teams to evaluate and reduce the amount of roads, trails, and routes that would be in conflict with wildlife management goals and objectives. Overall impacts on wildlife and special status species would be expected to be negligible to minor, which would be less than impacts described under Alternative A.

From Travel Management on Wildlife and Special Status Species

Motorized use in Alternative D would be limited to designated routes in the same manner as in Alternatives 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 on wildlife resources; resulting in fewer impacts than those under Alternative A.

In Alternative D, there would be approximately 49 miles of nonmotorized trails and approximately 219 miles of primitive roads where wildlife impacts would be 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 would be approximately 25 miles of maintained roads where impacts would be expected to range from negligible to moderate. Overall impacts on wildlife from Alternative D would be less than those described under Alternative A.

From Wilderness Characteristics on Wildlife and Special Status Species

Alternative D would contain the largest number of wilderness characteristic acreage—approximately 276,500 acres. Impacts would be expected to be similar to those described in Alternative C, except the intensity would increase slightly due to the larger area of lands managed to protect wilderness characteristics allocation.

4.14.6.3 Sonoran Desert National Monument

From Lands and Realty Management on Wildlife and Special Status Species

Impacts from utility corridors, LUAs, utility-scale renewable energy development, and land tenure adjustment 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 Minerals Management on Wildlife and Special Status Species

Impacts from mineral development on wildlife habitat management would be similar to those discussed under Alternative A.

From Recreation Management on Wildlife and Special Status Species

In Alternative D, up to fifteen 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 four acres of new disturbance. Impacts under Alternative D would be less than those under Alternative A. Impacts on wildlife are expected to be negligible to minor.

Impacts from target shooting would be negligible, as the SDNM would be closed to target shooting.

From Special Designations on Wildlife and Special Status Species

There would be no special designations proposed for wildlife in the SDNM; therefore no impact is expected.

From Transportation and Access Management on Wildlife and Special Status Species

Refer to **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, for impacts related to route designations within the SDNM.

From Wilderness Characteristics on Wildlife and Special Status Species

Approximately 154,800 acres would be allocated as lands managed to protect wilderness characteristics under Alternative D. This allocation is 37 percent more than Alternative C and more than any other alternative. Impacts on wildlife are expected to be negligible due to the level of protection prescribed in the proclamation. Impacts would be similar to those described in Alternative C, except the intensity would be greater due to the larger amount of lands that would be managed to protect wilderness characteristics.

4.14.7 ALTERNATIVE E (PROPOSED RMP)

4.14.7.1 Common to Both Decision Areas

From Wildlife and Special Status Species Management on Wildlife and Special Status Species

Alternative E, the BLM would only designate the Gila Bend Mountains WHA. Impacts from designation of the WHA would be similar to those described in Alternative D except that under Alternative E habitat conservation would be emphasized.

Surface-disturbing activities affecting an area greater than 40 acres, including land use authorizations and utility-scale renewable-energy development, would be avoided within suitable habitat. Uses would be concentrated in less sensitive resource areas or in previously disturbed areas. If no other options existed, activity impacts would be mitigated and managed to ensure consistency with wildlife management objectives, with an emphasis on maintaining habitat and 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 would be avoided within suitable bighorn sheep habitat. Uses would be concentrated in less sensitive resource areas or in previously disturbed areas. If no other options existed within bighorn sheep habitat, activity impacts would be mitigated and managed to ensure consistency with wildlife management objectives emphasizing habitat and connectivity. Overall impacts on wildlife under Alternative E would be less than under Alternative A and would be expected to range from negligible to minor.

4.14.7.2 Lower Sonoran

From Lands & Realty on Wildlife and Special Status Species

Impacts from utility corridors, energy projects, and LUAs on wildlife and special status species in the Lower Sonoran would be similar to those discussed under Alternative C due to similarities in the number, width, and location of utility corridors and reduced acreage between Alternatives C and E.

Impacts from land tenure decisions on wildlife operations in the Lower Sonoran would be similar to those discussed under Alternative C due to similar numbers of acres that would be available for disposal. However, through the identification process, impacts on wildlife habitat are expected to range from negligible to minor under this alternative.

From Livestock Grazing on Wildlife and Special Status Species

Alternative E represents a combination of Alternatives A and C. Impacts from grazing on wildlife would be very similar to those described in Alternative C because AUMs would remain unchanged.

Ephemeral use and associated impacts would be similar to those described in Alternative A. Alternative E does include similar seasonal livestock restrictions to those in Alternative C. Impacts related to seasonal livestock restrictions would also be the same as in Alternative C. Using 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 Alternative A. Changes in habitat conditions resulting from management prescriptions in Alternative E would be similar to those under Alternative A. Impacts would be expected to range from negligible to minor.

From Minerals Management on Wildlife and Special Status Species

Impacts from mineral development on wildlife and special status species would be similar to those described in Alternative A, except that Saddle Mountain would be closed to saleable mineral disposal, thus decreasing potential conflicts with wildlife and special status species. Overall impacts would be expected to range from negligible to minor.

From Recreation Management on Wildlife and Special Status Species

Impacts from recreation management would be similar to those discussed under Alternatives B and C except 244,000 acres would be allocated as front country and 345,100 acres as backcountry.

From Special Designations on Wildlife and Special Status Species

Coffeepot Batamote ACEC. Under Alternative E, impacts on wildlife and special status species would be similar to those discussed under Alternative D. However, the reduction in acres designated as the Coffeepot Batamote ACEC under Alternative E is based on elevation requirements and soil characteristics needed by the Acuña 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 April 15th to August 31st to protect pygmy-owls during the breeding, nesting, and dispersal season.

Designating camping areas within the ACEC would allow the general public to use the ACEC while providing protections to the owl during life cycle requirements.

Motorized vehicle use would be restricted in washes that contained occupied or suitable cactus ferruginous pygmy-owl habitat from April 15th to August 31st to protect pygmy-owls during the breeding, nesting, and dispersal season. All other areas would be limited to existing or designated routes. Such restrictions would afford the public recreational opportunities while protecting the owl and its life cycle requirements.

Livestock facilities could be developed to improve livestock distribution and natural resource conditions 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 development impacts would be mitigated to allow passage (in the case of fences) and use (in the case of 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 occur through plans of operation. Valid existing rights would be honored; however, potential surface disturbance would be minimized through plans of operations where appropriate. Impacts on wildlife would range from negligible to minor with proper management, which would be less than impacts described under 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. As a result of closing the area to mineral material disposals, habitat would remain connected and available for wildlife use. Valid existing rights would be honored; however, surface disturbance would be minimized through plans of operation where appropriate. Through plans of operations on existing rights, the footprints of operations could be decreased in the ACEC to allow for habitat availability for all wildlife species. Impacts would be expected to range from negligible to minor, which would be less than impacts described under Alternative A.

Lower Gila Terraces and Historic Trails ACEC. Under Alternative E, impacts would be similar to those discussed under Alternative D. However, under Alternative E mineral material disposals would not be allowed within 500 feet of cliff faces to protect raptor nesting areas. Impacts from Alternative E would be the same as those described under Alternative D, which would be less than impacts described under 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 were 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, which would be less than impacts described under Alternative A.

From Travel Management on Wildlife and Special Status Species

As in all other action alternatives, motorized use in Alternative E would be limited to designated routes. Motor vehicle use would be prohibited on 152,800 acres and 777,360 acres would be limited to designated routes. No open areas would be designated. The increase in closed areas would improve habitat connectivity and reduce impacts from human disturbance on wildlife resources.

Impacts under Alternative E would be similar to those described for Alternative C. Under Alternative E, some routes would be seasonally closed (141 miles) to reduce conflicts in special status species habitats. These closures would reduce disturbance and human interactions during breeding, nesting, lambing, and fledging lifecycles. In Alternative E there would be approximately 38 miles of nonmotorized trails and approximately 330 miles of primitive roads in which wildlife impacts would be 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 would be approximately 29 miles of maintained roads where impacts would be expected to be moderate. Overall impacts on wildlife from Alternative E would be less than those described under Alternative A and would be expected to range from negligible to moderate.

From Wilderness Characteristics on Wildlife and Special Status Species

Impacts would be similar to those discussed under Alternative C, except 36,900 fewer acres of would be allocated as lands managed to protect wilderness characteristics—29 percent fewer than under Alternative C. Overall impacts would be expected to range from negligible to minor.

4.14.7.3 Sonoran Desert National Monument

From Lands & Realty on Wildlife and Special Status Species

Impacts from lands and realty management would be the same as those described in Alternative D.

From Livestock Grazing on Wildlife and Special Status Species

Under Alternative E, 95,290 acres north of I-8, including the Conley Allotment inside the SDNM boundaries, would become unavailable to livestock grazing and available to wildlife. Impacts from these closures would be similar to those described for Alternative C, except greater with the closure of the Conley Allotment. The entire Conley Allotment would be closed to grazing. Areas that would remain available for grazing would see similar impacts to those described under Alternative A for the SDNM. Impacts from domestic sheep and goat grazing would be similar to those described under Alternative C. Overall impacts would be moderate.

Refer to **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, for impacts related to AUM allocations in the SDNM.

From Minerals Management on Wildlife and Special Status Species

Impacts from mineral development on wildlife habitat management would be similar to those described under Alternative A.

From Recreation Management on Wildlife and Special Status Species

In the SDNM, impacts from recreation management would be similar to those described under Alternative B, except 78,700 acres would be allocated as front country and 406,500 acres would be allocated as backcountry. Overall impacts would be expected to range from negligible to minor.

Since dispersed recreational target shooting throughout the Monument would continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

From Special Designations on Wildlife and Special Status Species

There are no special designations proposed for wildlife in the SDNM; therefore no impact is expected.

From Travel Management on Wildlife and Special Status Species

Refer to **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects, for impacts related to route designations in the SDNM.

From Wilderness Characteristics on Wildlife and Special Status Species

Impacts would be similar to those discussed under Alternative C, except four percent fewer (4,300) acres would be allocated as lands managed to protect wilderness characteristics under Alternative E.

4.15 IMPACTS ON LANDS AND REALTY MANAGEMENT

The following analysis discusses the impacts on lands and realty from the proposed alternatives and management actions in Chapter 2, Alternatives. Impacts may result from actions that effect land tenure (ownership) or 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 administered by the BLM could increase or decrease under the various alternatives depending on the availability of land for acquisition and the ability of the BLM to sell or exchange lands identified for disposal. All public lands would remain under federal ownership with the SDNM.

4.15.1 METHODS OF ANALYSIS

4.15.1.1 Indicators

Management actions described in the alternatives could result in impacts on the lands and realty program. The following indicators were used during the analysis of lands and realty:

- 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.

4.15.1.2 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 would be removed from federal ownership.
- Lands not designated as potentially suitable for disposal would 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, US 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 administration 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 expected to be fully developed over the next 20 years.

4.15.1.3 Program Areas with No Impacts on Lands and Realty Management

There would be no impacts on lands and realty from actions proposed under the following program areas:

- Public Safety and Hazardous Materials Management; and
- Wild Horse and Burro management.

4.15.1.4 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, 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.

4.15.2 COMMON TO ALL ALTERNATIVES

4.15.2.1 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, 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-administered surface estate lie within these nonattainment areas, this is equivalent to six percent of BLM-administered lands within the LSFO. The BLM is required to include mitigating stipulations when granting new authorizations in these nonattainment zones. This could potentially increase the number of LUA applications rejected if they do not agree to the terms and conditions proposed by the BLM.

Complying with laws and regulations that govern air quality could also affect LUAs and BLM actions to obtain physical and legal access.

From Cave Resources on Lands & Realty

No caves have been identified in the Planning Area, and there are currently no impacts from cave resources to land tenure, LUAs, withdrawals, or utility-scale renewable energy development. Identification of caves within affect land tenure adjustments and areas identified for disposal, limit LUA processing, or prevent utility-scale renewable energy development in site-specific areas. However, due to the relatively small scale of these sites, impacts on lands and realty would be negligible.

From Livestock Grazing on Lands & Realty

LUAs that traverse areas where livestock grazing occurs could 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. However, livestock grazing would not be expected to prohibit LUAs or disposals.

From National Byways on Lands & Realty

Management actions to maintain the character of landscapes within byway corridors would impact lands and realty actions by requiring specific siting or mitigation measures to ensure land use activities are consistent with the established VRM settings.

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 paleontological sites within the Planning Area could potentially affect land tenure adjustments and areas identified for disposal, limit LUA processing, or prevent utility-scale renewable energy development in site-specific areas. However, due to the relatively small scale of these sites, impacts on lands and realty would be 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 LUAs and the BLM's actions to obtain physical and legal access. Under all of the alternatives, proposals for actions that could potentially impact these soil types would require mitigation or relocations, which would result in increased project costs.

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 Acuña cactus habitat. Acuña cactus habitat constitutes three percent of the Planning Area (approximately 37,600 acres)The intensity of the impacts from this avoidance area would be major,; however, because this habitat is isolated from population and utility service areas, impacts would be negligible. Authorized surface-disturbing activities within habitat areas of any endangered, threatened, or special status plants would be avoided to ensure stable populations, which would result in impacts on LUAs and result in additional mitigation or re-location of the LUA. The total acres of endangered, threatened, or special status plant habitats are not known and additional areas may be identified; therefore impacts from this action cannot be quantified. Management of the WHAs under all alternatives restricts vegetation clearing in and around utility corridors to the existing authorized LUA corridor only.

From Water Resources on Lands & Realty

to avoid adverse effects on springs, streams, or seeps; a decrease of water availability at existing wells; or conflicts with other resource management goals would impact LUAs. Mitigation or relocation would be required for proposals for facilities and LUAs that would impact water resources. However, due to

limited water resources within the Planning Area, impacts on lands and realty from the management actions for water resources would be limited.

From Wildland Fire Management on Lands & Realty

Wildland fire management under all of the alternatives would protect facilities on public lands authorized through the lands and realty program by reducing fuel loads and suppressing fires.

4.15.2.2 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 ROWs and permits for utilities and access roads. Therefore, the more lands that are available to mineral entry, the greater the potential for LUAs.

From Vegetation Resources on Lands & Realty

The Fred J. Weiler Green Belt consists of 41,907 acres, or approximately five percent of the LSFO 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 BLM-administered lands.

4.15.2.3 Sonoran Desert National Monument

From Minerals Management

The SDNM is withdrawn from new mineral entry under all alternatives. The withdrawal was established in the proclamation that established the Monument.

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 and LUAs would likely be associated with these actions.

4.15.3 ALTERNATIVE A (NO ACTION)

4.15.3.1 Both Decision Areas

No lands managed to protect wilderness characteristics would be allocated under Alternative A.

4.15.3.2 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 development 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 on important cultural sites are avoided by project redesign/rerouting, 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.

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 on 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. Under this alternative, LUAs within the LSFO would be authorized on a case-by-case basis and, there would be 105,100 acres of LUA exclusion area, In addition, ten 1-mile wide utility corridors would be designated and large distribution systems would be encouraged to be situated within these utility corridors. Exclusion areas would limit the siting or location of LUAs and result in additional pressure on areas with less sensitive resources. This would be a moderate to major impact. Restricting all major linear LUAs within the utility corridors would assist the lands and realty program in managing these facilities and limit resource degradation throughout the LSFO but it would also limit the siting of LUAs and could discourage projects or development.

Land Tenure. In Alternative A, 27,400 acres have been identified as suitable for disposal. 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 BLM-administered lands in the LSFO would be increased, thus increasing the potential for more LUAs.

Utility-Scale Renewable Energy Development. Renewable energy facilities were not specifically addressed in previous planning efforts therefore no management actions are specified under this alternative.

From National Trails on Lands & Realty

No management prescriptions for National Trails are specified for Alternative A.

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 Coffeepot Botanical ACEC (consisting of 8,900 acres) would be an LUA avoidance area, which could require new facilities to be installed in less 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 LSFO. 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.

From Travel Management on Lands & Realty

Under Alternative A, 100,000 acres would be closed to vehicle use in the LSFO. These closures could result in a moderate to major impact to the lands and realty program, as they could restrict land use authorizations in these areas. Approximately 830,200 acres would be restricted to existing 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., ROWs) 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. Visual resources would be managed by using existing utility corridors. In addition, 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 LSFO. 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.

From Wilderness Characteristics on Lands & Realty

No lands managed to protect wilderness characteristics would be allocated under Alternative A.

From Wildlife and Special Status Species Management on Lands and Realty

Wildlife habitat areas (WHAs) would not be designated under Alternative A so there would be no impacts from the WHAs on lands and realty. Special status species direction would have impacts on the lands and realty program by restricting authorizations in certain areas to avoid impacts on special status

species' habitats, (e.g., Sonoran pronghorn, lesser long-nosed bat, and Acuña cactus); Categories I, II, and III desert tortoise habitat; or other important habitats. Decisions could require new facilities to be installed in less than desirable locations to avoid such habitats. Since pronghorn habitat is located in an area not likely subject to land use authorizations, therefore restrictions are expected to be minimal. Restrictions in Sonoran desert tortoise habitats, however, would likely impact LUAs that use utility corridors as most mountains in the LSFO 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.

4.15.3.3 Sonoran Desert National Monument

From Cultural and Heritage Resources on Lands & Realty

Although specific cultural and historic objects were listed for protection within the Monument, impacts from cultural and heritage resources on Lands and Realty would be the same as those described under Alternative A for the LSFO.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Land use authorization would be allowed within the SDNM if the surface disturbing activity does not disturb any Monument objects. Impacts from this action would be moderate, as the mitigation required limiting the impacts on 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. All 486,400 acres of public land within the SDNM would be retained; therefore, no lands would be allocated as suitable for disposal. Impacts would be negligible from this action, as there are few lands within the Monument that meet the criteria as lands suitable for disposal. The potential acquisition of non-federal lands within the Monument would result in the increase and greater consolidation of BLM-administered lands, which would assist the BLM in fulfilling the objectives set forth in the Monument Proclamation but would also increase the potential for more LUAs within the SDNM.

The SDNM is excluded from any potential utility-scale renewable energy development. This would result in more intensive use on BLM-administered lands outside of the SDNM.

From National Trails on Lands & Realty

No management prescriptions for National Trails are specified for Alternative A.

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 LSFO. 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.

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 325,200 acres would be restricted to existing 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 SDNM could create minor impacts on current LUA holders as access roads to their facilities are not designated for administrative purposes only and are open to the public, which 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 LSFO, 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.

From Wilderness Characteristics on Lands & Realty

No lands managed to protect wilderness characteristics would be allocated under Alternative A.

From Wildlife and Special Status Species Management on Lands & Realty

Impacts would be the same as those described under Alternative A for the LSFO, 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.

4.15.4 ALTERNATIVE B

4.15.4.1 Both Decision Areas

No unique impacts are identified for the both Decision Areas under Alternative B.

4.15.4.2 Lower Sonoran

From Cultural and Heritage Resources on Lands & Realty

Ninety percent of known and evaluated cultural resource sites would be allocated to one of five use categories and implement specific management actions that would impact lands and realty through the following actions: retaining public lands and acquiring state and private parcels and or easements; sites allocated to use category identified in **Appendix I** would be closed to locatable minerals and mineral material disposals and would be recommended for withdrawal; leases of energy LUAs in public use sites would contain a no surface occupancy stipulation; public use sites would be avoidance or exclusion areas for energy development and corridor LUAs. These actions would restrict the location of LUAs and other developments and would require additional siting and compliance efforts. There for impacts from this alternative would be greater than those under Alternative A and would be minor to moderate.

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 and not be otherwise feasible on lands outside the avoidance area. LUA avoidance areas could 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 LUA avoidance areas. Impacts from the designation of LUA exclusion areas would be major, as no new authorizations would be allowed within these areas. This restriction would promote more intensive use on nearby lands or would dissuade proponents from developing on BLM-administered lands altogether. While less restrictive, LUA avoidance areas would have a moderate impact on the lands and realty program because it could potentially dissuade proponents from location on BLM-administered lands or extensive mitigation strategies would be required to meet the purposes for which the area was initially designated. 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 LSFO to meet future demands if needed. The small number of communication sites in the Planning Area could discourage

development of communication sites within the LSFO. However, 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 increased. Ten 1-mile wide multiuse utility corridors would be designated under Alternative B (the same number of multi-use corridors as Alternative A 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 assist the lands and realty program in managing these facilities while also limiting resource degradation throughout the LSFO, but it would also limit the siting of LUAs and could discourage projects or development. Impacts would be the same as those described in Alternative A, except that that approximately 38,200 acres (3 percent of the public lands within the Planning Area) would be identified as suitable for disposal Alternative B would propose the most acres suitable for disposal. Impacts from Alternative B 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), 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) 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 major and would promote more intensive use on other BLM-administered lands or would dissuade proponents from developing on lands within the LSFO altogether.

From National Trails on Lands & Realty

Management actions to maintain the integrity of historic trails and visual setting would call for retention of public lands and acquisition of state and private lands or easements along the Juan Bautista de Anza NHT and within the two Anza NHT Management Areas. These lands would not be available for R&PP sales or leases. These actions would limit the siting of LUAs and reduce the areas for disposal thus impacting land tenure designations and adjustments.

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.,

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative A for the LSFO, except that slightly fewer acres (91,100) would be closed while the remainder would be classified as limited to designated routes. However, impacts would still be moderate to major.

From Visual Resources on Lands & Realty

Impacts would be similar to but greater than those described under Alternative A in the LSFO, because fewer acres (64,900 acres) would be managed as VRM Class II (7 percent as compared to 13 percent in Alternative A) but additional management would be implemented as outlined in **Table 2-11**, Management Actions and Allowable Uses for Visual Resources**.** These actions would include the following: incorporate visual design considerations consistent with the Visual Resource Contrast Rating Manual H-8431-1 to meet VRM class objectives for the area; implement measures to mitigate potential visual impacts; project restoration; specific management prescriptions for the viewshed of the Juan Bautista de Anza NHT, Painted Rock, Agua Caliente and Ajo Scenic Loop roads, Highway 238 and Interstate 8; maintain or improve dark, clear skies; restrictions on permanent outdoor lighting in VRM Class I areas; and the use of dark-sky-friendly technology would be emphasized. Although decreasing the total VRM Class II acres could lessen restrictions on LUAs for Class II areas, the additional restrictions would result in greater impacts from visual resources and management to lands and realty as a whole.

From Wilderness Characteristics on Lands & Realty

No lands managed to protect wilderness characteristics would be allocated under Alternative B.

4.15.4.3 Sonoran Desert National Monument

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described for Alternative A; however, under this alternative, sites would be identified and allocated to one of five use categories.

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 SDNM) 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 BLM-administered lands or would dissuade proponents from developing within the area altogether. While less restrictive, LUA avoidance areas would have a minor to moderate impact on the lands and realty program because they could potentially discourage development due to the fact that they would have to use extensive mitigation strategies to meet the purposes for which the area was initially designated.

The lack of communication sites in the Monument would put additional pressure on the Oatman Mountain Communication Site 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). 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 discourage proponents from placing facilities on BLM-administered lands as these corridors may not be provide a feasible route to their desired facility.

Land Tenure. Impacts would be the same as those described in Alternative A for the SDNM.

Utility-Scale Renewable Energy Development. The SDNM is excluded from any potential utility-scale renewable energy development. This would result in more intensive use on BLM-administered lands outside of the SDNM.

From National Trails on Lands & Realty

Impacts would be the same as those for Alternative B of the LSFO.

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 ERMA, which includes the desert backcountry RMZ, Juan Bautista de Anza NHT 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 SDNM, except that the Vekol Valley ACEC would not be carried forward.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative A for the SDNM, except that slightly fewer acres (157,700) would be closed to OHV use and the remainder would be limited to designated routes (328,700 acres) Impacts would still be moderate to major.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative B for the LSFO, 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 increase in VRM Class II acres compared to Alternative A) could restrict land use authorizations by imposing greater design and siting requirements. However, 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.

4.15.5 ALTERNATIVE C

4.15.5.1 Both Decision Areas

No unique impacts are identified for both Decision Areas under Alternative C.

4.15.5.2 Lower Sonoran

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described under Alternative B for the LSFO, except that Alternative C contains two cultural resource allocations referred to as SCRMAs. These designations would impact approximately 127,600 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 LSFO. 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. However, due to the total acres identified for avoidance, the impact under this alternative would be major.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Impacts would be that same as those described in Alternative B for the LSFO, except that more acres (604,300 acres) would be designated as a LUA avoidance areas. 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 Tucson Electric Power corridors that travel from Ajo, AZ to the Tohono O'odham Indian Reservation.

Impacts would be the same as those described in Alternative A, except that 36,200 acres would be identified as suitable for disposal

Utility-Scale Renewable Energy Development. Impacts would be the same as those described in Alternative B, except that more acres (271,900 acres) would be excluded from renewable energy development under Alternative C.

From Recreation Management on Lands & Realty

Impacts from establishing four SRMAs and four ERMAs in the Lower Sonoran would be similar to those discussed under Alternative B.. Alternative C would not allocate the San Tan Mountains. Impacts would remain moderate.

From National Trails on Lands & Realty

Impacts would be the similar to Alternative B; however, the Anza NHT corridor and the two Anza NHT Management Areas would be an exclusion area for major utility-scale renewable energy development and new major linear LUAs and 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). 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. Utility development could continue on a case-by-case basis in existing utility multiuse corridors and only if impacts are determined to have a negligible to minor effect to resources. This alternative would have the greatest impact on lands and realty and would restrict siting of utility-scale renewable energy developments and LUAs.

From Special Designations on Lands & Realty

Impacts would be the same as those discussed in Alternative A, except that the Coffeepot ACEC would be replaced with the Coffeepot Batamote ACEC, which consist of 63,300 acres, an area much larger than under Alternative A.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative B for the LSFO.

From Visual Resources on Lands & Realty

Under Alternative C, impacts from VRM would be similar to those described for Alternative B, 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 alternative would result in more impacts on land and realty compared to Alternative A.

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 Alternative C, the following would occur: private or state in-holdings, including subsurface, would be acquired when available from willing owners; lands managed to protect wilderness characteristics would be managed as exclusion areas for placement of new utility scale renewable energy developments; 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; any potential new minor and nonlinear LUAs, and maintenance of existing facilities, would be evaluated and allowed under specific circumstances as outlined in **Table 2-15,** Management Actions and Allowable Uses for Wilderness Characteristics; existing facilities and projects no longer active would be removed if practicable. As exclusions and avoidance areas for LUAs, communication sites, utility-scale renewable energy development, and other LUAs 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. Land acquisitions would place additional bureaucratic and financial responsibility on the BLM and, 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 permit holders within these areas, and in select cases, some might vacate existing authorizations. Impacts from wilderness characteristics on lands and realty would be greater than under Alternative A; however, these impacts would be reduced due to the fact that these areas are for the most part secluded from high intensity population areas.

From Wildlife and Special Status Species Management on Lands & Realty

Impacts would be the same as those described under Alternative B for the Lower Sonoran. except that WHAs would be designated and additional avoidance areas would be implemented. 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 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 would likely preclude any such land uses regardless of the WHA allocation.

4.15.5.3 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 LSFO, except that 16,200 acres would be allocated as an SCRMA under Alternative C in the Monument. Impacts would be also major.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Impacts on LUAs would be that same as those described in Alternative B for the SDNM. However, only two 0.5-mile wide multiuse utility corridors (underground facilities only) would be designated under Alternative C. As a result, there would be less space for additional utility lines to be placed in these corridors compared to Alternative A, which could spur conflicts between LUA holders.

Land Tenure. Impacts would be the same as those described in Alternative A for the SDNM.

Utility-Scale Renewable Energy Development. Impacts would be the same as those described under Alternative A for the SDNM.

From National Trails on Lands & Realty

Impacts would be the same as those described for Alternative B.

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 SDNM.

From Travel Management on Lands & Realty

Impacts would be the same as those described in Alternative B for the SDNM.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative B for the SDNM, except that approximately 267,300 acres would be designated as VRM Class II (55 percent of the Monument, an increase of about 37 percent over Alternative A) designations, which would further prohibit, restrict, or modify the location of other land use authorizations, as VRM Class II are allocated as LUA avoidance areas. This alternative would result in greater impacts on lands and realty when compared to Alternative A.

From Wilderness Characteristics on Lands & Realty

Impacts would be the same as those described in Alternative C for the LSFO, except that 112,200 acres would be allocated as lands managed to protect wilderness characteristics (approximately 23 percent of the Monument).

From Wildlife and Special Status Species Management on Lands & Realty

Impacts would be the same as those described in Alternative B for the SDNM.

4.15.6 ALTERNATIVE D

4.15.6.1 Both Decision Areas

No unique impacts are identified for the both Decision Areas under Alternative D.

4.15.6.2 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. More LUAs would be restricted in areas of sensitive cultural resources under Alternative D than under Alternative A due to the management of priority areas and cultural resource allocations. Although there are no SCRMA designations within the LSFO under Alternative D, these areas would be designated as ACECs, which would result in impacts due to restrictions on lands and realty actions. For a discussion of the 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 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. This alternative would result in major impacts. 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 for 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 this alternative would identify the least amount of acres suitable for disposal (19,400 acres).

Utility-Scale Renewable Energy Development. Impacts would be the same as those described in Alternative B, except that Alternative D would have the greatest amount of exclusion acres for utility-scale renewable energy development (511,500 acres, approximately 55 percent of the LSFO).

From National Trails on Lands & Realty

Impacts would be the same as those described in Alternative B.

From Recreation Management on Lands & Realty

Impacts from establishing two SRMAs, and one ERMA in the Lower Sonoran would be negligible due to a 93 percent decrease in acres managed as SRMAs and ERMAs. Alternative B and in Alternative C).

From Special Designations on Lands & Realty

Impacts would be the same as those discussed under Alternative A, except that fours ACECs would be allocated. Under Alternative D, 267,100 acres (approximately 28 percent of the LSFO) would be designated as ACECs. In addition, ACECs would be exclusion areas for utility-scale renewable energy development and exploration, and multiuse utility corridors. New major linear LUAs would be excluded outside of the corridors and utilities would be required to be installed underground within the existing multiuse utility corridors to retain the viewshed. This alternative would result in the greatest impacts on lands and realty because it would allocate the most acres for ACECs and as exclusion areas thus limiting location of LUAs and development and potentially discouraging use of the BLM-administered lands within the LSFO. Impacts from these allocations would be major.

From Travel Management on Lands & Realty

Impacts would be similar to but greater than those described in Alternative A because substantially more acres (342,700) would be closed with the remainder limited to designated routes (587,500 acres). Alternative D would be the most restrictive alternative to LUAs, due to the fact that the greatest amount of acres would be closed to vehicle use, potentially increasing the access limitations in certain areas of the LSFO. Impacts from this alternative on lands and realty would be major.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative B for the LSFO, 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 LSFO 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.

From Wilderness Characteristics on Lands & Realty

Impacts would be the same as those described under Alternative C, except that 250,000 acres would be allocated as lands managed to protect wilderness characteristics (approximately 27 percent of the LSFO compared to 14 percent in Alternative C). Under Alternative D, 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, which makes it the most restrictive alternative resulting in the greatest impacts on the lands and realty program.

From Wildlife and Special Status Species Management on Lands & Realty

Impacts would be the same as those described in Alternative C for the LSFO.

4.15.6.3 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 LSFO.

From Lands & Realty on Lands & Realty

Alternative D would be the most restrictive alternative to LUAs in the SDNM, because the entire SDNM (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 SDNM. As a result, no LUAs would be allowed within the SDNM (with the exception of authorizations related to public safety). This action would promote more intensive use on BLM-administered lands outside of the SDNM or would dissuade proponents from developing on BLM-administered lands altogether. The lack of multiuse utility corridors within the SDNM could also 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 under Alternative B.

Impacts on land tenure would be the same as those described in Alternative A for the SDNM.

Development impacts to utility-scale renewable energy would be the same as those described in Alternative A for the SDNM.

From National Trails on Lands & Realty

Impacts would be the same as those described for Alternative B.

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 SDNM.

From Travel Management on Lands & Realty

Impacts from travel management would be similar to impacts described under Alternative B for the SDNM; however, 313,600 acres (almost twice that under Alternative A) would be closed and 172,800 acres would be limited to designated routes. Alternative D would be the most restrictive alternative to LUAs, due to the fact that the greatest amount of acres would be closed to vehicle use, potentially

increasing the access limitations in certain areas of the SDNM. Impacts from this alternative on lands and realty would be major.

From Visual Resources on Lands & Realty

Impacts from visual resources on lands and realty would be limited under Alternative D, because the entire SDNM would be an LUA exclusion area that prohibits utility-scale renewable energy development and land disposals.

From Wilderness Characteristics on Lands & Realty

Impacts would be the same as those described for Alternative D of the LSFO, except that 154,800 acres would be allocated as lands managed to protect wilderness characteristics.

From Wildlife and Special Status Species Management on Lands & Realty

Impacts would be the same as those described under Alternative C for the SDNM.

4.15.7 ALTERNATIVE E (PROPOSED RMP)

4.15.7.1 Both Decision Areas

No unique impacts are identified for the both Decision Areas under Alternative E.

4.15.7.2 Lower Sonoran

From Cultural and Heritage Resources on Lands & Realty

Impacts would be the same as those described in Alternative D for the LSFO.

From Lands & Realty on Lands & Realty

Land Use Authorizations. Alternative D would be the most restrictive alternative to LUAs in the SDNM, because the entire SDNM (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 SDNM. As a result, no LUAs would be allowed within the SDNM (with the exception of authorizations related to public safety). This action would promote more intensive use on BLM-administered lands outside of the SDNM or would dissuade proponents from developing on BLM-administered lands altogether. The lack of multiuse utility corridors within the SDNM could also 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 under Alternative B.

Land Tenure. Impacts would be the same as those described in Alternative A for the SDNM.

Utility-Scale Renewable Energy. Development Impacts would be the same as those described in Alternative A for the SDNM.

From National Trails on Lands & Realty

Impacts would be the same as those described for Alternative B,

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 SDNM.

From Travel Management on Lands & Realty

Impacts from travel management would be similar to impacts described under Alternative B for the SDNM; however, 313,600 acres (almost twice that under Alternative A) would be closed and 172,800 acres would be limited to designated routes. Alternative D would be the most restrictive alternative to LUAs, due to the fact that the greatest amount of acres would be closed to vehicle use, potentially increasing the access limitations in certain areas of the SDNM. Impacts from this alternative on lands and realty would be major.

From Visual Resources on Lands & Realty

Impacts from visual resources on lands and realty would be limited under Alternative D, because the entire SDNM would be an LUA exclusion area that prohibits utility-scale renewable energy development and land disposals.

From Wilderness Characteristics on Lands & Realty

Impacts would be the same as those under described for Alternative D for the LSFO, except that 91,300 acres would be allocated as lands managed to protect wilderness characteristics.

From Wildlife and Special Status Species Management on Lands & Realty

Impacts would be the same as those described under Alternative C for the SDNM.

4.15.7.3 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 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 SDNM.

Utility-Scale Renewable Energy Development. Impacts would be the same as those described in Alternative A for the SDNM.

From National Trails on Lands & Realty

Impacts would be the same as those described for Alternative B.

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 SDNM.

From Travel Management on Lands & Realty

Impacts would be the same as described under Alternative B for the SDNM.

From Visual Resources on Lands & Realty

Impacts would be the same as those described under Alternative C for the SDNM.

From Wilderness Characteristics on Lands & Realty

Impacts would be the same as those described under Alternative C.

From Wildlife and Special Status Species Management on Lands & Realty

Impacts would be the same as those described under Alternative C for the SDNM.

4.16 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.

4.16.1 METHODS OF ANALYSIS

4.16.1.1 Indicators

Management actions described in the alternatives could result in impacts on 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, and type or scale of livestock management facilities, including watering facilities and pipelines, livestock handling facilities, and fencing.

4.16.1.2 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, pipelines, 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 would comply with Arizona Standards for Rangeland Health and Guidelines for Grazing Administration.

Requiring livestock operators to remove livestock during periods of drought for up to one 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.

4.16.1.3 Program Areas with No Impacts on Livestock Grazing

There would be no impacts on livestock grazing management from actions proposed under the following program areas: air quality and wild horse & burro management.

4.16.1.4 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.

4.16.2 COMMON TO ALL ALTERNATIVES

4.16.2.1 Both Decision Areas

From Cave Resources on Livestock Grazing

Activities associated with management of cave resources would affect relatively small, localized areas and would not have measurable impacts on livestock. Impacts would be negligible to minor.

From Paleontological Resources on Livestock Grazing

Management, identification, and protection of significant paleontological resources would protect vegetation and maintain available forage. Activities associated with management of paleontological resources would affect relatively small, localized areas and would not have measurable impacts on livestock forage. Even under the most intense management (e.g. site excavation), the amount of acreage disturbed would likely be very small. Fencing paleontological resource sites and excluding grazing from these sites would result in a minimal loss of forage. Impacts would be negligible to minor.

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, impacts on livestock grazing would likely occur from recreation management.

Human activities, 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.

The areas outside SRMAs would be allocated as ERMAs, which are managed to custodial standards and do not generally provide structured recreational opportunities. ERMAs would not typically include the proactive development of facilities or specific management actions that would prevent conflicts between grazing operations and recreation uses. However, over the lifetime of the RMP, increases in population

and recreation would cause similar impacts in ERMAs as in SRMAs, particularly near urban areas, increasing the potential for conflicts between livestock and recreationists.

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. However, limiting developments in these areas could also reduce surface disturbance and retain forage for grazing livestock.

From Special Designations on Livestock Grazing

Managing the Juan Bautista de Anza National Historic Trails consistent with NPS standards would help protect the historic landscape and visual values of this historic trail. This would have minor impacts on livestock operations by restricting placement of range improvement projects designed to improve livestock distributions (e.g. water developments, fences, etc.) on or near the Anza Trail. This impact on livestock distribution could be offset by locating range improvement projects 0.25 to 0.5 mile away from the trail and restricting salts and supplements on or near the trail.

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 actions 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 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 could restrict the development of livestock management facilities or 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 prescribed fire and treatments would impact livestock grazing by 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 on 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.

From Vegetation Management on Livestock Grazing

Under all alternatives, emphasis is placed on protection of the vegetative communities across both Decision Areas. 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.

4.16.2.2 Lower Sonoran

From Recreation Management on Livestock Grazing

The entire Lower Sonoran Decision Area 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. Impacts could be moderate to major if livestock are wounded or killed, or if range improvement projects are vandalized, which would become a financial loss to the livestock operator.

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 minor 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.

4.16.2.3 Sonoran Desert National Monument

From Minerals on Livestock Grazing

The SDNM is withdrawn from new mineral entry under all alternatives. The withdrawal was established in the proclamation that established the Monument. This withdrawal would have a protective effect on livestock grazing, as ground disturbance from exploration, prospecting, and other activities associated with mineral development would be prohibited.

In those few parcels (25,800 acres) within SDNM where the surface is owned by the US and the subsurface is owned by a non-federal entity, minerals development may still occur. Depending upon the extent and intensity of ground disturbance, livestock could be excluded during active operations or until the landscape has been reclaimed, thus reducing available forage. An increased level of disturbance and harassment of livestock from mineral development could also occur. The level of impact on livestock operations would vary by the size of the mineral development, but are generally expected to be minor in scale. However, the BLM, as the administrator of the surface, would work with operators to mitigate

and further reduce impacts. Methods would likely project design features and BMPs, such as required fencing and posted speed limits to prevent injuries to livestock.

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 would 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.

4.16.3 ALTERNATIVE A (NO ACTION)

4.16.3.1 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 resources would affect relatively small, localized areas and would not have measurable impacts on livestock forage. Even under the most intense management (e.g. 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.

4.16.3.2 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 would vary by allotment due to the loss of parcels that contain important range developments or facilities, and reduce 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 and would 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 LSFO Decision Area 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 on 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. An increased level of disturbance and harassment of livestock from mineral development could also occur. The level of impact on livestock operations would vary by the size of the mineral development but are generally expected to be minor in scale.

From Recreation Management on Livestock Grazing

Under Alternative A, four existing SRMAs totaling 379,400 acres would be retained in the Lower Sonoran Decision Area. 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.

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 actions intended to

maintain these classifications could restrict the location, extent, or type of rangeland improvement projects.

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 limiting grazing in the area through the decision to not allow new range developments.

From Travel Management on Livestock Grazing

Allocation of 1,670 miles of open routes under Alternative A in the Lower Sonoran Decision Area 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 Decision Area 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, Therefore, impacts on livestock grazing would be negligible.

From Wildlife and Special Status Species on Livestock Grazing

Management actions that limit projects, such as requiring mitigation or relocation of projects within 0.25 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 Area. 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.

4.16.3.3 Sonoran Desert National Monument

From Lands & Realty on Livestock Grazing

The designation of three 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 on 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 would 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 on livestock operators are expected to be negligible and would be addressed on a case-by-case basis through the permit renewal process. Those areas, which total 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 Recreation Management on Livestock Grazing

Impacts would be the same as those described under Alternative A for the LSFO Decision Area, 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 0.25 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 would be similar to those identified for the Lower

Sonoran Decision Area. These impacts would be negligible in areas of light use, and minor in areas of moderate to heavy use.

From Special Designations on Lands & Realty

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 a 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 and impacts would be negligible.

From Wildlife and Special Status Species Management on Livestock Grazing

Impacts would be the same as those described under Alternative A for the Lower Sonoran Decision Area, 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 during the rangeland health evaluation and permit renewal process or habitat management plan development for specific allotments or areas.

The impacts on the livestock operators would 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.

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 and horses.

4.16.4 ALTERNATIVE B

4.16.4.1 Both Decision Areas

There are no unique impacts for both Decision Areas under Alternative B.

4.16.4.2 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 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 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 Decision Area 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

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

percent 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 in the LSFO Decision Area would be similar to Alternative A, but potentially occurring over more acres (653,200). The level of impact on livestock operations would 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 on livestock grazing.

From Recreation Management on Livestock Grazing

The overall effects on livestock operations under Alternative B would be similar in nature to Alternative A. However, impacts would increase to moderate levels as there would be a greater than three-fold increase over Alternative A in the area designated for SRMAs and ERMAs. Under Alternative B, impacts from front country and community interface settings would have moderate impacts and be similar to those from the roaded natural ROS settings under Alternative A.

Impacts from backcountry and passage settings 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 RMAs allocated for motorized recreation use (Buckeye Hills East Trails, Ajo, and Painted Rock) and those along the urban interface (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 on 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 negligible impacts.

From Wildlife and Special Status Species Management on Livestock Grazing

Impacts would be the same as those described under Alternative A for the LSFO Decision Area, except where new roads are required for constructing new wildlife waters, which could cause minor impacts from increased conflicts between vehicles and livestock through direct collision or harassment.

4.16.4.3 Sonoran Desert National Monument

From Cultural and Heritage Resources on Livestock Grazing

Based on the results of the Compatibility Analysis (**Appendix E**), livestock grazing has been determined to be incompatible with 8,500 acres in the SDNM, some of which are cultural and heritage resources (the Anza and Mormon Battalion trails, for example). Under Alternative 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 area would be approximately 10 acres around the North Tank on the Conley Allotment along the Anza NHT. This exclosure would decrease available forage for livestock. Additional water developments would likely be necessary to offset the loss of water sources within the exclosures.

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 resources would affect relatively small, localized areas and would not have measurable impacts on livestock forage. Impacts from development of 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), such as loss of vegetation and available forage, are expected to be negligible because very little acreage would be involved in the development of these sites. Even under the most intense management (e.g. 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 on livestock operations; however, impacts would likely be negligible, as the Monument is an avoidance area for development projects. There would 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

Under Alternative B, 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 exclude 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 percent 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 exclosures would have to be addressed on a case-by-case basis. Other impacts would be similar to Alternative A. Combined impacts from Alternative B 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 Recreation Management on Livestock Grazing

The overall effects on livestock operations under Alternative B would be similar in nature to Alternative A; however, impacts could increase with management allocation increases. Under Alternative B, impacts from front country and community interface setting would be similar to those from the roaded natural ROS settings under Alternative A. Impacts from backcountry 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 an ERMA would not affect potentially increasing forage available for livestock grazing compared with Alternative A. Managing 84 percent of the SDNM SRMA to meet backcountry setting 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 on 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 percent) in potential impacts on 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.

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 Grassland ACEC would 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 (see **Appendix E**, Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument) 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 on 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 negligible impacts.

From Wildlife and Special Status Species on Livestock Grazing

Most impacts would be similar to those described under Alternative B for the LSFO Decision Area. 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. 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 wildlife.

4.16.5 ALTERNATIVE C

4.16.5.1 Both Decision Areas

No unique impacts exist for both decision areas under Alternative C.

4.16.5.2 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 SCRMA that runs through much of the Lower Sonoran Decision Area (see Map 2-1c).

Additionally, the proposed Saddle Mountain SCRMA 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 on 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 LSFO Decision Area, 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.

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 on 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 LSFO Decision Area 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 LSFO Decision Area (outside the SDNM boundaries) to winter season of use only (October 1st through April 30th). 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 on 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 1st to April 30) and approximately 35 percent use during the summer season (May 1st to September 30th). These management changes, and any actions designed to adjust livestock numbers or require more intensive management (pasture rotations, seasonal removals, etc.), would likely have moderate to major impacts on 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 become cost-prohibitive for some livestock operators. However, individualized consultation, coordination, and cooperation with the affected parties during the permit renewal process could help lessen financial impacts on 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).

In addition, allocation of four WHAs in the LSFO Decision Area could have minor impacts on 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 on 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 managing for nearly equal access for motorized and non-motorized uses. In comparison to Alternative B, this would entail a 45 percent increase in the back country and passage settings and a 20 percent decrease in front country and community Interface settings. 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 ACECs as perennial only would have moderate to 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 LSFO Decision Area compared to Alternative A 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. However, a substantial increase in VRM Class II (approximately 387,800 acres) over Alternatives A, as well as an additional 91,800 acres under VRM Class 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 Wilderness Characteristics on Livestock Grazing

Managing 128,100 acres in the Lower Sonoran Decision Area 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.

From Wildlife and Special Status Species on Livestock Grazing

Impacts would be the same as those described under Alternative B for the Lower Sonoran Decision Area, 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.

4.16.5.3 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 SCRMAs that runs along the Anza-Butterfield Trail, primarily through the Conley and Bighorn Allotments (see Map 2-1c). The SCRMAs proposed under Alternative C would increase the width of the Anza-Butterfield Interpretive Trail proposed under Alternative B. The SCRMAs would have minor impacts on 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. However, approximately 44,800 acres that are proposed to be fenced off to livestock could make these restrictions moot within the exclosed areas.

From Lands & Realty on Livestock Grazing

Impacts from utility corridors would be similar to Alternative A (negligible), except somewhat reduced due to a 0.5 mile wide limit on the corridor size and the elimination of the Tucson Electric Power 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 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, which in turn would decrease materials and operational costs to both the permittee and the BLM. Range improvement projects within the exclosure 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 on 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 become cost-prohibitive for some livestock operators or make future operations untenable. However, individualized consultation, coordination, and cooperation with the effected parties would help lessen financial impacts on the operator while also decreasing impacts of grazing on rangeland resources and Monument objects.

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 backcountry and passage settings 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. However, less than 1,134 acres would be open to target shooting and in limited, designated areas. This would decrease direct and indirect impacts on 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 I-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 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 on the Bighorn Allotment operator would be moderate, with 27 more miles of fencing to maintain. Installation of cattle guards and strategically located gates in heavily trafficked 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 Class 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 9,520 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 the Big Horn grazing allotment.

From Wildlife and Special Status Species on Livestock Grazing

The impacts from wildlife and special status species 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 then become available for wildlife. 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 wildlife.

4.16.6 ALTERNATIVE D

4.16.6.1 Both Decision Areas

From Livestock Grazing on Livestock Grazing

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. 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 Decision Area could potentially be removed. The burden of removing fences would fall on state and federal wildlife managers. Fences along ROWs, such as highways, roads, railways, and utility corridors, would remain in place. New fencing would also need to be installed in order to prevent livestock trespass into allotments where federal grazing permits have expired, but where state and private lands are still being grazed. The burden of installing fencing would also fall upon federal employees.

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 fence lines 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.

Under Alternative D, because all livestock would be removed from public lands, direct and indirect impacts to or from livestock would be eliminated. Approximately 1,416,600 acres would no longer be used for livestock grazing and approximately 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.

4.16.6.2 Lower Sonoran

No unique impacts have been identified for the LSFO Decision Area in Alternative D.

4.16.6.3 Sonoran Desert National Monument

No unique impacts have been identified for the SDNM in Alternative D.

4.16.7 ALTERNATIVE E (PROPOSED RMP)

4.16.7.1 Both Decision Areas

No unique impacts have been identified for Both Decision Areas under Alternative E.

4.16.7.2 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 Decision Area, except the allocation of the Lower Gila Terraces and Historic Trails SCRMAs would be developed through the SDNM but not in the Lower Sonoran Decision Area.

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 Decision Area would be similar to Alternative C due to similarity in acres available for projects. Impacts from land use authorizations would be slightly less than under Alternative C because 45,100 fewer acres would be set aside as LUA-exclusion areas. Impacts from land tenure actions on livestock operations in the Decision Area would be similar to Alternative A due to similar numbers of acres that would be available for disposal.

From Livestock Grazing on Livestock Grazing

Alternative E 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.

Similar to Alternative C, Alternative E proposes to restrict the portion of the Bighorn Allotment that is in the LSFO Decision Area (outside the SDNM boundaries) to winter season of use only (October 1st through April 30th). 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 south of I-8 to livestock grazing. This would result in negligible impacts on 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 moderate to 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 based on the findings from land health evaluations conducted at that time. These management changes and any actions to adjust livestock numbers or require more intensive management (pasture rotations, seasonal removals, etc.) would likely have moderate to major impacts on 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 on the operator while also decreasing impacts of grazing on rangeland resources.

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 Recreation Management on Livestock Grazing

Impacts from recreation on livestock operations would be the same as those under Alternative C due to similar RMZ acreage.

From Special Designations on Livestock Grazing

Management actions for the 8,900 acre Coffeepot Botanical 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 82,500 acres would be designated as the Lower Gila Terraces and Historic Trails ACEC. Designation of the ACEC would have minor impacts on 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 LSFO Decision Area, 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 LSFO Decision Area.

From Wilderness Characteristics on Livestock Grazing

Impacts would be the same as described under Alternatives A and B. No lands managed to protect wilderness characteristics are north of I-8.

From Wildlife and Special Status Species Management on Livestock Grazing

Impacts would be the same as those described under Alternative B for the LSFO Decision Area.

4.16.7.3 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 C. Impacts from the development of energy projects would be the same as Alternative B. There would be no impacts from LUAs as the Monument is excluded from any new projects.

From Livestock Grazing on Livestock Grazing

Impacts from grazing actions 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. 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, Alternative E 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 (see **Appendix E**, Compatibility Analysis: Livestock Grazing in the Sonoran Desert National Monument). Impacts from this alternative would have major impacts on the permittee of the Conley Allotment by decreasing the preference inside the SDNM to zero 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 Conley allotment would be affected. Water developments would be removed or modified for the enhancement of wildlife and other uses. Permittees would be reimbursed for the range improvement projects that would be removed, in accordance with 43 CFR 4120. At the expense of the federal government, miles of fencing would also need to be constructed to prevent livestock trespass into the closed Conley Allotment from adjacent state and private lands.

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. Since dispersed recreational target shooting throughout the Monument would continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

From Special Designations on Livestock Grazing

Impacts would be the same as those described under 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, 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 27,900 more acres categorized as VRM Class 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 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.

From Wildlife and Special Status Species Management 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.

4.17 IMPACTS ON MINERALS MANAGEMENT

The following evaluation discusses the impacts on mineral resources from the proposed management decisions in **Chapter 2**, Alternatives. Impacts may result from actions that restrict or prohibit surface-disturbing activities associated with minerals and energy exploration or development, including closures. Two levels of analysis are used to evaluate impacts on Minerals Management. The first level of analysis evaluates mineral potential on all BLM-administered mineral estate regardless of surface ownership in an attempt to provide a comprehensive accounting of the BLM's federal mineral estate. All acreages and calculations for this analysis include BLM-managed minerals under BLM-managed surface estate, in addition to BLM-managed subsurface minerals under surface lands owned by other federal agencies and non-federal jurisdictions, such as the State of Arizona, parks, counties, and private owners (i.e., split estate).

The second level of analysis evaluates impacts only on the portion of BLM-administered mineral estate *under* BLM-managed surface estate. This analysis focuses on BLM management actions proposed in **Chapter 2**, Alternatives, which only affect surface acres managed by the BLM. This analysis does not include split-estate lands since BLM decisions would not apply to other surface land owners.

Proclamation 7397 that established the SDNM closed the area to all forms of mineral entry and leasing, subject to valid existing rights. As of June 14, 2010, all previously existing mining claims within the SDNM have been allowed to lapse by the claimants. Additionally, there are no existing mineral leases or mineral materials contracts or permits within the SDNM.

There are a few parcels (25,800 acres) within the Monument where the surface is owned by the United States and the subsurface is owned by a non-federal entity where minerals development may still occur. Additionally, there are two mineral material sources pits associated with the Interstate 8 ROW where ADOT is authorized to acquire sand and gravel for maintenance of the highway. These are not mineral sales administered by the minerals program but rather, as a part of the I-8 ROW administered by the Lands and Realty program However, should a mineral owner wish to develop the mineral deposits, the BLM, as the owner/manager of the surface, would work with operators to mitigate impacts on affected sites and Monument objects with project design features and best management practices.

As described in **Section 3.3.3**, Minerals Management (**Table 3-21**, Leasable Mineral Potential in the Lower Sonoran Decision Area), approximately 735,600 acres (86 percent) of areas currently open to mineral activity in the Lower Sonoran have low potential for oil and gas, and the remaining 116,700 acres (14 percent) has moderate potential. Furthermore, approximately 753,900 acres (88 percent) of areas currently open to mineral activity in the Lower Sonoran have low potential for sodium, and the remaining 94,000 acres (11 percent) has moderate potential. Due to the relatively low potential for these minerals in the Lower Sonoran, coupled with an absence of resource development interest over the last two decades, impacts on these fluid leasable minerals are expected to be negligible and would not be further discussed in this section. Impacts on geothermal resources (also managed as a fluid leasable mineral) are discussed in detail.

4.17.1 METHODS OF ANALYSIS

4.17.1.1 Indicators

The following indicators were used during the analysis of this section:

- The amount of land made unavailable for mineral resource activities;
- The restrictions that may be placed on mineral claiming, leasing, or development activities; and
- The potential for the presence of mineral resources on these lands.

4.17.1.2 Assumptions

The following assumptions regarding the future of minerals management are made:

- Demand for mineral commodities, construction materials, and energy resources would increase over the long term in the US and within the Planning Area.
- Increased demand for energy and minerals would stimulate exploration for potential resources, predominately within areas of known high and moderate potential within the Planning Area.
- It is assumed there would be no major change in the legal framework under which locatable, leasable, and saleable minerals are administered.
- The BLM would ensure alternatives in this plan would not compromise valid and existing mineral rights.
- There would continue to be controversy surrounding mineral development associated with a range of societal pressures. This controversy would 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 would provide for timely permit evaluation and processing of all mineral exploration and development proposals, subject to personnel and administrative constraints.

4.17.1.3 Program Areas with No Impacts on

There would be no impacts on minerals management from actions proposed under the following program areas:

- Cave Resources
- Livestock Grazing
- Paleontological Resources

- Soil Resources
- Wild Horse & Burro Management
- Wildland Fire Management

4.17.1.4 Qualitative Intensity Scale

The intensities of impacts are the same as those described in **Table 4-1**, Qualitative Terms for the Intensity of Impacts.

4.17.2 COMMON TO ALL ALTERNATIVES

4.17.2.1 Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas for all action alternatives.

4.17.2.2 Lower Sonoran

Under all alternatives, the potential for locatable, leasable, and saleable minerals would remain the same; however, the availability of extracting the minerals would vary by alternative based on BLM management actions proposed in **Chapter 2**, Alternatives. **Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area, illustrates the total acreage open and closed by mineral potential (high, moderate, low) for locatable, leasable, and saleable minerals. The analyses tied to this table, titled "Impacts to Federal Mineral Estate (Including Split Estate)" under each alternative include BLM-administered mineral estate, regardless of surface ownership (i.e., analysis includes split estate). Alternatively, the analysis that discusses impacts on minerals from various BLM resource programs (e.g., titled, "From Cultural Resources on Minerals Management") focuses only on impacts for the portion of the BLM-administered mineral estate *under* BLM-managed surface estate. This analysis does not include split-estate lands since BLM decisions would not apply to other surface land owners.

Table 4-22
Mineral Closures by Alternative for the Lower Sonoran Decision Area

	Alternative				
	A	**B**	**C**	**D**	**E**
Federal Mineral Estate Potential[1]	*1,087,300*	*1,087,300*	*1,087,300*	*1,087,300*	*1,087,300*
Locatable Minerals					
Existing Withdrawals – Closed to Mineral Entry	235,000	235,000	235,000	235,000	235,000
High Potential	4,700				
Moderate Potential	76,900				
Low Potential	153,400				
Additional Acreage Considered for Withdrawal	0	2,400	2,300	394,900	2,300
High Potential	n/a	*	*	4,700	*

Table 4-22
Mineral Closures by Alternative for the Lower Sonoran Decision Area

	Alternative				
	A	**B**	**C**	**D**	**E**
Moderate Potential	n/a	0	0	139,400	0
Low Potential	n/a	2,400	2,300	250,800	2,300
Open to Mineral Entry	852,300	849,900	850,000	457,400	850,000
Leasable Minerals – Geothermal Resources[2]					
Existing Closures to Geothermal Leasing	235,000	235,000	235,000	235,000	235,000
High Potential	2,800				
Moderate Potential	132,800				
Low Potential	99,400				
Additional Closures to Geothermal Leasing	0	2,100	109,000	584,900	56,000
High Potential	n/a	0	7,100	22,600	5,200
Moderate Potential	n/a	2,100	51,300	414,500	*
Low Potential	n/a	0	50,600	147,800	50,800
Open to Geothermal Leasing	852,300	850,200	743,300	267,400	796,300
Saleable Minerals (Mineral Material)					
Existing Closures to Saleable Minerals	235,000	235,000	235,000	235,000	235,000
Potential for Crushed Stone, Decorative Rock, Boulders and Related Products[3]	133,700				
Potential for Sand and Gravel, Aggregate, Fill Material, and Related Products[3]	99,300				
Additional Closures to Saleable Minerals	0	24,700	193,300	560,200	209,500
Potential for Crushed Stone, Decorative Rock, Boulders and Related Products[3]	n/a	9,400	128,300	283,400	120,100
Potential for Sand and Gravel, Aggregate, Fill Material, and Related Products[3]	n/a	15,300	65,000	276,800	89,400
Open to Saleable Minerals	852,300	827,600	659,000	292,100	642,800

Source: BLM 2012xx [BLM GIS Reference]
*Denotes a non-zero acreage less than the GIS analytical threshold of 100 acres.
[1]Federal mineral estate acreage includes BLM-managed minerals under BLM-managed surface estate, in addition to BLM-managed minerals under subsurface owned by other federal agencies and non-federal jurisdictions, such as state land, parks, county land, and private land.
[2]Impacts on oil and gas and sodium are expected to be negligible and therefore not discussed in this section.
[3]The sum of the categories for mineral potential (specific to saleable minerals) may be greater than the total area proposed for closure because overlap between these categories may exist.

As mentioned previously, geothermal resources is the only fluid leasable discussed in detail because impacts on other fluid minerals in the Lower Sonoran (e.g., oil and gas, and sodium) are expected to be negligible due to their lack of potential in the Planning Area.

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 permits. 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.

4.17.2.3 Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.17.3 ALTERNATIVE A (NO ACTION)

4.17.3.1 Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative A.

4.17.3.2 Lower Sonoran

Impacts on the Federal Mineral Estate (including Split Estate)

Under Alternative A, 235,000 acres (22 percent) of BLM-administered mineral estate (1,087,300 acres) would remain withdrawn from the location of mining claims, closed to leasing, and closed to the disposition of saleable minerals. No additional areas would be recommended for withdrawal or proposed for mineral closure under this alternative. As such, there would be no decrease in the area currently available to mineral activity and therefore negligible impacts on the BLM-administered mineral estate are anticipated (**Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area).

From Cultural and Heritage Resources on Minerals Management

All mineral development on BLM-administered lands would be required to identify and avoid or mitigate, through documentation or collection, impacts on cultural resources. These requirements would add delays and additional costs to mineral development.

From Lands & Realty on Minerals Management

Under Alternative A, BLM-administered lands available for mineral development would be reduced by as much as 20,000 acres (3 percent of currently open lands) through disposal of public lands by various means. The public land to be disposed of 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 for sand and gravel mineral material resources.

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 conflict 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 the four SRMAs mentioned above would continue to be managed as an ERMA (totaling 550,800 acres) and would not have recreation facilities, visitation standards, or recreationally focused 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 Batamote and Vekol Valley Grassland ACECs (13,440 acres total) could place limitations on leasable and mineral materials 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 91,800 acres of wilderness areas and 8,900 acres of the -Coffeepot Batamote 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

Restoration objectives for vegetation reestablishment and control of invasive species could result in the need for increased expenditures by mineral development companies or individuals in order 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 they could impose additional rehabilitation requirements to return an area to its VRM class after mineral development is completed. In areas of VRM Class I or II, discretionary minerals activities could be prohibited. VRM Classes I and II aim to retain the visual character of viewsheds and typically require more restrictions or rehabilitation. VRM Class III allows for changes to the visual character or viewshed and requires fewer restrictions or rehabilitation to maintain the VRM class. VRM Class IV rarely requires restrictions or rehabilitation to maintain the VRM class.

Under Alternative A, 116,300 acres would be allocated as VRM Class 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 Class 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 Class 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.

From Wildlife and Special Status Species Management on Minerals Management

Specific management decisions for special status species and habitat resources that would affect mineral resources development include discretionary authority to restrict leasable and saleable 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 saleable 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.

4.17.3.3 Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.17.4 ALTERNATIVE B

The various land use allocations and prescriptions proposed under Alternative B, including for wildlife, lands, recreation, cultural resources, VRM, and wilderness characteristics, would affect the BLM-administered mineral estate as shown in **Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area.

4.17.4.1 Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative B.

4.17.4.2 Lower Sonoran

Impacts on the Federal Mineral Estate (including Split Estate)

Under Alternative B, 235,000 acres (22 percent) of BLM-administered mineral estate would remain withdrawn from the location of mining claims, and an additional 2,400 acres (less than one percent of BLM-administered mineral estate) would be recommended for withdrawal (**Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area). Nearly all of the additional lands that would be recommended for withdrawal have low potential for locatable minerals. As a result, the impact on claiming locatable minerals under this alternative is expected to be negligible.

Approximately 850,200 acres (78 percent) of BLM-administered mineral estate in the Lower Sonoran would be open to geothermal leasing, and 237,100 acres (22 percent) would be closed **Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area). This is a 2,100 acre (less than one percent of the BLM-administered mineral estate) increase compared to Alternative A, and none of the additional acres have high potential for geothermal leasing. As a result, the impact on geothermal resources under this alternative is expected to be negligible.

Of the 1,087,300 acres of BLM-administered mineral estate in the Lower Sonoran, 259,700 acres (24 percent) would be closed to the disposition of saleable materials (mineral material), precluding future mining activities in these areas. This is a 24,700 acre (2 percent) increase in lands closed to the disposition of saleable minerals compared to Alternative A. This closure would include 9,400 acres of areas with potential for crushed stone, decorative rock, boulders, and related products, and 15,300 acres of areas with potential of sand and gravel, aggregate, fill material, and related products, reducing the availability of these mineral materials by 2 and 3 percent, respectively (**Table 3-21**, Saleable Minerals Potential in the Lower Sonoran Decision Area and **Table 4-22**, Mineral Closures by Alternative for the Lower Sonoran Decision Area). Depending on the supply of other similar mineral materials in close proximity to the area and the market demand, the impact could range from negligible to moderate.

From Cultural and Heritage Resources on Minerals Management

Under Alternative B, a framework for proactive management of cultural resources would be established and would include management of sites at Sundad, Butterfield West, and Painted Rock public visitation. Increased public visitation could increase conflicts between mineral activities and cultural heritage tourism and could 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 *[BLM: specify the type of mineral development]* pursuant to BLM administration would be reduced by as much as 29,300 acres (4 percent of currently open lands *[BLM: specify what type of "open lands" – leasable, locatable or saleable]*) through disposal of public lands by various means. The lands to be disposed of include 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 as those described for the ten 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 Recreation Management on Minerals Management

Allocation of five SRMAs and five ERMAs covering 779,800 acres in the Lower Sonoran would have similar impacts on mineral development as those impacts described under Alternative A, except the impacts would be more widespread due to more acres falling within SRMA boundaries under Alternative B. Conflicts would likely occur in SRMAs and ERMAs near the urban interface and in areas managed for intensive recreation use, including Buckeye Hills East Trails, Ajo, and Arlington trails. These areas would be managed primarily for motorized recreation uses. Other urban interface SRMAs (such as Saddle Mountain and Buckeye Hills West) would be allocated for mixed motorized and nonmotorized uses. Increasing the amount of acres managed as SRMAs and ERMAs would increase the opportunity to direct recreation use away from areas of high mineral potential and mineral development.

From Special Designations on Minerals Management

Under Alternative B, the Coffeepot Batamote ACEC restrictions would be the same as those described under Alternative A. 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. Viewshed management restrictions could restrict or eliminate minerals activities, especially discretionary activities.

From Travel Management on Minerals Management

Overall impacts from limiting motorized vehicle travel to designated routes in the Lower Sonoran would be 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 under this alternative (consisting primarily of duplicate routes). On a case-by-case basis, users with a valid authorization would be allowed to use administrative only or closed routes or to create new routes. Motorized access to the Coffeepot ACEC would be restricted to designated routes.

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. Specific restoration objectives exist 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, fewer acres would be managed as VRM Class II (64,800 acres), more acres would be managed as VRM Class III (551,000), and fewer acres would be managed as VRM Class IV (222,600 acres) in comparison to Alternative A. Impacts would be similar to Alternative A since most acres remain in VRM Class III or IV; however, increasing total VRM Class II acres could increase restrictions on mineral sites by imposing more stringent design and siting requirements during development compared to Alternative A.

While reducing VRM Class 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 Lower Sonoran, would remain VRM Class IV. This would allow mineral development in those areas without additional restrictions. The allocation of more acres as VRM Class 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

Impacts from management of lands with wilderness characteristics would be similar to those under Alternative A, as no lands managed to protect wilderness characteristics would be allocated.

From Wildlife and Special Status Species Management on Minerals Management

Similar to 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 on 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, would be required to cease operations and reclaim following completion of any existing valid permit.

4.17.4.3 Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.17.5 ALTERNATIVE C

The various land use allocations and prescriptions proposed under Alternative C, including for wildlife, lands, recreation, cultural resources, VRM, and wilderness characteristics, would affect the BLM-administered mineral estate as shown in **Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area.

4.17.5.1 Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative C.

4.17.5.2 Lower Sonoran

Impacts on the Federal Mineral Estate (including Split Estate)

Under Alternative C, 235,000 acres (22 percent) of BLM-administered mineral estate would remain withdrawn from the location of mining claims, and an additional 2,300 acres (less than one percent of BLM-administered mineral estate) would be recommended for withdrawal (**Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area). Nearly all of the additional lands that would be recommended for withdrawal have low potential for locatable minerals. As a result, the impact on claiming locatable minerals under this alternative is expected to be negligible.

Approximately 743,300 acres (68 percent) of BLM-administered mineral estate in the Lower Sonoran would be open to geothermal leasing, and 344,000 acres (32 percent) would be closed **Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area). This is a 109,000 acre (46 percent) increase of lands closed to geothermal leasing compared to Alternative A, however, 93 percent of these lands fall within low or moderate potential for geothermal resources. As a result, the impact on geothermal resources under this alternative is expected to be minor.

Of the 1,087,300 acres of BLM-administered mineral estate in the Lower Sonoran, 428,300 acres (40 percent) would be closed to the disposition of saleable materials (mineral material), precluding future mining activities in these areas. This is a 193,300 acre (82 percent) increase compared to Alternative A. This closure would include 128,300 acres of areas with potential for crushed stone, decorative rock, boulders, and related products, and 65,000 acres of areas with potential of sand and gravel, aggregate, fill material, and related products, reducing the availability of these mineral materials by 32 and 15 percent, respectively (**Table 3-21**, Saleable Minerals Potential in the Lower Sonoran Decision Area and **Table 4-22**, Mineral Closures by Alternative for the Lower Sonoran Decision Area). Depending on the supply of other similar mineral materials in close proximity to the area and the market demand, the impact could range from negligible to moderate.

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, placing an emphasis on protecting sensitive cultural resources. Both areas would be unavailable for 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 with a no surface occupancy stipulation that would effectively render impracticable most leasable minerals activity. Both areas would remain open to locatable minerals activity, but additional requirements and stipulations would be necessary 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 *[BLM: specify the type of mineral development]* pursuant to BLM administration would be reduced by as much as 36,300 acres (5 percent of currently open lands *[BLM: specify what type of "open lands" – leasable, locatable or saleable]*) through disposal of public lands by various means. The public land to be disposed of 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 Recreation Management on Minerals Management

Impacts from implementing recreation management under Alternative C would be similar to those impacts described under Alternative B. In general, the RMAs under Alternative C would be aimed at more balanced recreation management, managing for both motorized and nonmotorized settings. Backcountry settings would be created with the intent to provide a more dispersed, undeveloped recreation experience. Conflicts between nonmotorized recreation users and mineral development may be greater compared to Alternative B in the SRMAs because nonmotorized users tend to look for a more undeveloped setting and natural experience. Conversely, nonmotorized users require fewer acres and would be more easily directed away from mineral development, thus decreasing conflicts.

From Special Designations on Minerals Management

Under Alternative C, impacts from the Coffeepot Batamote ACEC restrictions on minerals management would be similar to those impacts described under Alternative A except that the area would be increased to 63,300 acres. Impacts from designating the Anza National Historic Trail would similar to those impacts described under Alternative A. 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. Viewshed management restrictions could restrict or eliminate minerals activities, especially discretionary ones.

From Travel Management on Minerals Management

Impacts from closing and limiting routes would be similar to those impacts described under Alternative B. Under Alternative C in the Lower Sonoran, 334 miles of the existing route system would be closed to motorized use—more than under Alternatives A or B. These and other limitations placed on route use under this alternative (e.g., routes limited seasonally or to administrative use) would restrict access to areas that could limit mineral exploration and development to the extent that mineral exploration is accomplished via driving across the public lands. General impacts from travel management in the Lower Sonoran would be similar to those described under Alternative B except that fewer routes would be open under this alternative, 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 Class I, 387,800 acres would be managed as VRM Class II, 385,600 acres would be managed as VRM Class III, and 65,000 acres would be managed as VRM Class IV. The allocation of substantially more acres to VRM Class II could increase the stipulation and mitigation requirements for mineral development, particularly in areas of Saddle Mountain and Gila Bend Mountains where mineral materials and geothermal leasable mineral development is more likely; however, stipulations associated with desert tortoise habitat would likely encompass any stipulations needed to protect visual resources. The changes in acreage managed under VRM Class 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 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 unavailable for all mineral materials and closed to leasable mineral activities.

From Wildlife and Special Status Species 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 and unfragmented and sensitive wildlife habitat.

4.17.5.3 Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.17.6 ALTERNATIVE D

The various land use allocations and prescriptions proposed under Alternative D, including for wildlife, lands, recreation, cultural resources, VRM, and wilderness characteristics, would affect the BLM-administered mineral estate as shown in **Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area.

4.17.6.1 Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative D.

4.17.6.2 Lower Sonoran

Impacts on the Federal Mineral Estate (including Split Estate)

Under Alternative D, 235,000 acres (22 percent) of BLM-administered mineral estate would remain withdrawn from the location of mining claims, and an additional 394,900 acres (36 percent of BLM-administered mineral estate) would be recommended for withdrawal (**Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area). The additional lands that would be recommended for withdrawal would close all of the BLM-administered mineral estate with high potential for locatable minerals in the Lower Sonoran Decision Area. Most locatable minerals activity in the Planning Area occurs on a mix of private and Forest Service lands, however, if metal prices continue to increase, interest for staking claims on BLM-administered mineral estate could increase as well. As such, impacts on claiming locatable minerals under this alternative could range from minor to moderate.

Approximately 267,400 acres (25 percent) of BLM-administered mineral estate in the Lower Sonoran would be open to geothermal leasing, and 819,900 acres (75 percent) would be closed **Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area). This is a 584,900 acre (2.5 times) increase of lands closed to geothermal leasing compared to Alternative A, including nearly 40 percent of BLM-administered mineral estate with high potential for geothermal resources. As a result, the impact on geothermal resources under this alternative is expected to range from minor to moderate.

Of the 1,087,300 acres of BLM-administered mineral estate in the Lower Sonoran, 795,200 acres (73 percent) would be unavailable for the disposition of saleable materials (mineral material), precluding future mining activities in these areas. This is a 560,200 acre (2.4 times) increase of lands unavailable for the disposition of saleable minerals compared to Alternative A. This closure would include 283,400 acres of areas with potential for crushed stone, decorative rock, boulders, and related products, and 276,800 acres of areas with potential of sand and gravel, aggregate, fill material, and related products, reducing the availability of these mineral materials by 70 and 62 percent, respectively (**Table 3-21**, Saleable Minerals Potential in the Lower Sonoran Decision Area and **Table 4-22**, Mineral Closures by Alternative for the Lower Sonoran Decision Area). Depending on the supply of other similar mineral materials in close proximity to the area and the market demand, the impact could range from negligible to moderate.

From Cultural and Heritage Resources on Minerals Management

While no SCRMAs would be allocated under Alternative D, approximately 267,100 acres would be designated as ACECs that would place an 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. The increased restrictions 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 *[BLM: specify the type of mineral development]* pursuant to BLM administration would be reduced by as much as 34,800 acres (5 percent of currently open lands *[BLM: specify what type of "open lands" – leasable, locatable or saleable]*) through disposal of public lands by various means. Public lands to be disposed of 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 Wildlife and Special Status Species Management on Minerals Management

Impacts from establishing one WHA would be similar to those under Alternative C but with fewer acres allocated, as many of the WHAs would be ACECs under Alternative D.

From Recreation Management on Minerals Management

Impacts on mineral development from implementation of recreation management under Alternative D would be similar to those impacts described under Alternatives B and C, except that extremely fewer acres would be managed as RMAs (57,700 acres, the least among the Alternatives in the Lower Sonoran). In general, the RMAs under Alternative D would be focused on providing more motorized, recreation settings, which could cause fewer impacts as described in Alternative C. The increased unallocated areas 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 areas would be proposed as ACECs, placing a similar emphasis on protecting sensitive cultural and biological resources in these areas. ACECs could require additional stipulations and mitigation for mineral development and could restrict authorization of renewable mineral sites in a manner 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 from closing and limiting routes would be similar to those impacts described under Alternatives B and C; however, the impacts would be greater under this alternative since this alternative proposes closing the most miles of routes. 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 Lower Sonoran and would 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

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 Class I, 622,400 acres as VRM Class II, 192,000 acres as VRM Class III, and 24,000 acres as VRM Class IV.

From Wilderness Characteristics on Minerals Management

Impacts would be the same as those described under Alternative C for the Lower Sonoran, except that 250,000 acres of lands would be managed to protect wilderness characteristics under Alternative D (twice as many acres as proposed in Alternative C).

From Wildlife and Special Status Species Management on Minerals Management

Impacts from establishing one WHA would be similar to those under Alternative C but with fewer acres allocated, as many of the WHAs would be ACECs under Alternative D.

4.17.6.3 Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.17.7 ALTERNATIVE E (PROPOSED RMP)

The various land use allocations and prescriptions proposed under Alternative E, including for wildlife, lands, recreation, cultural resources, VRM, and wilderness characteristics, would affect the BLM-administered mineral estate as shown in **Table 4-22**, Mineral Closures by Alternative for the Lower Sonoran Decision Area.

4.17.7.1 Both Decision Areas

No impacts from any of the program areas are identified for both Decision Areas in Alternative E.

4.17.7.2 Lower Sonoran

Impacts on the Federal Mineral Estate (including Split Estate)

Under Alternative E, 235,000 acres (22 percent) of BLM-administered mineral estate would remain withdrawn from the location of mining claims, and an additional 2,300 acres (less than one percent of BLM-administered mineral estate) would be recommended for withdrawal (**Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area). Nearly all of the additional lands that would be recommended for withdrawal have low potential for locatable minerals so the impact on claiming locatable minerals under this alternative is expected to be negligible.

Approximately 796,300 acres (73 percent) of BLM-administered mineral estate in the Lower Sonoran would be open to geothermal leasing, and 291,000 acres (27 percent) would be closed **Table 4-22,** Mineral Closures by Alternative for the Lower Sonoran Decision Area). This is a 56,000 acre (24 percent) increase of lands closed to geothermal leasing compared to Alternative A; however, 91 percent of these lands have low potential for geothermal resources. The remaining 9 percent, however, have high potential for geothermal resources. As a result, the impact on geothermal resources under this alternative is expected to be minor.

Of the 1,087,300 acres of BLM-administered mineral estate in the Lower Sonoran, 444,500 acres (41 percent) would be closed to the disposition of saleable materials (mineral material), precluding future mining activities in these areas. This is a 209,500 acre (89 percent) increase of lands closed to the disposition of saleable minerals compared to Alternative A. This closure would include 120,100 acres of areas with potential for crushed stone, decorative rock, boulders, and related products, and 89,400 acres of areas with potential of sand and gravel, aggregate, fill material, and related products, reducing the availability of these mineral materials by 30 and 20 percent, respectively (**Table 3-21**, Saleable Minerals Potential in the Lower Sonoran Decision Area and **Table 4-22**, Mineral Closures by Alternative for the Lower Sonoran Decision Area). Depending on the supply of other similar mineral materials in close proximity to the area and the market demand, the impact could range from negligible to moderate.

From Cultural and Heritage Resources on Minerals Management

No SCRMAs would be designated under Alternative E, however, those areas identified in other alternatives would be proposed 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 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. The additional restrictions could effectively render minerals activities impracticable 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 *[BLM: specify what type of "open lands" – leasable, locatable or saleable]*)

through disposal of public lands by various 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 Recreation Management on Minerals Management

Impacts from recreation management on mineral development under Alternative E would be the same as under Alternative C due to similarities in both acreage and management intent.

From Special Designations on Minerals Management

Similar to Alternative D, no SCRMAs would be allocated under Alternative E, although those same areas would be proposed as ACECs but with reduced acreage to avoid areas with locatable mineral potential in the Gila Bend Mountains. The ACECs would place an emphasis on protecting sensitive cultural and biological resources and could require additional stipulations and mitigation for minerals development. In particular, lands within 500 feet of cliff faces with petroglyphs on the Gila River would be closed to saleable minerals. 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 Resource Conservation Area (Narramore Pit) and within a portion of the proposed Saddle Mountain ACEC (Courthouse Pit). Permits for both sites have expired, but MCDOT has expressed an interest in operating the sites again. The site within the Resource Conservation Area would not be allowed to resume operation. Within the Saddle Mountain 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 limitations would be similar to those impacts described under 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 Class I, 71,900 as VRM Class II, 548,400 as VRM Class III, and 218,100 as VRM Class IV. Under Alterative E, substantially fewer acres would be managed under VRM Classes I and II than under Alternative D, with VRM Class I being limited to wilderness areas. Nearly as

many acres as under Alternative B would be managed under VRM Class III, and only a small amount of BLM-administered lands would be assigned to VRM Class IV. The increase in VRM Class III acreage would decrease the stipulation and mitigation requirements for mineral development compared to Alternatives C and D, but would be more protective than under Alternatives A and B. VRM Class II would be used selectively under Alternative E to protect particularly sensitive visual resources in Saddle Mountain, Coffeepot and Batamote Mountains, and parts of the 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 (91,200) would be allocated as lands managed to protect wilderness characteristics.

From Wildlife and Special Status Species Management on Minerals Management

Impacts from allocating one 255,700-acre WHA would be similar to those under Alternative C but would be greater because the WHA would cover more acres.

4.17.7.3 Sonoran Desert National Monument

No impacts were analyzed for actions related to the SDNM, as the Monument has been withdrawn from mineral entry.

4.18 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 four 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.

4.18.1 METHODS OF ANALYSIS

4.18.1.1 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 Backcountry 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 landscape settings, 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.

4.18.1.2 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 ACECs 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.
- 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.
- National Trail Management Area allocation shall include Federal Protection Components; high potential historic sites; high potential route segments; the designated route which contains evidence of history; the National Register eligible, nominated or listed properties; associated landscape settings; and have boundaries that are identifiable on the ground. Landscape settings include recreational, historic, cultural, scenic, natural, scientific, and other landscape level components. These NHT Management Area allocations shall have management prescriptions applied to them. 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, would 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.

4.18.1.3 Program Areas with No Impacts on Special Designations

There would be no impacts on special designations from actions proposed under the following program areas:

Areas of Critical Environmental Concern

- Air Quality Resources
- Cave Resources
- Cultural and Heritage 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
- Wildlife and Special Status Species 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

4.18.1.4 Qualitative Intensity Scale

The intensities of impacts are the same as those described in **Table 4-1**, Qualitative Terms for the Intensity of Impacts, for the Intensity of Impacts.

4.18.2 COMMON TO ALL ALTERNATIVES

4.18.2.1 Both Decision Areas

Areas of Critical Environmental Concern

There are no unique impacts on ACECs in both decision areas.

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.

From Public Safety and Hazardous Materials Management on National Historic Trails

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 on 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.

From Lands and Realty Management on Wilderness Areas

Acquiring non-federal 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 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 nonnative 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, palo verde, cactus, scrubs and native grasses nonnative 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 firefighting organizations can suppress fires in special designation areas, limiting potential disturbances. Quick suppression actions would 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 nonnative ecosystem conversion. Overall impacts would range from minor to major.

4.18.2.2 Lower Sonoran

No unique impacts are identified under for the Lower Sonoran.

4.18.2.3 Sonoran Desert National Monument

Areas of Critical Environmental Concern

No unique impacts.

National Byways

No allocations.

National Historic Trails

No unique impacts.

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.

4.18.3 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. Special designations for Alternative A are identified on Map 2-16a.

4.18.3.1 Both Decision Areas

Areas of Critical Environmental Concern

No unique impacts.

National Byways

No national byways are designated under alternative A.

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's 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.

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 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 identified under Alternative A would protect wilderness values. Almost all wilderness area acreage is 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 to the wilderness value of naturalness, including the potential of ecosystem conversion from the Sonoran Desert to a nonnative fire-adapted grassland. Woodcutting, wood collection, could continue within and next to wilderness areas. Impacts would range from minor to moderate.

From Wildlife and Special Status Species 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 on 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 USFWS. 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.

4.18.3.2 Lower Sonoran

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 on 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 by disturbing the ground surface or trampling vegetation, but these would be minimized through grazing management prescriptions. Impacts would be expected to range from negligible to minor.

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 minerals. Mining activities would be required to be mitigated as to not disturb individual plants and avoid known populations for the cactus, thereby reducing habitat fragmentation and allowing persistence of the species on a small scale. Impacts would be expected to range from negligible to moderate.

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 on 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, for example, disturb the ground surface or trample vegetation, resulting in minor to moderate impacts on ACEC values.

From Soil Resources on Areas of Critical Environmental Concern

Alternative A would implement a variety of soil resources actions. The BLM would maintain and improve soil cover and productivity through erosion-prevention measures and land treatments. Also, the BLM would minimize soil disturbance and conserve soil resources on previously unimpacted sites. The soil protection actions would maintain surface conditions necessary for maintaining vegetation cover and litter cover and minimizing erosion, which would benefit ACEC values. However, these actions are not applicable to the entire Planning Area and, therefore, are not implemented on a broad scale. Impacts would be expected to be negligible.

From Special Designations on Areas of Critical Environmental Concern

Under Alternative A, the Coffeepot Botanical ACEC would continue to encompass approximately 8,900 acres 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 be 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, thereby continuing to potentially alter the ground surface in a manner that alters drainage and, therefore, availability of water for ACEC vegetation. 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

Alternative A would implement a variety of vegetation resources actions. The BLM would issue woodcutting permits, maintain and improve habitat, and prohibit vegetation material removal excluding specific cases deemed appropriate and properly permitted. However, these actions are not applicable to the entire Planning Area and, therefore, are not implemented on a broad scale. The actions would protect ACEC values by protecting plants from being collected and would also threaten ACEC values by allowing activities that may trample vegetation or disturb ecological process. A mixture of negligible to minor impacts would be expected.

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 and III, the ACEC would continue to be managed under VRM Class II standards under Alternative A. This would allow for uses that cause limited changes to scenic quality from, for example, surface disturbances. Impacts would be expected to be negligible.

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

There are no lands managed to protect wilderness characteristics.

From Wildlife and Special Status Species 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 also provide protection for the endangered lesser long-nosed bat and botanical resources within the ACEC.

Some protection of cactus habitat 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.

National Byways

No allocations.

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 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 associated landscape settings of the 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 SRPs 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 would 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 managed to protect wilderness characteristics would be allocated in Alterative A for the Lower Sonoran Decision Area.

From Wildlife and Special Status Species Management on National Historic Trails

Impacts proposed under Alternative A for the Lower Sonoran from Wildlife and Special Status Species would have a negligible impact on NHTs.

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, including (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, depending on the proposed action and would be addressed on a case-by-case basis in compliance with NEPA. 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 on naturalness and opportunities for solitude would thus be negligible to minor.

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 Woolsey Peak and Signal Mountain wildernesses. Not allocating these areas as lands managed 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 managed 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.

4.18.3.3 Sonoran Desert National Monument

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 such as altering ecosystem processes that support grasslands 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 was eliminated when permits expired. Impacts from livestock grazing on this ACEC are negligible.

Livestock grazing would also be controlled via the existing pasture fence. Negligible impacts would be expected.

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 due to the elimination of surface disturbing activities associated with mineral exploration, development, and extraction. By limiting development, the opportunities for activities that could degrade ACEC values would also limited. Negligible to moderate impacts would be expected.

From Recreation Management on Areas of Critical Environmental Concern

The Valley ACEC area would not be located within an SRMA or ERMA 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

Under Alternative A, would implement a variety of soil resources actions. The BLM would maintain and improve soil cover and productivity through erosion-prevention measures and land treatments. The BLM would minimize soil disturbance and conserve soil resources on previously unimpacted sites. Also, 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. The soil protection actions would maintain surface conditions necessary for maintaining vegetation cover and litter cover and minimizing erosion, which would benefit ACEC values. However, these actions are not applicable to the entire Planning Area and, therefore, are not implemented on a broad scale. Impacts would be expected to be negligible.

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 protections 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 ACEC has an existing decision of the previous RMP, to "close the Vekol Valley Grassland ACEC to OHV use," and remains in effect. Continuation of these policies under Alternative A would be protective of the resource values of the ACEC by limiting OHV disturbance of the grassland.

From Vegetation Resources on Areas of Critical Environmental Concern

Alternative A would implement a variety of vegetation resources actions. The BLM would issue woodcutting permits, maintain and improve habitat, and prohibit vegetation material removal excluding specific cases deemed appropriate and properly permitted. It would also prohibit unauthorized removal of living or dead native plant material in the SDNM. However, these actions are not applicable to the entire Planning Area and, therefore, are not implemented on a broad scale. The actions would protect ACEC values by protecting plants from being collected and would also threaten ACEC values by allowing activities that may trample vegetation or disturb ecological process. A mixture of negligible to minor impacts would be expected.

From Visual Resources on Areas of Critical Environmental Concern

Although the visual resource inventory completed as part of this RMP process characterized the Vekol Valley ACEC as Class III, the ACEC would continue to be managed under VRM Class IV standards under Alternative A. 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 This would continue to allow visual changes to the landscape that could involve ground-disturbing activities that could degrade ACEC values. Impacts would be expected to range from moderate to major.

From Water Resources on Areas of Critical Environmental Concern

All proposed new water uses and developments would be assessed to determine whether they would adversely affect springs, streams, tinajas, or seeps; decrease water availability at existing wells; or conflict with other resource management goals. This would continue to protect the botanical resources of the Coffeepot Botanical ACEC by protecting sources of water for plants.

Impacts would be negligible.

From Wilderness Characteristics on Areas of Critical Environmental Concern

There are no lands managed to protect wilderness characteristics.

From Wildlife and Special Status Species Management on Areas of Critical Environmental Concern

The continued implementation of existing wildlife and special status species management decisions under Alternative A would generally be protective of the resource values of the ACEC by preserving habitat. 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. 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.

National Byways

No allocations.

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 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 landscape settings by allowing visual intrusions and 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 more protection of the NHT resources and Monument objects, at a minor to moderate level of intensity throughout the SDNM.

From Wilderness Characteristics on National Historic Trails

No lands managed to protect wilderness characteristics would be allocated on the Monument under Alterative A.

From Wildlife and Special Status Species Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

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.

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 minor effects, including (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, depending on the proposed action and would be addressed on a case-by-case basis in compliance with NEPA.

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 on 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 managed to protect wilderness characteristics would have negligible to no impact on naturalness and opportunities for solitude and primitive, unconfined recreation in designated wilderness.

4.18.4 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 Grassland 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. Special designations for Alternative B are identified on Map 2-16b.

4.18.4.1 Both Decision Areas

Areas of Critical Environmental Concern

No unique impacts.

National Byways

No unique impacts.

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 effect 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 similar to those described under Alternative A for both Decision Areas, except that there would be 40 percent fewer livestock that would potentially impact the NHT. This would create negligible to minor impacts because of the decrease in potential surface disturbing activities from livestock movement that might harm the integrity of the NHT. Overall, impacts would be negligible to minor.

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 managed to protect wilderness characteristics would be allocated. Impacts would thus be the same as those described under Alternative A.

4.18.4.2 Lower Sonoran

From Lands & Realty on Areas of Critical Environmental Concern

Impacts would be the same as those described under Alternative A for the Lower Sonoran. New utility, communication, transportation, and utility-scale renewable energy facilities would be avoided within the ACEC. Avoiding these types of infrastructure would benefit the natural processes associated with the ACEC values. Minor impacts would be expected.

From Livestock Grazing on Areas of Critical Environmental Concern

Under Alternative B, perennial/ephemeral grazing in the Coffeepot ACEC could have localized impacts on botanical resources by disturbing the ground surface or trampling vegetation, but these would be minimized through grazing management prescriptions. Also, all perennial/ephemeral and perennial allotments available to grazing would receive a reduction in the authorized grazing preference, thereby reducing the potential for disturbances from grazing to ACEC values. Impacts would be expected to range from negligible to minor.

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 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

The BLM would maintain or restore upland, channel, and riparian components of watersheds, and avoid disturbance of sensitive soil surfaces. The soil protection actions would maintain surface conditions necessary for maintaining vegetation cover and litter cover and minimizing erosion, which would benefit ACEC values. Additionally, this would occur across the entire Planning Area. Impacts would be expected to range from negligible to minor.

From Special Designations on Areas of Critical Environmental Concern

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. Livestock facilities would not be developed where they would increase livestock use within an area of known or newly discovered populations of Acuña cactus. This would prevent livestock activities from trampling the cactus. Impacts would be expected to be minor.

From Travel Management on Areas of Critical Environmental Concern

Under Alternative B, OHVs would be limited to designated routes. This would potentially alter the ground surface in a manner that alters drainage and, therefore, availability of water for ACEC vegetation. Impacts would be expected to be negligible.

From Vegetation Resources on Areas of Critical Environmental Concern

Depending on the type of plant material, the collection of living or dead plant material may be either prohibited or allowed. This would protect ACEC values by protecting plants from being collected and would also threaten ACEC values by allowing activities that may trample vegetation or disturb ecological process. Additionally, this would occur across the entire Planning Area. A mixture of negligible to moderate impacts would be expected.

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 designation of the viewsheds would be a less protective designation than under Alternative A because the whole area is VRM Class II under Alternative A. This would allow visual changes to the landscape that could involve ground-disturbing activities that could degrade ACEC values. Impacts would be expected to range from moderate 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 managed to protect wilderness characteristics.

From Wildlife and Special Status Species Management on Areas of Critical Environmental Concern

Under Alternative B, impacts would be similar to Alternative A.

From Lands & Realty on National Byways

Designation of the Aqua Caliente Road as a backcountry 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 backcountry byway exploratory opportunity aspects of the current road.

From Livestock Grazing on National Byways

The Agua Caliente Backcountry Byway traverses open range land, but a 40 percent decrease in livestock, as proposed under Alternative B, would decrease potential impacts from highway collisions with livestock. Impacts would likely decrease from minor to negligible.

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 Backcountry 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.

From Minerals 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 ERMA and Juan Batista de Anza 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 ERMA, 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 ERMA 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 resources directly by cutting through and near them. 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 managed to protect wilderness characteristics would be allocated under Alterative B for the Lower Sonoran.

From Wildlife and Special Status Species Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

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 half of the Sierra Estrella Wilderness to a moderate degree over the long term. Additional power lines, 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 potential for improved forage and vegetation conditions from modified grazing practices and a 40 percent reduction in AUMs could result in long-term vegetative and visual impacts on the landscape that would maintain or improve naturalness. Correspondingly, a 40 percent increase in forage currently allocated to livestock would become 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 would 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 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 ERMA, which includes all lands within the Signal Mountain and Woolsey Peak Wildernesses. Existing ROS management classes would be replaced by settings, with all designated

wilderness managed as backcountry. 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 backcountry setting. 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 (e.g., plant theft, wood cutting, fires, campsite clearing, target shooting, OHV staging, and 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 nonnative 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.

From Wildlife and Special Status Species 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 on wilderness values. In the long term, the presence of new permanent structures in wilderness areas would detract from naturalness. Moreover, long-term, impacts on 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 no longer permitted; and the placement of fences would be restricted or mitigated to avoid adverse impacts on 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.

4.18.4.3 Sonoran Desert National Monument

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.

National Byways

No national byways are designated under Alternative B in the Monument.

From Minerals 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

Under Alternative B, the NHT would be managed under the SDNM ERMA – 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 ERMA – Anza NHT RMZ, the majority of the lands would be allocated to this level of management, as backcountry. In the backcountry, 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 a considerable increase in the length of the road network may affect many more of the Anza NHT resources directly by cutting through and near them. 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 managed to protect wilderness characteristics would be allocated under Alterative B for the Monument.

From Wildlife and Special Status Species 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 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, except that, in the SDNM, the portions of the Conley Allotment that are proposed to become unavailable to livestock fall within the South Maricopa Mountains Wilderness Area. Under Alternative B, fencing would be installed to prevent livestock from entering specific areas of the Wilderness Area. The proposed fence would detract from the naturalness of the area to a small degree but would enhance resources within the exclosure. Impacts would be minor.

From Recreation Management on Wilderness Areas

The SDNM wilderness areas would be included in the SDNM ERMA. Recreation allocations and prescriptions established by the ERMA 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 Juan Batista de Anza NHT RMZ (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 (e.g., plant theft, wood cutting, fires, campsite clearing, target shooting, OHV staging, and 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 nonnative 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 managed to protect wilderness characteristics would be allocated. Impacts would thus be the same as those described under Alternative A.

From Wildlife and Special Status Species 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 on wilderness values. In the long term, the presence of new permanent structures in wilderness areas would detract from naturalness. Long-term, impacts on 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 USFWS; existing earthen livestock waters would be used as refugia for native wildlife where livestock grazing is no longer permitted; and the placement of LUAs, and fences would be restricted or mitigated to avoid adverse impacts on wildlife. Long-term contributions to naturalness in wilderness areas would result if such actions would maintain native wildlife populations at natural levels.

4.18.5 ALTERNATIVE C

Under Alternative C, the 8,900-acre Coffeepot Botanical ACEC would not be carried forward. Instead of the Coffeepot Botanical ACEC, an approximately 63,300-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. This area would include the area of the former Coffeepot Botanical ACEC. In the SDNM, the Vekol Valley Grassland ACEC designations would be removed and the area would be managed in accordance with the terms of the SDNM proclamation.

The Aqua Caliente Backcountry 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.

Alternative C special designations are identified on Map 2-16c.

4.18.5.1 Both Decision Areas

Areas of Critical Environmental Concern

No unique impacts.

National Byways

No unique impacts.

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 would 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 decreased, as there would be less ephemeral grazing, thus decreasing the potential surface disturbing activities from livestock movement year-round that might harm the integrity of the NHT. Additionally, in the SDNM, some areas along the NHT, particularly around North Tank on the Conley Allotment, would be fenced off to livestock. This would help preserve the natural and historic features of the Anza NHT. Impacts would remain minor to moderate, as described in Alternative A, because livestock grazing would still be allowed during certain portions of the year.

4.18.5.2 Lower Sonoran

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. This would preserve the consistency of resource management across the area.

New utility, communication, transportation, and utility-scale renewable energy facilities would be avoided within the ACEC. The El Paso Natural Gas Multiuse Utility corridor would be removed from the ACEC. Avoiding these types of infrastructure and removing the corridor would benefit the natural processes associated with the ACEC values.

These actions would result in moderate impacts on the ACEC.

From Livestock Grazing on Areas of Critical Environmental Concern

Under Alternative C, perennial grazing in the ACEC could have localized impacts on botanical resources by disturbing the ground surface or trampling vegetation. The Coffeepot Batamote ACEC incorporates

the Batamote Mountains and covers 63,300 acres, or more than half of the Childs Allotment. Grazing management would emphasize protection of the Acuña cactus and other botanical resources in the area through site-specific grazing management systems and appropriate NEPA analysis. Similar to Alternative A, impacts would be expected to range from negligible to moderate.

From Minerals Management on Areas of Critical Environmental Concern

The Coffeepot Batamote ACEC would be closed to leasable minerals and unavailable to mineral material disposals. These actions would retain or improve habitat and limit disturbance to wildlife and cultural resources by not allowing these types of minerals development. Minor impacts on ACEC values are expected to occur.

Impacts on 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 mitigation measures 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 Recreation Management on Areas of Critical Environmental Concern

Coffeepot Batamote ACEC would also be allocated as the Ajo ERMA. The entire ACEC would be allocated as backcountry, with passage 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, front country, and passage settings; and encourage the use of existing sites for parking, staging, and camping areas would help reduce or avoid impacts on 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 on the ACECs would 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 Acuña 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 on resource values from the illegal proliferation of roads and off-road use. Negligible to minor impacts on 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 on wildlife would be expected.

From Vegetation Resources on Areas of Critical Environmental Concern

Impacts on ACECs are similar to those described under Alternative B for the Lower Sonoran.

From Visual Resources on Areas of Critical Environmental Concern

Coffeepot Batamote ACEC would be assigned to VRM Class II. The southernmost portion of the ACEC would be assigned to Class III. This would provide protection that is equal to or greater than Alternative A, because this area is designated VRM Class II, III, and IV under Alternative A. This would allow for fewer visual changes to the landscape that could involve ground-disturbing activities, which could degrade ACEC values. Impacts would be expected to range from minor to negligible.

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 Batamote 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

Coffeepot Batamote ACEC would be allocated as lands managed to protect wilderness characteristics, which would be protective of the resource values of the ACEC. Impacts would be minor.

From Wildlife and Special Status Species 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 (Acuña 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. Overall impacts on wildlife would be expected to range from negligible to minor.

From Lands & Realty on National Byways

Impacts are similar to those described under Alternative B for the Lower Sonoran.

From Livestock Grazing on National Byways

Impacts from livestock grazing on the Agua Caliente Backcountry Byway would be similar to those described under Alternative B for the Lower Sonoran, except that stocking rates would range from their current rates to their full permitted use to offset the loss of ephemeral authorizations. Nevertheless, impacts are expected to be negligible to minor.

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.

From Minerals 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 managed to protect wilderness characteristics would be allocated within or near the NHT boundaries.

From Wildlife and Special Status Species Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Lower Sonoran.

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 Lands & Realty on Wilderness Areas

Impacts from Lands & Realty Management would result in impacts similar to Alternative A.

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 both amplified and proactive contributions to naturalness, solitude and primitive recreation values. Impacts would be negligible to minor.

From Recreation Management on Wilderness Areas

Contributions to naturalness and opportunities for solitude due to the SRMA and ERMA allocations and backcountry settings 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 (e.g., plant theft, wood cutting, fires, campsite clearing, target shooting, OHV staging, and 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.

From Wildlife and Special Status Species 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 on 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 differences in impacts compared to Alternative A. Overall impacts would be negligible.

4.18.5.3 Sonoran Desert National Monument

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.

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, power lines and underground cables. Additional installations would not be greatly noticeable except by the most perceptive visitor. Impacts would be negligible to minor.

From Livestock Grazing on National Byways

Highway 238 Scenic Byway traverses through the Monument. However, this highway is currently fenced on both sides, so impacts from livestock grazing would be negligible. Many of the current facilities related to livestock operations (corrals, windmills, etc.) provide scenic historic structures that enhance the cultural enjoyment of the highway.

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 Arizona 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.

From Minerals 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.

From Wildlife and Special Status Species Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument.

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 0.5-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 similar to those described under Alternative A, except no ephemeral grazing would occur except occasionally on the Arnold Allotment, which is designated as ephemeral only and would not be affected by the reclassification of allotments. This re-classification would enhance naturalness in the long term as ephemeral forage would not be removed and would become available to wildlife. Additionally, under Alternative C, 44,800 acres in the SDNM are proposed to be fenced to prohibit livestock grazing. Impacts from this fencing would be similar to those described under Alternative B for the SDNM, except to a much lesser degree because the fencing would incorporate existing fences and topographic features, such as rocky outcrops and cliffs. These fencing mitigations would decrease impacts on wilderness resources from minor (Alternative B) to negligible. 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 Recreation Management on Wilderness Areas

Impacts are similar to Alternative B from management of the SDNM ERMA. 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 on 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.

From Travel Management on Wilderness Areas

Implementation of Travel Management actions under Alternative C would have 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 managed 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.

From Wildlife and Special Status Species 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.

4.18.6 ALTERNATIVE D

Under Alternative D, special designations would include six wilderness areas. 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. This area would include the area of the former Coffeepot Botanical ACEC. An approximately 58,500-acre area would be designated as the Cuerda de Lena ACEC to protect the endangered Sonoran pronghorn as well as to protect habitat for other wildlife species including cactus ferruginous pygmy-owl and to protect cultural resources. An approximately 82,500-acre area would be

designated as the Lower Gila Terraces and Historic Trails ACEC to manage the Gila River and terraces, Butterfield Overland Stage Route, Mormon Battalion Trail, Painted Rock Petroglyph Site, and associated areas to protect cultural resources.

In the SDNM, the Vekol Valley Grassland 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 River Terraces and Historic Trails ACEC and the management emphasis would 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 Backcountry Byways under Alternative D.

Special designations for Alternative D are identified on Map 2-16d.

4.18.6.1 Both Decision Areas

Areas of Critical Environmental Concern

No unique impacts.

National Byways

No unique impacts.

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 both Decision Areas, resulting in negligible effects 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.

Wilderness Areas

No unique impacts.

4.18.6.2 Lower Sonoran

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 from occurring within the Coffeepot Batamote ACEC. All public lands within the ACEC would be retained. Moderate impacts would be expected.

Within the Cuerda de Lena ACEC all LUAs would be prohibited, as the ACEC is allocated as a LUA Exclusion Area. This would prohibit land-disturbing activities from occurring that could threaten ACEC values. Impacts would be moderate.

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 moderate 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 a very small amount of state and private lands within the ACEC. LUAs would be excluded 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 moderate impacts on the management of this ACEC. Major linear LUAs can still be authorized in the El Paso Natural Gas corridor, which is retained in this alternative and would also be a continuation of existing management actions.

From Livestock Grazing on Areas of Critical Environmental Concern

Coffeepot Batamote, Cuerda de Lena, Lower Gila River Terraces and Historic Trails, and Saddle Mountain ACECs 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 on a case-by-case basis. Through removal of 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 of water removals could be detrimental to wildlife in the local area. These activities would also have a protective effect on any cultural resources by preventing livestock activities that could damage any cultural resources from occurring. Impacts on ACEC values would be expected to range from negligible to major.

From Minerals Management on Areas of Critical Environmental Concern

Coffeepot Batamote, Cuerda de Lena, Lower Gila River Terraces and Historic Trails, and Saddle Mountain ACECs would be withdrawn to locatable minerals; however, valid existing rights would be allowed to continue. Where appropriate, surface disturbance would be minimized through plans of operation, adaptive management, and BMPs. The ACECs would also be closed to leasable minerals and

unavailable to mineral material disposals. These actions would retain or improve habitat and limit disturbance to wildlife and cultural resources by not allowing minerals development. Moderate impacts on ACEC values are expected to occur.

From Recreation Management on Areas of Critical Environmental Concern

The Coffeepot Batamote ACEC would be allocated within the Ajo Desert RMZ ERMA. The ACEC is mostly backcountry and a small portion of front country in the western part. 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 on wildlife are expected to occur. Limiting other forms of recreation would be expected to have the same impact as camping. Overall impacts on 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. ERMAs and settings would be established to simultaneously enhance visitor settings and protect the integrity of the ACEC's resources and habitats. 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 on 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 on 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 wildlife from the construction on nonmotorized trails with mitigation. Motorized recreational speed events, such as endurance motocross racing, would be prohibited within the ACEC. These 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 on wildlife are expected to occur.

From Soil Resources on Areas of Critical Environmental Concern

Impacts on the ACECs would be the same as those described under Alternative B for the Lower Sonoran.

From Special Designations on Areas of Critical Environmental Concern

Under Alternative D, an area of approximately 7,600 acres of public lands would be designated as the Coffeepot Batamote ACEC to protect habitat and populations of the endangered Acuña 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 on 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 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 82,500 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 on 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 on 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 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 on 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 on 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. 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 either duplicative or the spur routes 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.

Cuerda de Lena ACEC would either be closed or limited to designated routes, depending on location within the ACEC. It is proposed that the Cuerda de Lena ACEC be closed to public entry from March 15th through July 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 pronghorn 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, few impacts on 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. Closing areas would prevent OHV activities from damaging ACEC values. Overall impacts would be expected to be negligible to moderate.

Impacts are expected to be negligible on the Lower Gila Terraces and Historic Trails ACEC and the Saddle Mountain ACEC. OHV use within the ACECs would either be closed or limited to designated routes, depending on location within the ACEC. Closing areas would prevent OHV activities from damaging ACEC values. 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 negligible to moderate.

From Vegetation Resources on Areas of Critical Environmental Concern

Impacts on ACECs are similar to those described under Alternative B for the Lower Sonoran.

From Visual Resources on Areas of Critical Environmental Concern

Under this alternative, the Batamote ACEC would be expanded south past HWY 85 and 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. 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 8,500 acres. The majority of the ACEC would be assigned as VRM Class II. 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 82,500 acres. Under this Alternative, VRM 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. This would be a more protective designation than under Alternative A. 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 on cultural resources are minor to moderate.

The Saddle Mountain ACEC encompasses approximately 48,500 acres. The majority of the ACEC is proposed as VRM Class II and VRM Class III along two pipelines within the ACEC. This would be a more protective designation than under Alternative A. 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 range from negligible to minor 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 managed to protect wilderness characteristics. These lands would be managed to minimize surface-disturbing activities. Impacts are expected be minor.

A portion of the Cuerda de Lena ACEC would be allocated as lands managed to protect wilderness characteristics. These lands would be managed to minimize surface-disturbing activities. Impacts are expected to be minor.

The majority of the Cuerda de Lena ACEC would be allocated as lands managed 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 managed to protect wilderness characteristics. These lands would be managed to minimize surface-disturbing activities. Impacts are expected to be minor.

The Saddle Mountain ACEC would be allocated as lands managed to protect wilderness characteristics. These lands would be managed to minimize surface-disturbing activities. Impacts are expected to be minor.

From Wildlife and Special Status Species Management on Areas of Critical Environmental Concern

Overall impacts would be expected to range from negligible to major. Impacts on the Coffeepot Batamote ACEC would be the same as those described under Alternative C for the Lower Sonoran.

It is proposed that the Cuerda de Lena ACEC be closed to public entry from March 15th through July 15th in accordance to the Sonoran pronghorn recovery teams' recommendations. By closing the area to public entry during this time frame, negligible impacts on the Sonoran pronghorn are expected. This closure to entry to the public allows the pronghorn females to birth uninterrupted, allows new born pronghorn 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. on special status species in the Lower Gila River Terraces and Historic Trails and Saddle Mountain ACECs would be negligible.

National Byways

No national byways have been allocated under this alternative in the Lower Sonoran.

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 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.

From Wildlife and Special Status Species 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 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 half of the Sierra Estrella Wilderness to a moderate degree over the long term. No additional power lines, 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 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 nonnative 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 would also primarily be classified as VRM Class II, although a portion of adjacent public lands along a major utility corridor would 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 managed 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 managed 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.

From Wildlife and Special Status Species 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. Removal would result in impacts on 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 discernible between the alternatives as both could lead to unnatural wildlife population levels.

Overall impacts would be negligible.

4.18.6.3 Sonoran Desert National Monument

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.

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 would 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 Livestock Grazing on National Byways

Impacts would be similar to those discussed under Alternative C except that no cattle would be permitted within the allotments. Related infrastructure would be removed on a case-by-case basis except for fencing along the right of way of Highway 238. This could impact the cultural value of the historic wells and corrals in the area. Impacts would be negligible to minor.

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.

From Minerals 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 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 managed to protect wilderness characteristics would lie within the central boundaries of the NHT within the Monument. Prescriptions for avoiding the placement of new trails, restoration of disturbed areas, and minimizing the intrusions of new and existing developments within allocated lands managed 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.

From Wildlife and Special Status Species 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 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 Arizona 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 Recreation Management on Wilderness Areas

Under Alternative D, recreation management and establishment of an ERMA 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.

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 managed 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 managed 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.

From Wildlife and Special Status Species 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.

4.18.7 ALTERNATIVE E (PROPOSED RMP)

Under Alternative E, special designations would include the Coffeepot Botanical ACEC (8,900 acres), Cuerda de Lena ACEC (58,500 acres), Lower Gila Terraces and Historic Trails ACEC (82,500 acres), and Saddle Mountain ACEC (48,500 acres). In the SDNM, the Vekol Valley Grassland ACEC designations would be removed and the area would be managed in accordance with the terms of the SDNM proclamation. Special designations for Alternative E are identified on Map 2-16e.

4.18.7.1 Both Decision Areas

Areas of Critical Environmental Concern

No unique impacts.

National Byways

No unique impacts.

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. Additionally, those parts of the Anza Trail corridor that fall within the proposed 44,800 acre cattle exclosure would realize positive impacts like those described under Alternative C.

Wilderness Areas

No unique impacts.

4.18.7.2 Lower Sonoran

From Lands & Realty on Areas of Critical Environmental Concern

The Coffeepot Botanical, Cuerda de Lena, and Lower Gila Terraces and Historic Trails ACECs would become an exclusion area for all LUAs, including utility-scale renewable energy development sites, thereby limiting surface disturbances that could affect ACEC values. Lands would also be retained, which would maintain consistent management of ACEC values across the area. Moderate impacts would be expected.

Impacts would be the same as those described under Alternative D for the Saddle Mountain ACEC, except conditions might slightly lessen as the Palo Verde to Devers multiuse utility corridor is still present under this alternative. Impacts would range from minor to moderate.

From Livestock Grazing on Areas of Critical Environmental Concern

Impacts on the Coffeepot Botanical ACEC would be the same as those described under Alternative A for the Coffeepot Batamote ACEC in the Lower Sonoran.

Under Alternative E, part of Cuerda de Lena ACEC within the Cameron Allotment would continue to be closed to grazing, and part of it would be available for perennial/ephemeral grazing. Parts of Lower Gila Terraces and Historic Trails ACEC and Saddle Mountain ACEC would be available for perennial, perennial/ephemeral, or ephemeral grazing.

Under Alternative E, the Saddle Mountain ACEC would be created. Livestock grazing within the Saddle Mountain ACEC would be managed to ensure the resource values are maintained and protected. Managing livestock grazing in this manner would allow the enhancement of habitat for wildlife species within the ACEC and reduce competition for resources needed by wildlife.

Perennial, perennial/ephemeral, or ephemeral grazing in the ACECs could have localized impacts on botanical resources by disturbing the ground surface or trampling vegetation, but these would be minimized through grazing management prescriptions. Livestock activities could also damage cultural resources in an ACEC. Livestock grazing would be managed to ensure the resource values of an ACEC are maintained and protected. Overall impacts from Alternative E would be expected to range from negligible to moderate.

From Minerals Management on Areas of Critical Environmental Concern

The Cuerda de Lena, Lower Gila River Terraces and Historic Trails, and Saddle Mountain ACECs would be closed to leasable minerals and unavailable to mineral material disposals. Where appropriate, surface disturbance would be minimized through plans of operation, adaptive management, and BMPs. Closing ACECs to minerals would retain habitat characteristics for wildlife species in the ACECs, reduce the amount of habitat fragmentation, and retain natural settings and cultural resources. Valid existing rights

would be respected; however, potential surface disturbance would be minimized through plans of operations, where appropriate. Impacts would be minor.

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 ERMA. With the exception of motorized routes that would be within the passage setting, nearly the entire ACEC would be within the backcountry (62,500 acres, with only 500 acres in front country 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 an ACEC. Impacts would be expected to range from negligible to minor. All camping (vehicle-based and primitive) would be limited to designated sites within an ACEC from February 1 to September 15 to protect pygmy-owls during the breeding, nesting, and dispersal season. Designating camping areas within an ACEC would allow the general public to utilize an ACEC while providing protections to the owl during life cycle requirements.

From Soil Resources on Areas of Critical Environmental Concern

Impacts on the ACECs would be the same as those described under Alternative B for the Lower Sonoran.

From Special Designations on Areas of Critical Environmental Concern

Impacts on the Coffeepot Botanical ACEC would be similar to Alternative B. Additionally, existing range improvements would remain in place unless the improvement is no longer needed for livestock operations or wildlife water distribution. Existing range improvements are not anticipated to result in new impacts on cacti. Negligible to minor impacts are anticipated.

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 would 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 impacts on the Lower Gila Terraces and Historic Trails ACEC. An increase in human visitation could provide greater opportunities for damaging cultural resources.

Impacts 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.

Impacts would be the same as those described under Alternative D for the Saddle Mountain ACEC, 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. Overall impacts from Alternative E 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

OHV use within the Coffeepot Botanical and Saddle Mountain ACECs would either be closed or limited to designated routes, depending on location within the ACEC. Closing areas would prevent OHV activities from damaging ACEC values, resulting in moderate impacts.

OHV use within the Cuerda de Lena and Lower Gila Terraces and Historic Trails ACECs would be limited to designated routes. OHV activities could potentially alter ACEC values. Impacts would be expected to be negligible.

From Vegetation Resources on Areas of Critical Environmental Concern

Impacts on ACECs are similar to those described under Alternative B for the Lower Sonoran.

From Visual Resources on Areas of Critical Environmental Concern

Impacts on the Coffeepot Botanical ACEC are similar to those described under Alternative A for the Lower Sonoran.

The Cuerda de Lena ACEC would be assigned as VRM Class III. This would be a more protective designation than under Alternative A. 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 II, 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 encompass approximately 144,500 acres. Under this Alternative, VRM Class II and III classifications would be assigned for most of the ACEC. A majority of the ACEC contains VRM Class III and some Class II to a lesser degree. This would be a more protective designation than under Alternative A. 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 majority of the Saddle Mountain ACEC is proposed as Class III and IV. A small portion in the northwest would be VRM Class II. The VRM 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 VRM Class III and VI designations 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 Botanical ACEC, Terraces and Historic Trails, and Saddle Mountain ACECs.

From Wilderness Characteristics on Areas of Critical Environmental Concern

Coffeepot Botanical ACEC lands would be allocated as lands managed to protect wilderness characteristics, which would be protective of the resource values of the ACEC. Impacts would be minor.

No lands managed to protect wilderness characteristics would be allocated in the Cuerda de Lena and Lower Gila Terraces and Historic Trails ACECs.

A small portion of the Saddle Mountain ACEC would be allocated as lands managed to protect wilderness characteristics, which would be protective of the resource values of the ACEC. Impacts would be minor.

From Wildlife and Special Status Species 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 Botanical 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 would 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 special status species would be negligible on the Lower Gila Terraces and Historic Trails ACEC and the Saddle Mountain ACEC.

From Lands & Realty on National Byway

Impacts would be the same as those described under Alternative C for the Lower Sonoran.

From Livestock Grazing on National Byway

Impacts from livestock grazing on the Agua Caliente Backcountry Byway would be the same as those described under Alternative B for the Lower Sonoran except that livestock numbers would remain at current levels. Impacts would be minor.

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.

From Minerals Management on National Historic Trails

Impacts would be the same as those described under Alternative D 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 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 managed to protect wilderness characteristics would be allocated within or near the NHT boundaries.

From Wildlife and Special Status Species 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 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 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 91,200 acres of the Lower Sonoran as lands managed to protect wilderness characteristics would have no impacts on wilderness areas; these areas are not in close proximity to designated wilderness.

From Wildlife and Special Status Species 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.

4.18.7.3 Sonoran Desert National Monument

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.

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 Livestock Grazing on National Byways

Alternative E proposes making Interstate 8 the "I-8 Scenic Byway." Because the interstate is already fenced, and no livestock grazing is permitted south of I-8, no impacts are expected from this proposal. Furthermore, impacts from livestock grazing on the Highway 238 Scenic Byway would be the same as those described under Alternative C. Impacts would be negligible to minor.

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 management 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 I 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 0.5 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.

From Minerals 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 would 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 managed to protect wilderness characteristics would be allocated within or near the NHT boundaries.

From Wildlife and Special Status Species Management on National Historic Trails

Impacts would be the same as those described under Alternative A for the Monument.

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 C for the Monument except that perennial/ephemeral grazing would be permitted. Impacts would be negligible to minor.

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 on 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 managed 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.

From Wildlife and Special Status Species 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.

4.19 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 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 management strategies; b) the objectives established to achieve those management 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 on 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 (backcountry) 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, and **Appendix R**, Special and Extensive Recreation Management Area Worksheets.

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 SRMAs and ERMAs.

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 backcountry 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, backcountry experiences.

In the SDNM, Alternatives B, C, and E would allocate the SDNM to an ERMA managed to produce benefits for visitors derived from the objects and resources for which the Monument was established.

Alternative D would not allocate the SDNM to produce recreation outcomes. 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 SDNM Decision Area.

4.19.1 TARGET SHOOTING

Target shooting impacts were analyzed throughout the entire Monument. Locations for allowing or disallowing target shooting have been based on the findings from the target shooting analysis in **Appendix G**, Sonoran Desert National Monument Recreational Target Shooting Analysis.

4.19.2 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.

4.19.2.1 Indicators

- Changes to the essential recreation opportunities and recreation setting characteristics (RSCs).
- Impediments to defined recreation activities and the associated qualities and conditions.
- Management actions that result in long-term elimination or reduction of basic recreation and visitor services and resource stewardship needs.
- Change in the availability, or area of availability, of types of recreation opportunities, particularly motorized and nonmotorized opportunities.

4.19.2.2 Assumptions

The following assumptions regarding the future management of recreation management are made.

- Over the planning period, demand for and use of recreational opportunities would 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.

- Alternative A impact analysis applies the management terminology from the older Recreation Management Manual. Impact analysis in Alternatives B through E applies the terminology from the current Recreation Manual.

4.19.2.3 Program Areas with No Impacts on Recreation Management

There would be no impacts on recreation management from actions proposed under the following program areas:

- Vegetation Resources,
- Wild Horse & Burro Management

4.19.2.4 Qualitative Intensity Scale

The intensities of impacts are the same as those described in **Table 4-1**, Qualitative Terms for the Intensity of Impacts.

4.19.3 COMMON TO ALL ALTERNATIVES

4.19.3.1 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 on 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 and ERMAs. 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 BLM's ability to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA 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, leasable and mineral material disposal activities would need to comply with prescribed setting prescriptions; therefore, there would be little or no impact to recreation resources from those activities.

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 on paleontological and geological resources management are expected to be negligible over the long term.

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 on 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 US 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 on 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 on 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 on opportunities for beneficial outcomes are expected to be negligible as no changes to these federal designations are foreseen.

From Travel Management on Recreation Management

The seasonal Sonoran pronghorn closure near the Gunsight Wash and Cuerda de Lena areas would only have minor impacts because other public lands nearby are available for dispersed recreation activities. Recreation opportunities in the Ajo block would be temporarily diminished through closing routes within washes from April 15th to August 31st to address forage, shelter, and thermal cover protection provided by washes as a component of wildlife habitat.

From Visual Resources on Recreation Management

Impacts from allocating designated wilderness to VRM Class I would be negligible. These areas are allocated to the backcountry 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.

From Wildlife and Special Status Species Management on Recreation Management

The Cuerda de Lena area would be closed to public entry seasonally to protect Sonoran pronghorn habitat. 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).

Recreation opportunities in the Ajo block would be temporarily diminished through closing routes within washes from April 15 to August 31 to address forage, shelter, and thermal cover protection provided by washes as a component of wildlife habitat.

4.19.4 ALTERNATIVE A (NO ACTION)

4.19.4.1 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 on 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 Decision 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 on 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 250,000 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 on recreation from loss of opportunities for appreciation of natural landscapes.

4.19.4.2 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 on 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 on 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 342,500 acres, or 70 percent, of the SDNM where recreation activities would be managed custodially, impacts on 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 143,900 acres, or 29 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 recreationists 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 may

lead to substantial closures of routes from misuse and over-use as impacts on 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 on 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.

4.19.5 ALTERNATIVE B

4.19.5.1 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 AUMs available annually. With fewer livestock seasonally, fewer impacts on 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 a targeted set of outcomes and desired recreation setting characteristics in five SRMAs. The widest range of diverse recreation opportunities, particularly related to motorized and

intensive recreation uses, would be provided under Alternative B. 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 95,200 acres in the Lower Sonoran would be part of five designated SRMAs, acknowledging each area's unique value, importance, and distinctiveness. This equates to approximately 10 percent of public lands in the Lower Sonoran targeted for recreation management.

Through the allocation of RMAs with recreation outcomes, 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 RMAs 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 backcountry setting where motorized use would be in the passage zone that provides motorized access to the backcountry. Other allocations include 34 percent in the front country setting and 9 percent in the community interface setting.

There would be five ERMAs in the Lower Sonoran decision area, each with its own specific management consideration in order to address recreation use, demand, or recreation program investments. 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 on 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 Backcountry 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 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 reduce 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 on 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 Area under 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 backcountry RMZs, but their maintenance or continuation over the life of the RMP could not be assured.

4.19.5.2 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 an ERMA to produce recreation benefits that derive from the objects and resources for which the Monument was designated.

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 on 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 on beneficial outcomes, such as enjoyment of natural landscapes and appreciation of environmental benefits, would be expected.

From Recreation Management on Recreation Management

Designating the entire SDNM as an ERMA would support and sustain the principal recreation activities (e.g., camping, hiking, educational opportunities, and scenic driving) and the associated qualities and conditions of the SDNM. Supporting management actions and allowable use decisions would facilitate the visitors' ability to participate in outdoor recreation activities and protect the associated qualities and conditions. 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.

Recreational target shooting would be confined to areas of the SDNM where Monument objects are not prevalent (approximately 96,411 acres), as described in **Appendix G**, Sonoran Desert National Monument Recreational Analysis. This may result in the displacement of this activity from approximately one-half of known recreational target shooting sites in the SDNM (**Appendix G**, Sonoran Desert National Monument Recreational Analysis, **Map G-8**). Displacement of this activity to other areas within the SDNM where recreational target shooting would be allowed would cause negligible impacts on

objects of the Monument; however, in the absence of suitable terrain to provide adequate backstops and safety fans such activity may be unsafe, both to target shooters and other visiting public. Displacement of this activity to adjacent public lands outside of the SDNM may lead to minor to moderate impacts on natural resources such as vegetation, rock outcrops, etc. as described in **Appendix G**, Sonoran Desert National Monument Recreational Target Shooting Analysis, for the SDNM. Additionally, the larger area of public lands adjacent to the SDNM may allow for wider dispersal of target shooting that is displaced from the SDNM, causing individuals wishing to engage in this activity on public lands to travel farther distances than currently.

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 from Alternative A poses negligible impacts on 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 an ERMA would support and motorized recreation activities. 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 Area under Alternative B versus 19 percent under Alternative A).

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 backcountry RMZs, but their maintenance or continuation over the life of the RMP could not be assured.

4.19.6 ALTERNATIVE C

4.19.6.1 Both Decision Areas

From Wildlife and Special Status Species on Recreation Management

Primitive roads in washes would be closed from April 15th to August 31st to address the forage, shelter, and thermal cover protection provided by washes as a component of wildlife habitat. Effects on travel

management would be minor and short term due to the availability of motorized access by at least one route to most popular places. Seasonal closure periods in washes would also be during the lower visitation times of the year. Therefore, the effects on visitors, including hunters, would be minor.

From Travel Management on Recreation Management

Primitive roads in washes would be closed from April 15th to August 31st to address the forage, shelter, and thermal cover protection provided by washes as a component of wildlife habitat. Effects on travel management would be minor and short term due to the availability of motorized access by at least one route to most popular places. Seasonal closure periods in washes would also be during the lower visitation times of the year. Therefore, the effects on visitors, including hunters, would be minor.

4.19.6.2 Lower Sonoran

From Cultural and Heritage Resources on Recreation Management

Under Alternative C, moderate increases in opportunities for beneficial outcomes, such as opportunities for individual and community awareness and appreciation of cultural heritage resources, would result across the Lower Sonoran. 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 (82,500 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, 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 than those resulting from 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 periods. 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 85,400 acres (9 percent) of the Lower Sonoran to four SRMAs, where recreation would be managed to protect and enhance a targeted set of activities, experiences, benefits, and desired recreation setting characteristics.

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 backcountry setting would be 28,100 acres (11 percent) greater than in Alternative B, and 557,200 acres (60 percent) of the Lower Sonoran would be managed as three individual ERMAs. These ERMAs would be managed to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA. Management of ERMA areas would be commensurate with the management of other resources and resource uses.

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 Backcountry 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 and 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 RMA 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 would affect recreational use by reducing opportunities for exploration and trail-based recreation.

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 as backcountry settings. Impacts on opportunities for beneficial outcomes would be negligible.

4.19.6.3 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 SCRMA (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 AUMs 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 on 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

Managing 486,400 acres as the SDNM ERMA would facilitate recreational enjoyment of the area by supporting and sustaining camping, hiking, educational opportunities, and scenic driving. 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.

Recreational target shooting would be confined to areas identified as moderately or highly suitable for such activity as described in **Appendix G**, Sonoran Desert National Monument Recreational Target Shooting Analysis, totaling approximately 1,136 acres. These are areas where Monument objects are not prevalent and terrain for adequate backstops would be expected to occur. Recreational target shooting would continue on 4 to 6 of the known recreational target shooting sites on the SDNM and be displaced from the remainder. Although the concentration of all target shooting activity currently occurring on the SDNM at these sites would be unlikely, such a concentration would be a potentially unacceptable public safety situation, and would be unmanageable under current BLM policy with regard to recreational target shooting. Displacement of this activity to adjacent public lands outside of the SDNM may lead to minor to moderate impacts on natural resources such as vegetation, rock outcrops, etc. as described in **Appendix G**, Sonoran Desert National Monument Recreational Target Shooting Analysis for the SDNM. Additionally, the larger area of public lands adjacent to the SDNM may allow for wider dispersal of target shooting that is displaced from the SDNM, causing individuals wishing to engage in this activity on public lands to travel farther distances than currently.

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).

From Wilderness Characteristics on Recreation Management

Alternative C would result in the allocation of 112,200 acres, or 23 percent, of the SDNM as lands managed to protect wilderness characteristics managed coincidentally with recreation resources as backcountry settings. Impacts on opportunities for beneficial outcomes would be negligible.

4.19.7 ALTERNATIVE D

4.19.7.1 Lower Sonoran

From Cultural and Heritage Resources on Recreation Management

Under Alternative D, there would be negligible opportunities for beneficial outcomes 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 on 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 with 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 (35,400 acres, or 4 percent of the Lower Sonoran). The Buckeye Hills East, Lower Gila Historic Trails, and Painted Rock Campground SRMAs would be managed to protect and enhance each SRMA's targeted set of activities, experiences, benefits, and desired recreation setting characteristics. Recreation activities in the 22,100-acre Buckeye Hills

West ERMA would be managed commensurate with the management of other resources and resource uses. The remainder of the Decision Area would not be designated as an RMA, meaning lands would be managed to meet basic recreation and resource stewardship needs, where recreation is not emphasized. Without recreation as a management focus, activities and beneficial outcomes would not be supported and visitors' experiences could be diminished in comparison to other action alternatives. The difference in opportunities for these types of beneficial outcomes between Alternative D and Alternative A would be negligible.

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 with Alternative A. Opportunities for beneficial outcomes that derive from nonmotorized activities, such as touring by hiking, bicycling, and horseback riding, would be enhanced to a minor degree in relation to Alternatives B and C, and to a moderate degree relative to Alternative A.

From Special Designations on Recreation Management

Under Alternative D, 263,700 acres (28 percent) of the Lower Sonoran would be allocated as ACECs 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 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 with Alternative C, and greater to a major degree in relation to Alternatives A and B.

From Wilderness Characteristics on Recreation Management

Alternative D would result in the allocation of 250,000 acres, or 27 percent, of the Lower Sonoran as lands managed to protect wilderness characteristics managed coincidentally with recreation resources as backcountry settings. Impacts on opportunities for beneficial outcomes would be negligible.

4.19.7.2 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 with 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 SDNM would be managed as Undesignated Lands for purposes of recreation management. While recreation use and demand would be supported through specific management consideration, 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. Visitors' ability to participate in recreation activities and derive beneficial outcomes from them would be preserved through management of developed and interpreted sites, such as appreciation of cultural heritage resources and easy access to natural areas through motorized travel. However, this management consideration would be the least offered in comparison to Alternatives A, B, and C.

Individuals currently using the SDNM for the purposes of recreational target shooting would be displaced to other venues for this activity. This displacement may increase use of nearby managed target shooting facilities, or of adjacent public lands where this activity is not restricted. On adjacent public lands, the types of impacts on natural resources such as vegetation, rock outcrops, wildlife, etc. described in **Appendix G**, Sonoran Desert National Monument Recreational Target Shooting Analysis, for recreational target shooting on the SDNM would be expected to occur as recreational target shooting is displaced from the SDNM to general public lands. Although the BLM cannot predict the number of new such sites that might arise on public lands as a result of such displacement, due to the larger area of adjacent public lands such sites may be dispersed over a greater geographic area. Thus, recreational target shooters may be required to travel a greater distance to reach appropriate target shooting sites on public lands.

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 with 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.

From Wilderness Characteristics on Recreation Management

Alternative D would result in the allocation of 154,800 acres, or 32 percent, of the SDNM as lands managed to protect wilderness characteristics managed coincidentally with recreation resources as backcountry settings. Impacts on opportunities for beneficial outcomes would be negligible.

4.19.8 ALTERNATIVE E (PROPOSED RMP)

4.19.8.1 Both Decision Areas

From Wildlife and Special Status Species on Recreation Management

Primitive roads in washes would be closed from April 15th to August 31st to address the forage, shelter, and thermal cover protection provided by washes as a component of wildlife habitat. Effects on travel management would be minor and short term due to the availability of motorized access by at least one route to most popular places. Seasonal closure periods in washes would also be during the lower visitation times of the year. Therefore, the effects on visitors, including hunters, would be minor.

From Travel Management on Recreation Management

Primitive roads in washes would be closed from April 15th to August 31st to address the forage, shelter, and thermal cover protection provided by washes as a component of wildlife habitat. Effects on travel management would be minor and short term due to the availability of motorized access by at least one route to most popular places. Seasonal closure periods in washes would also be during the lower visitation times of the year. Therefore, the effects on visitors, including hunters, would be minor.

4.19.8.2 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 37,900 acres (4 percent) of the Lower Sonoran to three SRMAs. The BLM's ability to protect and enhance a targeted set of activities, experiences and benefits, and desired recreation setting characteristics in these areas would be preserved through making recreation the predominant land use planning focus. Impacts on the production of beneficial outcomes would be similar to Alternative C, except the Saddle Mountain area would be managed as an ERMA, meaning recreation would receive specific management attention but to a lesser degree than if the area was managed as an SRMA. Impacts on recreation would be greater relative to Alternatives A and D because more areas would be managed to enhance recreation experiences and outcomes.

From Special Designations on Recreation Management

Impacts from special designations would be similar to Alternative D.

From Travel Management on Recreation Management

Impacts from travel management would be similar to Alternative C.

From Visual Resources on Recreation Management

Impacts from visual resources would be similar to Alternative B.

From Wilderness Characteristics on Recreation Management

Alternative D would result in the allocation of 91,200 acres, or 10 percent, of the Lower Sonoran as lands managed to protect wilderness characteristics managed coincidentally with recreation resources as backcountry settings. Impacts on opportunities for beneficial outcomes would be negligible.

4.19.8.3 Sonoran Desert National Monument

From Cultural and Heritage Resources on Recreation Management

Impacts from cultural and heritage would be similar to Alternatives B and C.

From Livestock Grazing on Recreation Management

Impacts from livestock grazing would be similar to Alternative A in that perennial, perennial/ ephemeral, and ephemeral grazing would be authorized. Area closures and associated impacts would be similar to those described in Alternative C except that the SDNM portion of the Conley Allotment would be closed to livestock, thus eliminating impacts from livestock on recreation resources in the closure area..

From Recreation Management on Recreation Management

Impacts from recreation management would be similar to Alternative C. Since dispersed recreational target shooting throughout the Monument would continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

From Travel Management on Recreation Management

Impacts from travel management would be similar to Alternatives B and C.

Impacts from SDNM Route Designations would be similar to Alternative C.

From Visual Resources on Recreation Management

Impacts from visual resources would be similar to Alternative C.

From Wilderness Characteristics on Recreation Management

Alternative D would result in the allocation of 107,800 acres, or 22 percent, of the SDNM as lands managed to protect wilderness characteristics, managed coincidentally with recreation resources as backcountry settings. Impacts on opportunities for beneficial outcomes would be negligible.

4.20 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 are legal public access to BLM-administered public lands, 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 are 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 (and noted below) were the basis for considering the designation of all routes at the time of evaluation; next, the routes were analyzed with the "evaluation-tree" questions (see **Appendix S**, Route Evaluation Methodology and Impact Analysis for explanation of the "evaluation tree"). Additional criteria, including the

management philosophy for each alternative, were also applied to aid in developing route systems for each alternative.

The authorized officer shall designate public lands as 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:

- Criterion (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.
- Criterion (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.
- Criterion (c)—Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreation on 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.
- Criterion (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 (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 under Alternative B to more restrictive and conservation oriented under 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 and Impact Analysis, for a detailed discussion of the analytical procedure.

Meetings with several resource specialists (including a wildlife biologist, archaeologist, geologist, lands specialist, law enforcement officer, and recreation planner) and AGFD representative wereconvened to analyze the various proposed route networks. Data were presented on detailed, accurate, up-to-date physical resource maps. 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 using 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 4-23, Equivalency of the Statutory Authority Related to Route Evaluation Questions, shows the statutory authority compared to the questions asked during the route evaluation process.

Table 4-23
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, on, 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 (or routes) that minimizes impacts on 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 on the above sensitive resources be avoided, minimized, or mitigated?	D, E, H, I, J, K
(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 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

Table 4-23
Equivalency of the Statutory Authority Related to Route Evaluation Questions

Authority (Section/Criteria)	Question from Route Evaluation Tree	Question Letter in Tree
	Can the impacts on the above sensitive resources be avoided, minimized, or mitigated?	D, E, H, I, J, K

Designation criterion (a) above considers impacts on 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 criterion (a) but also cumulative effects. The staff is free to identify issues not specifically called out in criterion (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 Criterion (a). Routes in more stable soils would have less impact on 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 area-wide 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 criterion (b) above considers impacts on wildlife habitats, with emphasis on protecting 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 seasonal closure or rerouting. Habitat fragmentation is an important analytical feature in the context of route/region analysis. One example of how this criterion was applied would include sand washes south of I-8. The range of alternatives includes two different seasonal closures under Alternatives C and E and complete closure under Alternative D. This would provide protection to important habitats during hot weather when wildlife is most vulnerable.

Designation criterion (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 before 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 criterion (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 on 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 under 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 on resources. There are no allocated lands managed to protect wilderness characteristics under 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 (Proposed RMP)**—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 would be designated within this RMP. The route evaluation process, shown in **Appendix S**, Route Evaluation Methodology and Impact Analysis, 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 method 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 on 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.

4.20.1 METHODS OF ANALYSIS

4.20.1.1 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 mile 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 and Realty: Routes may be truncated, disconnected, or closed as a result of authorizing power lines, 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 affects travel management is the number of miles of routes expected to be rerouted, mitigated, or closed.

Wildlife and Special Status Species 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, Sonoran desert tortoise, Acuña cactus, cactus ferruginous pygmy-owl, and 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 indicator is the number of new routes limited in physical placement or prohibited as a result of corridors or habitat areas.

Hazardous Materials and 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 backcountry and front country, would 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 Backcountry Byways would 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 would 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 the 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. One indicator is the number of miles of routes where erosion results in closure, limitation, mitigation, or closure; another 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.

4.20.1.2 Assumptions

The following assumptions regarding travel management were made:

- Use levels would not decrease. Use type may shift, but use would increase over time, likely keeping pace with population growth in the state.
- Developing higher standard roads would 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 would 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 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.
- 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.

Program Areas with No Impacts on Travel Management

There would be no impacts on travel management from actions proposed under the following program areas:

- Paleontological resources

- Water resources
- Wild horse and burro management
- Wildland fire management

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, 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 on 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, that affect routes for a specific geographic area of less than 33 percent of the Planning Area or specific issue, or that affect 10 to 24 percent of the routes would be considered moderate. Protection of a specific Monument object would affect routes at only a few locations but could affect access to a significantly larger area. Access may be eliminated to a geographic area of 3,000 to 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.

4.20.2 COMMON TO ALL ALTERNATIVES

No unique impacts are described for alternatives common to both Decision Areas.

4.20.3 ALTERNATIVE A (NO ACTION)

4.20.3.1 Both Decision Areas

No unique impacts are described for alternatives common to both Decision Areas.

4.20.3.2 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 on 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 and 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 nonexclusive-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 one 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 Management

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 would not total more than one or two new pits per year, eliminating no more than one 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 Public Safety and Hazardous Materials on Travel Management

Lands conveyed from the BGR, including the Sentinel Plains SRMA, require a free access permit to be obtained from the 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 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 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 on 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 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 or 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 Backcountry 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; this 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, long-standing 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 reestablish 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 are few routes inside the green belt, so 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 include 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.

From Wildlife and Special Status Species 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 March 15 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-administered lands outside the Ajo area, thus there would be no impacts.

4.20.3.3 Sonoran Desert National Monument

From Air Quality on Travel Management

Five miles of 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 five 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 routes in the SDNM. Closure of routes would have a negligible to moderate effect on travel in the RMZ, depending on each visitor's desired travel mode.

From Lands and 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. Impacts north of I-8 would be similar to those described in for Alternative A, LSFO.

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.

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 and 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-administered 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 five 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 roads in the immediate area, but over time, it is expected that use levels 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 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 of 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, an average of four route markers per mile is required to sign a low-density route network. Each new road intersection would require at least one to two new signs to direct visitors to stay on the existing route while a newly created route is reclaimed over several years.

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 under 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. Remaining open would be 617 miles of road, primitive roads, and trails, 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 under Alternative A.

From Wildlife and Special Status Species 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.

4.20.4 ALTERNATIVE B

4.20.4.1 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.

4.20.4.2 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 would raise the cost or need for management on Lower Sonoran areas inside the PM_{10} boundary (247,700 acres). It also would raise the cost or need for management 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 paved or stabilized surfaces on high pollution advisory days. 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 effect 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 a 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 mile 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 mile 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. In at least one case, the route would end 0.1 mile before the site to avoid parking on the site.

From Lands and 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 under 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 under 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 Hazardous Materials and 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

Managing five 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 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 Trails ERMA, Painted Rock SRMA, Ajo ERMA, and Buckeye Hills East Trails SRMA. 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 RMAs and implementing small reductions in the number vehicle routes in RMAs managed for backcountry 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 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 a 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 the 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 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 to remain and would reduce management needs in this area.

The management philosophy used in this alternative is 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 under Alternative B and all other resource allocations management actions. About 1,316 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 these roads 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 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 East SRMA. Motorized route connectivity would be emphasized in the Arlington, Painted Rocks and Buckeye Hills SRMAs. Under Alternative A, the Buckeye Hills East area is the highest use for OHVs, including off-highway motorcycles, where approximately 20 miles of single-track trails exist.

Managing 40 acres near Ajo as open to cross-country use would provide a unique opportunity for ATV and motorcycle enthusiasts.

Implementing OHV area allocations of "limited to designated routes" could result in an increase in new routes over the first five 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 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

Impacts would be the same as under Alternative A, except that fewer primitive roads in washes would likely be designated for use under 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 under this alternative.

From Wildlife and Special Status Species 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 of any of the action alternatives.

Routes would not be constructed on ridgelines 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 to 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 five 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 on 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 primitive roads.

4.20.4.3 Sonoran Desert National Monument

From Air Quality on Travel Management

Implementing a decision to comply with NAAQS the SIP and State law on air quality would raise engineering and management costs on five miles of routes and barren areas inside the PM_{10} boundary (3,452 acres). It would also raise the costs 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 raise costs to manage dust and could lead to route closure if compliance could not be achieved. This would be a minor effect on 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 motorized/nonmotorized 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 would remain locked for administrative use only.

From Lands and Realty on Travel Management

The development of minor linear and nonlinear LUAs on and along existing roads or primitive roads would have a minor to moderate short-term effect by interrupting 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 the 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 on 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 Hazardous Materials and 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 and improve passenger car access and air quality. As high-visitation areas, they would require road engineering and improvement to maintain the capacity, which would lead to increased funding needs and management attention.

Within the SDNM ERMA, 32.6 miles (5 percent of the Decision Area) of routes would be designated as roads, requiring additional improvement, construction, and disturbance. Approximately 569.9 miles (89 percent) of routes would be designated as primitive roads where maintenance would be performed only to protect soil and water from degradation and to 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 or less. The 3.9 miles of primitive road would be open only 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, 34.3 miles of which would be in designated wilderness and thus available only to horse and hiking use; one mile of trail would be closed and rehabilitated on

the far eastern end of the Anza NHT, which could prevent trespassing on private land 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, 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 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 on 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. standard operating procedures, 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 would 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 require route designations and would restrict vehicles to the designated route system. Allocating 157,700 acres as closed to OHV use would ban motorized and mechanized vehicles in designated wilderness areas. Compared to the No Action Alternative, OHV closed areas, approximately 161,200 acres under 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. This is because current restrictions of limited to existing roads and trails can be vague and offer visitors the most latitude in choosing their route of travel; "limited to designated routes" would be very definitive, and penalties would be higher for noncompliance.

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 of 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 under Alternative A to 125 miles under Alternative B, which would lead to more vegetative cover and stabilized soils and in turn would 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 is 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 under 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 that were inventoried as being in washes. Approximately 0.6 mile of road, representing 100 percent of the roads in washes, would remain open, while 47 percent of the primitive roads and 0.8 mile (100 percent) of trails in washes would be closed under this alternative. This would minimize effects on vegetation occurring in washes and would have a moderate effect on travel. This is because the area where primitive roads occur most in washes is near the Sand Tank Mountains and there are few upland primitive roads 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 five years would raise the cost and complexity, and likely the success rate, of projects, which would have 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 and rehabilitating 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 that 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, which 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.

From Wildlife and Special Status Species 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 three 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.

4.20.5 ALTERNATIVE C

4.20.5.1 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.

From Wildlife and Special Status Species on Travel Management

Primitive roads in washes would be closed from April 15 to August 31 to address the forage, shelter, and thermal cover protection provided by washes as a component of wildlife habitat. Effects on travel management would be minor and short term due to the availability of motorized access by at least one route to the most popular places. Seasonal closure periods in washes would also be during the lower visitation times of the year. Therefore, the effects on visitors, including hunters, would be minor.

4.20.5.2 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 mile 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 such effects 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 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 on 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 and Realty on Travel Management

The allocation of nine multiuse 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

Impacts would be 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 on the route system.

From Hazardous Materials and 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 four SRMAs, compared to 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 under 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 travel 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 backcountry and passage zone, for a net increase in backcountry recreation setting acres of 37,500, would reduce the amount of area where new recreation roads, 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 on 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 areas. 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 on 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 Backcountry Byway impacts would be the same as under Alternative B.

From Travel Management on Travel Management

Alternative C's allocation of 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.

A 40-acre area north of Ajo, where motocross takes place, would be managed as a designated route area under Alternative C, instead of an existing route area, 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 two-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 trails, 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 under Alternative C and all other resource allocations management actions where more area is allocated to backcountry 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 backcountry 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 backcountry. 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.

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 and 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 would 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. A total of 114 miles of primitive roads, or 7 percent of the total routes in Lower Sonoran, have been inventoried in desert 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 seven miles, or 15 percent, of existing trails open to only ATVs or motorcycles could be converted to nonmotorized trail as a 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. Under the No Action Alternative, no lands managed to protect wilderness characteristics are allocated, thus the impacts discussed here would not be present.

From Wildlife and Special Status Species 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 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 ridgelines 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 two 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 the 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 under 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 to July).

4.20.5.3 Sonoran Desert National Monument

From Air Quality on Travel Management

Effects would be similar to Alternative B, with the 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 Management

A shift from motorized use to nonmotorized 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 and 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 Hazardous Materials and 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 SDNM ERMA, 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 protect wildlife and provide 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 (43 percent) would be designated open to all vehicles under Alternative C, which is a major reduction from Alternative A. Trail asset designation would be the same as Alternative B. Compared with the No Action Alternative, route designations under Alternative

C would 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 on 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 effects similar 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 permitted only 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 Alternative 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 concentrate visitors on fewer roads and primitive roads. This would lead to a transfer of recreation opportunities from vehicles to dispersed nonmotorized opportunities. Under 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 under Alternative B. Law enforcement success in reducing driving off 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 and signs to maintain. Expenses for implementation of the travel system would be increased over Alternatives A, B, and 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 1to September 15), which would have a moderate effect on travel.

From Visual Resources on Travel Management

Impacts would be similar to 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 mile 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.

From Wildlife and Special Status Species Management on Travel Management

Managing for priority species would have a 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. 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 on movement. Because no new routes are planned under Alternative C, the effects would be negligible.

4.20.6 ALTERNATIVE D

4.20.6.1 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.

From Livestock Grazing on Travel Management

Under Alternative D, all allotments would become unavailable for livestock grazing as permits expire. This could enhance the travel experience because gates would no longer have to be closed to prevent cattle from escaping pasture enclosures. Moreover, conflicts between livestock and travellers would be dramatically reduced on federal lands. However, because livestock management would be eliminated, roads that are typically maintained by the permittees would likely no longer be maintained, thus making travel more difficult and dangerous for travellers.

4.20.6.2 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 have minor 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 under Alternative C would be managed as ACECs under this alternative. Therefore, effects on the route system are discussed in **Section 4.18,** Impacts on Special Designations.

From Lands and Realty on Travel Management

Impacts are anticipated to be negligible.

From Minerals Management on Travel Management

Impacts would be the same as Alternative A, except that fewer open routes would increase the importance of preventing the loss of access to designated routes.

From Hazardous Materials and 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 two 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 be encouraged only in the Buckeye Hills East Trails SRMA, 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 under the No Action Alternative, exhibiting denuded areas and, possibly, new unauthorized routes adjacent to popular camp areas. This would require additional annual rehabilitation. 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 backcountry 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 ERMA, 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 backcountry allocation combined with other allocations would have a major effect since the route system would be reduced in mileage by 40 to 50 percent across the field office area, and new routes to connect loops would not be developed, as under Alternatives B and C.

From Soil Resources on Travel Management

Approximately 137 miles, or 51 percent, of primitive roads could be closed to minimize effects on soils, mainly in the Buckeye Hills and Rainbow Valley areas north of the SDNM. Compared with the No Action Alternative, under which no routes would be closed in these areas, the proposed closure under Alternative D would have a moderate impact on 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 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 Backcountry 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 on 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 on 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 five 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 would increase the importance of acquiring the access on fewer routes. If the route system is reduced by 50 percent from Alternative A, the number of access points 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 farther apart and disallowed in some areas altogether. Furthermore, construction of only one 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 four 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. Allocating lands managed to protect wilderness characteristics could close up to 95 percent of the routes inside these areas to motorized vehicles. 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.

From Wildlife and Special Status Species Management on Travel Management

WHAs identified under Alternative C would be managed as ACECs under this alternative. Eight movement corridors would remain, and the effects would be the same as under 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. Routes would not be constructed on ridgelines used by bighorn sheep or in well-vegetated washes, especially where cactus ferruginous pygmy-owls are known to exist, such as 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. Two 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 on pronghorn by increasing unroaded habitat areas under this alternative.

4.20.6.3 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 nonmotorized use on the Anza NHT would affect 17.1 miles of the trail, which 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. Vehicles on the Anza NHT would be 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, 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 on the travel system overall.

From Lands and Realty on Travel Management

Impacts are anticipated to be negligible.

From Minerals Management on Travel Management

Impacts would be the same as those described under Alternative A for the Monument.

From Hazardous Materials and 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 the SDNM ERMA 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 backcountry 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 settings 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 SDNM ERMA, 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 only maintenance would 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 soil areas 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 on 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 under Alternative A to 0.10 percent under 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 effects similar to Alternative B, with the exception of shifting the entire 17 miles of 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 allowing only 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 concentrate 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. Under 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 pounds, would have a moderate effect on the travel system. One would be the 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 to 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. OHV 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, before accessing primitive roads, but they 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 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 and 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.

There are 44 access points to SDNM under this alternative, a 60 percent reduction from Alternative A. Acquiring legal access to a greatly reduced mileage system could reduce acquisition costs and staff workload. Similar to Alternatives B and C, with limited access points, each point becomes much more critical to secure.

From Vegetation Resources on Travel Management

Impacts would be the 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 of 63 miles 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 two miles, representing 100 percent of the trails outside wilderness, would be closed, two miles (2 percent) of primitive roads would remain open, and seven 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.

From Wildlife and Special Status Species Management on Travel Management

Managing for priority species would have a 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 one 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 and horseback riding because no other open roads or primitive roads would be present. 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.

4.20.7 ALTERNATIVE E (PROPOSED RMP)

4.20.7.1 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.

From Wildlife and Special Status Species on Travel Management

Primitive roads in washes would be closed from April 15 to August 31 to address the forage, shelter, and thermal cover protection provided by washes as a component of wildlife habitat. Effects on travel management would be minor and short term due to the availability of motorized access by at least one route to most popular places. Seasonal closure periods in washes would also be during the lower visitation times of the year. Therefore, the effects on visitors, including hunters, would be minor.

4.20.7.2 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 and 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

The impacts would be the same as Alternative B. Effects would be from the creation of new mines and the conversion of roads or primitive roads into haul roads not suitable for recreation or the truncation of recreation routes without rerouting.

From Hazardous Materials and 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 three SRMAs would have effects similar to Alternative C, except the Saddle Mountain area would be managed as an ERMA, not a SRMA. New primitive roads or trails could be constructed in the Arlington, Buckeye Hills, and Ajo areas, 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. This latter would be specifically in the Saddle Mountain area, where the "loop road" around the prominent Saddle Mountain could become nonmotorized to implement backcountry setting on around the mountain. North of Ajo, up to two 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 for the 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 effects similar to 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 closed to OHVs would continue the ban on driving motorized and mechanized vehicles in these areas. There would be no areas managed as "open" for cross-country OHV use, and demand for a cross-country experience would not be addressed, meaning some visitors may be tempted to create their own cross-country 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 effects similar to 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 backcountry areas where access would be reduced.

Effects on visiting popular sites or areas are expected to be minor. Effects on motorized use in the Buckeye Hills East SRMA 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 a way to group regional issues. Effects of securing public access would be similar to Alternative C, with comparable route mileages and number of access points. Effects on the travel system would be long term, making the trail system robust and sustainable.

From Vegetation Resources on Travel Management

Effects would be 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 likely 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, eight of which would likely 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.

From Wildlife and Special Status Species 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; this means that the locations would be limited to areas outside WHAs and the indirect effects on the WHA for habitat fragmentation and movement of wildlife would need to be considered. Such restrictions would likely limit new routes to only one or two per area. Also, 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 on 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 as "open" would likely not effect desert tortoise habitat, since high motorized use occurs in this area.

4.20.7.3 Sonoran Desert National Monument

From Air Resources on Travel Management

Management of air quality would have the effect of closing three of the five 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 hunters. 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 and 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 SDNM, except that there would be an overall reduction in the number of livestock that travellers could encounter, and more lands across the monument would be closed to livestock, including the entire Conley Allotment. Impacts from closed areas would be similar as described under Alternative D.

From Minerals Management on Travel Management

Impacts are anticipated to be negligible.

From Hazardous Materials and 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 on 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 SDNM ERMA, 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 to protect soil and water resources from degradation and secondarily to maintain the desired level of access. 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 similar to Alternative C. The management philosophy would be the same as Alternative C that is, seeking to find a balance between protection and enjoyment of the Monument, and has the same implications for management. Primitive road closures are 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 under 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 under 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 72, a 37 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. The intensity of effects would fall between Alternatives C and D.

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 on soils would be minimized from the current condition (Alternative A) by closing 46 percent of the routes, or 106 of 231 miles, in areas identified by staff as "route proliferation concern areas," specifically north of SR-238 and along Vekol Valley Road. Public access north of SR238 would be limited to North Tank and Gap Well to minimize soil disturbance and dumping/camping impacts. The management approach would be as described under 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 under Alternative A to 0.13 percent of the total poor soils area under Alternative E. Impacts on 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 on 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 on the travel system would be minor. Seasonal restrictions would increase the effects on the travel system, but they are not a result of wilderness characteristics. Rather, they are a result of managing for diverse wildlife populations

From Wildlife and Special Status Species Management on Travel Management

Effects would be the same as Alternative C.

4.21 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, threats to public health and safety are 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 the SDNM), livestock operations, activities related to smuggling and undocumented aliens (UDAs), wildfires, and natural hazards.

4.21.1 METHODS OF ANALYSIS

4.21.1.1 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
- Natural hazards

4.21.1.2 Assumptions

The following assumptions regarding the future 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 include rugged terrain, seasonally extreme temperatures, intense sunlight, 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, or 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 protocols during construction activities would occur, thereby lessening that risk.

- The use and application of mechanical, chemical, biological means, along with 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.

4.21.1.3 Program Areas with no Impacts on Hazardous Materials & Public Safety

No impacts on Hazardous Materials & Public Safety are anticipated for management actions relating to:

- Air Quality
- Cave Resources
- Cultural and Heritage Resources
- Paleontological Resources
- Wildlife and Special Status Species
- Special Designations
- Visual Resources
- Vegetation Resources
- Water Resources
- Soil Resources
- Wild Horse & Burro Management
- Wilderness Characteristics

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.

4.21.2 IMPACTS COMMON TO ALL ALTERNATIVES

4.21.2.1 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 wildland fire management would be common to all alternatives, it would not be discussed individually in the following analysis. Impacts could range from negligible to major.

4.21.2.2 Lower Sonoran

No unique impacts are identified for the Lower Sonoran that are common to all alternatives.

4.21.2.3 Sonoran Desert National Monument

No unique impacts are identified for the SDNM that are common to all alternatives.

4.21.3 ALTERNATIVE A (NO ACTION)

4.21.3.1 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 in the Planning Area are closed and remediated as they are discovered 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 on 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 and 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 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 unauthorized entry less noticeable to law enforcement. No TMA closures, including 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 under the other alternatives.

4.21.3.2 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 Lower Sonoran Decision Area. Therefore, 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 maintenance 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 presents the greatest amount of AUMs (17,541) of all 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 on 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 would 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 public 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 poses some risk of hazardous and solid waste dumping in the abandoned mine shafts. Impacts from a response-oriented inventory would present moderate impacts.

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 BGR. 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 provide the greatest opportunity for motorists to experience safety risks related to vehicle accidents with individuals recreating (off-road target shooting, hiking, or camping) on public lands, 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), 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 for this SRMA 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, providing 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 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 Lower Sonoran. 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 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 exists for spills and releases of hazardous materials in the event of a vehicular accident. 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. 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.

4.21.3.3 Sonoran Desert National Monument

From Lands & Realty on Hazardous Materials & Public Safety

In the SDNM, 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 is higher within this alternative than any other proposed alternative. As a result, the potential for accidents related to utility construction and maintenance 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

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 on 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, would be restricted to entry by permit only in an effort to decrease public injury from military activities associated with the BGR. 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 Lower Sonoran, except lands designated as SRMAs would comprise about 30 percent of the total acreage in the SDNM, 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 the 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. 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 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 Area. 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 Area of all 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.

4.21.4 ALTERNATIVE B

4.21.4.1 Both Decision Areas

From Minerals Management on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternative A 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.

4.21.4.2 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 impacts on public safety from LUA construction would be slightly reduced, 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 impacts on public safety from human-livestock interaction would be minimized, as there would be approximately 40 percent 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 Lower Sonoran and the closure of these sites to the public. Alternative B also calls for establishment of priorities for remediation of physical safety hazards, posting of signs, and closure of areas to public access where public safety is an issue. These management actions could substantially decrease the risk of human injury and death from 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 require the public to obtain permits to enter the Sentinel Plain area south of I-8, which would decrease public injury from military activities associated with the BGR. 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 10 percent of the total acreage in the Decision Area (four times more than under Alternative A), while ERMAs would comprise about 60 percent of the Decision Area. This would result in reduced opportunity for littering and illegal dumping under Alternative B due to the larger number of acres allocated to the more intensively-managed SRMAs. Portions of the Lower Gila Historic Trails ERMA and the Saddle Mountain SRMA would be allocated to the backcountry setting and would include areas that would be unavailable for motorized travel, thus decreasing the risk of vehicular traffic accidents. A 40-acre area within the Ajo ERMA 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). 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 restrictions on this activity, risk would be limited to the allocated areas . Along with the Ajo ERMA, the Buckeye Hills East Trails and Painted Rock 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 RMAs would be established under Alternative B to provide for nonmotorized day use activities. While the risk of accident or injury exists with any recreational activity, the lack of motorized activities would decrease the opportunity for serious injury or hazardous spills.

The Sentinel Plain area would be restricted to entry by permit only to protect the public 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.

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 is required under this alternative. However, disbursed recreational target shooting would most likely increase with the availability of more lands managed for recreational use, increasing 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), proportionately increasing the risk of injury or hazardous spills from an automobile accident. Alternative B would provide slightly less opportunity than Alternative A for recreational activities that could pose a safety risk, such as off-road target shooting, hiking, and camping.

Vehicle access routes 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 routes 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 unauthorized entry would be slightly more noticeable to 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 in comparison to Alternative A, slightly decreasing the risk to visitor safety from personal encounters or from hazardous materials.

4.21.4.3 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 cause the same decrease in risk to public safety related to the construction of LUAs as under Alternative A. The LUA avoidance area allocation would allow for LUA development within the Monument while ensuring 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 impacts on public safety from human-livestock interaction would be slightly reduced, as there would be approximately 40 percent fewer AUMs than in Alternative A. Impacts would be minor to negligible. Impacts in the 8,500 acres fenced of as an 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 BGR. 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 backcountry RMZ, where motorized travel is not permitted. This would reduce motorized travel, thereby reducing the likelihood of hazardous materials spills from accidents in comparison with Alternative A. The allocation of more acres to the backcountry 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 backcountry RMZ, requiring 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.

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 is required under this alternative. However, disbursed recreational target shooting would most likely increase with the availability of more lands managed for recreational use, increasing 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

Sixty-eight percent of the SDNM would remain open to travel on designated routes, and impacts would be similar to those under Alternative A. The increased travel restrictions under Alternative B would reduce the area where vehicular accidents could occur in the Decision Area. 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 than Alternative A for recreational activities that could pose a safety risk, such as off-road target shooting, hiking, and camping.

Vehicle access routes 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 routes 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 unauthorized entry would be slightly more noticeable to law enforcement officers. Travel management area closures for the pronghorn seasonal closure area under Alternative B would somewhat restrict the opportunity to access remote and low-lying areas for illegal activity in comparison to Alternative A, slightly decreasing the risk to visitor safety from personal encounters or from hazardous materials.

4.21.5 ALTERNATIVE C

4.21.5.1 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.

4.21.5.2 Lower Sonoran

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternatives A and B for the Lower Sonoran; however, the impacts on public safety from LUA construction would be slightly reduced, 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. Of this section of the El Paso Natural Gas corridor, 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 9 percent of the Lower Sonoran, while ERMAs would comprise only about 60 percent of the lands. This would result in reduced opportunity for littering and illegal dumping when compared to Alternative A due to the larger number of acres more intensively managed under the SRMA designation. Impacts from the Ajo ERMA (including the 40-acre OHV area) and Buckeye Hills East Trails SRMA would be the same as described under Alternative B. The acreage allocated for the Painted Rock SRMA under Alternative C would represent over twice the acreage as would occur under Alternative B, further decreasing the risk of accident or injury due to rough terrain and unforeseen obstacles compared to 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 reducing the risk of injury to the recreational shooter and 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 be 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 release hazardous materials or wastes compared to Alternative A. 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 Alternative A, 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 Alternative A, 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 Lower Sonoran under Alternative C would create fewer opportunities for illegal and solid waste dumping along established roadways compared to Alternative A, 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.

4.21.5.3 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 half-mile-wide multiuse corridors would be allocated in the Monument. Management under Alternative B would slightly reduce impacts on public safety from LUA construction and maintenance because 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 impacts on public safety from human-livestock interaction would be slightly reduced. There would be the same amount of AUMs as under 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 under 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 backcountry setting, which would further reduce motorized travel in comparison to Alternative A, thereby further reducing the total area exposed to hazardous materials spills from accidents and the associated risks to public health and safety. On the other hand, concentrating visitor use in the front setting RMZ would increase the potential for vehicle

accidents and associated injury in this area. Litter and debris would also likely increase in the front country setting due to concentrated use, which would require a greater cleanup effort. In the SDNM, impacts from requiring a permit to be obtained prior to entering the Sand Tank Mountains would be the same as under Alternative A.

Because 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 and reduce the risk of injury to the recreational shooter and 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 further reduce the risk of stranded or abandoned automobiles in flooded washes that could release hazardous materials or wastes compared to Alternative A. 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 Alternative A, 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 Alternative A, 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 SDNM under Alternative C would create fewer opportunities for illegal and solid waste dumping along established roadways compared to Alternative A, anticipated increases in population and use of public land would increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

4.21.6 ALTERNATIVE D

4.21.6.1 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 Decision Areas, decreasing risks caused by 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.

4.21.6.2 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 impacts on public safety from LUA construction would be minimized 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 along with 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 a 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

While the percentage of the Lower Sonoran that would be managed as SRMAs would be similar to that under 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 and would 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 mileage of routes in 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 fewest miles of routes open to motorized use, further reducing the potential for automobile accidents. At the same time, fewer open route miles would allow for increased concentration of traffic on the remaining open routes, increasing the

possibility for traffic accidents due to congestion. Based on projected population growth and the increase in demand for public lands, more congestion on the roadways would likely continue to occur in the future. By providing for the fewest miles of routes open to the public, Alternative D would reduce more than any alternative the opportunities for recreational activities that could pose a safety risk, 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 of the fewest miles of open routes within the Decision Areas under Alternative D would create the fewest opportunities among the alternatives for illegal waste dumping along established roadways, anticipated increases in population and use of public lands would increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

4.21.6.3 Sonoran Desert National Monument

From Lands & Realty on Hazardous Materials & Public Safety

Public safety impacts would be eliminated under Alternative D for the SDNM because there would be no future LUAs authorized within the Monument. 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 discussed under 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, with 89 percent of the lands being managed within the backcountry setting. 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 backcountry setting would further concentrate the visitor use in the front country setting, increasing the risk of accidents and hazardous spills. The front country setting would also likely experience more litter and debris, requiring a greater cleanup effort. Impacts from requiring a permit to be obtained 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 fewest miles of routes open to the motorized use, further

reducing the potential for automobile accidents. At the same time, fewer open route miles would allow for more concentration of traffic on the remaining open routes, increasing the possibility for traffic accidents due to congestion. Based on projected population growth and the increase in demand for public lands, more congestion on the roadways would likely continue to occur in the future. By providing for the fewest miles of routes open to the public, Alternative D would reduce more than any other alternative opportunities for recreational activities that could pose a safety risk, 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 among the alternatives for illegal waste dumping along established roadways, anticipated increases in population and use of public lands would increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

4.21.7 ALTERNATIVE E (PREFERRED ALTERNATIVE)

4.21.7.1 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.

4.21.7.2 Lower Sonoran

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those described under Alternatives A and B for the Lower Sonoran, however, the impacts on public safety from LUA construction would be slightly reduced, 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 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 4 percent of the total acreage, while ERMAs comprise about 66 percent of the lands. Overall impacts would be similar to Alternative C due to a similar percentage of the Decision Area being allocated to SRMAs and ERMAs and similar management strategies existing for these recreation management areas. Impacts from recreational target shooting in the Lower Sonoran would be similar to those under Alternative C.

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 as closed to public use would be most similar to Alternative C. 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 Lower Sonoran, the opportunities for illegal waste dumping along established roadways would be similar to those under Alternative C. As under all alternatives, 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.

Impacts from encounters with smugglers and UDAs would be similar to those described under Alternative C.

4.21.7.3 Sonoran Desert National Monument

From Lands & Realty on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative D in the SDNM.

From Livestock Grazing on Hazardous Materials & Public Safety

Impacts would be the same as those discussed under Alternative C for the SDNM.

From Hazardous Materials & Public Safety

Impacts would be the same as those discussed 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 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, resulting in

similar impacts. Impacts from allocating roughly 87 percent of the SDNM under Alternative E to the backcountry setting would also be similar to those under Alternative C. Impacts from requiring visitors to obtain a permit prior to entering the Sand Tank Mountains would be the same as those discussed under Alternative A.

Since dispersed recreational target shooting throughout the Monument would continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. If that were to happen, impacts would be negligible to minor.

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. Alternative E would allow more opportunity 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 SDNM, the opportunities for illegal waste dumping along established roadways would be similar to those under Alternative C. As under all alternatives, anticipated increases in population and use of public land would increase the incidences of dumping and littering. Heavily traveled routes used by UDAs would remain areas of substantial litter accumulation.

Impacts from encounters with smugglers and UDAs would be similar to those discussed under Alternative C.

4.22 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 on 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.

4.22.1 METHODS OF ANALYSIS

4.22.1.1 Indicators

When analyzing impacts on social and economic resources, quantitative analysis is provided when available and appropriate. Qualitative analysis is provided in the absence of sufficient quantitate data. 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
- The values of sense-of-place and sense-of-well-being are important methods of evaluating impacts on social values.

4.22.1.2 Assumptions

The following assumptions regarding socioeconomics are made:

- Visitor use is expected to increase as populations increases. Increased visitation would have economic impacts on 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 would be developed, decreasing the amount of open space available within SDNM.
- Management actions that influence employment, the demand for goods and services, business growth, and visitation within this broad study area would affect socioeconomics. Impacts would 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 would potentially increase visitation. Increased visitation would stimulate increased expenditures for goods and services in the local and regional economies. This in turn would 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 would 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 would 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 would 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 would tend to decrease or at least limit local and regional economic benefits.
- Changes in allowable grazing level 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

proclamations termination of livestock grazing permits south of I-8 in 2008-09 would likely 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 would 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 would 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) would preclude economic activity that could potentially be associated with land development activity on disposed lands. The BLM would receive no revenue from land disposal in the Monument. All SDNM lands would remain a part of the Monument in perpetuity.
- This would protect the Monument and sustain it as permanent open space for the growing area that surrounds it.

4.22.1.3 Program Areas with No Impacts on Socioeconomics

No impacts on socioeconomics are anticipated for management actions relating to:

- Cave Resources
- Paleontological Resources
- Wild Horse & Burro Management

4.22.1.4 Qualitative Intensity Scale

The intensities of impacts are the same as those described in **Table 4-1**, Qualitative Terms for the Intensity of Impacts.

4.22.2 COMMON TO ALL ALTERNATIVES

4.22.2.1 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.

4.22.2.2 Lower Sonoran

No unique impacts are identified for the Lower Sonoran under Common to All Alternatives.

4.22.2.3 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 due to lack of area suitable for development.

From Minerals Management on Socioeconomics

The SDNM is withdrawn from new mineral entry under all alternatives. The withdrawal was established in the proclamation that established the Monument. This withdrawal would likely reduce revenues from mineral development in the SDNM and surrounding planning area.

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 mineral development, 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. The BLM, as the owner/manager of the surface, would work with operators to mitigate impacts on affected Monument objects, such as requesting project design features and/or best management practices to reduce impacts, which would result in increased costs for the developer.

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 on 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 on socioeconomic values. Impacts from all alternatives to area income/revenue are expected to be negligible to minor.

4.22.3 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 priority 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 priority to resource protection may feel the resources they are concerned about would not be adequately protected.

4.22.3.1 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 saleable, leasable, and locatable minerals on public lands would continue to provide mineral resources 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. Total employment and secondary economic impacts from locatable mineral related jobs can be significant at the community level but is relatively low for the tri-county areas overall, particularly in recent years as communities have diversified their economies and turned towards more service related sectors (refer to section 3.5.3, socioeconomic resources).

In June 2009, the most notable active locatable mineral 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, although mineral potential may be present on adjacent public lands.

Extraction of saleable minerals (mineral materials) such as crushed stone and gravel from public lands would continue to represent a growing source of income for the BLM and an important material source for local communities (refer to section 3.5.3, socioeconomic resources). BLM sells mineral materials to the public at fair market value, but gives them free to states, counties, or other government entities for public projects. BLM shares a portion of the revenues from the sale of mineral materials with the state where the minerals are produced. Mineral material prices are impacted by Supply and Demand and transportation costs. Prices would increase with an imbalance between supply and demand if local mines are closed. In addition, due to the sheer weight of mineral materials, transportation plays an important

role in the cost of mineral resources to the consumer, and is the principal constraint in defining the market area for an aggregate mining operation. Therefore, adequate local supplies of these basic resources are important the economies of local communities for their infrastructure construction and maintenance. Restricting mineral development in the SDNM to valid and existing rights, such as the few parcels (totaling 25,800 acres) of split estate where the United States owns the surface land, but a non-federal entity owns the subsurface mineral estate, would have negligible to moderate negative effects on employment and economics associated with mineral development. Mineral development on these split estate lands 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. However, the BLM, as the owner/manager of the surface, would work with operators to mitigate impacts on affected Monument objects to reduce impacts, including requiring the use of project design features and/or best management practices to reduce the effects.

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 Grassland 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 on 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 effect 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. While not allocating lands to protect wilderness characteristics could provide employment and income to local communities in the form of other land uses such as mineral development, some studies indicate that protection of wilderness characteristics may provide economic benefits to surrounding communities. Rural counties with Wilderness or other protected federal lands experience greater economic and population growth than those without Wilderness (Rosenberger and English 2005). Furthermore, protected lands can have an important influence on economic growth in rural isolated counties that lack easy access to larger markets. From 1970 to 2000, real per capita income in isolated rural counties with protected land grew more than 60 percent faster than isolated counties without any protected lands (Sonoran Institute 2004). Protected lands can be especially important in promoting economic growth in tourism and in attracting retirees and others with non-labor income (Rudzitis and Johnson 2000). 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.

From Wildlife and Special Status Species 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.

4.22.3.2 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. Total proposed AUMs for Alternative A are 17,541 for the Lower Sonoran decision area. As discussed in 3.5.3, socioeconomic resources, public permit costs for these permits can be calculated at $23,680 should all of these permits be active.

4.22.3.3 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. As discussed in 3.5.3, socioeconomic resources, economic impacts may be limited due to small and decreasing portion of the tri-county economy dependent on ranching and farming (0.1 percent in Maricopa and Pima Counties and 0.7 percent in Pinal County of total employment in 2009). Total proposed AUMs for Alternative A are 8,703 for the SDNM decision area. As discussed in 3.5.3, socioeconomic resources, public permit costs for these permits can be calculated at $11,749 should all of these permits be active. 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 renewal process.

4.22.4 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.

From Recreation Management on Socioeconomics

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 settings 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.

4.22.4.1 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. In the Lower Sonoran decision area, a total of 10,431, or 7,110 AUMS fewer than Alternative A, are proposed. The approximate total cost of these AUMS on public land would be $9,598. Under the current grazing rates, the equivalent cost of these 7,110 AUMs on private land would be $63,990. In the SDNM, a total of 5,321, or 3,382 AUMs less than Alternative A, are proposed. The approximate total cost of these AUMS on public land would be $4,565. Under the current grazing rates, the equivalent cost of these 3,382 AUMs on private land would be $30,438. Coordination and consultation with affected parties would be the same as described in alternative A. Minor negative social impacts would be expected for the ranching lifestyle. Reduced grazing would have a greater positive impact on the social well-being of those who think that grazing should be limited.

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. No new areas would be managed for wilderness characteristics.

From Wildlife and Special Status Species 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 would 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.

4.22.4.2 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 on 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. Impacts of ACEC designation are discussed under ACEC management, below.

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 648,900 acres of RMAs (including 53 percent backcountry 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 RMAs 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 on 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 would 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. ACEC management under this alternative could impact locatable, leasable, and saleable mineral extraction and associated jobs and revenue in local economies. Existing and proposed ACECs are located primarily on public lands, and existing area locatable minerals operations are located on private lands, but some potential may exist on adjacent public lands. Valid existing rights would be recognized on all ACECs, but some areas would be withdrawn to locatable mineral extraction or classified as avoidance areas for mineral materials. The ACEC designation could require additional stipulations and mitigation for minerals development. Closures and stipulations may impact the amount of locatable and saleable minerals extracted, with potential impacts on local direct and indirect jobs as well as costs for local community building projects, should local mineral material process be increased.

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.

4.22.4.3 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 an ERMA, with 76 percent managed as backcountry and 22 percent managed as front country. This alternative has the least amount of backcountry 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 Grassland 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.

4.22.5 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 motorized 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.

4.22.5.1 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 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 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.

From Wildlife and Special Status Species 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 would 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.

4.22.5.2 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. Jobs and income associated with locatable minerals may be reduced in local areas, although quantitate impacts would be determined by a variety of factors including price of minerals in the market, and the location and cost of extraction. See ACEC management and Lands Managed to Protect Wilderness Characteristics discussions below for additional details.

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 backcountry 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 on 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 on the local economy are anticipated to be minor to negligible. No large changes in employment and income are expected to remain unchanged despite the lands managed to protect wilderness characteristics allocations.

From Special Designations on Socioeconomics

Restrictions for ACEC mineral management under Alternative C would be similar to those under Alternative A except that the area is increased to 63,300 acres. As discussed under Alternative B, ACEC management under this alternative could impact locatable, leasable, and saleable mineral extraction and associated jobs and revenue in local economies. In particular, closures and stipulations may impact the amount of locatable and saleable minerals extracted, with potential impacts on local direct and indirect jobs as well as costs for local community building projects, should local mineral material process be increased.

4.22.5.3 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 an ERMA; however, under Alternative C, 88 percent would be allocated as backcountry and 11 percent allocated as front country, with more acreage assigned to backcountry compared to Alternative B. As a result, the front country recreational demand would be less served and the less intensive backcountry 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.

4.22.6 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.

4.22.6.1 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 under Alternative D. Economic and social impacts limited primarily to rural communities with a history of ranching. In Tonopah, Arizona, for example, participants in a socioeconomic workshop in 2003 identified retention of grazing rights and the ranching lifestyle as a priority for the community. In such localities, impacts are expected to be major as revenue from livestock grazing on public lands in the Planning Area 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. Overall economic impacts on the region would be minor to moderate as ranching provides a small percentage of jobs and income for the

tri-county region. Comparing costs of public and private permitting; in the Lower Sonoran Decision Area, all 17,541 perennial AUMs proposed under Alternative A would be eliminated. The approximate total cost of these AUMS on public land would be $23,680. Under the current grazing rates, the equivalent cost of these permits on private land would be $213,120. In the SDNM, all 8,703 AUMs proposed under Alternative A would be eliminated. The approximate total cost of these AUMS on public land would be $11,749. Under the current grazing rates, the equivalent cost of these permits on private land would be $72,327. The difference in these rates could make the cost of livestock operations cost-prohibitive to many ranchers who would have to then turn to other sources for feeding their cattle or get out of the ranching business completely. Impacts of Alternative D on these permittees and their employees would be major. On other public users, impacts would be minor.

From Recreation Management on Socioeconomics

Alternative D would allocate much less land to RMAs – 56,500 acres versus more than 648,000 acres in Alternatives B and C for the Lower Sonoran and no ERMA 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 outcomes 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. 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. Mineral material prices are related to distance of transport and supply and demand. If sufficient alternate locations for mineral material cannot be located in the vicinity of the planning area, costs of materials for local communities may increase.

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: 250,000 acres in Lower Sonoran and 1548000 acres in the SDNM. Impacts would be similar to Alternative C, only with larger intensity. There is potential for minor impacts on the local economy should the management of areas for wilderness characteristics attract additional visitors or enhance quality of life as discussed under Alternative A.

From Wildlife and Special Status Species 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.

4.22.6.2 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. In addition, ACEC management under this alternative could impact locatable, leasable, and saleable mineral extraction and associated jobs and revenue in local economies.

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.

4.22.6.3 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.

4.22.7 ALTERNATIVE E (PROPOSED RMP)

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 priority 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.

4.22.7.1 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, with the exception that proposed AUMs would be reduced to by 5,589 to a total of 3,114 AUMs as compared with Alternative A. Estimated replacement cost of the 5,589 permits on private land would be $50,301 compared to $4,203 on public lands.

From Wildlife and Special Status Species 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 RMAs as Alternative C. Front country allocation would be similar to Alternative D and backcountry 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 an ERMA, 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 setting 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 backcountry 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.

ACEC management under this alternative could impact locatable, leasable, and saleable mineral extraction and associated jobs and revenue in local economies as discussed under Alternative B. Similar to Alternative D, no SCRMAs would be allocated under Alternative E, although the same area would be under ACEC designation with a reduced boundary to avoid areas with locatable mineral potential in the Gila Bend Mountains. Similar to Alternative C, lands within 500 feet of the cliff faces with petroglyphs on the Gila River would be closed to saleable minerals. As discussed under Alternative C, this restriction is currently in place through site-specific decisions and thus would have no effect. 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 would 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 Socioeconomics

Overall, impacts on 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 provide potential associated economic benefits from protected lands as well as allow for the development of some areas for 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.

4.22.7.2 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.

4.22.7.3 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.

4.23 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, Tolleson, Ak Chin Village, Gila River Indian Community, Arlington, Tonopah, Mobile, Palo Verde, Sentinel, Rainbow Valley, Ajo, the Tohono O'odham Nation, Casa Grande, Florence, the Gila River Indian Community, Maricopa, Stanfield, the community bordering the eastern portion of the SDNM, Globe, and Miami and Gila County all have characteristics of either minority populations greater than 42.2 percent or more than 17.4 percent of the community live below the poverty level.

The resource management decisions expected to have the greatest impacts on socioeconomics in the study area includes those relating to the management of energy and minerals and lands and realty.

4.23.1 METHODS OF ANALYSIS

4.23.1.1 Indicators

The following impact indicators are used when conducting analysis on Environmental Justice:

- Adverse impacts on 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.

Assumptions

See assumptions described for socioeconomic impacts.

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.

4.23.2 COMMON TO ALL ALTERNATIVES

4.23.2.1 Both Decision Areas

No unique impacts are identified that are common to all alternatives for both Decision Areas.

4.23.2.2 Lower Sonoran

No unique impacts are identified that are common to all alternatives for the Lower Sonoran.

4.23.2.3 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 on 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.

4.23.3 ALTERNATIVE A (NO ACTION)

4.23.3.1 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.

4.23.3.2 Lower Sonoran

From Minerals Management on Environmental Justice

Ajo, Globe, and Miami area are minority communities. Miami is 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.

4.23.3.3 Sonoran Desert National Monument

No unique impacts are identified for Alternative A for the SDNM.

4.23.4 ALTERNATIVE B

4.23.4.1 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.

4.23.4.2 Sonoran Desert National Monument

From Lands & Realty on Environmental Justice

In the SDNM, impacts would be similar to those discussed in Alternative A.

4.23.5 ALTERNATIVE C

4.23.5.1 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.

4.23.5.2 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.

4.23.5.3 Sonoran Desert National Monument

No unique impacts have been identified for Alternative C for the SDNM.

4.23.6 ALTERNATIVE D

4.23.6.1 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.

4.23.6.2 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.

4.23.6.3 Sonoran Desert National Monument

No unique impacts have been identified for Alternative D for the SDNM.

4.23.7 ALTERNATIVE E (PROPOSED RMP)

4.23.7.1 Both Decision Areas

From Lands & Realty on Environmental Justice

Impacts on minority and low-income populations in the Planning Area would be similar to that described under Alternative C.

4.23.7.2 Lower Sonoran

From Minerals Management on Environmental Justice

Impacts on minority and low-income populations in the Planning Area would be similar to that described under Alternative C.

4.23.7.3 Sonoran Desert National Monument

No unique impacts have been identified for Alternative C for the SDNM.

4.24 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, the locations of most cultural resource sites in the Planning Area are not known, which makes analyzing impacts on 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.

4.24.1 METHODS OF ANALYSIS

4.24.1.1 Indicators

No indicators were used to analyze impacts from program areas on tribal interests.

4.24.1.2 Assumptions

No assumptions were used to analyze impacts from program areas on tribal interests.

4.24.1.3 Program Areas with No Impacts on

There would be no impacts on tribal interests from actions proposed under the following program areas:

- Air Quality
- Cave Resources

- Paleontological Resources
- Soil Resources
- Water Resources
- Wild Horse and Burro Management
- Hazardous Materials and Public Safety

4.24.1.4 Qualitative Intensity Scale

The intensities of impacts are the same as those described in **Table 4-1**, Qualitative Terms for the Intensity of Impacts.

4.24.2 COMMON TO ALL ALTERNATIVES

4.24.2.1 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.

4.24.2.2 Lower Sonoran

No unique impacts are identified for the Lower Sonoran that are common to all alternatives.

4.24.2.3 Sonoran Desert National Monument

No unique impacts are identified for the SDNM that are Common to All Alternatives.

4.24.3 ALTERNATIVE A (NO ACTION)

4.24.3.1 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 on 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 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 on 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 on 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.

From Wildlife and Special Status Species 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.

4.24.3.2 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 on 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 on 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.

4.24.3.3 Sonoran Desert National Monument

The SDNM would remain closed to new mineral entry under all alternatives.

4.24.4 ALTERNATIVE B

4.24.4.1 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 on 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.

4.24.4.2 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.

4.24.4.3 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.

4.24.5 ALTERNATIVE C

4.24.5.1 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 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.

From Wildlife and Special Status Species 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.

4.24.5.2 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 impact; 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.

4.24.5.3 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.

4.24.6 ALTERNATIVE D

4.24.6.1 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 Wildlife and Special Status 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.

4.24.6.2 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.

4.24.6.3 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.

4.24.7 ALTERNATIVE E (PROPOSED RMP)

4.24.7.1 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 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.

From Wildlife and Special Status Species 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.

4.24.7.2 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 saleable mineral material disposal, protecting American Indian resources in this area.

4.24.7.3 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.

4.25 CUMULATIVE IMPACTS

Cumulative impacts are those effects on the environment that result from incremental impacts of management direction contained in this PRMP/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.

4.25.1 METHODS OF ANALYSIS

4.25.1.1 Indicators

See indicators identified previously for each specific resource or resource use.

4.25.1.2 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.
- All of the Reasonably Foreseeable Development Scenarios mentioned in **Section 4.1.6**, Reasonably Foreseeable Development Scenarios would occur over the next 20 years.

4.25.1.3 Qualitative Intensity Scale

The intensities of impacts are the same as those described in **Table 4-1**, Qualitative Terms for the Intensity of Impacts.

4.25.2 COMMON TO ALL ALTERNATIVES

4.25.2.1 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 because offsite sources are the major contributors to dust within the Planning Area, there would be negligible differences in

cumulative impacts on air resources from the BLM activities proposed under each RMP alternative.

Cumulative Impacts on Climate Change

Primary climate change indicators that can be monitored include ambient air temperature, precipitation amounts and timing, annual snow pack levels, and stream flow volume and timing. The trends in climate change and its impacts within the Planning Area discussed in **Section 3.2.3**, Climate Change, would continue under all alternatives. Current management policy and direction is to address climate change, although no management actions in the current RMPs for the Planning Area specifically address climate change.

By its very nature, climate change is a cumulative impacts issue. Individual local GHG emissions cannot be considered outside of the larger context of global cumulative emissions. As discussed in **Section 4.3**, Impacts on Climate Change, the precise link between potential emissions from BLM-proposed actions and specific impacts on or from global climate change is not known. However, it is known that some proposed actions would likely increase or decrease GHG levels in the atmosphere if implemented. These are discussed below in qualitative terms.

A report by the Arizona Climate Change Advisory Group from 2005 estimates that, in 2000, approximately 87 million metric tons (MMt) of CO_2 equivalent (CO_{2e}) were emitted from sources in Arizona. That same year, an estimated 7 MMt of CO_{2e} was sequestered in Arizona's forests and forest products (not including any rangeland sequestration that might occur), resulting in net Arizona CO_{2e} emissions of 80 MMt in 2000 (Arizona Climate Change Advisory Group 2005). This amount equals 1.2 percent of total US GHG emissions and 0.2 percent of global GHG emissions for the same year (World Resources Institute 2011). However, Arizona GHG emissions have been raising rapidly compared with the nation as a whole as a result of the state's rapid rate of population and economic growth. From 1990 to 2000, Arizona's GHG emissions rose 51 percent compared with a national GHG emissions increase of 23 percent (Arizona Climate Change Advisory Group 2005). Even with Arizona's increasing share of total US GHG emissions, any emissions changes from BLM management actions in the Planning Area, either short term or long term, would have a negligible cumulative impact on national and global GHG emission levels.

Burning of fossil fuels for transportation made up 39 percent of Arizona's GHG emissions in 2000 (Arizona Climate Change Advisory Group 2005). The small proportion of this fossil fuel-powered travel that would be impacted by the BLM's management actions under this PRMP/FEIS makes the contribution of such actions to state, national, and global GHG levels negligible. Additionally, methane emissions from agricultural activities—including manure management, fertilizer use, and livestock—contributed 5 percent of Arizona's 2000 GHG emissions (Arizona Climate Change Advisory Group 2005). Therefore, BLM management actions related to livestock grazing in the Planning Area would also have a negligible impact on state, national, and global GHG emission levels.

Under all alternatives BLM actions would not be expected to influence directly or indirectly how non-BLM lands or resources are managed in terms of either increasing or decreasing CO_{2e} levels from those sources.

Cumulative Impacts of Illegal Border Activities

Arizona's 370-mile border with Mexico consists of sparsely populated areas, vast expanses of rugged mountainous terrain aligned in north-south corridors, and broad valleys and desert. Such geography provides unlimited opportunities for drug-related activities and illegal immigrant trafficking. Illegal activities around the US-Mexico border have been occurring for the past several decades and are anticipated to continue into the future.

Undocumented aliens and drug traffickers frequently cause damage to the environment by creating new roads, destroying vegetation, cutting fencing, and leaving garbage and/or hazardous materials (e.g., human waste, abandoned vehicles, drug paraphernalia, etc.) on the landscape. Trash, illegal roads, graffiti, and general vandalism resulting from illegal alien traffic would be expected to continue to detract from the visual quality of area. Illegal roads and trails may divert surface water flows to some extent. Illegal crossings and required law enforcement response to this traffic have resulted in route proliferation, off-road vehicle activity, increased human presence in backcountry areas, discarded trash, abandoned vehicles, cutting of firewood, illegal campfires, and increased chance of wildfire. Habitat degradation and disturbance of Sonoran pronghorn almost certainly result from these illegal cross border activities (DHS 2009).

Law enforcement activities employed to combat the illegal activities include construction of fences, new roads to patrol the affected areas, construction of electronic surveillance equipment, and gather trash and clean up hazardous materials.. The construction related activities result in short-term environmental impacts similar in nature to the impacts described in this Final EIS (e.g., loss of vegetation, soil erosion, displacement of wildlife, new visual intrusions on the landscape, etc.). Longer term impacts include permanent built features (such as surveillance equipment and border fences) that are expected to reduce the illegal activities, resulting in fewer impacts occurring on the natural and human environment that would allow currently disturbed areas to rehabilitate through natural processes or management efforts (DHS 2009).

As noted in Chapter 5, Consultation and Coordination, the BLM works with state and federal agencies to reduce the impacts from the illegal and law enforcement activities. Additionally, the BLM has standard operating procedures and administrative actions that are employed to reduce these impacts.

Cumulative Impacts on Special Designations

Areas of Critical Environmental Concern**.** Over the next 20 years, ACEC lands would 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 on 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, 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 on 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 would become both urbanized and residential. Trail values would 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 would 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 would 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 would 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 would 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, would 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 would 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 on 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 would 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 would 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 LSFO and the SDNM, 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 ERMA and the Ajo ERMA 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 of ERMAs 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 would 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 would constrain opportunities for solitude and quiet landscapes. Not much can be done to mitigate this impact and all areas with wilderness character would 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 would 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 would 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 would 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 would be directly impaired or lost due to development of locatable and saleable minerals, with the greatest potential in the Ajo Block and Gila Bend Mountains. About 10 percent 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 would increase over the life of the plan due to the expansion of community development and nonattainment areas ($PM_{2.5}$ and PM_{10}). Such restrictions would 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) is 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 would not be limited to roads and trails, cumulative impact do not exist for this type of use. Bicycle use would 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 special status species 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.

4.25.2.2 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 power lines, 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 may be constrained by local land management decisions. If saleable mineral deposits are removed from availability by planning decisions, such as areas made unavailable for development, the resource could be developed at another location, be it local (on non-BLM lands) or regional. 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.

Leasables minerals, e.g., oil, gas, geothermal, etc., are also heavily influenced by local planning. If the BLM closes an area to leasing, the leasable mineral would not be available for development; an area open for leasing, even with major or moderate constraints, could be available, but would be restricted by the distance of the access to the actual reservoir area. While some resources could be developed via directional drilling, these are still location specific due to constraints on drilling technology.

Locatable minerals, such as uranium, gold, and copper, are less influenced by local planning, but could be significantly affected if the planning decisions are to recommend or propose withdrawal of the mineral from development. Withdrawal would remove developers' opportunity for access to the mineral resources; these types of actions are very location specific and simply moving to another location is largely out of the question.

The ongoing development for solar energy development on public, state, and private lands in the planning area results in taking areas out of locatable and/or saleable development. Some leasable mineral development could continue to occur, especially if it involves directional drilling methods that a developer could tap into a reservoir below a solar facility. However, if the access or drilling direction/depth was beyond current technology then the resource would be unavailable.

4.25.2.3 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 on 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

The SDNM is withdrawn from new mineral entry. The withdrawal was established in the proclamation that established the Monument. This withdrawal would have a protective effect on many different resources, as ground disturbance from exploration, prospecting, and other activities associated with mineral development would be prohibited (see individual resource discussion in the above sections of chapter 4).

There are a few parcels (totaling approximately 25,800 acres) within the Monument where the surface is owned by the United States and the subsurface is owned by a non-federal entity, on which minerals development may still occur. Depending upon the extent and intensity of the mineral extraction activities, there would likely be ground disturbance and road building for access and mineral development. The related sights and sounds of mining activity would degrade Monument visitor experiences for viewing and enjoying the Objects for which the Monument was designated to protect to a moderate level. However, the BLM, as the owner/manager of the surface, would work with operators to mitigate these impacts on affected Monument objects through project design features and/or best management practices. .

4.25.3 ALTERNATIVE A (NO ACTION)

4.25.3.1 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 effects 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 on 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.

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.

4.25.3.2 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 Wildlife and Special Status Species

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 BGR. 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 would 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 would 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 would 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 would 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 on visual resources from unauthorized causal recreational use including travel management would be minor to moderate.

Cumulative Impacts on Livestock Grazing

Cumulative impacts on 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 on 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 on 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 would 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, would 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 would grow and require more agency resources over the life of the plan. Furthermore, the growth of metropolitan areas would 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.

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 would 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 would 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 would 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 percent 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.

4.25.3.3 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 on 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 Wildlife and Special Status Species

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 BGR. 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 would 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 on wildlife or special status species associated with livestock grazing include competition for space, forage, cover, and water resources. Typically, negligible and minor impacts on 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 Grassland 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 special status species 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 on 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 would 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 would 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 an ERMA. Under Alternative A, the majority of the SDNM would not be managed as an SRMA and the opportunities to attain beneficial outcomes would be the same as for the action alternatives due to custodial management of the recreation resource over 70 percent 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.

4.25.4 ALTERNATIVE B

4.25.4.1 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 on 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.

4.25.4.2 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 on 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 Wildlife and Special Status Species

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 would be moderate compared to Alternative A due to the shift from VRM Class IV into Class III. Although recreation management would be more developed, impacts would be moderate due to the allocation of the VRM Classes. With the reduction in roads, the route network would generally result in an improved visual character, and impacts would be minor. Negative moderate and minor impacts on 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 on 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 percent of the decision area as SRMA's together with slightly less availability of motorized travel routes.

Cumulative Impacts on Travel Management

Cumulative impacts on 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.

4.25.4.3 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 negligible 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 percent 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 Wildlife and Special Status Species

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 on 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 on 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 percent 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 ERMA 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 on 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.

4.25.5 ALTERNATIVE C

4.25.5.1 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. 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 on lands and realty under Alternative C would be the same as 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 (. Compared to Alternative A, 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.

4.25.5.2 Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Impacts on cultural resources would be similar to those listed in the Common to All section.

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 more SRMA's identified than Alternative A. These additional restrictions would have an overall protective effect on cultural resources than that offered under Alternative A. Cumulative impacts on 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 Wildlife and Special Status Species

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 would reduce the impacts on 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 on 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 percent of the decision area as ERMA 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 on 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 on 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.

4.25.5.3 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 percent 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 Wildlife and Special Status Species

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 on 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 on 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.

4.25.6 ALTERNATIVE D

4.25.6.1 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 would 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.

4.25.6.2 Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts on 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 Wildlife and Special Status Species

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 US 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 on 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 would be managed custodially on 75 percent of the decision area and beneficial outcomes would 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 on 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 on 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.

4.25.6.3 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 on 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 Wildlife and Special Status Species

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 on 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 on 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.

4.25.7 ALTERNATIVE E (PROPOSED RMP)

4.25.7.1 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.

4.25.7.2 Lower Sonoran

Cumulative Impacts on Cultural and Heritage Resources

Cumulative impacts on 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 Wildlife and Special Status Species

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 US 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 on Classes I and III in comparison to Alternative A and potentially major impacts on Class II landscapes.

Impacts on Class IV would be similar to Alternatives A and B, but less beneficial effects compared with 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 threatened and endangered 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 on travel management and the route system, cumulative impacts would be expected to be moderate.

4.25.7.3 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. Since dispersed recreational target shooting throughout the Monument would continue, the impacts of target shooting under Alternative E would be the same as those described for Alternative A. However, if Management and Administrative Actions designed to change the conduct of recreational target shooters has the desired effect, impacts from recreational target shooting should be greatly decreased. Under Alternative E, transportation planning effects on Monument objects and cultural resources would be similar to those under Alternative C.

Cumulative Impacts on Wildlife and Special Status Species

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 on 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 on 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 Big Horn 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.

4.26 IMPLEMENTATION-LEVEL ANALYSIS

4.26.1 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; and
- AUM levels for administering livestock grazing in the SDNM based on the findings from the grazing compatibility analysis (which can be found in **Appendix E**, Compatibility Analysis: Livestock Grazing on the Sonoran Desert National Monument).

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) have analyzed these decisions in detail. Program areas that manage these objects include cultural and heritage resources (**Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects), Wildlife and Special Status Species (**Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects), and vegetation resources (**Table 4-26**, Impacts from Implementation-Level Decisions on Vegetation Monument Objects). Special designations also manage a Monument object (i.e. the Juan Bautista de Anza NHT); however, impacts on the Anza NHT are discussed with the cultural and heritage Monument objects in **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects.

Impacts are quantified to the extent practical with available data. Qualitative terms have been established to indicate the level of intensity an impact would 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.

4.26.1.1 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 in **Appendix S**, Route Evaluation Methodology & Impact Analysis 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.

4.26.1.2 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, special status 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.

4.26.2 IMPLEMENTATION-LEVEL ANALYSIS FOR CULTURAL & HISTORIC SITES MONUMENT OBJECTS

Impacts from implementation-level decisions on cultural and historical sites Monument objects are presented below in **Table 4-24**, Impacts from Implementation-Level Decisions on Cultural and Historical Sites/Monument Object).

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument 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

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

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*)

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 would intensify impacts.
- Vandalism or unauthorized collecting would continue to destroy historic trails and associated cultural resources. Exposure or access to areas where these resources are present would 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

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

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

	Roads			Primitive Roads			Trails		
Area Analyzed	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

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

		condition means a return to the former management regime before the closure, routes would 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. 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, 8005E, 8005H, 8005I	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 led 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.
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 on 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 inevitably would 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

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

		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

	Roads			Primitive Roads			Trails		
Area Analyzed	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 1 & 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	-	-	-

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

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 9.1 miles 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

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

		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 on 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 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.		

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

SDNM Route Designations									
	Roads			Primitive Roads			Trails		
Area Analyzed	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 1 & 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 & 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,	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 on the site, thus leading to a minimization of impacts compared to Alternative A and decreasing the impacts to a negligible intensity.

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

	8000X, 8000Y, 8001, 8001F, 8001G, 8002, 8002G, 8002H, 8005, 8005D, 8005E, 8005H, 8005I	
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 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.		

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

SDNM Route Designations									
	Roads			Primitive Roads			Trails		
Area Analyzed	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 & 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,	Impacts would be negligible, as all of the access routes off the pipeline road would be closed.

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

	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	
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

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

		management than under Alternative A, therefore impact intensities would be decreased to minor.

Alternative E (Proposed RMP)

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

	Roads			Primitive Roads			Trails		
Area Analyzed	Open	Admin Only	Closed	Open	Admin Only	Closed	Open	Admin Only	Closed
Area 1 & 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 & 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,	Impacts would be the same as those described under Alternative C for Area 4.

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Sites Monument Objects

	8005E, 8005H, 8005I	
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

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.

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Site Monument Objects

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

Allotment	Proposed Permitted Livestock Grazing Animal Unit Months (AUMs)
Arnold	0
Beloat	541
Bighorn	2,301
Conley	1,572
Hazen	531
Lower Vekol	646

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Site Monument Objects

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 fence line. . 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 fence line. 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 on 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.

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Site Monument Objects

Alternative C	
Alternative C SDNM Livestock Grazing Action	
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 similar 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 fence line 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 off with about 3 miles of fence line. Impacts from this would be similar to those described in Alternative B.

Table 4-24
Impacts from Implementation-Level Decisions on Cultural and Historical Site Monument Objects

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 Action
• Impacts would be negligible, as all allotments currently available to grazing would be closed to grazing when current permits expire.	
Alternative E (Proposed RMP)	
Alternative E (Proposed RMP) 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.
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 868. The number of acres made unavailable, and the miles of fence line, 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 on 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.

4.26.3 IMPLEMENTATION-LEVEL ANALYSIS FOR WILDLIFE AND SPECIAL STATUS SPECIES MONUMENT OBJECTS

Impacts from implementation-level decisions on special status species Monument objects are presented below in **Table 4-25**, Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects.

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

Monument Objects Managed by Special Status Species Habitat

- 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,:
- A 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 palo verde-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. E
Areas 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

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

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**	482,334

* 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 special status species.
- Special status 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 on special status wildlife and special status 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 on 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 Special Status 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

	Roads			Primitive Roads			Trails		
Area Analyzed	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**
Area 15	8000, 8000J, 8002, 8002E, 8002H, 8003, 8003A,	Within existing non-designated routes, 939 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

	8003B, 8005, 8005A, 8005B, 8005D, 8005E, 8005F, 8005G, 8037, 8037F, 8037G, 8037L, 8037Q, 8037R, 8039, 8039A, 8039B, 8039H, 8039I, 8039J, 8039K, 8039L	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

	Roads			Primitive Roads			Trails		
Area Analyzed	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	• 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

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

	8005, 8005A 8005B, 8005D 8005E, 8005F 8005G, 8037 8037F, 8037G 8037L, 8037Q 8037R, 8039 8039A, 8039B 8039H, 8039I 8039J, 8039K, 8039L	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.
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.		

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

SDNM Route Designations									
	Roads			Primitive Roads			Trails		
Area Analyzed	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 8037L, 8037Q 8037R, 8039 8039A, 8039B 8039H, 8039I 8039J, 8039K, 8039L	• 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.
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,

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

		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

	Roads			Primitive Roads			Trails		
Area Analyzed	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 8037L, 8037Q 8037R, 8039 8039A, 8039B 8039H, 8039I 8039J, 8039K, 8039L	Within designated routes, 263 acres of palo-verde mixed cacti, creosote-bursage, and xeroriparian habitat would be disturbed. Alternative D would close 8.1 miles 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.
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

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

		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

	Roads			Primitive Roads			Trails		
Area Analyzed	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 8037L, 8037Q 8037R, 8039 8039A, 8039B 8039H, 8039I	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.

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

	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 Special Status Species and Habitat 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 Palo verde-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 on Monument objects would generally be negligible to minor in intensity. Range improvement projects would be considered pursuant to 43 CFR 4120-3.

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

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 Palo verde-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 on objects would be expected to range from negligible to minor.
Conley Allotment	The Conley Allotment consists of 1,668 acres of Sonoran-Mojave Mixed Salt Desert Scrub, 30,427 acres of Sonoran Palo verde-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 on 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 Palo verde-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 on 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 Palo verde-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 on 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

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

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 Estrella 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 fence line 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.
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 on special status species are expected to be negligible to minor.

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

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 to those described under Alternative B for the Beloat Allotment, just to a lesser degree, as AUMs would be decrease d by 384. Impacts on 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 534 AUMs 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 fence line 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 on special status species.
Conley Allotment	Under Alternative C, nearly half of the Conley Allotment 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 on special status species.

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

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 special status 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 2000 pounds/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 fence line 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

Table 4-25
Impacts from Implementation-Level Decisions on Wildlife and Special Status Species Monument Objects

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.
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 Lower Sonoran 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 on 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 on wildlife from this difference are expected to be negligible to minor.

4.26.4 IMPLEMENTATION-LEVEL ANALYSIS FOR VEGETATION MONUMENT OBJECTS

Impacts from implementation-level decisions on vegetation Monument objects are presented below in **Table 4-26**, Impacts from Implementation-Level Decisions on Vegetation Monument Objects.

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

Vegetation Management Objects

- 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 palo verde-mixed Cacti Vegetation Community.
- Diversity of Plant and Animal Species
  - Acres of woodland assemblages, palo verde-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 (miles)**				
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	21.5	7.4	1.5	1.3
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

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

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	482,334

* 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 on special status 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,	These areas represent the palo verde-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

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

	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	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 palo verde-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, 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, 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.
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,	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

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

	8012, 8013, 8013A, 8014, 8014A, 8016, 8016A, 8016B, 8016D, 8017, 8018, 8019, 8021, 8026, 8026B, 8039C, 8039D, 8039M	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 (palo verde-mixed cacti community and saguaro cactus forest, creosote bush-bursage and desert washes). The potential impacts on 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.

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

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
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, 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	Approximately 283.3 acres of the palo verde-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.

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

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, 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	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.
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

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

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
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.		

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

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, 8037F, 8037G, 8037H, 8037K, 8037O, 8037P, 8038B, 8038E, 8039, 8039K, 8039C, 8039D, 8039M, 8043, 8044, 8045, 8046	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.

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

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, 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.		

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

SDNM Route Designations									
	Roads			Primitive Roads			Trails		
Area Analyzed	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.

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

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, 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 C for these areas, negligible, however minimized with 47 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 1.5 miles of routes would be open in wash areas. Impacts would be negligible.
Area 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 (Proposed RMP)		
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.		

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

SDNM Route Designations									
	Roads			Primitive Roads			Trails		
Area Analyzed	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, 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.

Table 4-26
Impacts from Implementation-Level Decisions on Vegetation Monument Objects

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, 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 C for these areas, negligible, however minimized with 18.6 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 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 **Section 4.26.4**, Implementation-Level Analysis for Vegetation Monument Objects, because the actions that address wildlife habitat likewise address vegetation characteristics and impacts from livestock grazing as well.		