



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Alaska State Office
222 West Seventh Avenue, #13
Anchorage, Alaska 99513-7504
<http://www.ak.blm.gov>



1610 (020)

JUL 21 2006

Dear Reader:

Enclosed for your review is the Bay Draft Resource Management Plan/Environmental Impact Statement (Draft RMP/EIS). The Draft RMP/EIS considers and analyzes four alternatives that address future management of approximately 2.5 million acres of public lands administered by the Bureau of Land Management's (BLM) Anchorage Field Office. The planning area includes lands in the Bristol Bay and Goodnews Bay areas of southwest Alaska.

Your comments are needed at this time. The public review period for the Draft RMP/EIS will last 90 calendar days beginning with the publication of the Environmental Protection Agency's Notice of Availability in the Federal Register. Public hearings will be held before the close of the comment period in communities within the planning area. Hearing dates, times, and specific locations will be announced through news releases and on Bay RMP Web site (<http://www.blm.gov/ak/ado/BayRMP01.html>). Written comments may be sent via U.S. Mail to the BLM Anchorage Field Office, Attn: Bay Draft RMP/EIS, 6881 Abbott Loop Road, Anchorage, Alaska, 99507, or via e-mail to akbayrmp@blm.gov. All comments will be considered and evaluated in the preparation of the Final RMP/EIS, and all substantive comments will be addressed.

Comments will be most useful if they are specific, mention particular pages (where appropriate), and address one or more of the following items:

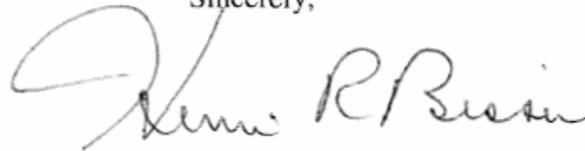
- Inaccuracies or discrepancies in information,
- Identification of new information that would have a bearing on the analysis,
- Identification of new impacts, alternatives, or mitigation measures, and
- Suggestions for improving management direction.

Public comments submitted for this planning review, including names and street addresses of respondents, will be available for public review at the Anchorage Field Office during regular business hours, 7:30 a.m. to 4:30 p.m., Monday through Friday, except holidays, and may be published as part of the Final EIS. If you wish to withhold your name or address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your comments. Such requests will be honored to the extent allowed by law. Anonymous comments will not be considered. All submissions from

organizations and businesses, and from individuals identifying themselves as representatives or officials of an organization or business, will be available for public inspection in their entirety.

We appreciate your help in this planning effort and look forward to your continued interest and participation. For additional information or clarification regarding the Draft RMP/EIS or the planning process, please contact Pat McClenahan, Bay RMP Lead Planner, at 907-267-1484.

Sincerely,

A handwritten signature in black ink that reads "Henri R. Bisson". The signature is written in a cursive style with a large initial "H" and "B".

Henri R. Bisson
State Director

Table of Contents

Cover Sheet	
Dear Reader Letter	
Abstract	i
Executive Summary	iii
Table of Contents	ix
List of Tables	
List of Figures	

Chapter I: Introduction

A. Background	1-2
B. Purpose and Need for the Plan	1-2
C. Description of the Planning Area	1-3
1. Land Ownership and Administration	1-3
2. Geographic and Social Setting	1-5
D. Planning Blocks	1-11
E. Issues and Management Concerns Identified During Scoping	1-11
1. Issues Addressed	1-12
2. Issues Considered But Not Further Analyzed	1-14
F. Planning Criteria and Legislative Constraints	1-18
G. The Planning Process	1-19
1. Policy	1-20
2. Relationship to BLM Policies, Plans, and Programs	1-22
3. Forms of Public and Intergovernmental Involvement	1-23
H. Organization of Bay RMP/EIS	1-26

Chapter II: Alternatives

A. Introduction	2-2
B. General Description of Alternatives	2-3
1. Alternative A: No Action	2-3
2. Alternative B	2-3
3. Alternative C	2-4
4. Alternative D: Preferred Alternative	2-4
C. Alternatives Considered But Not Carried Forward	2-4
1. Nomination of the Kvichak River as a Wild and Scenic River	2-4
2. Nomination of Special Recreation Management Areas (SRMAs)	2-5
D. Detailed Descriptions of the Alternatives	2-5
1. Resources: Air Quality, Soil, Vegetation, and Water Resources	2-5
2. Resource Uses	2-21
3. Special Designations	2-51
4. Social and Economic	2-55
E. Required Operating Procedures, Stipulations, and Standard Lease Terms	2-57
1. Introduction	2-57
2. Required Operating Procedures	2-59
3. Oil and Gas Leasing Stipulations	2-78
4. Standard Lease Terms for Oil and Gas (BLM Form 3100-11)	2-82
F. Comparison of Alternatives	2-85

Chapter III: Affected Environment

A. Introduction	3-3
1. How to Read This Chapter	3-3
2. Geographic Scope	3-3
B. Resources	3-12
1. Geography and Climate	3-12
2. Air Quality	3-14
3. Soil Resources	3-15
4. Water Resources	3-26
5. Fish and Wildlife	3-65
6. Special Status Species	3-137
7. Fire Management and Ecology	3-144
8. Cultural Resources	3-154
9. Paleontological Resources	3-163
10. Visual Resources	3-164
C. Resource Uses	3-168
1. Forest Products	3-168
2. Livestock and Reindeer Grazing	3-171
3. Minerals	3-172
4. Recreation Management	3-195
5. Travel Management	3-201
6. Renewable Energy	3-212
7. Lands and Realty	3-213
D. Special Designations	3-288
1. Areas of Critical Environmental Concern	3-288
2. Wild and Scenic Rivers	3-289
E. Social and Economic	3-291
1. Public Safety	3-291
2. Social and Economic Conditions	3-294
F. Subsistence	3-305
1. Definition of Subsistence	3-305
2. The Federal Subsistence Program	3-305
3. Historic Subsistence Use Patterns, Social Organization and Sharing Patterns	3-307
4. Sociocultural, Socioeconomic and Cosmological Aspects of Subsistence Lifeways	3-308
5. Historic and Contemporary Subsistence Use Patterns	3-309
6. Resources Harvested	3-310

List of Tables

Table 1.1	Land Status within the Bay Planning Area	1-4
Table 1.2	Steps in the BLM Planning Process	1-22
Table 1.3	List of Land Management Plans for Lands Within and Adjacent to the Bay Planning Area	1-25
Table 2.1	Fish and Wildlife Habitat - Summary of Alternatives	2-11
Table 2.2	Fire Management and Ecology - Summary of Alternatives	2-14
Table 2.3	Cultural and Paleontological Resource Management - Summary of Alternatives	2-16
Table 2.4	Visual Resource Management - Summary of Alternatives	2-20
Table 2.5	Livestock and Reindeer Grazing - Summary of Alternatives	2-24
Table 2.6	Acres of Federal Mineral Estate Available/Unavailable for Fluid Mineral Leasing	2-26
Table 2.7	Fluid Leasable Minerals - Summary of Alternatives	2-30
Table 2.8	Locatable Minerals and Salable Minerals - Comparison of Alternatives	2-35

Table 2.9	Current ROS Class Acreages and Descriptions for BLM-Administered Lands in the Bay Planning Area	2-37
Table 2.10	Comparison of Alternatives - Recreation Management. Off-Highway Vehicles and Recreation Opportunity Spectrum	2-41
Table 2.11	Comparison of Alternatives - Lands and Realty	2-49
Table 2.12	Comparison of Alternatives - Special Management Areas.....	2-53
Table 2.13	Required Operating Procedures Common to Alternatives A-D.....	2-59
Table 2.14	Oil and Gas Leasing Stipulations	2-78
Table 2.15	Summary and Comparison of Effects on Resources by Alternative	2-85
Table 3.1	List of Relevant Plans and Amendments for the Bay Planning Area	3-11
Table 3.2	Soils Found in Bay Planning Area BLM Unencumbered Lands: Suitability and Limitations for Selected Uses	3-24
Table 3.3	Earth Cover Classes for Vegetation in Portions of the Bay Planning Area	3-31
Table 3.4	Percentage of Planning Block in Major Land Cover Types Bay Planning Area BLM Unencumbered Lands.....	3-31
Table 3.5	Table of Amphibian and Mammal Species Present in the Bay Planning Area (ADF&G CPDB 2005, Foster 1991, Mountaineers 1994, Udvardy 1977, Whitaker 1980, Jacobsen 2004, USFWS 2005)	3-66
Table 3.6	Table of Resident, Migratory, Wintering, Rare* and Accidental Bird Table (ADF&G CPDB 2005, Foster 1991, Udvardy 1977, USFWS 2005).....	3-67
Table 3.7	Table of Marine Invertebrate Species of Subsistence or Sport Interest Present at Coastal Locations Potentially Present in the Bay Planning Area (ADF&G CPDB 2005, Mountaineers 1994, Foster 1991)	3-69
Table 3.8	Common Fish Species Endemic to the Waters of the Bay Planning Area.....	3-135
Table 3.9	Rare and Imperiled Plant Species on BLM Special Status Species Documented in the Planning Area.....	3-137
Table 3.10	Other Rare and Imperiled Plant Species Documented in the Planning Area.....	3-137
Table 3.11	Federally Listed Threatened and Endangered Animal Species Present in The Bay Planning Area	3-139
Table 3.12	BLM Alaska Sensitive Animal Species Present in the Bay Planning Area	3-141
Table 3.13	Fire Suppression Classes	3-146
Table 3.14	Cultural Contexts for the Bay Planning Area.....	3-157
Table 3.15	Timeline for Historic Period	3-157
Table 3.16	Recreation Opportunity Spectrum Physical Criteria - Resources and Facilities	3-198
Table 3.17	Recreation Opportunity Spectrum Social Criteria - Visitor Use and Users.....	3-198
Table 3.18.	Recreation Opportunity Spectrum Administrative - Management Controls and Service Settings.....	3-199
Table 3.19	Effect of ANCSA §17(d)(1) Withdrawals on Federal Public Lands	3-215
Table 3.20	17(b) Easements within the Alagnak Planning Block.....	3-240
Table 3.21	17(b) Easements within the Goodnews Planning Block.....	3-247
Table 3.22	17(b) Easements within the Iliamna East Planning Block.....	3-255
Table 3.23	17(b) Easements within the Iliamna West Planning Block	3-265
Table 3.24	17(b) Easements within the Koggiling Creek Planning Block	3-270
Table 3.25	17(b) Easements within the Klutuk Planning Block	3-275
Table 3.26	17(b) Easements within the Kvichak Planning Block	3-279
Table 3.27	Yellow Creek 17(b) Easements	3-287
Table 3.28	Activities and Associated Hazardous Materials	3-293
Table 3.29	Growth of Alaska Native Population.....	3-296
Table 3.30	Population per Community, Historic U.S. Census Data	3-297
Table 3.31	Population of Selected Boroughs, Census Areas	3-297
Table 3.32	Workers and Wages in the Seafood Processing Industry.....	3-298
Table 3.33	Commercial Fishing Permits Held by Residents.....	3-298
Table 3.34	Employment by Sector (Percentage of Total Employment)	3-299
Table 3.35	Percent of Private Sector Workers Who Are Local Residents	3-300
Table 3.36	Comparative Unemployment Rates December 2004-November 2005.....	3-301

Table 3.37	Comparison of Per Capita Income (2000).....	3-302
Table 3.38	Environmental Justice Data from the 2000 Census	3-303
Table 3.39	2004 Per Capita Tax Revenues in Dollars	3-304
Table 3.40	Bay Planning Area Communities and their Locations With Relation to the Subsistence Game Management Units	3-307
Table 3.41	Bay Planning Area Communities and their Alaska Native Population Composition (U.S. Census Bureau 2004)	3-310
Table 3.42	Bay Planning Area Communities' Subsistence Take for One Study Year.....	3-311

List of Figures

Maps

Figure 1.1	Overview of Bay Plan.....	1-7
Figure 2.1	VRM Inventory Classes, Alternative B, Bristol Bay/Iliamna Region.....	2-115
Figure 2.2	VRM Inventory Classes, Alternative C, Bristol Bay/Iliamna Region	2-117
Figure 2.3	VRM Inventory Classes, Alternative D, Bristol Bay/Iliamna Region	2-119
Figure 2.4	VRM Inventory Classes, Alternative B, Goodnews Planning Block.....	2-121
Figure 2.5	VRM Inventory Classes, Alternative C, Goodnews Planning Block.....	2-123
Figure 2.7	Proposed Bristol Bay ACEC.....	2-125
Figure 2.8	Proposed Carter Spit ACEC.....	2-127
Figure 2.9	Wild & Scenic River Eligibility - Bristol Bay/Iliamna Region	2-129
Figure 2.10	Wild and Scenic River Eligibility - Goodnews Planning Block.....	2-131
Figure 3.1	BLM Unencumbered Lands for Klutuk Creek, Yellow Creek, Koggiling Creek, Kvichak, Alagnak, and Iliamna West planning blocks	3-5
Figure 3.2	BLM Unencumbered Lands for Iliamna East and Iliamna West planning blocks.....	3-7
Figure 3.3	Unencumbered Lands for Goodnews planning blocks	3-9
Figure 3.4	Soil Types Consolidated, Bay Plan.....	3-17
Figure 3.5	Soil Types, Bay Plan	3-19
Figure 3.6	Permafrost Classified, Bay Plan	3-21
Figure 3.7	Annual Precipitation	3-27
Figure 3.8a	Lowland/Upland Herbaceous Tundra landcover for Goodnews Planning Block ..	3-33
Figure 3.8b	Lowland/Upland Herbaceous Tundra landcover for Klutuk Creek, Yellow Creek, Kvichak, and Iliamna West planning blocks	3-35
Figure 3.8c	Lowland/Upland Herbaceous Tundra landcover for Koggiling Creek, Yellow Creek, Kvichak, Alagnak and Iliamna West planning blocks	3-37
Figure 3.8d	Lowland/Upland Herbaceous Tundra landcover for Iliamna East and Iliamna West Planning blocks	3-39
Figure 3.9a	Forest landcover for Goodnews Planning blocks	3-41
Figure 3.9b	Forest landcover for Klutuk Creek, Yellow Creek, Kvichak, and Iliamna West Planning Blocks	3-43
Figure 3.9c	Forest landcover for Koggiling Creek, Yello Creek, Kvichak, Alagnak and Iliamna West planning blocks	3-45
Figure 3.9d	Forest landcover for Iliamna East and Iliamna West Planning Blocks	3-47
Figure 3.10a	Wetlands landcover for Goodnews planning blocks	3-49
Figure 3.10b	Wetland landcover for Klutuk Creek, Yellow Creek, Kvichak, and Iliamna West planning blocks	3-51
Figure 3.10c	Wetland landcover for Koggiling Creek, Yellow Creek, Alagnak and Iliamna West Planning blocks	3-53
Figure 3.10d	Wetland landcover for Iliamna East and Iliamna West planning blocks	3-55
Figure 3.11a	Lichen Types landcover for Goodnews planning block	3-57
Figure 3.11b	Lichen Types landcover for Klutuk Creek, yellow Creek, Kvichak, and Iliamna West planning blocks	3-59

Figure 3.11c Lichen Types landcover for Koggiling Creek, yellow Creek, Kvichak, Alagnak and Iliamna West Planning Blocks 3-61

Figure 3.11d Lichen Types landcover for Iliamna East and Iliamna West planning blocks 3-63

Figure 3.12 Caribou Range and Migration Patterns 3-89

Figure 3.13 Range (95% fixed kernel) of the the Mulchatna Caribou Herd before and after the 1994 shift to the west, southwest Alaska, USA 1980-2000 3-91

Figure 3.14 Moose Habitat - Bay Plan Overview 3-95

Figure 3.15 Moose Winter Range..... 3-97

Figure 3.16 Bear Habitat and Concentration Areas 3-99

Figure 3.17 Dall Sheep Obervations 3-107

Figure 3.18 Waterfowl Habitat and Activity Areas..... 3-131

Figure 3.19a Game management Unites, Uniform Coding Units for planning blocks Klutuk Creek, Yellow Creek, Koggiling Creek, Kvichak, Alagnak, Iliamna West ... 3-71

Figure 3.19b Game Management Units, Uniform Coding Units for planning blocks Iliamna East and Iliamna West 3-73

Figure 3.19c Game Management Units, Uniform Coding Units for Goodnews planning block 3-75

Figure 3.32a Fish Inventory - Klutuk Creek, Yellow Creek Kvichak, Iliamna West Planning Blocks 3-79

Figure 3.32b Fish Inventory for Yellow Creek, Kvichak, Koggiling Creek, Alagnak, Iliamn West Planning Blocks 3-81

Figure 3.32c Fish Inventory - East Iliamna and West Iliamna Planning Blocks 3-83

Figure 3.32d Fish Inventory for Goodnews Planning Block 3-85

Figure 3.33 Native Languages in the Bristol Bay Area 3-155

Figure 3.34a Fire Management Options in Bristol Bay/Iliamna Region 3-147

Figure 3.34b Fire Management Options in Goodnews Planning Block 3-149

Figure 3.35 Fire History through 2005 3-151

Figure 3.36 Bailey Ecoregions, Province Level, Bay Plan 3-169

Figure 3.37a OHV/Transportation for Klutuk Creek, Yellow Creek, Kvichak, and Iliamna West Planning Blocks 3-203

Figure 3.37b OHV/Transportation for Koggiling Creek, Yellow Creek, Kvichak, Alagnak, and Iliamna West Planning Blocks 3-205

Figure 3.37c OHV/Transportation for Iliamna East and Iliamna West Planning blocks 3-207

Figure 3.37d OHV/Transportation for Goodnews Planning Block 3-209

Figure 3.38 Index Map for Withdrawals (other than ANCSA d(1).) 3-217

Figure 3.38a Land Withdrawal Locations (excluding d(1) withdrawals) 3-219

Figure 3.38b Land Withdrawal Locations (excluding d(1) withdrawals)..... 3-221

Figure 3.38c Land Withdrawal Locations (excluding d(1) withdrawals)..... 3-223

Figure 3.38d Land Withdrawal Locations (excluding d(1) withdrawals)..... 3-225

Figure 3.39 D-1 Withdrawals..... 3-229

Figure 3.40 Recreation and Public Purpose Sites 3-233

Figure 3.41 Proposed Land Disposition 3-237

Figure 3.42 Subsurface Estate 3-241

Figure 3.43 Dillingham/Aleknagik vicinity 3-243

Figure 3.44 Naknek/King Salmon Vicinity 3-243

Figure 3.45 Alagnak Planning Block 3-243

Figure 3.47 Alagnak Planning Block Transportation Systems 3-243

Figure 3.48 Goodnews Planning Block 3-249

Figure 3.50 Goodnews Planning Block Transportation Systems 3-249

Figure 3.51 Goodnews Planning Block 17(b) Easements 3-249

Figure 3.52 Goodnews Planning Block 17(b) Easements..... 3-249

Figure 3.53 Goodnews Planning Block 17(b) Easements 3-253

Figure 3.54 Goodnews Planning Block 17(b) Easements 3-253

Figure 3.55 Goodnews Planning Block 17(b) Easements 3-253

Figure 3.56 Goodnews Planning Block 17(b) Easements 3-253

Figure 3.57	Iliamna East Planning Block	3-263
Figure 3.58	Iliamna East Land Use Withdrawal/Authorization	3-263
Figure 3.59	Iliamna East 17(b) Easements	3-263
Figure 3.60	Land Tenure Adjustments - Chulitna Block	3-263
Figure 3.61	Land Tenure Adjustments - Chekok Creek Block	3-267
Figure 3.62	Goodnews Planning Block	3-267
Figure 3.63	Iliamna West Land Use Withdrawal/Authorization	3-367
Figure 3.64	Iliamna East Land Use Withdrawal/authorization	3-367
Figure 3.65	Iliamna West Land Tenure Adjustments	3-373
Figure 3.67	Koggiling Creek Planning Block	3-373
Figure 3.68	Koggiling Creek 17(b) Easements	3-373
Figure 3.69	Klutuk Creek Land Use Authorization	3-373
Figure 3.70	Klutuk Creek Land Use Authorization	3-381
Figure 3.71	Klutuk Creek 17(b) Easements	3-381
Figure 3.72	Kvichak Planning Block.....	3-381
Figure 3.73	Kvichak 17(b) Easements	3-381
Figure 3.74	Yellow Creek Planning Block	3-385
Figure 3.75	Kvichak 17(b) Easements	3-385
Figure 3.76	Geologic Map of the Bay Planning Area	3-173
Figure 3.77	Mineral Terranes	3-175
Figure 3.78	Oil and Gas	3-179
Figure 3.79	Mineral Occurrence Map of the Bay Planning Area	3-183
Figure 3.80	High Locatable Mineral Potential and Occurrence Map of the Bristol Bay Area	3-185
Figure 3.81	High Locatable Mineral Potential and Occurrence Map of the Goodnews Bay Planning Block.....	3-187
Figure 3.82	State and Federal Mining Claims	3-189

Photos

Figure 1.2	Alagnak River, View South.....	1-9
Figure 1.3	Jacksmith Creek, Goodnews Block	1-10
Figure 1.4.	Bear Creek, Kvichak Block.....	1-11
Figure 3.20	Kaskanak Creek, Northwest Iliamna Block. View North	3-102
Figure 3.21	Tundra Lake on BLM Lands West of Lake Iliamna	3-102
Figure 3.22	Ole Creek, Southwest Iliamna Block.....	3-103
Figure 3.23	Chekok Creek, View North East. BLM lands in the background are in GMU 9(B) UCU	3-104
Figure 3.24	Coffee Creek.	3-110
Figure 3.25	Confluence of Branches of Ben Courtney Creek.	3-111
Figure 3.26	Headwaters of Ben Courtney Creek.	3-112
Figure 3.27	Upper Yellow Creek , View North West.	3-113
Figure 3.28	King Salmon Creek	3-115
Figure 3.29	Klutuk Creek.....	3-116
Figure 3.30	Klutuk Creek in regional perspective.	3-118
Figure 3.31	Takiketak, View South.....	3-119
Figure 3.46	Bristol Bay Cellular Partnership Communications Site	3-239
Figure 3.66	Iliamna West Block Communication Site	3-269

Bay Draft Resource Management Plan and Environmental Impact Statement

Lead Agency: U.S. Department of the Interior, Bureau of Land Management

Proposed Action: Bay Draft Resource Management Plan/Environmental Impact Statement (Draft RMP/EIS)

Type of Action: Draft (X) Final ()
Administrative (X) Legislative ()

Abstract: The Bay Draft RMP/EIS was developed based on information provided by BLM personnel, other agencies and organizations, and the public. Four Alternatives are described and analyzed in this Draft RMP/EIS: Alternative A is the “no action” Alternative; Alternatives B and C propose varying levels of resource use and conservation; and Alternative D, the agency preferred Alternative, provides a balance between resource conservation and development.

Major issues and management concerns analyzed include: minerals management, sustaining renewable resources, subsistence, land tenure adjustments, recreation, special designations, and management of cultural and natural resources.

Comments: Comments on the Bay Draft RMP/EIS are due within 90 days from publication of the Environmental Protection Agency’s Notice of Availability in the Federal Register. The close of the comment period will also be announced in news releases, newsletters, and on the Bay RMP Web site (<http://www.blm.gov/ak/ado/BayRMP01.html>). Comments can be submitted electronically or mailed to the address below.

Further Information:

Gary Reimer, Field Manager

Phone: (907) 267-1205
E-mail: akbayrmp@blm.gov

Pat McClenahan, Team Leader

Phone: (907) 267-1484
E-mail: akbayrmp@blm.gov

Bureau of Land Management
Anchorage Field Office
Attn: Bay Draft RMP/EIS
6881 Abbott Loop Road
Anchorage, Alaska 99507

<http://www.blm.gov/ak/ado/BayRMP01.html>

Executive Summary

A. Introduction

The Bureau of Land Management (BLM) has prepared this Draft Resource Management Plan (RMP) and Environmental Impact Statement (EIS) to provide direction for managing public lands within the Bay planning area boundaries and to analyze the environmental effects that would result from implementing the Alternatives presented in the Draft RMP/EIS.

The Bay planning area encompasses lands within the Bristol Bay and Goodnews Bay areas of southwest Alaska. Of the approximately 22,601,183 acres within the planning area, decisions in the RMP/EIS will apply to 2,551,608 acres. After conveyances are complete in 2010, it is expected that approximately 1,197,688 acres, or approximately 5% of the total acreage in the Bay planning area, will remain under BLM management.

The Draft RMP/EIS was prepared using BLM's planning regulations and guidance issued under the authority of the Federal Land Policy and Management Act of 1976, and under requirements of the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations for implementing NEPA (40 CFR 1500-1508), the BLM's NEPA Handbook 1790-1, and the BLM's Land Use Planning Handbook 1601-1 (March 2005).

B. Purpose and Need

The RMP will provide the Anchorage Field Office with a comprehensive framework for managing lands within the planning area under the jurisdiction of the BLM. The purpose of an RMP is to provide a public document that specifies overarching management policies and actions for BLM-managed lands. Implementation-level planning and site-specific projects are then completed in conformance with the broad provisions of the RMP. The RMP is needed to update the Southwest Management Framework Plan (MFP) approved in 1981, and to provide a land use plan consistent with evolving law, regulation, and policy. This RMP meets the requirements of FLPMA, which states, "The Secretary shall, with public involvement . . . develop, maintain, and, when appropriate, revise land use plans which provide by tracts or areas for the use of the public lands" (43 U.S.C. 1712).

C. Decisions to be Made

Land use plan decisions are made on a broad scale and guide subsequent site-specific implementation decisions. The RMP will make the following types of decisions to establish direction in the planning area:

- Establish resource goals, objectives, and desired future conditions.
- Describe actions to achieve goals, objectives, and desired future conditions.
- Make land use allocations and designations.
- Make land use adjustments.

Management under any of the Alternatives would comply with State and Federal regulations, laws, standards, and policies. Each Alternative considered in the Draft RMP/EIS allows for some level of

support of all resources present in the planning area. The Alternatives are designed to provide general management guidance in most cases. Specific projects for any given area or resource would be detailed in future implementation plans or site-specific proposals, and additional NEPA analysis and documentation would be conducted as needed.

After the comments on the Draft RMP/EIS are reviewed and analyzed, the responsible officials can decide to:

- Select one of the Alternatives analyzed for implementation, or
- Modify an Alternative (e.g., combine parts of different Alternatives) as long as the environmental consequences are analyzed in the Final RMP/EIS.

The Alternative selected for implementation will be presented in a Proposed RMP and Final EIS. Following a 60-day Governor's Consistency Review, a 30-day protest period, and the resolution of any protests, a Record of Decision will be signed and an approved RMP will be released.

D. Issues

A planning issue is an area of controversy or concern regarding management of resources or uses on the BLM-managed lands within the planning area. Issues for the Bay RMP were identified through scoping, interactions with public land users, and resource management concerns of BLM, the State, and other Federal agencies. These issues drive the formulation of the plan Alternatives, and addressing them has resulted in the range of management options across the Draft RMP Alternatives. Additional discussion on each issue can be found in the Scoping and Issues section in Chapter I. Issues of primary concern in the development of this Draft RMP/EIS include:

- Determine which lands should be made available for oil and gas and hardrock mineral development, and how these lands will be managed to sustain natural resources and subsistence use.
- Explore land tenure adjustments that would allow BLM to consolidate discontinuous blocks of land to benefit land management.
- Determine how access will be provided to BLM managed lands for various purposes including recreation, subsistence activities, and general enjoyment of public lands, while protecting natural and cultural resources.
- Determine whether any Special Management Areas will be identified.
- Determine whether eligible rivers should be recommended for inclusion in the National Wild Rivers System.

E. Alternatives

The basic goal in developing Alternatives was to prepare different combinations of management actions to address issues and resolve conflicts among uses. Alternatives must meet the purpose and need; must be reasonable; must provide a mix of resource protection, use, and development; must be responsive to the issues; and must meet the established planning criteria. Each Alternative constitutes a complete RMP that provides a framework for multiple use management of the full spectrum of resources, resource uses, and programs present in the planning area. Under all Alternatives the BLM would manage their lands in accordance with all applicable laws, regulations, and BLM policies and guidance.

Four Alternatives were developed and carried forward for detailed analysis in the Draft RMP/EIS. Alternative A (the No Action Alternative) represents the continuation of current management practices. Alternatives B, C, and D describe proposed changes to current management, as well as what aspects of current management would be carried forward. These three Alternatives were developed with input from

the public, collected during scoping, from the BLM Planning Team, and through collaborative efforts conducted with the State of Alaska and the BLM-Alaska Resource Advisory Council (RAC). The Alternatives provide a range of choices for meeting BLM planning and program management requirements, and resolving the planning issues identified through scoping.

1. Alternative A

Alternative A represents the continuation of current management practices, also called the No Action Alternative. This Alternative would include continued management under guidance of the existing Southwest Management Framework Plan (1982) for the Goodnews Block only, and other management decision documents affecting all BLM-managed lands in the entire planning area. Direction contained in existing laws, regulations and policy would also continue to be implemented, sometimes overriding provisions in the Southwest MFP. The current levels, methods and mix of multiple use management of BLM land in the planning area would continue, and resource values would receive attention at present levels. No lands would be open to oil and gas leasing, including leasing for coalbed natural gas (CBNG), and large tracts would remain closed to Locatable Minerals exploration or development due to retention of the Alaska Native Claims Settlement Act (ANCSA) 17(d)(1) withdrawals. No special management areas, such as Areas of Critical Environmental Concern (ACECs), Special Recreation Management Areas (SRMAs), or Wild and Scenic Rivers (WSRs), would be designated or recommended in this RMP for BLM-managed lands within the planning area, and lands would remain unclassified for off-highway vehicles (OHVs) and visual resources. In general, most activities would be analyzed on a case-by-case basis and few uses would be limited or excluded as long as their actions were consistent with State and Federal laws. Oil, gas, locatable mineral activities, and other permitted activities would be guided by requirements in specific Plans of Operations on a project-specific basis. The BLM publication, *Placer Mining in Alaska - A Guide to Mitigation and Reclamation (BLM 1989)*, is incorporated by reference for Required Operating Procedures for Locatable Minerals.

2. Alternative B

Alternative B highlights actions and management that would facilitate resource development. All BLM unencumbered lands would be open to Leasable and Locatable Mineral exploration and development unless they were withdrawn under some authority other than ANCSA 17(d)(1) (e.g. Military withdrawal, FERC withdrawal). The latter comprise withdrawals of approximately 3,999 acres. Selected lands whose selection is relinquished or rejected would also be open to mineral exploration and development. All ANCSA 17(d)(1) withdrawals would be revoked, allowing increased potential for mineral exploration and development. The BLM-managed lands within the planning area would be designated as “open” to OHV use. No SRMAs would be identified. In all areas, the focus would be on management of permits. As with Alternative A, no Special Management Areas (SMAs) would be designated and visual resources would be managed as Visual Resource Management (VRM) Class IV. Oil, gas, locatable mineral activities and other permitted activities would be guided by requirements in specific Plans of Operations on a project-specific basis.

3. Alternative C

Alternative C emphasizes actions and management that protect and enhance renewable resources, archaeological, and paleontological values. Oil and gas leasing and mineral exploration and development would be more constrained than in Alternatives B or D, and where Areas of Critical Environmental Concern (ACEC) are proposed, mineral materials exploration and extraction would be excluded to protect important resources. Two ACECs, the Bristol Bay ACEC and the Carter Spit ACEC, would be established, plans developed for the areas, and specific measures adopted to protect or enhance values within these areas. All BLM-managed lands within the planning area would have a “limited” OHV

designation, allowing for limitations on OHV activities to protect habitat, soil and vegetation, cultural resources, and recreation experiences. No SRMAs would be identified. In all areas, the focus would be on management of permits. ANCSA 17(d)(1) withdrawals would be maintained as an interim measure at locations where proposed Wild and Scenic river segments are located until Congress has had an opportunity to act on the proposals, in order to protect or maintain resource values. Three river segments, a portion of the Alagnak River, and portions of the Goodnews River mainstem and Goodnews River Middle Fork would be recommended for WSR designation. Portions of these rivers recommended for a Wild River designation would be managed for VRM Class III, the proposed ACECs would be managed as VRM Class III, and most of the remainder of the BLM-managed lands within the planning area would be managed as VRM Class IV. Resources would be protected through Stipulations, Required Operating Procedures, and project-specific requirements.

4. Alternative D

Alternative D provides a balance of protection, use, and enhancement of resources. ANCSA 17(d)(1) withdrawals would be revoked, and the majority of unencumbered lands and any selected lands whose selection is relinquished or rejected, would be open to oil and gas leasing and development subject to seasonal or other constraints, and to mineral location. Approximately 3,999 acres would continue to be withdrawn under withdrawals other than ANCSA 17(d)(1). One ACEC would be established, the Carter Spit ACEC. Plans would be developed, and specific measures adopted through Stipulations, Required Operating Procedures, and project-specific requirements, to protect values within these areas. The ACEC would be closed to Salable Mineral entry. No WSRs would be recommended. Specified lands in the Goodnews Bay and Bristol Bay areas would be managed up to one-half mile from established winter trail or road systems at VRM Class III (Table 2.4). BLM lands in the full visible foreground up to one mile from the boundaries of CSUs would be managed at VRM Level III. The proposed ACEC would be managed at VRM Class III, and all other BLM lands would be managed at VRM Class IV. All BLM-managed lands within the planning area would have a “limited” OHV designation, allowing for limitations to be placed on OHV use to protect habitat, soil and vegetation resources, and/or recreation experiences. As with Alternative C, resources would be protected through Stipulations, Required Operating Procedures, and project-specific requirements.

5. BLM Preferred Alternative

Alternative D was selected as the preferred Alternative based on examination of the following factors:

- Balance of use and protection of resources.
- Extent of the environmental impacts.

This Alternative was chosen because it best resolves the major issues while providing for common ground among conflicting opinions. It also provides for multiple use of BLM-managed lands in a sustainable fashion. Alternative D provides the best balance of resource protection and use within legal constraints.

F. Environmental Consequences

Selection of Alternative A, the No Action Alternative, would maintain the current rate of progress in protecting resource values and in resource development. It would allow for use levels to mostly continue at current levels in the same places in the planning area, with adjustments required in order to mitigate resource concerns in compliance with existing laws and regulations. ANCSA 17(d)(1) would be retained, precluding all Leasable Mineral exploration and development and most Locatable Mineral exploration and development, and the effects of those activities. With no Off-highway vehicle designations or weight limits, OHV activity could be the source of some impacts to vegetation, soil, and water.

Alternative B would allow for maximum resource development with the fewest constraints. This Alternative would result in greater impacts on the physical and biological environment than would implementation of Alternative C or D. Effects of Leasable Mineral exploration and development would be the greatest under this Alternative, but according to the Reasonable Foreseeable Development Scenario, would be limited to the Koggiling Creek block of BLM-administered land. Effects of Locatable Mineral exploration and development would most likely occur in the Goodnews block due to renewal of historic placer mining and exploration for lode mining; however, the Klutuk Creek block could also be affected by placer or lode mining exploration. Cumulative effects from mining and infrastructure developments in the planning area but outside of BLM-administered lands could occur during the life of this plan. Impacts could occur from an "Open" OHV designation.

Alternative C would have the least potential to impact physical and biological resources from BLM actions. Uses would be the most restrictive. While ANCSA 17(d)(1) withdrawals would be revoked, the two proposed ACECs and three Wild and Scenic River designations would preclude Leasable and Locatable Mineral exploration and development on BLM lands in much of the planning area. A "Limited" OHV designation would restrict OHVs to designated trails, avoiding impacts to vegetation, soils, and water.

Alternative D would allow for increased levels of resource development while providing for site-specific protection of resources through designation of one Area of Critical Environmental Concern and through Required Operating Procedures, Stipulations, and project-specific requirements. This Alternative would provide as much opportunity for mineral development as Alternative B. Closures to mineral entry and location would be limited to small, site-specific areas or to specific seasons of the year. Alternative D provides a balance of protection and use of resources.

G. Public Involvement

Public involvement has been an integral part of the BLM's planning effort. During scoping, nine public meetings were held during March and April 2004. Public scoping meetings were held in Anchorage, Kenai, Homer, Dillingham, Iliamna, New Stuyahok, Aleknagik, King Salmon, and Naknek. Newsletters have been mailed to update interested parties on the progress of the Planning Team and stages of the planning process. In addition, numerous briefings were held with various groups and organizations during the preparation of the Draft RMP/EIS. The BLM also invited all Native villages in the area for government-to-government consultation during the course of the process. Public involvement is described in more detail in Chapter V.

The comment period on the Bay Draft RMP/EIS will extend for 90 days following publication of the Environmental Protection Agency's Notice of Availability in the Federal Register. After 90 days, comments will be evaluated. Substantive comments could lead to changes in one or more of the Alternatives, or changes in the analysis of environmental effects. A proposed RMP and Final EIS will then be completed and released. If protests are received on the Proposed RMP/Final EIS, they will be reviewed and addressed by the Director of the BLM before a Record of Decision and Approved Plan are released.

This page intentionally left blank.

Chapter I: Introduction

A. Background	2
B. Purpose and Need for the Plan	2
C. Description of the Planning Area.....	3
1. Land Ownership and Administration	3
2. Geographic and Social Setting	5
D. Planning Blocks.....	11
E. Issues and Management Concerns Identified During Scoping	11
1. Issues Addressed	12
2. Issues Considered But Not Further Analyzed	14
F. Planning Criteria and Legislative Constraints.....	18
G. The Planning Process	19
1. Policy	20
2. Relationship to BLM Policies, Plans, and Programs	22
3. Forms of Public and Intergovernmental Involvement.....	23
H. Organization of the Bay Resource Management Plan/Environmental Impact Statement	26

Chapter I: Introduction

A. Background

On December 6, 2004, the Bureau of Land Management (BLM) issued a Notice of Intent in the Federal Register to prepare a Resource Management Plan (RMP) and associated Environmental Impact Statement (EIS) for lands administered by the Anchorage Field Office. As defined by the Federal Land Policy and Management Act (FLPMA) of 1976, as amended, public lands are those Federally-owned lands and interests in lands that are administered by the Secretary of the Interior, specifically through the BLM. This includes lands selected, but not yet conveyed, to the State of Alaska and Native corporations and villages. This chapter establishes the purpose and need for the Bay Resource Management Plan (RMP) and Environmental Impact Statement (EIS). It also contains information about the Bureau of Land Management's (BLM) RMP planning process.

The Anchorage Field Office of the Bureau of Land Management (BLM) is preparing the Bay Resource Management Plan/Environmental Impact Statement to provide a comprehensive framework for managing and allocating uses of the public lands and resources within the Bristol Bay and Goodnews Bay areas of southwest Alaska. A new Resource Management Plan (RMP) is necessary to comply with the Federal Land Policy and Management Act and 43 CFR 1600, to address lands within the Bay planning area not previously covered by a plan, to implement new programs and regulations, and to address any new issues that evolved since the Southwest Management Framework Plan (MFP) was approved in 1981. The RMP will address resource management concerns for which new standards exist, for example Off-Highway Vehicle (OHV) designations. It would also provide direction for site-specific activity planning and implementation of specific tasks that would occur in the future should specific Alternatives be selected, for example, an Area of Critical Environmental Concern and related Habitat Management Plan.

The Federal Land Policy and Management Act of 1976 (FLPMA), as amended, provides the authority for the BLM to conduct land use planning on public lands. In particular, Section 202 (a) requires the Secretary of the Interior, with public involvement, to develop, maintain, and when appropriate, revise land use plans that provide for the use of the public lands by tracts or areas. Implementing regulations are contained in the Code of Federal Regulations, at 43 CFR 1600. BLM Manual 1601 Land Use Planning, and the BLM Land Use Planning Handbook (H-1601-1) provide procedures and guidance for the planning process.

Preparation of an RMP/EIS is required before taking specific resource management actions or pursuing additional work planning. BLM guidelines integrate the planning process with the requirements of the National Environmental Policy Act (NEPA) (1969). This document provides an analysis of management Alternatives developed in Chapter 2 for the Bay planning area, and helps to set the stage for informed decision making for future management actions. The overall organization of this document is outlined in Section H.

B. Purpose and Need for the Plan

The Bay RMP will provide site-specific management guidance on approximately 1,176,269 acres of unencumbered BLM-administered land, and any of the 1,327,671 acres of State-selected or Native-selected lands that remain under BLM jurisdiction until they are conveyed. After all conveyances take place, some selected lands may remain under BLM jurisdiction as BLM unencumbered lands due to over-selection, rejection or relinquishment by the State and/or Native corporations. After the RMP is adopted, Implementation Plans will be written and the approved management decisions will be implemented. Currently, the Southwest MFP, completed in 1981, guides the use of the portion of these lands that lie within the Goodnews Block. Of the seven planning blocks of BLM land that were the basis of the 1981

Southwest MFP, only the Goodnews Block of BLM-administered lands has become part of the current Bay planning area. Ultimately, the new Bay RMP will supersede that portion of the existing MFP that addresses the Goodnews Block. Since approval of the MFP in 1981, new regulations and policies have created additional considerations that affect the management of public lands. In addition, new issues and concerns have arisen over the past 20 years. Consequently, some of the decisions in the MFP are no longer valid or have been superseded by requirements that did not exist when the MFP was prepared. These new issues and changes in management policy drive the need for an inclusive, comprehensive plan that provides clear direction to both the BLM and the public.

C. Description of the Planning Area

1. Land Ownership and Administration

Figure 1.1 shows the location of the planning area within the State of Alaska and provides the varying ownership and conveyance status within the planning area, for purposes of this draft, as it existed on March 15, 2006. Of the approximately 22,601,183 acres within the planning area, decisions in the RMP/EIS will apply to 2,551,608 acres, as described below and as shown in Table 1.1. When conveyances are complete in 2010, approximately 1,197,688 acres, or approximately 5% of the total acreage in the Bay planning area, are expected to remain under BLM management.

BLM - These are lands that will most likely be retained in long-term Federal ownership. These lands, which are referred to as “unencumbered,” constitute approximately 1,197,688 acres or 5% of the planning area. They are not selected by the State or by Native corporations or villages.

State-selected - These are previously unappropriated and unreserved public lands that were selected by the State of Alaska as part of the Alaska Statehood Act of 1958 and the Alaska National Interest Lands Conservation Act (ANILCA) of 1980. Until conveyance, State-selected lands outside of National Park system lands or National Wildlife refuges will continue to be managed by the BLM. ANILCA allowed for overselection by the State of up to 25% of the entitlement (sec. 906[f]). Therefore, some State-selected lands will eventually be retained in long-term Federal ownership. State-selected lands constitute approximately 875,620 acres or 4% of the planning area.

Native-selected - The Alaska Native Claims Settlement Act (ANCSA) of 1971 gave Alaska Natives an entitlement of 44 million acres to be selected from a pool of public lands specifically defined and withdrawn by the Act for that purpose. Some ANCSA corporations filed selections in excess of their entitlements. Similar to that of overselections by the State, some of the Native-selected lands will not be conveyed and will be retained in Federal ownership. Native-selected lands constitute approximately 437,729 acres or 2% of the planning area.

Dual-selected - These are lands that have been selected by both the State and Native corporations. Because of overselection, some of these lands could be retained in long-term Federal ownership. Dual-selected lands constitute approximately 297,573 acres or 1% of the planning area.

Mineral estate - Alaska is a “split estate” property rights state in which there can be two distinct owners of a given parcel of land, the surface owner and the sub-surface owner. Federal split-estate lands are those on which the surface of the land has been patented, that is, transferred to private ownership, while the mineral interests are retained by the United States. Surface property owners, for example, include home owners and businesses. The rights of a surface owner generally do not include ownership of mineral resources such as oil, natural gas or coal. Under the appropriate provisions and authorities of the Mineral Leasing Act of 1920, individuals and companies can prospect for and develop coal, petroleum, natural gas and other minerals reserved by the Federal government. All subsurface mineral estate lying beneath BLM lands is managed by the BLM. State and Native selections segregate the land and keep it closed to mineral entry, except on pre-existing, valid Federal mining claims (locatable minerals) and issue of

mineral material permits with the concurrence of the selecting entity (salable mineral materials). Conveyances made under ANCSA and the Statehood Act include the mineral estate. In some cases, subsurface mineral estate is reserved to the Federal government through conveyance of Native allotments. This reservation only occurs where information dictates that a particular mineral was prospectively valuable at the time of conveyance. Conveyances made under other land disposal laws, such as the Recreation and Public Purpose Act, do not include the mineral estate and it remains under BLM management when the surface is conveyed. Within the planning area, the BLM manages an estimated 40,000 acres of subsurface mineral estate where it does not manage the surface.

Military lands - These lands are under withdrawal to the military. If released and returned to BLM management during the life of the plan, direction contained in the RMP/EIS would apply. Military lands constitute one-tenth of one percent of the planning area.

Table 1.1. Land Status within the Bay Planning Area

Land Category	Acres	Percent of the Planning Area
BLM managed lands		
BLM public lands (unencumbered)*	1,197,688	5.3%
State-selected**	875,620	3.9%
Native-selected	437,729	1.9%
Dual-selected***	297,573	***
Subsurface	40,571	0.2%
BLM-managed lands subtotal	2,551,608	11.3%
National Park Service managed lands	4,041,661	17.9%
U.S. Fish and Wildlife Service managed lands	4,080,681	18.0%
Military	14,238	0.1%
State of Alaska	9,132,834	40.4%
Private****	2,780,161	12.3%
Total lands within the planning area	22,601,183	100.0%

*Includes a portion of the Neacola Block, in the northeasternmost corner of the planning area, comprising 21,419 acres, which was addressed in the Ring of Fire RMP/EIS and will not be addressed in this plan.

**State-selected lands according to BLM Land Status.

*** Intersection of State priority selection with Native selected lands (according to BLM Land Status). Dual-selected acres are already included in the State-selected and Native-Selected totals, and are not included in the total lands within the planning area acreage.

****Private lands include ANCSA lands, Native allotments, and all other privately owned lands. The vast majority of this acreage is comprised of Native corporation land.

Lands within the planning area that will not be covered by the RMP/EIS:

State of Alaska lands - These are lands that have already been conveyed to the State of Alaska. These lands constitute approximately 40% of the planning area.

Native lands - These are lands already conveyed to village and regional Native corporations and are now private lands. These lands constitute approximately 12% of the planning area, and are included with other private lands in Table 1.1.

National Park Service lands - These are lands within Lake Clark National Park and Preserve, Katmai National Park and Preserve, and the Alagnak Wild River. These lands constitute approximately 18% of the planning area.

U.S. Fish and Wildlife Service lands - These are lands managed by the U.S. Fish and Wildlife Service within the Yukon-Kuskokwim Delta National Wildlife Refuge, the Alaska Maritime National Wildlife Refuge, the Togiak National Wildlife Refuge, and the Alaska Peninsula/Becharof National Wildlife Refuge. These lands constitute approximately 18% of the planning area.

Private lands - these lands are privately owned, aside from Native corporations or villages and include Native allotments and other private land. They are included with Native lands to comprise approximately 12% of the planning area.

2. Geographic and Social Setting

The Bay planning area includes lands adjacent to Bristol, Goodnews, and Jacksmith bays, and extends northerly to the Kanektok River. It includes the headwaters of the Togiak, Tikchik, King Salmon, Nushagak, Mulchatna, Kvichak-Alagnak, and Naknek river drainages. It also includes the east side of Iliamna Lake and Kakhonak Lake, the western portion of the Alaska Range and the Aleutian Range, and the upper portions of the Alaska Peninsula north of Becharof Lake and Egegik Bay (Figure 1.1). This region consists primarily of broad, level to rolling upland tundra-covered river basins (Figure 1.1). Residents of the Bay planning area are located in 25 villages. The planning area lies within the boundaries of three organized boroughs, Bethel, Bristol Bay, and Lake and Peninsula, and includes land within three ANCSA regional corporation boundaries.

What actions produced the major land ownership patterns in the Bay planning area?

The following actions removed large tracts of lands from BLM management and created the major outlines of today's land ownership in the planning area.

Early Withdrawals

Katmai National Monument, September 24, 1918, by presidential proclamation.

A small portion of what is today the Togiak NWR south of Goodnews was withdrawn as a Refuge prior to ANILCA; Cape Newenham NWR, Clarence Rhode NWR, Hazen Bay NWR and Nunivak Island NWR were also previously withdrawn and became parts of the Yukon Delta NWR at ANILCA.

Land in the Bay planning area that is today parks and refuges was being managed by the Bureau of Land Management as part of the public domain.

Statehood Act

Sometime after Alaska achieved statehood in 1959, the State selected large tracts of land administered by the Federal government.

ANCSA - 1971. Native corporations selected large tracts of land administered by the Federal government.

Alaska National Interest Land Conservation Act (ANILCA) - Signed December 2, 1980, expanded Katmai National Monument to include Wilderness, National Park, and Preserve. Lake Clark National Park and Preserve was established December 2, 1980.

Alaska National Interest Lands Conservation Act (ANILCA) established Alaska Peninsula National Wildlife Refuge and Becharof National Wildlife Refuge in 1980.

Wood-Tikchik State Park was also created in 1978 to protect fish and wildlife breeding areas and support systems and to preserve continued subsistence and recreational activities in a wilderness setting.

The region is served by three Regional ANCSA corporations, Calista, Incorporated, Ltd., Bristol Bay Native Corporation, and Cook Inlet Region, Incorporated. The Bay planning area encompasses one of the most traditional subsistence regions in Alaska. Besides the subsistence economy commercial fishing, commercial guiding, and sports hunting and fishing are the primary pursuits in the planning area.

Natural gas, coal, and coal bed methane may be present in the region based on data collected from exploratory wells drilled on the Alaska Peninsula and offshore in the Bristol Bay basin. A few families have windmills, but most of the energy used to generate heat and electricity is derived from diesel fuel and heating oil that is barged to the region. Transportation is predominantly by air or water. The planning area contains approximately 92 miles of secondary roads, none of which are located on BLM unencumbered lands. Access to public lands is by boat, airplane, or snowmachine, though a few areas are accessible by automobile or off-road vehicle (OHV).

Insert Figure 1.1. The Bay Planning Area. (11x17 fold-in)



Figure 1.2. Alagnak River, View South.

In addition to BLM-administered lands, the planning area includes lands administered by the State of Alaska (State), Native corporations, the National Park Service (NPS), U.S. Fish and Wildlife Service (FWS) and private land owners (Figure 1.1; Table 1.1).



Figure 1.3. Jacksmith Creek, Goodnews Block.



Figure 1.4. Bear Creek, Kvichak Block.

D. Planning Blocks

In order to more easily discuss specific locales within the Bay planning area, and to provide for some consistency among discussions within the RMP/EIS, the different blocks of unencumbered BLM land have been named. Figure 1.1 provides the names.

Due to the Alaska Land Transfer Acceleration Act, Public Law 108-45, the land conveyance process is currently a dynamic one, creating changes in land ownership daily. The existing land ownership situation on a particular date needed to be used as the basis for the proposals in this resource management plan. For the purposes of this Draft RMP/EIS, the land status as it existed on March 15, 2006 is the baseline for the plan. Updated maps and figures will be included in the Final RMP/EIS. Existing questions or issues surrounding selected lands have been taken into consideration and addressed in the plan.

E. Issues and Management Concerns Identified During Scoping

The Bay Scoping Report was issued on May 30, 2005, and is available at the BLM website for the Bay RMP/EIS at <http://www.blm.gov/ak/ado/BayRMP01.html>, or a hard copy is available from BLM AFO upon request (BLM 2005). Scoping is an open public process for determining the range of issues to be analyzed in the RMP/EIS, and for identifying important issues related to the Bay planning area. Internal scoping meetings were held, meetings were arranged with other public agencies, and a series of five public meetings were conducted in order to provide the public and all interested entities with information about the project and to identify issues and concerns that should be addressed in the RMP/EIS and information that should be used to select the best overall Alternative to meet project objectives. In

addition to public scoping meetings, Government-to-Government consultations were carried out in six villages, and presentations were given to a wide variety of interested public upon request. In addition, comments were received by letter and through the Bay planning website.

Comments received fell into three categories: (1) Issues and concerns that could be addressed in this planning document; (2) Issues that relate to BLM-administered lands but are beyond the scope of this RMP/EIS; (3) Issues that relate to lands administered by other agencies. The first two will be discussed here. In regard to the third, issues that relate to lands administered by other agencies or entities, the comments were forwarded to the relevant agencies in formal letters, and letters were also sent to the commenters informing them of our actions.

1. Issues Addressed

Public and internal scoping identified several issues and management concerns that are being addressed in the Bay RMP/EIS. They are:

Issue Statement 1: Which lands would be made available for oil and gas and hardrock mineral development, and how should these lands be managed to sustain natural resources?

The plan makes recommendations for the location and number of acres available for Fluid Mineral leasing, Locatable Mineral entry, and the sale of Salable Minerals, and provides Required Operating Procedures, Oil and Gas Stipulations, and guidelines for these activities (Chapter II).

Withdrawal orders issued under the authority of Section 17(d)(1) of ANCSA withdrew substantial acreage within the planning area from all forms of appropriation under the public land laws, including mining and mineral leasing laws. These withdrawal orders were intended to be temporary, until conveyance of the majority of State and Native corporation selected lands had taken place and a planning process for BLM lands could take place. They close the land to mineral development and provide temporary protection of resources, but can restrict BLM from responding to the public to fully realize the multiple-use potential for lands it manages.

BLM would propose revoking the ANCSA 17(d)(1) withdrawals on BLM lands in the Bay planning area. Where necessary for conservation purposes, they would be replaced by other appropriate management strategies.

The Bristol Bay blocks of BLM land have a wide variety of world-class renewable and non-renewable resources, including much-utilized salmon, caribou, moose, and bear, the potential for the presence of rich cultural and paleontological resources, as well as a potential for oil, gas, and metalliferous mineral development. These lands are the focus of current multiple uses, including subsistence hunting, fishing, and gathering, sport hunting and fishing, and commercial fishing. Members of the public have expressed concern that these resource values be retained, including that of a properly functioning ecosystem. At the same time there is an interest in developing mineral resources and attendant infrastructure, creating the possibility of user conflict.

The Goodnews block is remarkable for its unique coastal beaches, wetlands and marshes, habitat for migrating waterfowl and shorebirds, and wide variety of unique vegetation types. Ahklun Mountains habitat is non-forested alpine tundra with willow-lined drainages and tall willow and alder shrub thickets skirting the bases of the hills and occurring in scattered patches throughout (Figure 1.3). Salmon and freshwater fish are available in its rivers and streams. It is a focus of subsistence activities for this region's villages. A number of known historic sites are present on BLM lands in this block. BLM lands in this block have moderate to high potential for metalliferous minerals, and mining has taken place in the area historically. There is a concern that there is potential for user conflict.

These issues are addressed in the program Goals and Objectives in Chapter II, in the Alternatives, and in the Required Operating Procedures and Stipulations found in Chapter II.

Issue Statement 2: What land tenure adjustments would allow BLM to consolidate discontinuous blocks of land to benefit land management for the people of the United States?

The pattern of State and Native corporation selections and conveyances leaves a number of small, scattered tracts of BLM unencumbered lands to administer, creating management difficulties for BLM, for subsistence, sport, and commercial users, and for adjacent landowners. The situation also complicates permitting processes for those who want to conduct an activity across administrative lines. Additionally, it has left a number of large, discontinuous blocks of land that BLM wishes to consolidate.

After settling all of the State and Native corporation conveyances in the planning area, BLM would prefer to use the smaller, isolated blocks for exchange in order to consolidate its long-term holdings.

Issue Statement 3: How will access be provided to BLM managed lands for various purposes including recreation, subsistence activities, and general enjoyment of public lands, while protecting natural and cultural resources?

The public expressed concern about the compatibility of new Rights-of-Way with other interests. Avoidance areas for Land Use Authorizations and Rights-of-Way would be identified in conjunction with the proposed Bristol Bay and Carter Spit ACECs in this plan. Because BLM currently has no development project proposals for BLM lands in the Bay planning area, other avoidance areas would be identified on a case-by-case basis.

Members of the public expressed a desire to be informed about access to public lands via 17(b) easements. Existing 17(b) easements are identified and described in this plan. The summary table in Appendix E provides identification of each 17(b) easement by the Easement Identification Number (EIN), which is tied to an easement quad file in our official record. The digital representations on the map (Figure 3.50) will also identify the easements by EIN number.

BLM will make recommendations in this RMP/EIS regarding how recreation opportunities on BLM lands will be managed, and will provide recommendations to establish Visual Resource Management and Recreation Opportunity Spectrum classes.

Commenters expressed the expectation that user conflicts would be expressly addressed in the RMP. Concerns expressed include:

- competition between subsistence hunters and sport hunters
- analysis of Special Recreation Permit program
- regulating aircraft access to BLM lands
- enforcement of regulations on BLM lands
- signing BLM lands

Both State and Federal statutes provide a priority for subsistence use of wildlife in Alaska. State regulations apply statewide to all subsistence activities unless otherwise superseded by Federal regulations. The Federal Subsistence Board regulates subsistence harvests on unencumbered BLM-managed lands which are not selected by the State of Alaska or Native corporations for rural residents while the State Division of Wildlife Conservation continues to have the responsibility to manage wildlife for all other users on all lands within Alaska. Withdrawals and mining claims are qualified Federal public lands and so are under the authority of the Federal Subsistence Board. Potential subsistence management conflicts and potential management resolutions with respect to harvesting wildlife do not reside with the BLM but rather with the State Board of Game and the Federal Subsistence Board.

To help carry out the responsibility for subsistence management locally, the BLM Anchorage Field Office performs reviews of permit use, occupancy, and land use to evaluate the effect of such use on subsistence uses and needs. A Section 810 (ANILCA) Compliance/Clearance Determination of Need is

performed on all environmental assessments before any use authorization on BLM-managed and interim-managed lands is determined.

Prior to the Anchorage Field Office issuing any permits or use authorizations proposed on State-selected or Native-selected lands, the written views of the State, regions, or villages are obtained and considered. On State-selected lands, no processing of a permit or use authorization will occur without State concurrence. An analysis and detailed information about the Anchorage Field Office Special Recreation Permit program is addressed in Chapter III, in Resource Uses, and in the Stipulations and Required Operating Procedures for each permit are found in Chapter II.

Enforcement of Bureau regulations and policies on unencumbered BLM-administered lands, and on any State-selected or Native-selected lands that remain under BLM jurisdiction until they are conveyed, will be performed by AFO Recreation Program staff, BLM Law Enforcement rangers, field staff located in Nome and Dillingham, and by other AFO specialists conducting field examinations and permit compliance. In addition, monitoring and enforcement will also continue to be performed by coordinating and collaborating with neighboring land managers and contacts located in rural communities.

Because the land conveyance process is a dynamic one that is creating changes in land ownership daily, the implementation of placing signs that identify BLM lands and boundaries, while a very good idea, is not practical at this time. Signing BLM lands at popular roads and trails entering BLM unencumbered lands should occur when the majority of State-selected and Native-selected lands are conveyed. However, signing, especially to prevent damage, for example to trails or to wetland/riparian areas, could be initiated in areas where BLM unencumbered lands occur.

Issue Statement 4: Should eligible rivers be recommended for inclusion in the National Wild Rivers System?

Twenty eight rivers, river segments, streams, and lakes were nominated by the public during scoping to be evaluated for their eligibility to be nominated as Wild and Scenic Rivers. The details regarding these water bodies can be found in Appendix A, Bodies of Water Evaluated for Wild and Scenic River Eligibility.

The National Wild and Scenic River Act of 1968 was enacted to preserve the free flowing condition, water quality, and outstandingly remarkable values of select rivers. A four-step process is required before a river can be included in the National Wild and Scenic River System. The criteria used for ranking a river are based on eligibility, classification, suitability, and a further study analysis by Congress for authorized rivers.

The first step is an evaluation of a river's eligibility. In order for a river to be eligible, it must be both free-flowing and possess one or more outstandingly remarkable values (ORVs). An ORV is defined as a unique, rare or exemplary feature that is significant at a comparative regional or national scale. If a river is found eligible it is then analyzed as to its current level of development. Next, a recommendation is made for assigning one or more of three classifications: wild, scenic, and/or recreational. The final step is the suitability analysis which provides the basis for determining whether to recommend one or more rivers as part of the National System as an Alternative in the RMP/EIS. The RMP may recommend select rivers or river segments within the Bay planning area that have been determined to be eligible for nomination to the National Wild and Scenic Rivers System; however, only Congress may designate rivers to the System.

2. Issues Considered But Not Further Analyzed

The following topics were raised during public scoping but will not be addressed in this RMP process. Some of these issues are beyond the scope of the plan, while in other cases it has already been determined through BLM policy or planning criteria that the topic will not be addressed. The issues and concerns that will not be analyzed further are summarized below.

a) Wilderness Inventory

In 1964, Congress enacted the Wilderness Act “...to assure that an increasing population...does not occupy and modify all areas within the United States..., leaving no lands designated for preservation and protection in their natural condition.” The statutory criteria used to identify lands with wilderness character have been in effect since passage of the Wilderness Act over 40 years ago.

Alaska lands were inventoried, reviewed, and studied for their wilderness values under the Wilderness Act criteria beginning in 1971 when Congress enacted ANCSA. For eight years thereafter, the Department evaluated national parks, forests, wildlife refuges, wild and scenic rivers, and other lands for potential designation as wilderness.

Subsequently Congress passed ANILCA, which preserved more than 150 million acres in specially protected conservation units. This represents more than 40% of the land area of the State of Alaska, and about 60% of the Federal land in Alaska. Pursuant to ANILCA, more than one third of the lands preserved in conservation units, or 57 million acres, were formally designated as wilderness.

In recognition of the sensitive and protracted negotiations that resulted in the designation of large amounts of wilderness and the limitations wilderness designations impose on the multiple use of those lands, Congress did not mandate further wilderness inventory, review, or study of BLM lands in Alaska with one exception, lands not in the planning area.

Rather than mandating further wilderness inventory, review, or study, Congress granted the Secretary the discretion to undertake additional wilderness study of BLM lands but, per section 1326 (b) of ANILCA, precluded further study of any Department lands in the State of Alaska “...for the single purpose of considering the establishment of a conservation system unit, national recreation area, national conservation area, or for related or similar purposes” absent Congressional direction.

Shortly after the passage of ANILCA, the Secretary exercised this discretion to adopt a policy to not conduct further wilderness inventory, review, or study (outside of ANILCA) as part of the BLM planning process in Alaska. This policy was in effect for approximately 20 years. On January 18, 2001, Secretary Babbitt adopted another approach that deviated from this long-term policy.

Clearly, Congress may direct the BLM to undertake further wilderness study in Alaska in future legislation. However, in the absence of further legislation, Congress has granted the Secretary the discretion to determine whether further wilderness inventory, review and study of BLM lands in Alaska is warranted. Secretary Gail Norton, in a letter dated April 11, 2003, instructed the BLM to “...consider specific wilderness study proposals in Alaska, as part of any new or revised resource management planning effort, if the proposals have broad support among the State and Federal elected officials representing Alaska. Absent this broad support, wilderness should not be considered in these resource management plans (USDI 2003).”

The State of Alaska has asked the BLM to adhere to this directive in this RMP because the State feels that at this time it is clear that there is a lack of broad support for further wilderness proposals (ADNR 2004). Therefore, wilderness inventory was not conducted as part of this planning process and wilderness areas are not considered in any of the Alternatives.

There are no BLM-managed wilderness areas or wilderness study areas within the planning area. There are areas that provide opportunities for a primitive recreation experience, solitude, and naturalness. These areas are described in Chapter III. These will not be recommended for Congressional designation as wilderness areas.

b) Subsistence

Many comments were received on subsistence. Many people requested that subsistence be made a priority in the plan and on BLM lands, that subsistence resources and the subsistence way of life be protected, that important subsistence use areas be identified, and that impacts on subsistence from other uses be monitored. Iliamna residents noted that they were seeing a decline in moose, caribou, and salmon populations. Commenters placed a great deal of emphasis on the salmon fisheries and the importance of maintaining the health of the Bay area rivers that provide salmon spawning habitat. Development of infrastructure (i.e. connecting roads) was seen as being both positive for access to subsistence resources and as a potential negative source of user conflict.

The RMP will not change administration of the Federal subsistence program by the Federal Subsistence Board. The RMP will, however, consider impacts to subsistence activities, stipulations to protect subsistence resources, access for subsistence, and management of fish and wildlife habitat to support subsistence species. Appendix B provides the Section 810 (ANILCA) analysis.

c) Fish and Wildlife, Habitat, and Regulations

The majority of comments received during scoping addressed fish and wildlife as they relate to subsistence, sport hunting and fishing, and commercial activities involving fish and wildlife. Comments pointed out the unique nature of the Bay region with regard to fish and wildlife populations and the natural environment. Commenters urged preservation of the fish and wildlife inhabiting the area, and protection of the habitats within the Bay planning area. Commenters highlighted the potential clash between maintenance and use of these resources and development of mineral resources and infrastructure in the Bay area.

The BLM received many comments relating to habitat management for important subsistence species such as caribou and moose, and this issue proved to be one of the most important themes at all of the public meetings held in the region, as well as in written comments received. Several comments noted that the planning area includes important habitats and migration routes for moose and for the Nushagak and Mulchatna caribou herds. Twenty-five villages in and adjacent to the planning area depend on these resources. Comments reflected the serious concerns of subsistence and recreational users about various kinds of development on BLM lands, including development of infrastructure to support industry. Commenters recommended an ecosystem management approach to habitat management.

Commenters recognized the world-class status of the river systems within the Bay planning area as spawning and rearing habitat for the five species of salmon and for other anadromous and freshwater fish species. Salmon are the single most important species for subsistence users. There is a great deal of concern that this habitat be retained intact. Specific rivers and streams were identified for their importance (Table 1.1).

Commenters were interested in the BLM working with others to discuss enhancing moose and caribou populations, and carefully tracking wildlife populations. Commenters in the villages repeatedly mentioned the increased presence of wolves and bears near their villages, and the inroads those species were making in the moose and caribou populations. The BLM was encouraged to work with Togiak National Wildlife Refuge to adopt consistent conservation objectives to protect the Nushagak and Mulchatna caribou herds.

The RMP will not affect State and Federal hunting or fishing regulations, or predator control activities. While the BLM manages fish and wildlife habitat on BLM-administered lands, the Alaska Department of Fish and Game (ADF&G) manages fish and wildlife populations, harvest by recreational, commercial, and subsistence users on State lands, on selected lands, and on private lands, and the Federal Subsistence Board manages qualified Federal subsistence harvest of fish and wildlife populations on Federally-administered public lands and waters in Alaska. Changes in hunting and fishing regulations are controlled by the Boards of Game and Fish and the Federal Subsistence Board and are beyond the scope of this plan. BLM participates in the Federal Subsistence Board, and is a member of several fish and wildlife planning groups for the Bay planning area, including those addressing moose, the Mulchatna caribou herd, brown bear, salmon, migratory waterfowl, and shorebirds. Any actions that might affect hunting and

fishing will be coordinated with ADF&G consistent with 43 CFR Part 24, the Department of the Interior Fish and Wildlife Policy (which clarifies the Department's relationship with State fish and wildlife management agencies) and the Master Memorandum of Understanding between the agencies (Appendix G).

d) State of Alaska Administration of Guides, Outfitters, and Transporters

There were numerous comments about the State of Alaska's administration of guides, outfitters, and transporters. A State Commercial Services Board was recently reestablished to make recommendations to the State on how to better manage guides, outfitters, and transporters. BLM does not administer the State of Alaska program.

e) Special Status Species/Critical Habitat

Members of the public requested that BLM focus on identifying critical wetland and water habitat areas. Several commenters recommended that Kaskanak Creek be designated critical fish habitat, and critical habitat for moose, beaver, and migratory birds.

BLM manages fish and wildlife habitat on BLM lands, and can provide special attention to important habitat areas by using any of a number of planning tools. However, the term, "critical habitat" has legal connotations. It is the function of the U.S. Fish and Wildlife Service to formally make a determination of critical habitat in conjunction with the Federal List of Endangered and Threatened Wildlife. This is done under the auspices of the Endangered Species Act of 1973 (16 USC 1531-1544). A formal notice of the determination is printed in the Federal Register.

f) Implementation of the RMP

Public comments requested that BLM make clear in this RMP/EIS how it intends to implement proposed actions. The specifics of implementing this RMP/EIS will not be addressed in this plan, but will be addressed in a subsequent Bay Implementation Plan.

g) Fire

A few comments were received that addressed fire. Some concerned residents of the Bay planning area have noticed a warming and drying trend in the planning area during the past few years, a lowering of the water level in some rivers, a bark beetle infestation of certain trees, and an increase in conditions that may lead to greater incidence of wildfire in a region that has historically seen few natural fires due in part to the marine influence. Commenters requested that BLM be clear about the fire management plan for the BLM lands around villages in the Bay planning area, and how the fire management plan will be incorporated into the planning process. Commenters asked that the plan address fire, fire suppression zones, and fire management, including provisions for letting fires burn and for protecting or propagating wildlife habitat.

While the effects of fire have been analyzed to a certain degree in Chapter IV, Environmental Consequences, fire management planning decisions for BLM lands will be made through the existing process detailed in the Alaska Interagency Wildland Fire Management Plan (<http://fire.ak.blm.gov/content/planning/98aifmp.pdf>). All fire management requests for active fires on BLM lands will be made through the existing process.

h) Education and Interpretation

Commenters recommended educating people to the subsistence customs of the local people, including educating recreational users on local culture, to include game movement, hunting techniques, elimination

of wasteful practices, avoidance of water contamination from human waste, respect for private land and Native belief systems, and protection of historic and prehistoric archaeological sites.

Chapter III, Section F (beginning on page 3-305) and Appendix B (analysis of impacts to subsistence by the proposed Alternatives and subsistence use area maps) provide information on the subsistence customs and practices of the people in the Bay planning area, traditional subsistence hunting areas and hunting practices, and Native belief systems.

i) Co-Management

One comment expressed interest in co-management of lands and resources between BLM and the Tribes. While the administration of BLM lands remains under BLM management, land management issues will be addressed on a case-by-case basis in Government-to-Government consultations between the interested Tribal entity and BLM AFO. While Government-to-Government consultations can take place regarding any subject at any time, should a Tribal entity desire to have a formal agreement, AFO is willing to enter into a Memorandum of Agreement with any affected Tribe to provide a framework for Government-to-Government discussions.

j) Impacts to Subsistence Users of Activities Occurring on State or Private Lands.

Some comments that were outside the scope of the RMP included the impacts to subsistence users from lodges, guiding, and transporting activities being carried out on State lands, and the impacts on subsistence use from U.S. Air Force low flying aircraft. These issues will not be addressed in this RMP/EIS. However, the comments were forwarded to the appropriate agencies.

F. Planning Criteria and Legislative Constraints

FLPMA (1976) is the primary authority for BLM's management of public lands. This law provides fundamental policy by which public lands will be managed, and establishes provisions for land use planning, land acquisition and disposal, administration, range management, ROWs, designated management areas, and the repeal of certain laws and statutes. NEPA (1969) provides the basic national charter for environmental responsibility and requires the consideration and public availability of information regarding the environmental impacts of major Federal actions significantly affecting the quality of the human environment. In Alaska, ANCSA (1971) and ANILCA (1980) add to the legal framework for lands and realty issues, as well as access and subsistence issues.

Planning criteria are the standards, rules and guidelines that help to guide data collection, Alternative formulation, and Alternative selection in the RMP/EIS development process. In conjunction with the planning issues, planning criteria assure that the planning process is focused. The criteria also help guide the selection of the Final RMP and provide a basis for judging the responsiveness of the planning options.

The AFO uses the following planning criteria for the Bay planning effort:

- Opportunities for public participation will be made available and encouraged throughout the RMP/EIS process.
- Valid existing rights will be protected throughout the planning area.
- Subsistence uses will be considered and adverse impacts minimized in accordance with Section 801 of ANILCA.
- BLM will work cooperatively with the State and Federal agencies, Native corporations, Tribes, Municipal governments, and interested groups and individuals.

- Wildlife habitat management will be consistent with Alaska Department of Fish and Game (ADF&G) objectives and/or the Federal Subsistence Board requirements and mandates.
- The plan will be consistent with the standards and guidance set forth in FLPMA, NHPA, the Wild and Scenic Rivers Act, and other Federal laws, regulations, and policies required. The RMP/EIS will be prepared in compliance with Council on Environmental Quality (CEQ) regulations implementing NEPA, and will comply with BLM's planning regulations at 43 CFR 1600 and the BLM H-11601-1 Land Use Planning Handbook, Program-Specific and Resource-Specific Decision Guidance and supplemental program guidance Manual for ACECs and Fluid Minerals (BLM 2005).
- The plan will be consistent with the Alaska Land Health Standards.
- Land tenure adjustments, disposals and acquisitions will be analyzed when in the national interest. Land acquisition or disposal options will include land transfers, exchanges, and sales as allowed under FLPMA, the Recreation and Public Purposes Act (R&PP) (1954), and other laws. However, emphasis will be placed on exchanges of isolated parcels of unencumbered land for parcels that will help in consolidating existing discontinuous large blocks of BLM unencumbered land in the Bristol Bay area and the Goodnews Bay area.
- Plans and policies of adjacent Federal conservation system units, landowners and State and local governments will be considered, and the RMP/EIS decisions will be consistent with officially approved or adopted resource-related plans of other Federal, State, local and tribal governments to the extent those plans are consistent with Federal laws and regulations applicable to public lands. BLM's management of the subsurface estate in components of the National Wildlife Refuge and the National Park System will be consistent with the plans of the surface managers.
- Management of withdrawn lands will be consistent with the purpose for which the withdrawal was established.
- The plan will identify, designate, and protect special management areas such as Areas of Critical Environmental Concern (ACECs), Special Recreation Management Areas (SRMAs) and other special management designations. Management Alternatives will be developed and incorporated into the RMP/EIS.
- Management prescriptions will focus on the relative values of resources and not the combination of uses that will give the greatest economic return or economic output.
- The Visual Resource Management (VRM) class designations will be analyzed to reflect present conditions and future needs. Areas requiring modifications or restrictions for specific land uses to resolve conflicts will be identified.
- Planning will include the preservation, conservation, and enhancement of important historic, cultural, paleontological, and natural components of public land resources.
- Coordination will be maintained with Alaska Native entities to identify sites, areas, and objects important to their cultural and religious heritage.
- In accordance with the Endangered Species Act (ESA), BLM will undertake consultation with USFWS and the National Marine Fisheries Service (NMFS).
- Determinations of Wild and Scenic River eligibility and suitability will be made in accordance with Section 5(d) of the Wild and Scenic Rivers Act (WSRA) and BLM Manual 8351.
- Designations for Off-Highway Vehicles for all public lands within the planning area will be completed according to the regulations found in 43 CFR 8342.

G. The Planning Process

This Resource Management Plan is intended to be a flexible and adaptive management tool for managing public lands. Decisions in land use plans guide future land management actions and subsequent site-specific implementation decisions. These land use plan decisions establish goals and objectives for resource management (desired outcomes) and the measures needed to achieve these goals and objectives (management actions and allowable uses).

The RMP describes broad, multiple-use guidance for managing public lands and mineral estate administered by BLM. In Alaska this applies to unencumbered BLM lands that have not been selected by

the State or by Native corporations, as well as those that have been selected but have not yet been conveyed. RMP decisions are made on a broad scale and guide subsequent site-specific, day-to-day decisions.

Preparing an RMP is a prerequisite to taking specific resource management actions and pursuing additional planning. The plan provides future direction for site-specific activity planning. BLM will follow the RMP when initiating subsequent implementation actions and will monitor the consistency of these actions with direction laid out in the RMP.

In BLM, what is the relationship between a Resource Management Plan and an Environmental Impact Statement?

Section 202 of FLPMA requires carrying out comprehensive planning, while requirements in NEPA call for analyzing the impacts of Federal actions, including planning. A BLM Resource Management Plan is therefore developed in the context of an Environmental Impact Statement. Each of the Alternatives presented in Chapter 2 represents a different plan for the future management of BLM lands under its responsibility in the Bay planning area. These Alternatives also satisfy the requirements in NEPA that BLM consider alternative approaches to proposed Federal actions. The Record of Decision (ROD) that will be issued at the end of the planning process will provide the approved RMP that will guide BLM's management in the Bay Planning Area.

1. Policy

The following policies and legislation are outside the scope of the plan but may influence decisions or constrain Alternatives.

a) State of Alaska Selections

Under the Statehood Act, the State of Alaska has an entitlement to select Federal lands for conveyance to the State. Approximately 875,620 acres or 34% of all BLM-managed lands in the planning area are State-selected. ANCSA requires the conveyance of lands to Alaska Native corporations. Approximately 437,729 acres, or 17% of the BLM-managed lands in the planning area are Native-selected. Conveyance of State-selected and Native-selected lands within the planning area is ongoing. Implementation of planning decisions on selected lands may be delayed until conveyances are complete and final ownership is determined and will only apply to these lands if they remain in Federal Ownership. Other decisions may be precluded because the lands in question may ultimately pass from BLM management.

b) Coastal Zone Management

The Coastal Zone Management Act of 1972 as amended (PL 92-583), directs Federal agencies conducting activities within the coastal zone or that may affect any land or water use or natural resources of the coastal zone to conduct these activities in a manner that is consistent "to the maximum extent practicable" (to the fullest degree permitted by existing law [15 CFR Sec. 930.32]) with approved State management programs.

The Alaska Coastal Zone Management Act of 1977, as amended, and the subsequent Alaska Coastal Management Program and Final Environmental Impact Statement (1979) establish policy guidance and standards for review of projects within or potentially affecting Alaska's coastal zone. In addition, specific policies have been developed for activities and uses of coastal lands and water resources within regional coastal resource districts. Most incorporated cities, municipalities, and boroughs as well as

unincorporated areas (coastal resource service areas) within the coastal zone now have State-approved coastal management programs.

Although State and coastal district program policies guide consistency determinations, more restrictive Federal agency standards may be applied. Federal regulations state that when “Federal agency standards are more restrictive than standards or requirements contained in the State’s management program the Federal agency may continue to apply its stricter standards...” (15 CFR Sec. 930.39[d]).

Certain Federal actions may require a Federal Consistency Determination. The BLM will contact the ADNR Alaska Coastal Management Program for program applicability before beginning a project that may affect a coastal zone.

c) RS 2477 Routes

Under Revised Statute (RS) 2477, Congress granted a Right-of-Way for the construction of highways over unreserved public land. Under Alaska law, the grant could be accepted by either a positive act by the appropriate public authorities or by public use. “Highways” under State law include roads, trails, paths, and other common routes open to the public. Although RS 2477 was repealed in 1976, a savings clause preserved any existing RS 2477 Right-of-Way. The State of Alaska claims numerous Rights-of-Way across Federal land under RS 2477, including those identified in AS 19.30.400. The validity of all RS 2477 Rights-of-Way will be determined on a case-by-case basis and outside of this planning process.

Table 1.2. Steps in the BLM Planning Process

Step		Description
1	Identify Issues	Identify major problems, concerns, and opportunities associated with the management of public lands in the planning area. The public, BLM, and other agencies and entities identify issues. The planning process focuses on resolving the planning issues.
2	Develop Planning Criteria	Identify planning criteria which will guide development of the RMP and prevent the collection of unnecessary data.
3	Collect and Compile Inventory Data	Collate and collect environmental, social, economic, resource, and institutional data. In most cases, this process is limited to information needed to address the issues. The data required for land use planning decisions is usually broader than data required at the implementation level.
4	Analyze the Management Situation	Assess the current management situation. Identify the way lands and activities are currently managed in the planning area, describe conditions and trends across the planning area, identify problems and concerns resulting from the current management, and identify opportunities to manage these lands differently.
5	Formulate Alternatives	Formulate a reasonable range of Alternatives for managing resources in the planning area. Alternatives include a combination of current management and other alternatives that seek to resolve the major planning issues while emphasizing different management scenarios. Alternatives usually vary by the amount of resource production or protection that would be allowed, or in the emphasis of one program area over another.
6	Describe the Affected Environment; Evaluate Potential Effects	Describe the affected environment. Assess the physical, biological, economic, and social effects of implementing each Alternative in order to provide a comparative evaluation of impacts in compliance with CEQ regulations for implementing NEPA (40 CFR 1500).
7	Select Preferred Alternative	Based on the information resulting from the evaluation of effects, BLM identifies a Preferred Alternative. The Draft RMP/EIS is then prepared for printing and is distributed for public review and comment.
8	Select Proposed RMP	Following review and analysis of public comments on the Draft RMP/EIS, BLM makes adjustments as warranted and selects a proposed RMP, which along with the Final EIS is published. A final decision is made after a 60-day Governor's Consistency Review and a 30-day public protest period are complete. BLM then publishes the ROD and prepares the approved RMP.
9	Implement, Monitor and Evaluate	Implement the approved RMP. Collect and analyze resource condition and trend data to determine the effectiveness of the plan. Implementation of decisions requiring subsequent action is also monitored. Monitoring continues from the time the RMP is adopted until changing conditions require revision of the whole plan or any portion of it.

2. Relationship to BLM Policies, Plans, and Programs

BLM has developed a number of plans and Standards that relate to or govern management in the planning area. They are listed below and provide the broad picture of management considerations relevant to the planning area.

- Southwest Management Framework Plan (BLM 1981) (no amendments)
- Alaska Interagency Wildland Fire Management Plan (Alaska Department of Natural Resources et al. 1998)
- Land Use Plan Amendment for Wildland Fire and Fuels Management - Environmental Assessment (BLM 2004) Decision Record (BLM 2005)
- BLM's Alaska Statewide Land Health Standards (2004)
- In addition, this plan will comply with all applicable Federal Executive Orders, laws, and regulations.

3. Forms of Public and Intergovernmental Involvement

Planning is an inherently public process. BLM uses a number of methods to involve and work with members of the public, interest groups, and government entities.

Public involvement entails “The opportunity for participation by affected citizens in rule making, decision making, and planning with respect to the public lands, including public meetings or hearings...or advisory mechanisms, or other such procedures as may be necessary to provide public comment in a particular instance” (FLPMA, Section 103(d)).

Coordination, as required by FLPMA (Section 202(c)(9)), involves ongoing communication between BLM managers and State, local, and Tribal governments to ensure that BLM considers pertinent provisions of non-BLM plans in managing public lands; seeks to resolve inconsistencies between such plans; and provides ample opportunities for State, local, and Tribal government representatives to comment in the development of BLM's RMPs (43 CFR 1610.3-1). The CEQ regulations implementing NEPA further require timely coordination by Federal agencies in dealing with interagency issues and in avoiding duplication with Tribal, State, county, and local procedures (40 CFR 1510).

Consultation involves a formal effort to obtain the advice or opinion of another agency regarding an aspect of land use management for which that agency has particular expertise or responsibility, as required by statute or regulation.

Collaboration is a process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other lands. Collaboration mandates methods, not outcomes, and does not imply that all parties will achieve consensus.

a) Collaboration With Alaska Native Governments

EO 13175, Consultation and Coordination with Indian Tribal Government, signed by the President on November 6, 2000, and published November 9, 2000 (65 FR 67249), is intended to establish regular and meaningful consultation and collaboration between Federal agencies and Native tribal governments in the development of Federal regulatory practices that significantly or uniquely affect their communities. In preparing this RMP/EIS, BLM has initiated a Government-to-Government consultation process with affected Native communities.

b) Other Stakeholder Relationships

It is important to the success of the Bay RMP/EIS that key stakeholders and other parties potentially affected by the outcome of the RMP planning process are identified and involved in the planning process. Interested parties have been identified as having a concern in the project because of:

- Jurisdictional responsibilities and review.
- Proximity to the planning area.
- Use of the planning area.
- Expressed interest.

These stakeholders have been contacted and are included in the Bay mailing list. Those identified as having potential interest in the project include Federal, State, and local agencies; elected and appointed officials; Alaska Coastal Management Districts; ANCSA regional and village corporations, village and Tribal councils, Alaska Federation of Natives, and Alaska Inter-Tribal Council; and interested organizations, including recreation/tourism, mineral development, conservation, individual citizens, media, and the BLM Resource Advisory Council (RAC), which is a citizen body representing a wide spectrum of public interests.

The BLM and ADF&G Master Memorandum of Understanding (MOU)

In 1983, ADF&G and BLM agreed to recognize their respective roles in managing fish and wildlife resources and their habitat. Through an MOU, ADF&G agreed to:

- Recognize BLM as the Federal agency responsible for multiple use management of BLM lands including wildlife habitat in accordance with FLPMA, ANILCA, and other applicable Federal laws.
- Regulate and manage use of fish and wildlife populations on BLM lands in such a way as to improve the quality of fish and wildlife habitat and its productivity.
- Act as the primary agency responsible for the management of all uses of fish and wildlife on state and BLM lands, pursuant to applicable State and Federal laws.

BLM agreed to:

- Recognize ADF&G as the primary agency responsible for management of use and conservation of fish and wildlife resources on BLM lands.
- Recognize ADF&G as the primary agency responsible for management of use and conservation of fish and wildlife resources on BLM lands, pursuant to applicable State and Federal laws.
- Incorporate ADF&G's fish and wildlife management objectives and guidelines in BLM land use plans unless such provisions are not consistent with multiple use management principles established by FLPMA, ANILCA, and applicable Federal laws.

Plans previously written by Federal, State, local and Tribal governments that relate to management of lands and resources within and adjacent to the Bay planning area are reviewed and considered as the RMP/EIS is developed. BLM planning regulations require that BLM plans be consistent with officially approved or adopted resource-related plans of other agencies to the extent those plans are consistent with Federal laws and regulations applicable to public lands. Table 1.2 provides a list of major regional plans that have been reviewed as part of preparation of this RMP/EIS. These plans can be obtained at the University of Alaska Anchorage, Alaska Resources Library and Information Services section, or from the sponsoring agency.

Table 1.3. List of Land Management Plans for Lands Within and Adjacent to the Bay Planning Area

Management Plan	Agency
Draft Ring of Fire Resource Management Plan/Environmental Impact Statement	BLM 2006
Alaska Peninsula/Becharof National Wildlife Refuge Complex Final Public Use Management Plan	USFWS 2004
Alaska Maritime National Wildlife Refuge Comprehensive Conservation Plan EIS/Wilderness Review Draft	USFWS 2006
Alaska Department of Fish and Game Habitat Protection Section State Game Refugees Critical Habitat Areas & Game Sanctuaries	ADNR 1981
Alaska Statewide Land Health Standards	BLM 2004
Becharof National Wildlife Refuge Comprehensive Conservation Plan EIS/Wilderness Review Final	USFWS 1985
Bureau of Land Management Finding of No Significant Impact and Proposed Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska	BLM 2004
Bristol Bay Area Plan For State Lands	ADNR 1984
Bristol Bay Area Plan	ADNR 2004
Bristol Bay Borough Comprehensive Plan	ADNR and ADF&G 1985
Fire Management Plan for Western Arctic National Parklands, Alaska	BLM 2004
Integrated Natural Resources Management Plan King Salmon Airport	U.S. Air Force 1999-2003
Integrated Natural Resources Management Plan South coastal Long Range Radar Sites, Alaska	U.S. Air Force 2000-2003
Integrated Natural Resources Management Plan Southwestern Inactive Sites, Alaska	U.S. Air Force 2001-2005
Katmai General Management Plan Wilderness Suitability Review Land Protection Plan	NPS 1986
Lake Clark General Management Plan National Park and Preserve/Alaska Environmental Assessment	NPS 1984
Lake Clark National Park and Preserve Resource Management Plan	NPS 1999
Land Use Plan Amendment for Wildland Fire and Fuels Management - Environmental Assessment	BLM 2004
McNeil River State Game Refuge and State Game Sanctuary Management Plan	ADNR 1996
Nushagak & Mulchatna Rivers Recreation Management Plan Resource Assessment	ADNR Draft 2004
Southwest Planning Area Management Framework Plan Anchorage District Office	BLM 1981
Togiak National Wildlife Refuge Comprehensive Conservation Plan EIS/Wilderness Review	USFWS 1985

H. Organization of the Bay Resource Management Plan/Environmental Impact Statement

The plan has been organized into a series of chapters and sections.

Chapter 1 establishes the purpose and need for the Bay Resource Management Plan, describes the planning area, addresses scoping, including scoping issues addressed and those considered but not further analyzed, provides planning criteria and legislative constraints, describes the planning process including an overview of NEPA and its procedural requirements, and identifies other related plans.

Chapter 2 provides a general description of each Alternative, and identifies management common to all Alternatives. It identifies the preferred Alternative.

Chapter 3 addresses the affected environment, including presenting information needed to understand issues and environmental consequences and providing a context for the Goals and Objectives.

Chapter 4 provides analytical assumptions, including reasonably foreseeable development scenarios for mineral development, addresses direct, indirect, and cumulative impacts of the proposed Alternatives, summarizes critical elements that are addressed, not affected, or not present, and identifies incomplete or unavailable information.

Chapter 5 includes a discussion of specific actions taken to consult and coordinate with agencies, entities, and the general public.

Chapter II: Alternatives

A. Introduction.....	2-2
B. General Description of Alternatives.....	2-3
1. Alternative A: No Action.....	2-3
2. Alternative B.....	2-3
3. Alternative C.....	2-4
4. Alternative D: Preferred Alternative.....	2-4
C. Alternatives Considered But Not Carried Forward.....	2-4
1. Nomination of the Kvichak River as a Wild and Scenic River.....	2-4
2. Nomination of Special Recreation Management Areas (SRMAs).....	2-5
D. Detailed Descriptions of the Alternatives.....	2-5
1. Resources: Air Quality, Soil, Vegetation, and Water Resources.....	2-5
2. Resource Uses.....	2-21
3. Special Designations.....	2-51
4. Social and Economic.....	2-55
E. Required Operating Procedures, Stipulations, and Standard Lease Terms.....	2-57
1. Introduction.....	2-57
2. Required Operating Procedures.....	2-59
3. Oil and Gas Leasing Stipulations.....	2-78
4. Standard Lease Terms for Oil and Gas (BLM Form 3100-11).....	2-82
F. Comparison of Alternatives.....	2-85

Chapter II: Alternatives

A. Introduction

This chapter outlines Alternatives that describe different approaches to the management of Bureau of Land Management (BLM) public lands and resources in the Bay planning area (Figure 1.1). Each Alternative represents a complete and reasonable set of objectives, actions, and allocations that will guide future management of public land and resources in the planning area should it be selected.

Four Alternatives are presented in this chapter. They are described in Section B. The Alternatives provide a range of choices for meeting BLM planning and program management requirements and resolving the planning issues identified through scoping. Alternatives were developed using an interdisciplinary team process that included BLM staff specialists and other interested agencies and entities. To begin the Alternative development process, goals and desired future conditions were identified by the planning team in consideration of public comment received through scoping as well as direction established by Bureau-wide initiatives and mandates. Each Alternative analyzed in the Draft Resource Management Plan (RMP) Environmental Impact Statement (EIS) emphasizes a different combination of resource uses, allocations, and restoration measures to address issues and resolve conflicts among uses, so program goals are met in varying degrees across the Alternatives. Each Alternative is designed to guide future management and resolve land management issues identified during the early stages of the planning process. Implementation of decisions in any Alternative would be subject to the limits of available funding.

The planning decisions identified for each Alternative generally apply to lands within the Bay planning area currently under BLM management, including unencumbered Federal public lands, State-selected lands, and Native-selected lands outside of the National Park and National Wildlife Refuge systems. Exceptions to the general applicability of the Alternatives described in this chapter are as follows:

- Management of the military withdrawals for the King Salmon Air Force Base would be the same under all Alternatives. These lands were withdrawn for military purposes by Public Land Order 6893. BLM is the Secretary of the Interior's authorized delegate and retains jurisdiction of mineral and vegetative resources on the installations. However, the agency's authority is limited in scope. Under all Alternatives, BLM will continue to permit non-military activities consistent with the withdrawal orders and only with the concurrence of the military.
- Management of all other withdrawals other than Alaska Native Claims Settlement Act (ANCSA) 17(d)(1). These lands will remain withdrawn. They will not be available for fluid mineral leasing, locatable or salable mineral entry.
- Management of the Federal subsurface estate, within BLM's responsibility, in components of the National Wildlife Refuge System would be the same under all Alternatives. BLM is responsible for oil and gas leasing within refuges. The Alaska National Interest Lands Conservation Act (ANILCA)(1980) Section 206 withdrew new and expanded components of the National Park System from the mining laws. Provisions of ANILCA (Sections 304(b) and 1008 require that no leasing take place in refuges when the U.S. Fish and Wildlife Service (USFWS) determines the leasing to be incompatible with the purposes of the refuge. The determination of compatibility is fulfilled through the development of refuge comprehensive conservation plans. The USFWS has not determined that lands they manage in the Bay planning area are compatible with oil and gas leasing. Under all Alternatives, BLM would only undertake leasing on refuge lands if the surface management agency determines that oil and gas leasing is appropriate; in such cases, BLM would undertake the NEPA process, preferably with the surface management agency as a "cooperating agency" for purposes of preparation of the NEPA document.

A common set of Stipulations and Required Operating Procedures are integral to the management decisions for the action Alternatives. Stipulations and required operating procedures are developed

through the RMP process and are based on knowledge of the resources in the planning area and current industry practices. The Stipulations are specific to oil and gas activities. They constitute significant restrictions on the conduct of operations under a lease. All oil and gas activity permits issued subsequent to a lease will comply with the lease Stipulations appropriate to the activity under review. Required Operating Procedures are requirements, procedures, management practices, or design features that would be applied as applicable to all types of permitted activities on BLM-managed lands in the planning area. Required Operating Procedures have been developed to ensure that objectives identified within the Alaska Land Health Standards (BLM 2004) are met in carrying out permitted activities and management practices. The Required Operating Procedures and Stipulations specific to this planning area are discussed in detail in Section E of this chapter.

B. General Description of Alternatives

1. *Alternative A: No Action*

Alternative A represents the continuation of current management practices. It is also called the No Action Alternative. This Alternative would include continued management under guidance of the existing Southwest Management Framework Plan (1981) for the Goodnews Block only, and other management decision documents affecting all BLM-managed lands in the entire planning area. Management set forth in the Alaska Land Use Plan Amendment for Wildland Fire and Fuels Management (2005) is one such document. Direction contained in existing laws, regulations and policy would also continue to be implemented, sometimes overriding provisions in the Southwest MFP. The current levels, methods and mix of multiple use management of BLM land in the planning area would continue, and resource values would receive attention at present levels. No lands would be open to oil and gas leasing, including leasing for coalbed natural gas (CBNG), and large tracts would remain closed to Locatable Minerals exploration or development due to retention of the Alaska Native Claims Settlement Act (ANCSA) 17(d)(1) withdrawals. No Special Management Areas, such as Areas of Critical Environmental Concern (ACECs), Special Recreation Management Areas (SRMAs), or Wild and Scenic Rivers (WSRs), would be designated or recommended in this RMP for BLM-managed lands within the planning area, and lands would remain unclassified for off-highway vehicles (OHVs) and visual resources. In general, most activities would be analyzed on a case-by-case basis and few uses would be limited or excluded as long as their actions were consistent with State and Federal laws. Oil, gas, locatable mineral activities, and other permitted activities would be guided by requirements in specific Plans of Operations on a project-specific basis. The BLM publication, *Placer Mining in Alaska - A Guide to Mitigation and Reclamation (BLM 1989)*, is incorporated by reference for Required Operating Procedures for Locatable Minerals.

2. *Alternative B*

Alternative B highlights actions and management that would facilitate resource development. All BLM unencumbered lands would be open to Leasable and Locatable Mineral exploration and development unless they were withdrawn under some authority other than ANCSA 17(d)(1) (e.g. Military withdrawal, FERC withdrawal). Selected lands whose selection is relinquished or rejected would also be open to mineral exploration and development. All ANCSA 17(d)(1) withdrawals would be revoked, allowing increased potential for mineral exploration and development. The BLM-managed lands within the planning area would be designated as "open" to OHV use. No SRMAs would be identified. In all areas, the focus would be on management of permits. As with Alternative A, no Special Management Areas (SMAs) would be designated and visual resources would be managed as Visual Resource Management (VRM) Class IV. Oil, gas, locatable mineral activities and other permitted activities would be guided by requirements in specific Plans of Operations on a project-specific basis. The BLM publication, *Placer Mining in Alaska - A Guide to Mitigation and Reclamation (BLM 1989)*, is incorporated by reference for Required Operating Procedures for Locatable Minerals.

3. Alternative C

Alternative C emphasizes actions and management that protect and enhance renewable resource, archaeological, and paleontological values. Oil and gas leasing and mineral exploration and development would be more constrained than in Alternatives B or D, and where Areas of Critical Environmental Concern (ACEC) are proposed, mineral materials exploration and extraction would be excluded to protect important resources. Two ACECs, the Bristol Bay ACEC and the Carter Spit ACEC, would be established, plans developed for the areas, and specific measures adopted to protect or enhance values within these areas. All BLM-managed lands within the planning area would have a “limited” to OHV designation, allowing for limitations on OHV activities to protect habitat, soil and vegetation, cultural resources, and recreation experiences. No SRMAs would be identified. In all areas, the focus would be on management of permits. ANCSA 17(d)(1) withdrawals would be maintained as an interim measure at locations where proposed Wild and Scenic rivers are located until Congress has had an opportunity to act on the proposals, in order to protect or maintain resource values. Three river segments, a portion of the Alagnak River, and portions of the Goodnews River mainstem and Goodnews River Middle Fork would be recommended for WSR designation. Portions of these rivers recommended for a Wild River designation would be managed for VRM Class III, the proposed ACECs would be managed as VRM Class III, and most of the remainder of the BLM-managed lands within the planning area would be managed as VRM Class IV. Resources would be protected through Stipulations, Required Operating Procedures, and project-specific requirements.

4. Alternative D: Preferred Alternative

Alternative D provides a balance of protection, use, and enhancement of resources. ANCSA 17(d)(1) withdrawals would be revoked, and the majority of unencumbered lands and any selected lands whose selection is relinquished or rejected, would be open to oil and gas leasing and development subject to seasonal or other constraints, and to mineral location. One ACEC would be established, the Carter Spit ACEC. Plans would be developed, and specific measures adopted through Stipulations, Required Operating Procedures, and project-specific requirements, to protect values within this area. The ACEC would be closed to Salable Mineral entry. No WSRs would be recommended. Specified lands in the Goodnews Bay and Bristol Bay areas would be managed up to ½ mile from established winter trail or road systems at VRM Class III (Table 2.4). BLM lands in the full visible foreground up to one mile from the boundaries of CSUs would be managed at VRM Class III. The proposed ACEC would be managed at VRM Class III, and all other BLM lands would be managed at VRM Class IV. All BLM-managed lands within the planning area would have a “limited” OHV designation, allowing for limitations to be placed on OHV use to protect habitat, soil and vegetation resources, and/or recreation experiences. For Leasable Minerals, 1,768,450 acres would be open to mineral leasing subject to minor constraints. As with Alternative C, resources would be protected through Stipulations, Required Operating Procedures, and project-specific requirements.

C. Alternatives Considered But Not Carried Forward

The Bay RMP has considered a full range of Alternatives consistent with the goals of the plan. BLM has considered, but eliminated from detailed analysis, Alternatives that would address the issues that were not within the scope of the plan. These issues are listed and the reasons for not further considering them are provided here.

1. Nomination of the Kvichak River as a Wild and Scenic River

Among the issues listed but not addressed in an Alternative is the proposed nomination of the Kvichak River as a WSR. Recently a Recordable Disclaimer of Interest finding was issued by the Bureau of Land Management for the Kvichak River. This Disclaimer clarifies that the Federal government does not have a

competing interest (with the State of Alaska) in the submerged lands. Because BLM does not have jurisdiction for the Kvichak River, the proposal was not carried forward.

2. Nomination of Special Recreation Management Areas (SRMAs)

BLM Anchorage Field Office (AFO) considered SRMA status for each block of BLM unencumbered land within the Bay planning area. However, the use patterns and types of recreation opportunities to justify SRMA status were not found.

D. Detailed Descriptions of the Alternatives

This section provides a detailed description of proposed management, organized into four categories: Resources, Resource Uses, Special Designations, and Social and Economic Conditions. Goals are listed under each resource, resource use, or program. They are followed by a description of objectives, management actions, and allocations proposed to achieve the goals and to address issues. Goals are consistent across Alternatives. Objectives, management actions and allocations may change by Alternative. Management that is common across the Alternatives is presented first, followed by descriptions of management by Alternative.

1. Resources: Air Quality, Soil, Vegetation, and Water Resources

a) Vegetation, Wetlands, and Riparian Habitat

(1) Goals

- BLM will maintain and protect vegetative land cover that provides for healthy fish and wildlife habitat on BLM-administered lands.
- Treatments to alter the vegetative composition of a site, such as prescribed burning, seeding, or planting will
 - be based on the potential of the site and will retain or promote infiltration, permeability, and soil moisture storage;
 - contribute to nutrient cycling and energy flow;
 - protect water quality and fish habitat;
 - help prevent the introduction and spread of noxious weeds;
 - contribute to the natural diversity of plant communities, plant community composition, and structure;
 - maintain proper functioning condition;
 - support the conservation of Special Status Species.
- BLM will take action to minimize the destruction, loss, or degradation of wetlands and riparian areas, and to preserve and enhance their natural and beneficial values. Desired ecological conditions for wetlands-riparian areas are described in the BLM Alaska Statewide Land Health Standards (BLM 2004).

(2) Alternative A

This Alternative would continue existing management. The Southwest MFP (1981), applicable only to the Goodnews Block, provides little guidance related to vegetation other than that of the Walpole poppy. The BLM would manage so as to maintain or improve the quality of the range through proper management of livestock and fire. Proposed permitted or authorized uses would be analyzed through the appropriate NEPA document. Based on this analysis, mitigation would be developed to minimize impacts from proposed activities to vegetative resources. The resulting mitigation measures would be included in the

permit that authorized the use. The BLM would continue to comply with applicable policy relative to management of riparian vegetation.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

- Support monitoring and assessment of riparian areas for proper functioning condition, as defined in the BLM manual Technical Reference 1737-3. Develop maintenance and restoration projects. Priority areas will include rivers determined suitable for inclusion as wild or scenic, designated ACECs, areas known to be in need of restoration, and riparian areas within anticipated or ongoing mining activity.
- Assess impacts of OHV trails, especially in high-use areas where riparian and wetland resources or water quality are at risk.
- Lessees and all parties receiving BLM authorizations for activities impacting riparian and/or wetlands would be required to comply with protective measures listed in the Required Operating Procedures, Stipulations, Standard Lease Terms, and project-specific requirements.

(b) Management Decisions

- Vegetation treatments will be designed to achieve desired conditions clearly described in individual burn plans or timber sales. Desired conditions will be based on the ecological capability of a given site and will be expressed as cover types or seral stages within cover types, based on management objectives.
- Vegetation treatments will be designed to prevent introduction of noxious weeds. Prescribed burn plans will contain a segment on known occurrence of noxious weeds within planned burning areas and strategies for post-burn monitoring or treatment.
- Timber sales are not anticipated; however, should they occur, machinery used in timber sales will be inspected for noxious weed seeds, especially if it is brought in from outside the planning area.
- Burn plans for large burns will prescribe conditions that result in a mosaic of burned or unburned areas within the burn unit. Smaller burns may not require a mosaic, dependent on objectives.
- Timber sales will rely, to the extent possible, on natural regeneration through proper site preparation.
- Permitted livestock grazing is not expected to occur; however, should it occur, it will be conducted in a manner that maintains long-term productivity of vegetation. Animals will not be picketed in riparian areas. In areas of low grass production, operators will pack in weed-free hay or concentrated feed.
- Currently there is known habitat in the planning area for Special Status plant species, based on several inventories. However, one specific population location is known. If other specific populations or individual Special Status species are located, measures will be taken to protect these populations or individuals through site-specific buffers or management prescriptions.

(c) Land Use Requirements

Resource protection would be applied on a site-specific basis for permitted activities and uses that affect vegetation based on guidelines provided in the Required Operating Procedures, as described in Section E of this chapter. Oil and gas leases would be subject to the Oil and Gas Lease Stipulations, also listed in Section E.

b) Soil, Water and Air

(1) Goals

- Resource Protection - maintain, improve, and restore the health of watersheds. Ensure that watersheds are in, or are making significant progress toward, a properly functioning physical condition that includes stream banks, wetlands, and water quality. BLM will protect and enhance the quality of air resources associated with BLM-managed lands in the planning area as well as consider, if practicable, minimizing the impacts of smoke to human health, communities, recreation and tourism from wildfire and prescribed burns. Smoke and its public health impacts are a parameter in fire suppression decisions. BLM will manage soils to promote healthy, sustainable, fully functioning ecosystems by maintaining the soils, which support a wide range of public values and uses.
- Air and water quality should meet or exceed local, State, and Federal requirements. A goal is to minimize negative impacts to soils and wetland vegetation and prevent soil erosion. Maintain desired ecological conditions as defined by the BLM-Alaska Statewide Land Health Standards.
- Resources Use - support planning, use authorizations, compliance, and special designations.
- Service to Communities - support collaboration in shared watersheds.
- Management Excellence - promote program financial efficiency and improve data quality, security, and availability.

(2) Alternative A

This Alternative would continue existing management. The Southwest MFP (1981), which applies only to the Goodnews Block in the Bay planning area, contains little guidance relative to management of soil, water, and air resources. The use of OHVs on interim managed encumbered lands is limited to 1,500 pounds curb weight as defined by the State's "Generally Allowed Uses on State Land," (Appendix F). This Alternative also recommends that the BLM file for water rights under State law to secure water for needed BLM uses on an as-needed basis. To date, the BLM has not filed for water rights in the planning area. Proposed permitted or authorized uses would be analyzed through the appropriate NEPA document. Based on this analysis, the BLM would develop mitigation to minimize impacts from proposed activities to soil, water, and air resources. The resulting mitigation measures would be included in the permit that authorized the use. The BLM would continue to comply with applicable legislation, Federal regulations, and policy relative to soil, water, and air.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

- Develop a water quality sampling protocol step down plan and determine baseline water quality values in areas having critical aquatic habitats or have potential for significant impacts due to permitted activities. Monitor for significant alterations to water quality value and water flow in accordance with State and Federal regulations.
- Collect data necessary for an Alaska instream water reservation on water bodies having critical aquatic habitats, within ACEC boundaries, or nominated for NLCS designation.
- Contract soil surveys in areas of high resource value or proposed development as needed.

(b) Management Decisions

- In cooperation with the appropriate Federal, State, local or Native requirements, identify area-wide use restrictions, or other protective measures, to ensure compliance with the Clean Water Act, State water quality standards, and Federal wetlands and floodplain requirements.
- In order to comply with the Safe Drinking Water Act and protect the quality and quantity of drinking water, BLM will consult with owners/operators of potentially affected, Federally-regulated public

water supply systems when proposing management actions in State-designated Source Water Protection Areas. The locations of public water supply systems and Source Water Protection Areas are available from the Alaska Department of Environmental Conservation Drinking Water and Wastewater Program.

- File for water rights under State law, when necessary, to secure water needed for BLM management purposes.
- BLM will stipulate that all direct or authorized emission-generating activities occurring on BLM-administered lands within the planning area comply with the Federal and State air quality laws and regulations. All permittees will be required to mitigate any activity that may result in air pollution. BLM will also implement interagency wildland fire smoke mitigation measures adopted by the Alaska Wildland Fire Coordination Group and consider public health and safety in all fire management activities.
- BLM will provide for a wide variety of public land uses without compromising the long-term health of soil resources. BLM will require permittees to mitigate for all activities that may cause accelerated soil erosion, and to follow Stipulations and Required Operating Procedures.

(c) Land Use Requirements

Resource protection would be applied on a site-specific basis for permitted activities and uses that affect soil, water and air based on guidelines provided in the Required Operating Procedures, as described in Section E of this chapter. Oil and gas leases would be subject to the Oil and Gas Leasing Stipulations also listed in Section E.

c) Floodplains

(1) Goals

- Reduce flood damage and loss of life and property.
- Minimize the impacts of floods on human safety, health and welfare.
- Sustain, restore and preserve the natural resources, ecosystems, and other functions of the floodplain, and the other beneficial values served by floodplains. Beneficial processes include maintaining the frequency and duration of floodplain/wetland inundation.

(2) Alternative A

This Alternative would continue existing management. Proposed permitted or authorized uses would be analyzed through the appropriate NEPA document. Based on this analysis, BLM would develop mitigation to minimize impacts from proposed activities to floodplains. The resulting mitigation measures would be included in the permit that authorized the use. BLM would continue to comply with applicable legislation, Federal regulations, and policy pertaining to floodplains.

(3) Management Common to All Alternatives

Floodplain management guidelines are defined within Executive Order 11988 (Floodplain Management). For administrative purposes, the 100-year floodplain serves as a basis for floodplain management on public land. If available, floodplain boundaries are based on the Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (FEMA). If FEMA maps are not available, floodplain boundaries will be based on the best available information. The following are steps to be taken in order to determine whether an activity will be allowed in the floodplain.

- Before taking any action, determine whether the proposed action will occur within a floodplain.
- Provide for public review.
- Identify and evaluate practicable Alternatives for locating in the floodplain.
- Identify the impacts of the proposed action.

- Minimize threats to life, property and to natural and beneficial floodplain values, and restore and preserve natural and beneficial floodplain values.
- Re-evaluate Alternatives including no action.
- Issue findings and a public explanation.
- Implement the action (or no action).

In addition, BLM may undertake projects as required to restore and preserve the natural and beneficial values served by floodplains. Stipulations and Required Operating Procedures apply to Alternatives B, C, and D.

d) Fish and Wildlife

(1) Goals

(a) Fish

- Work in conjunction with other programs and agencies to manage riparian areas.
- Achieve fish habitat stability and manage the aquatic habitat of various life stages of anadromous and resident fish.
- Provide for the continuing availability of fish habitat that contributes to the social, scientific, and economic aspects of the local communities and the nation.
- Determine and maintain or restore the fisheries potential of the aquatic habitat in BLM jurisdiction in the Bay planning area.

(b) Wildlife

- Maintain high enough quality and quantity of habitat to support healthy wildlife populations.
- To the extent practical, mitigate impacts to wildlife species and their habitats from authorized and unauthorized uses of BLM-managed lands.
- In cooperation with ADF&G, ensure a natural abundance and diversity of wildlife resources and habitat.

(2) Alternative A

This Alternative continues current management. The Southwest MFP (BLM 1981), which applies only to the Goodnews Block in this planning area, excepts "crucial habitat" from opening to various kinds of settlement entry and calls for preparing habitat management plans for wildlife and riparian habitat. Outside of crucial habitats, and outside of the Goodnews Block, other uses would be mitigated to prevent any significant alterations in wildlife populations. Proposed permitted or authorized uses would be analyzed through the appropriate NEPA document. Based on this analysis, mitigation would be developed to minimize impacts from proposed activities. These mitigation measures would be included in the permit that authorized the use.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

i. Fish

- BLM Alaska has a Master Memorandum of Agreement with the State of Alaska for management of fish and wildlife (Appendix G).
- Inventory and monitor fish habitat in cooperation with ADF&G, other Federal agencies, private non-profit corporations and tribal agencies.
- Inventory habitat for Special Status fish species.

- In cooperation with ADF&G, monitor priority species population trends where issues exist or are pending and populations may be impacted.

ii. Wildlife

- Manage fish and wildlife in accordance with BLM Alaska's Master Memorandum of Agreement with the State of Alaska for management of fish and wildlife.
- In cooperation with ADF&G and other Federal agencies, BLM will monitor habitats and populations of important subsistence species to provide information necessary to develop subsistence regulations and bag limits on Federal lands, monitor priority migratory bird species, identify habitats of importance to special status species, and identify habitats for priority species.

(b) Management Decisions

i. Fish

- Develop activity plans that address fish habitat and population management issues where appropriate.
- Additional site-specific objectives and habitat management actions for priority species will be made through activity level planning or as mitigation on proposed activities.

ii. Wildlife

- In cooperation with ADF&G ensure a natural abundance and diversity of wildlife habitat to assist ADF&G in ensuring sustained populations and a natural abundance of wildlife.
- BLM will work cooperatively with ADF&G, other Federal agencies, and adjacent land managers to implement the Mulchatna Caribou Herd Monitoring Plan, the Western Brown Bear Management Area planning group, the Unit 18 Goodnews/Arolik Moose Moratorium and Restoration Plan, the migratory bird MOU, Boreal Partners in Flight Conservation Plan, and other cooperative management efforts of which BLM is a part.

(c) Land Use Requirements

- BLM will consult with USFWS and NMFS under Section 7 of the ESA for all actions that may affect listed species or designated critical habitat, or confer if actions are likely to jeopardize the continued existence of a proposed species or result in the destruction or adverse modification of proposed critical habitat.
- BLM will participate in the ESA Threatened and Endangered Species Recovery Plans, and will take into consideration the BLM Special Status sensitive species.
- All permitted activities would operate under the Stipulations, Required Operating Procedures, and Standard Lease Terms provided in Section E of this chapter. These procedures were developed through the EIS process and are based on current knowledge of resources in the planning area and current permitting procedures.

(4) Alternative B

This Alternative would be the same as Alternative A. Stipulations and Required Operating Procedures would apply.

(5) Alternative C

This Alternative would be the same as Alternative B with the exception that a Fish and Wildlife Habitat Management Plan would be developed for management of habitat supporting a variety of wildlife species in the Carter Spit ACEC and the Bristol Bay ACEC. For Fluid Leasable Minerals, portions of the planning area comprising the Goodnews, Koggiling, Yellow Creek, Kvichak, Iliamna West, Alagnak, and Klutuk Blocks would be open to leasing subject to seasonal restrictions or other minor constraints. Stipulations, Required Operating Procedures, and project-specific requirements would apply.

(6) Alternative D

This Alternative would be the same as Alternative B with the exception that a Fish and Wildlife Habitat Management Plan would be developed for management of habitat supporting a variety of wildlife species in the Carter Spit ACEC. For Fluid Leasable Minerals, portions of the planning area comprising the Goodnews, Koggiling, Yellow Creek, Kvichak, Iliamna West, Alagnak, and Klutuk Blocks would be open to leasing subject to seasonal restrictions or other constraints. Stipulations, Required Operating Procedures, and project-specific requirements would apply.

Tables 2.1 and 2.15 describe special provisions for fish and wildlife habitat management under each Alternative.

Table 2.1. Fish and Wildlife Habitat - Summary of Alternatives

Alternative A	Proposed permitted or authorized uses analyzed through the NEPA process on a case-by-case basis. Mitigation measures developed to minimize impacts from proposed activities would be included in the permit that authorized use.
Alternative B	Same as Alternative A. Stipulations, Required Operating Procedures, and project-specific requirements apply.
Alternative C	<p>Same as Alternative B. In addition, a Fish and Wildlife Habitat Management Plan would be developed for the Carter Spit ACEC and the Bristol Bay ACEC.</p> <p>For Fluid Leasable Minerals, Goodnews, Koggiling, Yellow Creek, Kvichak, Iliamna West, Alagnak, and Klutuk Blocks would be open to leasing subject to seasonal restrictions or other minor constraints.</p> <p>A 300-foot minimum setback on BLM unencumbered lands would be designated on segments of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River. This setback would protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.</p>
Alternative D	<p>Same as Alternative B. In addition, a Fish and Wildlife Habitat Management Plan would be developed for the Carter Spit ACEC.</p> <p>For Fluid Leasable Minerals, Goodnews, Koggiling, Yellow Creek, Kvichak, Iliamna West, Alagnak, and Klutuk Blocks would be open to leasing subject to seasonal restrictions or other minor constraints.</p> <p>A 300-foot minimum setback on BLM unencumbered lands would be designated on segments of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River. This setback would protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.</p>

e) Special Status Species

(1) Goals

- Identify, conserve and monitor the abundance of Special Status Species and their habitats through conservation and management of crucial plant and animal habitat and food base.
- Manage habitats consistent with the conservation needs of Special Status Species and BLM sensitive species, and in a manner that will not contribute to the need to list any species under the Endangered Species Act (ESA).
- Manage plant and animal resources and wildlife habitat to ensure compliance with the ESA and to ensure progress towards recovery of listed species.

- Manage habitats consistent with the conservation needs provided in Recovery Plans for listed species.

(2) Alternative A

This Alternative would continue current management practices. The Southwest MFP (BLM 1981), applicable only to the Goodnews Block, does not contain any specific guidance for the general management of Special Status Species, which would be managed according to BLM policy, applicable laws, and Federal regulations. Land use proposals would be addressed on a case-by-case basis through interagency cooperation and the NEPA process with project-specific requirements and mitigation on proposed actions. If actions authorized, funded, or carried out by the BLM had the potential to affect any Federally-listed species or designated critical habitat, consultation under Section 7 of the ESA would be initiated with USFWS. Proposed permitted or authorized uses that may affect special status species are analyzed through the appropriate NEPA document. Based on this analysis, mitigation is developed to minimize impacts from proposed activities. The resulting mitigation measures are included in the permit that authorizes the use.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

- Identify botanically unexplored BLM lands within the planning area and prioritize for floristic inventory.
- Inventory project sites for Special Status Species plants on an as-needed basis.
- Monitor Special Status Species plant populations and associated habitats for population trends and threats.
- Contribute data on Special Status Species plant locations, population numbers, and trends (and voucher specimens as needed) to the Northern Plant Documentation Center (University of Alaska Fairbanks Museum Herbarium) and Alaska Natural Heritage Program in a cooperative effort to build a statewide rare plant database.
- Inventory habitat and plant and animal populations for Special Status Species on public lands for reasonable population levels in accordance with the ESA.
- Cooperate with USFWS and other agencies to monitor habitats and populations of Threatened and Endangered Species (T&E).

(b) Management Decisions

- Plant and wildlife resources and habitat will be managed to insure compliance with the ESA, to ensure progress towards recovery of listed threatened or endangered species, and to prevent listing of additional species.
- T&E evaluations will occur on all actions proposed and mitigation or consultation carried out where listed species may occur.
- Additional site-specific actions needed to manage habitat for priority species will be made through activity level planning or as mitigation on proposed activities. A special habitat management area should be proposed for the Carter Spit/Goodnews Bay area for Steller's eiders.

(c) Land Use Requirements

- Cooperate with USFWS in the development and implementation of recovery plans, management plans, conservation strategies for T&E that occur on BLM lands.
- Wildlife resources will be managed to comply with the ESA to ensure recovery of listed species and to prevent listing of additional species.
- Consult with USFWS or National Marine Fisheries Service under Section 7 of the ESA for all actions that may affect listed species or designated critical habitat or confer if actions are likely to

jeopardize the continued existence of a proposed species or result in the destruction or adverse modification of proposed critical habitat.

f) Fire Management and Ecology

(1) Goals

- Protect human life and property.
- Provide appropriate management response on all wildland fires, with an emphasis on firefighter and public safety.
- Management of wildland fires and fuels will focus on maintaining intact and functioning within their historical range the key ecosystem components.
- Reduce adverse effects of fire management activities
- Management decisions are based on land use and resource objectives.
- Continue interagency collaboration and cooperation.

(2) Alternative A

Under Alternative A, current management would continue. Wildland fire would be used to protect, maintain, and enhance natural resources and, as much as possible, function in its natural ecological role. The Southwest MFP (BLM 1981), applicable only to the Goodnews Block, requires that BLM preserve forest resources until the economics for harvest are more favorable; protect commercial grade timber stands; manage moose habitat emphasizing high value moose winter range and benefit moose browse by prescribed burning out of viewshed; identify and protect from fire caribou habitat with substantial lichen component; provide for a natural fire occurrence (mosaic) where other important resource values would not be harmed; protect and preserve cultural sites; include constraints in Burn Plans to protect climax-dependent species, swan and raptor habitat, recreation and view shed; and prohibit OHVs from areas after a burn to prevent erosion.

Throughout the Bay planning area, rehabilitation and restoration efforts would be undertaken to protect and sustain ecosystems, public health and safety, and to help communities protect infrastructure. Current guidance for fire management is provided by the BLM-Alaska Land Use Plan Amendment for Wildland Fire and Fuels Management (BLM 2005). Under this Alternative, BLM would continue to cooperate and collaborate with other Federal, State, and Native land managers, and with other suppression organizations to address issues and concerns related to wildland fire management in Alaska and to implement operational decisions. Fire Management programs would emphasize the protection of human life and site-specific values while recognizing fire as an essential ecological process and natural agent of change to ecosystems. This Alternative recognizes wildland fire use for resource benefit as a viable management tool. Vegetative communities would be monitored for cumulative effects of wildland fire and suppression activities as funding permits. Fuels management projects and prevention programs would be proposed and funded on a case-by-case basis.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

- Monitor the number and size of wildland fires for cumulative impacts on wildlife habitat, particularly caribou winter range.
- Monitor vegetative communities for cumulative effects of wildland fire and suppression actions.
- Monitor cultural resources for effects of wildland fire and suppression actions.

(b) Management Decisions

- Fire management strategies must recognize the role of wildland fire as an essential ecological process and natural change agent.

- Fire management planning, preparedness, prevention, suppression, fire use, restoration and rehabilitation, monitoring, research, and education will be conducted on an interagency basis.
- BLM will work together with its partners and other affected groups and individuals to prevent unauthorized ignition of wildland fires.
- Manage vegetation adjacent to populated areas to reduce risk of wildfires.
- Use wildland fire and fuel treatments to meet resource objectives.
- Reduce risk and cost of uncontrolled wildland fire through wildland fire use, prescribed fire, manual or mechanical treatment.
- Reduce adverse effects of fire management activities.
- Continue interagency collaboration and cooperation.
- Apply the fire management options for fire suppression (Critical, Full, Limited, or Modified) appropriately and effectively. A full discussion of fire management categories can be found in Chapter III.

(4) Alternative B

Alternative B would be the same as Alternative A. Stipulations and Required Operating Procedures would apply.

(5) Alternative C

Alternative C would be the same as Alternative A, except that Stipulations and Required Operating Procedures would apply, and fire strategies specific to the areas would be included in the Management Plans for the proposed Carter Spit ACEC and Bristol Bay ACEC.

(6) Alternative D

Alternative D would be the same as Alternative A, except that Stipulations and Required Operating Procedures would apply, and fire strategies specific to the area would be included in the RMP for the proposed Carter Spit ACEC.

Table 2.2. summarizes Fire Management and Ecology for the Alternatives.

Table 2.2. Fire Management and Ecology - Summary of Alternatives

Alternative A	This Alternative would allow Wildland fire use for resource benefit and to meet land use and resource management objectives.
Alternative B	Same as Alternative A.
Alternative C	Same as Alternative A. Fire strategies would be developed for Carter Spit and Bristol Bay ACECs.
Alternative D	Same as Alternative A. Fire strategies would be developed for Carter Spit ACEC.

g) Cultural and Paleontological Resources

(1) Goals

- Identify, protect, and preserve significant cultural resources.
- Manage cultural and paleontological resources for a variety of uses, including scientific use, conservation for future use, public education and interpretation, traditional use (in the case of Cultural Resources), and experimental use.

(2) Alternative A

Under Alternative A, current management would continue. Currently, decisions regarding specific inventory, data recovery, monitoring and stabilization projects are made through the statewide program workshops and the cultural resource business plan. The Southwest MFP (BLM 1981), applicable only to the Goodnews Block of the Bay planning area, requires protecting significant Cultural Resources and developing a paleontological resource management program for the protection and research of paleontological resources.

Decisions about avoidance or other forms of mitigation of impacts to cultural and paleontological sites would be made based on weighing the relative value of the resources, the effects on development interests, and the interests and needs of the present and future public. Priorities for inventory would be assigned based on a combination of expected development activities and resource values. Non-destructive data recovery (e.g. mapping) would be done as necessary based on management needs and resource values. Limited destructive forms of data recovery (testing and excavation) and limited collection of artifacts and specimens would be allowed when other information is limited and/or the resource is threatened. Most sites would be designated as suitable for current research. Known and newly discovered sites would be assigned to multiple use categories. Suitable sites would be designated for educational/interpretive purposes in areas having general public access. Cultural sites would be designated for traditional use as they are identified.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

- Continue to conduct non-Section 106 related inventories as funds are available.
- Monitor cultural and paleontological resource sites in danger of alteration or destruction from natural or human-made causes, including wildland fires and the effects of fire suppression.
- Develop partnerships to achieve goals.

(b) Management Decisions

- All cultural properties on BLM-administered lands in the Bay planning area would be managed for their scientific use (preserved until their research potential is realized).
- Identify area wide criteria or site-specific restrictions that apply to special cultural resource issues, including traditional cultural properties that may affect location, timing, or method of development or use of other resources in the planning area. Identify measures to proactively manage, protect, and use cultural and paleontological resources.

(c) Land Use Requirements

All actions that may impact cultural resources will comply with the National Historic Preservation Act (NHPA) Sections 106 and 110, and with the Native American Graves Protection and Repatriation Act (NAGPRA), as well as laws governing the protection or consideration of cultural resources. When any Federal undertaking, including any action funded or authorized by the Federal Government with the potential to directly or indirectly affect any archaeological or historic site is planned, a consultation with the State Historic Preservation Officer (SHPO) under the 1997 National Cultural Programmatic Agreement and the 1998 State Protocol that stands in place of 36 CFR 800. If archaeological or historic sites are identified in the project area their significance will be evaluated to determine their eligibility for inclusion in the National Register of Historic Places. The State requests that the SHPO be notified if archaeological or historic sites are identified through this planning process. The State may request that recreational or commercial uses be precluded in order to protect archaeological and historic sites.

(4) Alternative B

Alternative B would be similar to Alternative A. Under Alternative B, decisions regarding avoidance of sites would be made after considering input from interested parties. When avoidance is not possible, given the overall benefits of the development, mitigate the impacts. Priority for non-Section 106 survey

and inventory would be assigned to broad areas because of the likelihood of development impacts. Non-destructive data recovery would be conducted in areas where development is anticipated; destructive data recovery would be allowed in mitigation when avoidance is not feasible for the approved development project. Most sites would be designated as suitable for current research use. Allow other uses only to the extent that they do not restrict research use. Balance public use designations with other resource developments. Required Operating Procedures and Stipulations would apply.

(5) Alternative C

Alternative C would be similar to Alternative A. Under Alternative C, impacts to cultural and paleontological resources would be avoided except when it is physically impossible to do so. Priority for non-Section 106 survey and inventory would be assigned based on the value of the resource. Priority would be given to areas known to include important and/or numerous sites. Non-destructive data recovery would be conducted in areas of known or expected high resource values; destructive data recovery would be allowed to address important research topics when part of the site would be left intact for the future. Destructive data recovery would also be allowed in cases when there is danger of destruction of significant cultural resources by natural forces. Most sites would be reserved for conservation for future use unless threatened. Uses that would lead to destruction or major changes in sites would be avoided.

Under Alternative C, Stipulations and Required Operating Procedures would apply, and cultural and paleontological resource strategies and priorities specific to the SMAs would be developed for the proposed Carter Spit ACEC and Bristol Bay ACEC and the nominated Wild Rivers, the Alagnak River, Goodnews River mainstem, and Goodnews River Middle Fork.

(6) Alternative D

Alternative D would be similar to Alternative C. Under Alternative D, Stipulations and Required Operating Procedures would apply, and cultural and paleontological resource strategies and priorities specific to the SMA would be developed for the proposed Carter Spit ACEC.

Table 2.3 provides the comparison of how these management actions proposed for cultural and paleontological resources are applied under each Alternative.

Table 2.3. Cultural and Paleontological Resource Management - Summary of Alternatives

Alternative A	Identify, protect, and preserve significant cultural and paleontological resources; manage cultural and paleontological resources for a variety of scientific, conservation, public education, interpretation, traditional, and experimental use.
Alternative B	Same as Alternative A.
Alternative C	Same as Alternative A. Develop cultural and paleontological resource strategies and priorities for Carter Spit and Bristol Bay ACECs.
Alternative D	Same as Alternative A. Develop cultural and paleontological resource strategies and priorities for Carter Spit ACEC.

h) Visual Resources

(1) Goals

Protect the quality of scenic values of these lands.

What Do VRM Classes Mean for Future Management?

The objectives for the VRM classes are:

Class	Objective
I	Preserve the existing character of the landscape; change to the characteristic landscape should be very low and should not attract attention.
II	Preserve the existing character of the landscape; change to the characteristic landscape may be seen, but should be low and should not attract the attention of the casual observer.
III	Partially retain the existing character of the landscape; change to the characteristic landscape should be moderate and may attract attention, but not dominate the view of the casual observer.
IV	Provides for action that would make major modifications to the existing character of the landscape; change to the characteristic landscape can be high, dominate the view, and be the major focus of the viewer.

(2) Alternative A

Alternative A would continue current management. The Southwest MFP (BLM 1981), applicable only to the Goodnews Block, contains guidance for the general management of Visual Resources. It requires that all proposed management activities be evaluated using the visual resource management contrast rating system. In that way, areas that have not been classified for visual resources can be evaluated. The following guidance is provided:

The MFP VR-1 Objective states “Allow only very limited visual change in areas designated “Wild” portions of Wild and Scenic Rivers.” These areas are to be designated VRM Class I which provides for primarily natural ecological changes in visual resources, but does not preclude limited management activities.

The MFP VR-2 Objective is to “Maintain the visual quality of the planning area.” The planning area is virtually undisturbed by human activities. Any major development would be highly visible from aircraft. Development should be designed for minimum impact to visual resources and to reduce unnecessary surface disturbance.”

The MFP multiple-use recommendation calls for evaluating all proposed management activities using the visual resource management contrast rating system and encourage activities that are compatible or designed to be compatible with the character of the natural landscape.

Current management practices require that a specialist analyze the visual resource impacts of proposed actions on a case-by-case basis. BLM’s policy is to minimize impacts to visual resources and place stipulations on permits to accomplish this goal. To date, most VRM actions in the planning area have been applied to communication tower permits and have addressed mitigation issues related to structure heights and color schemes.

Under Alternative A, no VRM classes would be established on BLM-managed lands within the Bay planning area. The visual resources of an area would be identified and assigned inventory classes using the BLM visual resource inventory process (Manual 8400). The principles of the visual contrast rating

system (Manual 8431) would be used to identify mitigation measures and to develop stipulations to meet the objectives of the assigned inventory class.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

All BLM unencumbered, State-selected, and Native-selected lands within the Bay planning area would be inventoried for scenic qualities, sensitivity level analysis, and distance zone classification utilizing the visual resource inventory system as described in BLM Manual 8410 - Visual Resource Inventory. VRM Inventory Classes would be assigned based upon this analysis.

(b) Management Decisions

- Visual resources within the planning area would be managed at the assigned VRM Inventory Classification unless and until VRM Management Classes are established in the final RMP/EIS.
- All proposed actions within the planning area would be analyzed individually for impacts on visual resources utilizing the Visual Resource Contrast Rating System as described in BLM Manual 8431 - Visual Resource Contrast Rating. This analysis would determine if the potential visual impacts from proposed surface-disturbing activities or developments would meet VRM Inventory Class management objectives assigned for the area, or whether design adjustments would be required.
- All Actions would be mitigated to reduce impacts on visual resources utilizing design techniques including proper siting and location, reducing unnecessary disturbance, and the repetition of the basic elements of form, line, color, and texture found in the existing visual landscape. Design strategies and appropriate stipulations will be employed to ensure that surface-disturbing activities are in harmony with their surroundings and VRM management classes.
- Consult with neighboring Federal, State, and Native corporation land managing agencies to coordinate compatible VRM management along common boundaries.

(4) Alternative B

Under Alternative B, all lands in the Bay planning area would be managed as VRM Class IV. The principles of the visual resource contrast rating system (Manual 8431) would be used to identify mitigation measures and to develop stipulations to meet the objectives of VRM Class IV. Development would be allowed with mitigation. Stipulations and Required Operating Procedures would be applicable (Section E of this Chapter).

(5) Alternative C

Under Alternative C, BLM lands in the full visible foreground based on GIS analysis up to five miles from established winter trail/road systems would be managed at VRM Class III, including trails in the Goodnews Block (Goodnews to Quinhagak coastal and Arolik River routes; Goodnews Bay to Dillingham route), and the blocks in Bristol Bay (Dillingham to Aleknagik; Dillingham to Koliganek; Ekwok to Naknek; New Stuyahok to Levelock; and Naknek to King Salmon). BLM lands in the full visible foreground up to five miles from main river travel routes would be managed at VRM Class III, including portions of the Goodnews Block (North Fork Goodnews River; Middle Fork Goodnews River; South Fork Goodnews River; and East Fork Arolik River) and Bristol Bay blocks (Nushagak River; Kvichak River; Lower Mulchatna River; and Alagnak Wild River).

BLM lands in the full visible foreground up to five miles from the boundaries of Togiak NWR, Becharof NWR, Katmai NPP, and Lake Clark NPP would be managed at VRM Class III.

The proposed Carter Spit and Bristol Bay ACECs would be managed at VRM Class III. The proposed National WSRs, a portion of the Alagnak River, Goodnews River and Middle Fork Goodnews River would be managed at VRM Class III.

All other BLM lands would be managed at VRM Class IV. Stipulations and Required Operating Procedures, located in Section E of this chapter, would apply (Figures 2.1 - 2.6).

(6) Alternative D

Under Alternative D, BLM lands in the full visible foreground based on GIS analysis up to 1/2 mile from established winter trail/road systems would be managed at VRM Class III, including trails in the Goodnews Block (Goodnews to Quinhagak coastal and Arolik River routes; Goodnews Bay to Dillingham route), and the blocks in Bristol Bay (Dillingham to Aleknagik; Dillingham to Koliganek; Ekwok to Naknek; New Stuyahok to Levelock; and Naknek to King Salmon).

BLM lands in the full visible foreground up to 1/2 mile from main river travel routes would be managed at VRM Class III, including portions of the Goodnews Block (North Fork Goodnews River; Middle Fork Goodnews River; South Fork Goodnews River; and East Fork Arolik River) and Bristol Bay blocks (Nushagak River; Kvichak River; Lower Mulchatna River; and Alagnak Wild River).

BLM lands in the full visible foreground up to one mile from the boundaries of Togiak NWR, Becharof NWR, Katmai NPP, and Lake Clark NPP would be managed at VRM Level III. The proposed Carter Spit ACEC would be managed at VRM Class III.

All other BLM lands would be managed at VRM Class IV. Stipulations and Required Operating Procedures, found in Section E of this Chapter, would apply (Figures 2.1 - 2.6)

Tables 2.4 and 2.15 provide the comparison of how these management actions proposed for visual resource management are applied under each Alternative.

Table 2.4. Visual Resource Management - Summary of Alternatives

	Classification of BLM-administered unencumbered lands for Visual Resource Management	VRM Classification in Special Management Areas
Alternative A	No VRM classes would be established on BLM-administered lands within the Bay planning area.	No Special Management Areas would be recommended.
Alternative B	All lands in the Bay planning area would be managed as VRM Class IV (Figures 2.1 - 2.6).	No Special Management Areas would be recommended.
Alternative C	<p>BLM lands in the full visible foreground based on GIS analysis up to 5 miles from established winter trail/road systems would be managed at VRM Class III including (Figures 2.1 - 2.6):</p> <p>Goodnews Bay region</p> <ul style="list-style-type: none"> • Goodnews to Quinhagak coastal and Arolik River routes • Goodnews Bay to Dillingham <p>Bristol Bay region</p> <ul style="list-style-type: none"> • Dillingham to Aleknagik • Dillingham to Koliganek • Ekwok to Naknek • New Stuyahok to Levelock • Naknek to King Salmon <p>BLM lands in the full visible foreground up to 5 miles from main river travel routes would be managed at VRM Class III including:</p> <p>Goodnews Bay region</p> <ul style="list-style-type: none"> • North Fork Goodnews River • Middle Fork Goodnews River • South Fork Goodnews River • East Fork Arolik River <p>Bristol Bay rivers</p> <ul style="list-style-type: none"> • Nushagak River • Kvichak River • Lower Mulchatna River • Alagnak Wild River <p>BLM lands in the full visible foreground up to five miles from the boundaries of Togiak NWR, Becharof NWR, Katmai NPP, and Lake Clark NPP would be managed at VRM Class III.</p> <p>All other BLM lands would be managed as VRM Class IV.</p>	<p>Proposed Carter Spit and Bristol Bay ACECs would be managed at VRM III.</p> <p>Proposed National WSR Alagnak River (Wild, Recreational) would be managed at VRM Class III.</p> <p>Proposed National WSR Goodnews River and Middle Fork Goodnews River (Wild) would be managed at VRM Class III.</p>
Alternative D	<p>BLM lands in the visible foreground up to 1/2 mile from established winter trail/road systems would be managed at VRM Class III including (Figures 2.1-2.6):</p> <p>Goodnews Bay region</p> <ul style="list-style-type: none"> • Goodnews to Quinhagak coastal and Arolik River routes • Goodnews Bay to Dillingham <p>Bristol Bay region</p> <ul style="list-style-type: none"> • Dillingham to Aleknagik 	Proposed Carter Spit ACEC would be managed at VRM Class III.

	Classification of BLM-administered unencumbered lands for Visual Resource Management	VRM Classification in Special Management Areas
	<ul style="list-style-type: none"> • Dillingham to Koliganek • Ekwok to Naknek • New Stuyahok to Levelock • Naknek to King Salmon <p>BLM lands in the visible foreground up to 1/2 mile from main river travel routes would be managed at VRM Class III including:</p> <p>Goodnews Bay region</p> <ul style="list-style-type: none"> • North Fork Goodnews River • Middle Fork Goodnews River • South Fork Goodnews River • East Fork Arolik River <p>Bristol Bay rivers</p> <ul style="list-style-type: none"> • Nushagak River • Kvichak River • Lower Mulchatna River • Alagnak Wild River <p>Manage BLM lands in the visible foreground up to one mile from the boundaries of Togiak NWR, Becharof NWR, Katmai NPP, and Lake Clark NPP at VRM Class III.</p> <p>All other BLM lands would be managed as VRM Class IV.</p>	

2. Resource Uses

a) Forest Products

(1) Goals

- Manage forests and woodlands to sustain their health, productivity, and biological diversity.
- Consistent with other resource values, provide opportunities for personal use of forest resources and for commercial timber harvests, should any viable commercial-grade trees become available.

(2) Alternative A

Alternative A would continue current management. Under this Alternative, requests for forest resources would be considered on a case-by-case basis as permits were received. Forested lands would be managed for a sustained yield of forest products. The Southwest MFP (1981), which applies only to the Goodnews Block within the Bay planning area, provides for the use of forestry products in the Goodnews Block with priority areas opened for settlement entry. No potential commercial harvest areas have been identified for BLM-administered lands in the planning area. No commercial timber harvesting is anticipated within the life of this plan, due to the lack of commercial grade timber on BLM lands in the Bay planning area.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

Should any exist, BLM will identify potential commercial harvest areas and high interest personal use areas. If any of these areas are identified within the proposed ACECs, management will be consistent with the objectives of the proposed ACEC.

(b) Management Decisions

- All forestry management practices would be conducted consistent with guidelines described in the Stipulations and Required Operating Procedures (Section E of this Chapter).
- The natural range of variation in plant composition and structure and the high value of natural resources will be sustained.
- Issue permits to authorize harvest of personal use firewood and house logs consistent with 43 CFR 5400 on a case-by-case basis.
- Issue free use permits to harvest vegetative products for personal use consistent with 43 CFR 5500 on a case-by-case basis.

(4) Alternative B

Under Alternative B, forested lands would be managed for the public a variety of forest products including firewood, house logs, and other forest products for personal or household use. The feasibility of prescribed fire, wildland fire, or salvage logging in localized areas of beetle-killed spruce would be assessed. Requests for forest products would be considered on a case-by-case basis as applications were received. Required Operating Procedures, Stipulations, and project-specific requirements would apply.

(5) Alternative C

Under Alternative C, forested lands would be managed as in Alternative B. In addition, further restrictions on harvest of forest products would apply in the Carter Spit ACEC and the Bristol Bay ACEC and suitable rivers.

(6) Alternative D

Under Alternative D, forested lands would be managed as in Alternative B. In addition, further restrictions on harvest of forest products would apply in the Carter Spit ACEC.

b) Livestock and Reindeer Grazing

(1) Goals

- Avoid conflicts between livestock grazing uses, fisheries and wildlife habitat, and subsistence.
- Determine the suitability and compatibility for livestock range, and the capability and allocation of forage for native wildlife and livestock in Bay area ecosystems.
- Maintain habitat needed to support healthy populations of wildlife to meet population viability and human use demands, as required by FLPMA and the Land Health Standards.

(2) Alternative A

Alternative A would continue current management practices. The Southwest MFP (1981), which is applicable only to the Goodnews Block in the Bay planning area, allows seasonal grazing for domestic livestock and reindeer on a local level where public demand warrants and where compatible with other resources. Livestock grazing would be managed on a case-by-case basis as permits are received. The type of livestock permitted would be limited to reindeer. Incidental grazing by pack animals associated with special recreation use permits would be considered on a case-by-case basis. Conflicts with wildlife and subsistence, compatibility, and suitability would be taken into consideration.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

- Currently there is no livestock or reindeer grazing in the Bay planning area, nor has any interest been expressed. In the future, should there be renewed interest, BLM would work cooperatively with ADNR, ADF&G, NRCS, NPS, and the Federal Subsistence Program to monitor range conditions to provide the necessary information to manage all aspects of grazing activities. BLM would also work with NRCS and others to assess seasons of use, grazing systems, suitability and compatibility.
- BLM would inventory habitat to ensure priority for wildlife species, and that no conflicts or threats are created.

(b) Management Decisions

- Currently no livestock or reindeer grazing exists in the Bay planning area, and no interest has been expressed. Should BLM receive requests for grazing, BLM Anchorage Field Office (AFO) will consider livestock grazing on a case-by-case basis after suitability, and compatibility determinations have been made.
- Avoid conflicts between grazing, habitat requirements of fish and wildlife, and other human uses.
- Develop allotment management plans for any proposed grazing that includes grazing systems and fire management and allows for maintaining long-term native vegetative communities, composition, diversity, distribution and productivity.
- Allow incidental grazing of pack animals associated with special recreation permits on a case-by-case basis consistent with the permitting process for special recreation use permits, Required Operating Procedures and the Alaska Statewide Land Health Standards.
- Special recreation permits and casual use of grazing animals require evaluation for suitability and compatibility before authorizing use.
- Grazing permits would be subject to Required Operating Procedures and project-specific requirements, which will help maintain habitat needed to support healthy populations.

(4) Alternative B

Alternative B would be the same as Alternative A, with the addition of Management Common to All Action Alternatives. Required Operating Procedures, Stipulations, and project specific requirements would apply.

(5) Alternative C

Alternative C would be the same as Alternative B. No grazing or domestic pack animals would be allowed in the Carter Spit ACEC, the Bristol Bay ACEC, or designated WSRs.

(6) Alternative D

Alternative D would be the same as Alternative B. No grazing or domestic pack animals would be allowed in the Carter Spit ACEC.

Table 2.5. provides the comparison of management actions proposed for livestock and reindeer grazing under each Alternative.

Table 2.5. Livestock and Reindeer Grazing - Summary of Alternatives

Resource	Alternative A	Alternative B	Alternative C	Alternative D
Livestock and Reindeer Grazing	Alternative A would continue current management. Livestock grazing would be managed on a case-by-case basis as permits were received. Livestock permitted would be limited to reindeer	Same as Alternative A. Permits subject to Required Operating Procedures.	Same as Alternative A. Permits subject to Required Operating Procedures.	Same as Alternative A. Permits subject to Required Operating Procedures.
Grazing Management in Special Management Areas	Grazing permitted in the Bay planning area.	Grazing permitted in the Bay planning area	No grazing or domestic pack animals allowed in Carter Spit ACEC, Bristol Bay ACEC, or designated WSRs.	No grazing or domestic pack animals allowed in Carter Spit ACEC.

c) Minerals

Lands currently under selection by the State and Native corporations are segregated from locatable mineral entry and location, and from mineral leasing to avoid potential encumbrances on selected lands prior to conveyance. These lands comprise approximately 1,327,553 acres out of the 2,503,822 acres currently managed by the BLM. Therefore, decisions made within this land use planning effort to “open” areas for mineral exploration or development by revoking withdrawals would not go into effect unless selected lands are retained long-term in Federal ownership. In other words, these BLM-administered lands would never be conveyed to the State or Native corporations in the future.

c.1. Fluid Leasable Minerals (Oil and Gas)

(1) Goals

Public lands and Federal mineral estate will be made available for orderly and efficient exploration (including geophysical exploration), development and production of fluid leasable minerals, including oil, natural gas, tar sands, coal bed methane and geothermal steam, unless a withdrawal or other administrative action is justified in the national interest.

(2) Alternative A

Under Alternative A, current management would continue. Approximately 2,503,822 acres of BLM-administered lands (100%) would be closed to leasing. No oil and gas leasing would occur under Alternative A and no BLM-administered lands would be identified as open for fluid mineral leasing in the Bay planning area. Appropriate NEPA analysis must be completed and approved before Federal oil and gas lease sales can occur. Additionally, no withdrawal review would occur and all ANCSA 17(d)(1) withdrawals would remain in place, pending future legislation or unrelated management direction. However, where drainage occurs, that is, where Federal oil and gas resources are being drained from

lands otherwise unavailable for leasing, there is implied authority in the agency having jurisdiction of those lands to grant authority to the BLM to lease such lands.

The Southwest MFP (BLM 1981), which addresses only the Goodnews Block of the planning area, called for opening all BLM-administered public lands to oil and gas leasing under Section 1008 of ANILCA (PL 96-487 Title 10 §1008).

(3) Management Common to All Action Alternatives (B, C, and D)

- Lands currently under selection by the State and Native corporations are segregated from mineral leasing to avoid potential encumbrances on selected lands prior to conveyance.
- Areas for potential leasing would be identified consistent with the goals, standards, and objectives for natural resources within the planning area. Areas where oil and gas development could coexist with other resource uses would be open to leasing under Standard Lease Terms or with added stipulations. Stipulations describe how lease rights are modified. Table 2.6 summarizes the number of acres available and unavailable for leasing in the planning area by Alternative.
- Oil and Gas Stipulations and Required Operating Procedures described in Section E of this chapter apply to all BLM-managed lands in the Bay planning area open to oil and gas leasing. Stipulations notify the leaseholder that development activities may be limited, prohibited, or implemented with mitigation measures to protect specific resources. The stipulations would condition the leaseholder's development activities and provide BLM the authority to require other mitigation or to deny some proposed exploration and development methods.
- Additional Stipulations and Required Operating Procedures might also be required based on site-specific NEPA compliance. Additional information can be provided to the lessee in the form of a lease notice. This notice does not place restrictions on lease operations, but does provide information about applicable laws and regulations, and the requirements for additional information to be supplied by the lessee.
- The BLM land use planning process determines availability of Federal lands for oil and gas leasing where BLM is the surface management agency. For Federal oil and gas where the surface is managed by another Federal agency, the BLM will consult with that agency before issuing leases.
- All areas open to mineral leasing would be open to geophysical exploration, except those lands containing No Surface Occupancy (NSO) restrictions, which would only be available for geophysical exploration in winter conditions, subject to Stipulations and through Casual Use as described in 43 CFR 3150.05(b) during non-winter conditions. On a case-by-case basis geophysical exploration may be allowed in areas closed to oil and gas leasing based on the nature and level of impacts from the exploration, and consistency with other applicable policy. Oil and gas geophysical exploration activity on public lands in Alaska, the surface of which is administered by the BLM, is governed by regulations found at 43 CFR Subparts 3150, 3152, and 3154. A Federal oil and gas lease is not required to conduct geophysical exploration. The BLM will review Notices of Intent to Conduct Geophysical Exploration (NOI) in the planning area and develop appropriate mitigation measures so as not to create undue and unnecessary degradation. A site-specific environmental analysis will be prepared for each NOI filed. The oil and gas lease stipulations developed in this document serve as the starting point for developing required mitigation measures for each NOI.
- Geothermal resources would be available for leasing in areas open to oil and gas leasing. Areas closed to oil and gas leasing are also closed to geothermal leasing. There are no Known Geothermal Resource Areas (KGRAs) in the planning area. A site-specific environmental analysis would be prepared should interest be expressed in exploring for or developing geothermal resources in the planning area. This analysis would address the application of stipulations and develop additional mitigating measures over and above the lease stipulations required. Stipulations developed in this document for oil and gas leases would be applied to any geothermal lease issued if appropriate.
- Coal bed natural gas (CBNG) development is authorized by the same process as oil and gas.
- Public lands available for oil and gas leasing would be offered first by competitive bid at an oral auction. Stipulations, terms, and conditions would be applied at the time of leasing. Leasing of

available lands under jurisdiction of another Federal agency would only occur following consultation, and consent if necessary, from the surface managing agency. Notices of Intent to conduct geophysical exploration would be reviewed and mitigation measures developed so as not to cause undue or unnecessary degradation for other resources.

- Where oil or gas is being drained from lands otherwise unavailable for leasing, there is implied authority in the agency have jurisdiction of those lands to grant authority to the BLM to lease such lands (43 CFR 3100.0-3(d)). Leasing of such lands would only occur following consultation, and consent if necessary, from the surface managing agency.
- The terms of existing oil and gas leases cannot be changed by the decisions in this document. However, when the lease expires, the area will be managed for oil and gas according to the decisions made in this RMP/EIS.

No Surface Occupancy

No Surface Occupancy (NSO) is a limitation of oil and gas leasing. It denotes an area that is open for mineral leasing, but that analysis has found that in order to protect other resources, no well sites, tank batteries, or similar facilities are to occupy the surface of specified lands, unless site-specific analysis shows that resource values can be protected.

Table 2.6. Acres of Federal Mineral estate Available/Unavailable for Fluid Mineral Leasing

	Alt A	Alt B	Alt C	Alt D
Acres <i>Available</i> for Oil and Gas Leasing	0	2,499,823	2,484,698	2,499,823
Under Standard Lease Terms	0	2,499,823	713,893	729,018
Under Minor Constraints	0	0	1,768,450	1,768,450
Under Major Constraints	0	0	2,355	2,355
Acres <i>Unavailable</i> for Oil and Gas Leasing	2,503,822	3,999	19,124	3,999
Discretionary	2,503,822	3,999	3,999	3,999
Non-Discretionary	0	0	15,125	0

As described in BLM Manual 1624, Federal oil and gas resources (including CBNG) fall into one of the following categories relative to restrictiveness:

- **Areas open to leasing, subject to the terms and conditions of the standard lease form.** These are areas where it has been determined through the planning process that the standard terms and conditions of the lease form are sufficient to protect other land uses or resource values.
- **Areas open to leasing, subject to minor constraints such as seasonal restrictions.** These are areas where it has been determined through the planning process that moderately restrictive lease Stipulations may be required to mitigate impacts to other land use or resource values. This category of leases frequently involves timing limitations such as restricting construction activities in important designated big game habitats, or controlled surface use Stipulations such as creating a buffer zone around a key resource.
- **Areas open to leasing, subject to major constraints such as NSO Stipulations on an area more than 40 acres in size or more than one-quarter mile in width.** These are areas where it has been determined through the planning process that highly restrictive lease stipulations are required to mitigate impacts to other lands and resource values. This category also includes areas where

overlapping minor constraints would severely limit development of fluid minerals. This category of leases may prohibit the construction of well production and support facilities. These areas can be subject to directional drilling, if technologically and economically feasible.

- **Areas closed to leasing.** These are areas where it has been determined through the planning process that other land uses or resource values cannot be adequately protected with even the most restrictive lease stipulations. Appropriate protection can be ensured only by closing the lands to leasing through either statutory or administrative requirements.

What is Drainage?

Drainage of oil or gas occurs whenever an oil or gas well on property adjacent to BLM-administered subsurface estate produces from a reservoir or reservoirs that extend onto both properties. In such a case, Federal resources are being drained through a well on lands owned or administered by others, and BLM would lease the Federal subsurface estate or, at a minimum, pursue an agreement for payment of royalties on the government's share of the oil and gas produced.

(4) Alternative B

Under Alternative B, all existing ANCSA 17(d)(1) withdrawals would be revoked to allow increased opportunities for exploration, development and production of fluid leasable minerals pending Native and State conveyances.

Approximately 1,177,705 acres of BLM unencumbered lands and any State-selected or Native-selected lands (1,322,118 acres) whose selections are relinquished or revoked would be open to fluid mineral leasing subject to standard lease terms. There would be no restriction under this Alternative for seasonal closures or for NSO. Additionally, oil and gas Stipulations #6 and #7 in Section E of this chapter would not be applicable under this Alternative. Withdrawals, other than the ANCSA 17(d)(1) withdrawals, would close approximately 3,999 acres to leasing.

(5) Alternative C

Under Alternative C, lands available for fluid mineral leasing would be reduced and subject to more constraints than in Alternatives B or D. All but 15,125 acres of existing ANCSA 17(d)(1) withdrawals would be revoked to allow increased opportunities for mineral exploration and development, pending Native and State conveyances.

Approximately 713,893 acres of BLM-managed lands, all of which are State-selected or Native-selected lands, would be open to fluid mineral leasing subject to standard lease terms should they be relinquished or revoked and return to long-term Federal ownership. Approximately 1,768,450 acres of unencumbered BLM lands and any State- or Native-selected lands (716,385 acres) whose selections are relinquished or revoked would be open to fluid mineral leasing subject to minor constraints. This includes two proposed ACECs (Bristol Bay and Carter Spit). To protect caribou habitat on identified aggregation areas, oil and gas exploration and development activities would not be permitted from May 20 through August 15. Oil and gas exploration and development activities would not be permitted from May 1 through June 15 to protect calving caribou; from June 15 through August 15 to protect the Mulchatna Caribou Herd, Nushagak and Northern Alaska Peninsula Caribou Herd in their post calving aggregations and insect relief areas; from April 10 through July 15 for migratory bird nesting located in the forest and woodland habitat of the Bristol Bay area; from May 1 through July 15 for open or shrub habitat types; from May 10 through September 15 for seabird colonies; and from April 15 through August 15 for raptors. These seasonal restrictions would be dependent upon the actual location of the species in question.

Total Acreage subject to no surface occupancy (NSO) is 2,355 acres. Areas subject to NSO include a 300 foot buffer on either side of the East and South Fork Arolik River, Faro Creek, and South Fork

Goodnews River to protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.

Existing withdrawals of approximately 3,999 unencumbered acres would remain closed to fluid mineral leasing. In addition, existing ANCSA 17(d)(1) withdrawals for proposed Wild River segments of the Alagnak, Goodnews and Goodnews Middle Fork rivers (15,125 acres) would remain closed to fluid mineral leasing until Congressional action is completed.

(6) Alternative D

Under Alternative D, existing ANCSA 17(d)(1) withdrawals would be revoked to allow for increased opportunities for exploration, development and production of fluid leasable minerals pending Native and State conveyances. This Alternative would not propose Wild River designations for the Alagnak, Goodnews and Goodnews Middle Fork rivers.

Approximately 729,018 acres of unencumbered BLM lands and any State-selected or Native-selected lands (425,082 acres) whose selections are relinquished or revoked would be open to fluid mineral leasing subject to standard lease terms.

Approximately 1,768,450 acres of unencumbered BLM lands and any State-selected or Native-selected lands (716,385 acres) whose selections are relinquished or revoked would be open to fluid mineral leasing subject to minor constraints. To protect caribou habitat on identified aggregation areas, oil and gas exploration and development activities would not be permitted from May 20 through August 15. Oil and gas exploration and development activities would also not be permitted from May 1 through June 15 to protect calving caribou; from June 15 through August 15 to protect the Mulchatna Caribou Herd, Nushagak and Northern Alaska Peninsula Caribou Herd in their post calving aggregations and insect relief areas; from April 10 through July 15 for migratory bird nesting located in the forest and woodland habitat of the Bristol Bay area; from May 1 through July 15 for open or shrub habitat types; from May 10 through September 15 for seabird colonies; and from April 15 through August 15 for raptors. These seasonal restrictions would be dependent upon the actual location of the species in question.

Total Acreage subject to no surface occupancy (NSO) is 2,355 acres. Areas subject to NSO include a 300 foot buffer on either side of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River to protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.

Existing withdrawals (other than ANCSA 17(d)(1) lands), of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing.

Lands available subject to minor (seasonal) constraints are roughly 1,768,450 acres, with 773,767 acres on selected lands. To protect caribou habitat on identified aggregation areas, oil and gas exploration and development activities will be closed from May 15 through August 15. An additional closure to protect calving caribou will restrict exploration and development activities from May 1 through June 15. Closures will protect the Mulchatna Caribou Herd, Nushagak and Northern Alaska Peninsula Caribou Herd in their post calving aggregations and insect relief areas from June 15 to August 15. Closures are required for the migratory bird nesting period of April 10 to July 15 for forest and woodland habitat types in Bristol Bay, May 1 to July 15 for open or shrub habitat types, May 10 to September 15 for seabird colonies and April 15 to August 15 for raptors. These closures would be dependent upon the actual location of the species in question.

There are no oil and gas leasing closures proposed with the exception of existing withdrawals that make up approximately 3,999 acres. This figure does not include lands closed due to existing ANCSA 17(d)(1) withdrawals. These withdrawals would be revoked to allow for oil and gas exploration and development, pending Native and State conveyances.

Tables 2.7 and 2.15 provide the comparison of how these management actions proposed for fluid leasable minerals are applied under each Alternative.

Table 2.7. Fluid Leasable Minerals - Summary of Alternatives

Management Action	Alternative A (Current management)	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Areas Open to Fluid Mineral Leasing Subject to Standard Lease Terms	No BLM-administered lands would be open for fluid mineral leasing.	2,499,823 acres (99%), 1,327,671 acres of which are State- or Native-selected.	2,484,696 acres (99%), all of which are State- or Native-selected.	2,499,823 acres (99%), 1,176,629 of which are State- or Native-selected.
	Notwithstanding the provisions listed within this management action, BLM may lease lands in cases where oil and gas is being drained from the Federal subsurface estate by wells drilled on adjacent lands. Oil and Gas Stipulations and Required Operating Procedures described in Section E of this Chapter apply to all BLM-managed lands in the Bay planning area open to oil and gas leasing.			
Areas Closed to Fluid Mineral Leasing	All BLM lands would be closed to fluid mineral leasing.	Existing withdrawals other than ANCSA 17(d)(1) of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing.	Approximately 19,124 acres (>1%) which are unencumbered BLM lands. Existing withdrawals of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing	Existing withdrawals other than ANCSA 17(d)(1), of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing.
(Discretionary)				
(Non-Discretionary)			Proposed Wild River segments of the Alagnak, Goodnews and Goodnews Middle Fork rivers (15,125 acres). ANCSA 17 (d)(1) withdrawals would be retained for these river segments as an interim measure to provide an opportunity for Congressional action.	
Total Acres Unavailable	2,503,822	3,999	19,124	3,999

Management Action	Alternative A (Current management)	Alternative B	Alternative C	Alternative D (Preferred Alternative)
<p>Areas Open to Fluid Mineral Leasing Subject to Seasonal or Other Minor Constraint</p>	<p>No Federal leases would occur on BLM-managed lands within the Bay planning area.</p>	<p>No acres are subject to seasonal or other minor constraints.</p> <p>Stipulations #6 and #7 (Section E) do not apply under this Alternative.</p>	<p>1,768,450 acres (42%), none of which are State-selected or Native-selected.</p> <p>Carter Spit ACEC (62,862 acres).</p> <p>Bristol Bay ACEC (989,202 acres).</p> <p>To protect caribou and their habitat, oil and gas exploration and development activities would be limited on identified aggregation areas (insect relief, post calving, and migration) between May 20 and August 15.</p> <p>To minimize disturbance to calving caribou, oil and gas exploration and development activities will be restricted from May 1 to June 15.</p>	<p>1,768,450 acres (42%), none of which are State-selected or Native-selected.</p> <p>Carter Spit ACEC (62,862 acres).</p> <p>To protect caribou and their habitat, oil and gas exploration and development activities would be limited on identified aggregation areas (insect relief, post calving, and migration) between May 20 and August 15.</p> <p>To minimize disturbance to calving caribou, oil and gas exploration and development activities would be restricted from May 1 to June 15.</p>
<p>Areas Open to Fluid Mineral Leasing Subject to No Surface Occupancy Constraint</p>	<p>No Federal leases would occur on BLM-managed lands within the planning area.</p>	<p>0 acres.</p> <p>Stipulations #6 and #7 (Section E) do not apply under this Alternative</p>	<p>2,355 acres (>.1 %).</p> <p>A 300-foot minimum setback on BLM unencumbered lands on segments of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River.</p> <p>This setback would protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.</p>	<p>2,355 acres (>.1%).</p> <p>A 300-foot minimum setback on BLM unencumbered lands on segments of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River.</p> <p>This setback would protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.</p>

c.2. Solid Leasable Minerals

Currently there are no known coal resources on BLM-administered lands in the Bay planning area. The Governor of any state with an approved regulatory program may request that the Secretary of the Department of the Interior enter into a cooperative agreement to grant the State the authority to implement the Surface Mining Control and Reclamation Act of 1977 on Federal lands. At present, Alaska has no such agreement in place. However, should coal operations be developed on Federal lands, an agreement would likely be developed between the State and the Office of Surface Mining defining the regulatory role of the State in these mining operations (30 CFR 745).

(1) Goals

- Public lands and Federal mineral estate will be made available for orderly and efficient exploration, development and production of solid leasable mineral resources (including coal and oil shale, and non-energy leasable minerals (including potassium, sodium, phosphate and gilsonite), unless continued withdrawal from mineral entry is justified in the national interest.
- All solid leasable minerals actions will comply with goals, objectives, and resource restrictions (mitigations) to protect other resource values in the planning area.

(2) Alternative A

Under Alternative A, current management would continue. No BLM-administered lands would be identified as open for solid leasable mineral leasing in the Bay planning area. The Southwest MFP (BLM 1981), which addresses only the Goodnews Block of the planning area, called for providing opportunities for leasing or permitting of coal reserves on all BLM-administered public lands.

(3) Management Common to All Action Alternatives (B, C, and D)

The following management direction applies to all BLM-administered lands within the Bay planning area.

(a) Land Use Plan Decisions

- Leasing and exploration licensing are subject to BLM standard lease terms and BLM-Alaska's Oil and Gas Stipulations and Required Operating Procedures, located in Section E of this chapter.
- Coal and oil shale exploration and leasing will comply with the Mineral Leasing Act of 1920, as amended, the Surface Mining Control and Reclamation Act of 1977, the Federal Coal Leasing Amendments Act of 1976, the Mineral Leasing Act for Acquired Land of 1947 and other Federal resource and environmental laws, coal regulations and coal planning criteria.
- Identify BLM-administered public lands acceptable for further consideration for coal leasing and the methods under which such development may take place, consistent unsuitability assessment procedures outlined in 43 CFR 3461, including
 - Areas unacceptable for further consideration for coal leasing and development by all mining methods.
 - Areas acceptable for further consideration for coal leasing and development by only certain stipulated mining methods.
 - Areas acceptable for further consideration for coal leasing and development by all mining methods.
- All unencumbered BLM-administered lands within the Bay planning area subject to coal leasing under Part 43 CFR 3400.2 are open to coal exploration and study through the issuance of an exploration license. To date, no areas within the Bay RMP have been identified as having economic coal reserves. Therefore, the coal screening process (as identified by 43 CFR 3420.1-4) has not been conducted for this plan. Interest in exploration or leasing of Federal coal would be handled on a case-by-case basis. If an application for a coal lease should be received in the

future, an appropriate land use and environmental analysis, including the coal screening process, would be conducted to determine whether or not the coal areas are acceptable for further consideration for leasing under 43 CFR 3420.1-4(e). The Bay RMP/EIS would be amended as necessary.

- Should coal operations be developed on Federal lands, an agreement would likely be developed between the State of Alaska and the Office of Surface Mining defining the regulatory role of the State in these mining operations (30 CFR 745).
- The Mineral Leasing Act authorizes the leasing of Federal lands for the development of oil shale. However, there are currently no regulations governing the leasing of oil shale. Oil shale will be leased on a case-by-case basis and issued under the authority of 30 U.S.C. Chapter 3A, Subchapter V, Section 241.
- Solid leasable minerals include chlorides, sulfates, carbonates, borates, silicates or nitrates of potassium or sodium and related products; sulphur, phosphate and related minerals; oil shale, coal and gilsonite (including all vein-type solid hydrocarbons). The likelihood of commercially valuable deposits of these minerals occurring on BLM-managed lands in the planning area is not presently known. If solid leasable mineral deposits (excluding oil shale and coal) were discovered, subsequent leasing, exploration, and development would be analyzed on a case-by-case basis and would be subject to regulations under 43 CFR 3500 (Leasing of Solid Minerals other than Coal and Oil Shale). Non-energy leasable minerals exploration and leasing will comply with the Mineral Leasing act of 1920, as amended, the Mineral Leasing Act for Acquired Land of 1947, as amended, Federal resource laws, the Reorganization Plan No. 3 of 1946, non energy leasable minerals regulations and planning criteria.
- Lands under selection by the State and Native corporations are segregated from mineral leasing. The categories and constraints identified in this section only apply on lands retained in long-term Federal ownership.
- Oil and gas Stipulations prescribed for Federal mineral development in split estate situations apply only to the development of the Federal minerals. These stipulations do not dictate surface management.

Stipulations, Required Operating Procedures, and project-specific requirements would apply.

c.3. Locatable Minerals and Salable Minerals

(1) Goals

Maintain or enhance opportunities for mineral exploration and development while preventing undue and unnecessary degradation of other resource values from the development of locatable mineral resources. Tables 2.8 and 2.15 provide a comparison of the locatable and salable mineral management actions proposed under each Alternative.

(2) Alternative A

Under Alternative A, current management would continue. All ANCSA 17(d)(1) withdrawals would remain in place, pending future legislation or unrelated management direction. Approximately 152,746 acres would be available for locatable mineral entry. Other withdrawals of approximately 3,999 acres would remain closed to Locatable and Salable Mineral entry. Approved Plans of Operations would contain stipulations based on site-specific resource concerns.

The Southwest MFP (BLM 1981), which addresses only the Goodnews Block of the planning area, required reviewing areas presently closed to the various mining laws and the Mineral Leasing Act of 1920 for potential opening under those laws. However, this action was never implemented.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring

- Identify areas open and closed to the operation of the mining laws and mineral material disposal.
- In open areas identify area-wide terms, conditions, or other special considerations needed to protect resource values.

(b) Management Decisions

- Mining of locatable minerals and salable material, including existing mineral claims, would be subject to the surface management regulations found in 43 CFR 3809. Surface occupancy under the mining laws will be limited to uses incident to the mining operation. Bonding will be required in accordance with BLM policy. Specific measures that would be utilized to minimize surface impacts and to facilitate rehabilitation and revegetation of mined areas can be found in the Required Operating Procedures in Section E of this chapter.
- All operations must file a Plan of Operations with BLM. The Plan of Operations must be approved prior to commencement of on-the-ground activities. Areas withdrawn from mineral location in which valid existing rights are being exercised require the filing of a Plan of Operations.
- Lands under selection by the State and Native corporations are segregated from locatable mineral and salable material entry. For State- and Native-selected lands, revocation or modification of ANCSA (d)(1) withdrawals as indicated below only apply if lands are retained in long-term Federal ownership.

(c) Land Use Requirements

Mining of locatable minerals and salable material will be subject to the surface management regulations found in 43 CFR 3809.

(4) Alternative B

Under Alternative B, ANCSA 17(d)(1) withdrawals would be revoked and approximately 1,176,269 acres of BLM unencumbered lands and any selected lands (1,327,553 acres) which selection is revoked or relinquished would be available for locatable entry and the sale of mineral materials. Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1). Exploration and development would be guided by Required Operating Procedures, and project-specific requirements (Section E).

(5) Alternative C

Under Alternative C, ANCSA 17(d)(1) withdrawals would be revoked. Approximately 1,176,269 acres of BLM unencumbered lands and any selected lands (1,327,553 acres) which selection is revoked or relinquished would be available for locatable entry and the sale of mineral materials with the following exceptions. Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1). Bristol Bay ACEC and Carter Spit ACEC would be closed to locatable mineral exploration and development (1,052,065 acres). The proposed Wild River segments of the Alagnak River, Goodnews River mainstem, and Goodnews River Middle Fork (15,125 acres) would retain the ANCSA 17(d)(1) withdrawals until Congress has an opportunity to act on their nominations. Exploration and development would be guided by Required Operating Procedures and project-specific requirements (Section E).

(6) Alternative D

Under Alternative D, ANCSA 17(d)(1) withdrawals would be revoked and approximately 1,176,269 acres of BLM unencumbered lands and any selected lands (1,327,553 acres) which selection is revoked or relinquished would be available for locatable entry and the sale of mineral materials. Within the Bay

planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1). Carter Spit ACEC would be closed to mineral material sales (62,863 acres). Exploration and development would be guided by Required Operating Procedures, and project-specific requirements (Section E).

Tables 2.8 and 2.15 provide the comparison of management actions proposed for locatable minerals under each Alternative.

Table 2.8. Locatable Minerals and Salable Minerals - Comparison of Alternatives

Management Action	Alternative A (Current Management)	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Locatable Minerals	<p>152,746 acres would be identified as open for locatable mineral entry.</p> <p>Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>	<p>ANCSA 17(d)(1) withdrawals would be revoked.</p> <p>Approximately 1,176,269 acres of unencumbered lands would be available for locatable mineral entry.</p> <p>Selected lands would be made available if the selection is revoked or relinquished.</p> <p>Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>	<p>Same as Alternative B, except the following lands would be closed to locatable mineral entry:</p> <p>Exceptions (Selected): Proposed wild river segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres).</p> <p>Exceptions (Unencumbered): Proposed Carter Spit ACEC (62,863 acres) and Bristol Bay ACEC (989,202 acres) would be closed to mineral entry.</p> <p>ANCSA 17 (d)(1) withdrawals for these river segments would be retained as an interim measure to provide an opportunity for Congressional action. Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>	<p>Same as Alternative B, except the following lands would be closed to locatable mineral entry:</p> <p>Exceptions (Unencumbered): Proposed Carter Spit ACEC (62,863 acres) would be open but would be subject to more stringent Required Operating Procedures.</p> <p>Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>
	Approved Plans of Operations would contain stipulations based on site-specific resource concerns.	Same as Alternative A, with the addition that an approved Plan of Operations will contain guidelines as listed in the Required Operating Procedures in Section E.		

<p>Salable Minerals</p>	<p>Approximately 1,176,269 acres of unencumbered lands would be available for sale of mineral materials.</p> <p>Selected lands would be made available if the selection were revoked or relinquished.</p> <p>Within the Bay planning area, approximately 3,999 acres of unencumbered lands would remain withdrawn from mineral entry due to withdrawals other than ANSCA 17(d)(1).</p>	<p>Same as Alternative A, except the following lands would be closed to sale:</p> <p>Exceptions (unencumbered):</p> <ul style="list-style-type: none"> • Proposed Carter Spit ACEC (52,862 acres) • Proposed Bristol Bay ACEC (989,202 acres) <p>Exceptions (Selected):</p> <ul style="list-style-type: none"> • Proposed Wild river segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres). <p>ANSCA 17 (d)(1) withdrawals would be retained for these river segments as an interim measure to provide an opportunity for Congressional action.</p>	<p>the following lands would be closed to sale:</p> <p>Exception (unencumbered):</p> <ul style="list-style-type: none"> • Proposed Carter Spit ACEC (62,862 acres)
	<p>Approved Plans of Operations would contain stipulations based on site-specific resource concerns.</p>	<p>Same as Alternative A, with the addition that approved Plans of Operations would contain guidelines as listed in the Required Operating Procedures in Section E.</p>	

k) Recreation Management

(1) Goals

- Manage recreation to maintain a diversity of recreational opportunities.
- Improve access to appropriate recreation opportunities.
- Ensure a quality experience and enjoyment of natural resources
- Provide for fair value in recreation on BLM-administered lands

(2) Alternative A

Under Alternative A, all unencumbered BLM-administered lands in the Bay planning area (1,176,269 acres) and selected lands (1,327,553 acres) until they are conveyed would be managed as “Roaded Natural” under the Recreation Opportunity Spectrum (Table 2.9).

Table 2.9. Current ROS Class Acreages and Descriptions for BLM-Administered Lands in the Bay Planning Area

Class (acres/% of planning area)	Description
Primitive 0 Acres (0 %)	Area is characterized by essentially unmodified natural environment of fairly large size. Concentration of users is low and no conflicts with users are evident. Sights and sounds of road systems are nonexistent and area is remote. Human-built structures are few and far between, or are inconspicuous. Vegetation and soils remain in a natural state.
Semi-Primitive Non-Motorized 0 Acres (0 %)	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is often evidence of other area users. Area is generally free of motorized trails and roads. Sights and sounds of transportation systems (mainly air) are encountered. Local traditional subsistence use is evident but impacts are fairly minimal. Vegetation and soils are predominantly natural but some impacts exist.
Semi-Primitive Motorized 0 Acres (0 %)	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. Area is accessible to specialized OHVs but is generally not accessible to most four-wheel drive vehicles. Sights and sounds of the road system may or may not be dominant. Some portions of the area may be distant from road systems, but all portions are near motorized trails. Vegetation and soils are predominantly natural but localized areas of disturbance may exist. Local traditional subsistence use is evident but environmental impacts are minimal.
Roaded Natural 2,503,822 Acres (100 %)	Area is characterized by a generally natural environment with moderate evidence of sights and sounds of humans. Resource modification and utilization practices are evident, but harmonize with the environment. Concentration of users is low to moderate, and rustic facilities may exist for user convenience and safety. The area is accessible to conventional motorized vehicles and roads are maintained on a regular basis. Sights and sounds of the road system are evident and traffic levels may be highly variable. Areas of localized vegetation and soil impacts exist. User concentrations are low to moderate but may be high in popular recreational sites such as waysides, trailheads, and water access points.
Rural 0 Acres (0 %)	Area is characterized by a substantially modified natural environment. Resource modification and utilization practices are obvious. Sights and sounds of humans are readily evident and concentration of users is moderate to high. Some facilities may be designed for use by a large number of people. Areas typically are readily accessible to conventional motorized vehicles and are in areas where other camp structures are fairly common. Traffic levels are fairly constant. Areas of modified soil and vegetation exist.
Urban 0 Acres (0 %)	Area is characterized by a highly modified environment, although the background may have natural elements. Vegetation is often exotic and manicured. Soils may be protected by surfacing. Sights and sounds of humans predominate. Large numbers of users should be expected. Modern facilities may exist for the convenience and comfort of large numbers of people.

(3) Management Common to All Action Alternatives (B, C, and D)

- Opportunities for commercial recreation will be provided consistent with area objectives for recreation management.
- The entire planning area would be designated as an Extensive Recreation Management Area. Management would be for dispersed recreation use, and no facilities would be developed. No significant amounts of recreational staffing would be expended for the area.
- Camping associated with commercial activities would be prohibited without written authorization from BLM. Short-term commercial camping would be limited to 14 days within a 28-day period. After a camp has been occupied for 14 days, the camp must be moved at least 28 miles. Short-term camping associated with non-commercial activities would be permitted for less than 14 days in one location.
- With respect to the limits of acceptable change, detailed recreation planning inventories such as Visual Resource Management (Table 2.4) and the Recreation Opportunity Spectrum (Table 2.10) developed and documented for the Bay planning area would be utilized to determine existing and future desirable limits for the recreation program.

What Are "Limits of Acceptable Change"?

As developed by George Stankey and others (1985), using Limits of Acceptable Change (LAC) is a process that requires deciding what kinds of conditions are acceptable in recreational settings, then prescribing actions to protect or achieve those conditions. The objective of the LAC system is not to prevent change but rather to control it, and to decide what management actions are required to maintain or enhance the desired conditions.

The LAC process consists of four major components:

- Specifying acceptable and achievable resource and social conditions, defined by a series of measurable parameters.
- Analyzing the relationships between existing conditions and those judged to be acceptable.
- Identifying objectives and management actions necessary to achieve those conditions.
- Planning and implementing a program of monitoring and evaluating program effectiveness to see if objectives are being met.

(4) Alternatives B, C and D

Under Alternatives B, C, and D the entire recreation area setting, including all unencumbered BLM-administered lands (1,176,269 acres) and selected lands (1,327,553 acres) until they are conveyed, would be managed as Semi-Primitive Motorized (Table 2.9).

Table 2.9 and Table 2.15 provide a comparison of the recreation management actions proposed under each Alternative.

I) Travel Management - Off-Highway Vehicles

(1) Goals

- Manage access to BLM-administered lands and water.
- Ensure protection of natural and cultural resources from OHV impacts.
- Improve access to appropriate recreation opportunities on BLM-administered lands and water.
- Incorporate BLM's national strategy for motorized off-highway vehicle use.
- Provide OHV access consistent with the provisions of ANILCA

- Manage OHV access for resource development by applying Required Operating Procedures and Stipulations.

(2) Alternative A

Under Alternative A, there would be no OHV designations within the Bay planning area.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Inventory and Monitoring.

Inventory trails in order to identify all existing trails and assess trail density and resource impacts. Inventory and assessment information would also be used to prioritize trail maintenance needs.

(b) Management Decisions

- Consider all access to public lands, including recreational, traditional, commercial, industrial, public roads and airstrips.
- Vehicle weight limits for OHV activities in “limited” designation areas would be to 2,000 pounds gross vehicle weight rating (GVWR includes load capacity) on unencumbered BLM managed lands. Encumbered (Selected) BLM managed lands, those lands selected by the State and Native corporations, will be managed similar to the State of Alaska’s *Generally Allowed Uses on State Land* [11 AAC 96.025] (Appendix F), which allows using an all-terrain vehicle with a curb weight of up to 1,500 pounds.
- Any activity-level plan or integrated activity plan (IAP) such as for an ACEC, would include a trails inventory in the activity planning area, would describe specific resource concerns or conflicts, and could describe specific designated trails and trail conditions or limitations of use (seasonal, vehicle class). Such a planning process would include public, State, and Native coordination. These plans would identify and prioritize specific maintenance needs and opportunities for trail development or loops. BLM unencumbered lands would be first priority for implementation-level planning.
- OHVs will use existing trails whenever possible (i.e. subsistence hunting need for game retrieval), consistent with the State’s Conditions on Generally Allowed Uses (11 AAC 96.025) (Appendix F). OHV use will be conducted in a manner that minimizes disturbance of vegetation, disturbance of soil stability, or impacts to drainage systems; changing the character of, polluting, or introducing silt and sediment into streams, lakes, ponds, seeps, or marshes; and disturbance of fish and wildlife. Snowmachines will be allowed open cross-country travel when adequate snow cover is present, that is, adequate to avoid crushing vegetation or removing ground cover.
- All proposals for OHV management under consideration would be consistent with Section 811 of ANILCA, which allows for “appropriate use for subsistence purposes of snowmobiles, motorboats, and other means of surface transportation traditionally employed for such purposes by local residents, subject to reasonable regulation.

What is Meant by “Open,” “Limited,” and “Closed” OHV Designations?

To comply with BLM regulation 43 CFR 8342.1, all BLM lands must be designated in one of the following three categories:

- “Open” - OHVs may travel anywhere; cross-country travel is permitted.
- “Limited” - OHVs are restricted to certain areas or specific trails, with restrictions that can include vehicle weight, type of vehicle, seasonal limitations, or travel restricted to designated trails.
- “Closed” - no OHV activity is allowed.

(4) Alternative B

Under Alternative B, All lands within the Bay planning area would be designated as “open” to OHV use.

(5) Alternative C

Under Alternative C, All lands would be designated as “limited” to OHV use, allowing for limitations on OHV activities to protect habitat, soil and vegetation, cultural resources, and recreation experiences. Additional limitations within the proposed Carter Spit ACEC and Bristol Bay ACEC would be defined through the development of activity plans to meet the objectives of the proposed SMAs.

(6) Alternative D

All lands would be designated as “limited” to OHV use, allowing for limitations on OHV activities to protect habitat, soil and vegetation, cultural resources, and recreation experiences. Additional limitations within the proposed Carter Spit ACEC would be defined through the development of activity plans to meet the objectives of the proposed Special Management Area.

Tables 2.10 and 2.15 compare the OHV management actions proposed under each Alternative.

Table 2.10. Comparison of Alternatives - Recreation Management. Off-Highway Vehicles and Recreation Opportunity Spectrum

Management Actions	Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred Alternative
Travel Management on BLM Administered Unencumbered Lands				
Designation of BLM-administered unencumbered lands for Off-Highway-Vehicle (OHV) Use	There would be no OHV designations on BLM-managed lands within the planning area.	All unencumbered BLM-managed lands within the planning area would be designated as “open” for OHV use. Required Operating Procedures and Stipulations apply to authorized or permitted activities.	All unencumbered BLM-managed lands would be designated as “limited” for OHV use. Vehicle weight limits for OHVs would be 2,000 pounds gross vehicle weight rating (GVWR, includes load capacity). Allowing OHV travel on designated roads and trails vs. existing roads and trails would be addressed through the development of an activity plan if any significant resource impacts are observed. Limitations within the proposed Bristol Bay and Carter Spit ACECs would be defined through the development of activity plans to meet the objectives of the proposed Special Management Area. Required Operating Procedures and Stipulations apply to authorized or permitted activities.	All unencumbered BLM managed lands would be designated as “limited” to OHV use. Vehicle weight limits for OHVs would be 2,000 pounds gross vehicle weight rating (GVWR, includes load capacity). Allowing OHV travel on designated roads and trails vs. existing roads and trails would be addressed through the development of an activity plan if any significant resource impacts are observed. Limitations within the proposed Carter Spit ACEC would be defined through the development of activity plans to meet the objectives of the proposed Special Management Area. Required Operating Procedures and Stipulations apply to authorized or permitted activities.
	No route restrictions; cross-country travel allowed everywhere on BLM lands within the planning area.	Same as Alternative A.	The “limited” designation is the same as the State’s “Generally Allowed Uses on State Land,” which requires OHVs to stay on existing trails whenever possible (Appendix F).	Same as Alternative C.

Travel Management on BLM Administered Encumbered Lands				
<p>Designation of interim BLM-administered encumbered lands for Off-Highway-Vehicle (OHV) Use</p>	<p>There would be no OHV designations on BLM-managed lands within the planning area.</p>	<p>All interim BLM-managed encumbered lands within the planning area would be designated as “open” for OHV use.</p> <p>Required Operating Procedures and Stipulations apply to authorized or permitted activities.</p>	<p>All interim BLM-managed encumbered lands would be designated as “limited” for OHV use.</p> <p>The “limited” designation is the same as the State’s “Generally Allowed Uses on State Land,” which requires OHVs to stay on existing trails whenever possible (Appendix F).</p> <p>Vehicle weight limits for OHVs would be 2,000 pounds gross vehicle weight rating (GVWR, includes load capacity). Allowing OHV travel on designated roads and trails vs. existing roads and trails would be addressed through the development of an activity plan if any significant resource impacts are observed.</p> <p>Required Operating Procedures and Stipulations apply to authorized or permitted activities.</p>	<p>All interim BLM-managed encumbered lands would be designated as “limited” to OHV use.</p> <p>The “limited” designation is the same as the State’s “Generally Allowed Uses on State Land,” which requires OHVs to stay on existing trails whenever possible (as described in Appendix F).</p> <p>Vehicle weight limits for OHVs would be 2,000 pounds gross vehicle weight rating (GVWR, includes load capacity). Allowing OHV travel on designated roads and trails vs. existing roads and trails would be addressed through the development of an activity plan if any significant resource impacts are observed.</p> <p>Required Operating Procedures and Stipulations apply to authorized or permitted activities.</p>
Recreation Opportunity Spectrum for BLM Administered Unencumbered Lands				
<p>Designation of BLM-administered unencumbered lands for Recreation Experience Opportunities.</p>	<p>Manage as “Roaded Natural” under the Recreation Opportunity Spectrum.</p>	<p>Manage the entire recreation area setting as Semi-Primitive Motorized.</p>	<p>Same as Alternative B</p>	<p>Same as Alternative B.</p>

m) Renewable Energy

(1) Goals

Make BLM-managed lands available for development of renewable energy sources.

(2) Alternative A

Currently there are no permits issued for renewable energy facilities. No areas have been classified for hydropower in the Bay planning area. Requests for permits to develop renewable energy sources would be considered on a case-by-case basis.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Management Decisions

Potential exists for the development of a variety of sources of renewable energy on BLM-administered lands in the Bay planning area, including solar, wind, and biomass renewable energy facilities. No authorizations for these purposes have been issued on BLM-administered lands within the planning area to date, nor has any interest been expressed. BLM would consider applications for permit or lease to conduct such developments, subject to the constraints for leasing and permitting, on a case-by-case basis.

(b) Land Use Requirements

Permits for development of renewable energy would include Required Operating Procedures, Stipulations and project-specific requirements that minimize impacts to resources. Required Operating Procedures and Stipulations can be found in Section E of this chapter.

n) Lands and Realty Actions

(1) Goals

- Meet public needs for use authorizations while minimizing adverse impacts to other resource values.
- Adjust land ownership to consolidate public land holdings, acquire lands with high public resource values, and meet public and community needs.
- Assist with Alaska goal of completing the Alaska Lands Transfer program by established timeframes.
- Satisfy State and local government land use needs as well as public and/or private demonstrated needs as they arise.
- Identify disposal areas based on specific disposal criteria and other evaluation factors identified in this plan.
- Revoke BLM-held withdrawals deemed inappropriate and restore them to the public domain.
- Revoke withdrawals for other agencies at their request, provided that the lands are suitable to be restored to the public domain.

(2) Alternative A

Under Alternative A, the Lands and Realty program would continue in its current role of supporting other BLM programs, providing for land use authorizations, and supporting the BLM-Alaska State Office in conveyances. No specific lands would be identified for disposal, exchange, or acquisition. Land use authorizations such as FLPMA leases and permits would continue to be dealt with on a case-by-case basis, as would other unauthorized uses, such as trespass cabins. Withdrawal review would not occur for

ANCSA 17(d)(1) withdrawals or other smaller administrative withdrawals. Some uses would continue to be constrained by such withdrawals.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Land Tenure Adjustments

Land tenure adjustments could consist of a sale or an exchange. BLM may identify disposal areas by parcel or by specific areas that would be subject to disposal based on the application of the specific disposal criteria (FLPMA, Section 203 or 206) and other evaluation factors (e.g. resource values and concerns, accessibility, public investment, encumbrances, and community needs) identified in this plan. A goal of future adjustments would be to exchange identified isolated parcels of land for those which would help BLM to consolidate its unencumbered lands.

Lands withdrawn from the public land laws or segregated by State or Native selection would not be offered for disposal until such time as the State and Native corporations reach full entitlement.

(b) Entitlement and Settlement

BLM Anchorage Field Office (AFO) will assist in the conveyance of lands pursuant to legislative mandates. These mandates include the Alaska Statehood Act (1958), ANCSA (1971), and the Native Allotment Act (1906).

(c) Sales

Public lands meeting one or more stated criteria could be disposed of through FLPMA Section 203 (43 CFR 2710). No specific parcels available for sale are identified in this RMP.

What is the R&PP Act?

The Recreation and Public Purposes (R&PP) Act (43 CFR 2740, as Amended, 2001) authorizes the sale or lease of public lands for recreational or public purposes to State and local governments and to qualified nonprofit organizations. Examples of typical uses under the Act are historic monument sites, campgrounds, schools, fire houses, law enforcement facilities, municipal facilities, landfills, hospitals, parks and fairgrounds. Lands patented under this Act contain a reversionary clause in the patent, requiring continued use for the intended purpose.

(d) Recreation and Public Purposes (R&PP) Act Sales

Lands identified for disposal under this authority that are selected by either the State or Native corporations would have to be fully adjudicated before BLM would entertain a sale. In order to be analyzed for disposal under the R&PP Act (43 CFR 2740, as amended, 2001), the following conditions must exist:

- Lands must be readily accessible to a qualified applicant.
- The qualified applicant must have a defined purpose for the land and secure funding to develop it.
- R&PP sales would not be implemented on lands withdrawn for another agency without that agency's approval.
- Lands within a proposed SRMA or ACEC would not be considered available under R&PP, nor would lands acquired by the Federal government for inclusion in the proposed Special Management Area.

- In most instances, BLM would first lease lands under this Act and only convey the lands after the project is constructed in compliance with an approved development and management plan. An important exception to this would be tracts proposed as sanitary landfills, which would always be sold. They would not be leased.
- Application for tracts to be used as a sanitary landfill would only be conveyed with a clause that would prohibit reversion to the Federal government.
- Existing leases must be converted to patents if the lands are used for sanitary landfills.

No lands in the Bay planning area have been identified for disposal under this authority.

(e) Recreation and Public Purposes Leases

A lease allows the lessee to conduct authorized activities on BLM lands, at less than fair market value; however, the land remains in Federal ownership. Should the land be patented (authorized for sale), the land would be removed from Federal ownership to the lessee. R&PP leases would not be issued for sanitary landfill purposes. In the case of a patent for an existing lease of a sanitary landfill, it is possible for the land to be patented without a reversionary clause preventing the land from returning to Federal ownership (reverter clause).

(f) Airport and Airway Improvement Act of September 3, 1982

BLM would continue to process airport conveyances as requested by the Federal Aviation Administration. Each conveyance must contain appropriate covenants and reservation requested by the Federal Aviation Administration. As a condition to each conveyance, the property interest conveyed must revert to the Federal government in the event the lands are not developed for airport or airway purposes or are used in a manner inconsistent with the terms of the conveyance.

(g) Exchanges

BLM would seek to put in place mutually benefiting public interest land exchanges, which are authorized in Alaska by FLPMA, ANCSA, and ANILCA. Where feasible BLM will consider land exchanges to resolve issues of split estate of ownership of surface and subsurface resources. When considering public interest, full consideration must be given to efficient management of public lands and to secure important objectives including protection of fish and wildlife, cultural resources, and aesthetic values; enhancement of recreational opportunities; consolidation of mineral holdings for more efficient management; expansion of communities; promotion of multiple use values, and fulfillment of public needs. Exchanges would not be pursued until State and Native entitlements are fulfilled. Parcels of land in the Iliamna East block, Iliamna West block and two sections east of Aleknagik have been identified in this RMP/EIS for potential exchange.

(h) Withdrawals

Chapter 3 discusses the numbers and types of withdrawals on BLM lands in the Bay planning area and their purposes. Under all Alternatives, BLM would maintain the withdrawals other than ANCSA 17(d)(1) withdrawals until the agency for which the land was withdrawn requested relinquishment of the withdrawal. Under Alternatives B, C, and D, BLM would relinquish ANCSA 17 (d)(1) withdrawals, except that in Alternative C, ANCSA 17(d)(1)s would be retained in the locations of three nominated WSRs until Congress had opportunity to act on the nominations.

ANCSA 17(d)(1) Withdrawals

Under the authority of ANCSA Section 17(d)(1), a series of public land orders were issued which withdrew and reserved lands for study and classification. These orders closed or segregated the lands to all forms of appropriation under the public land laws including mining and mineral leasing except for PLO 5180, which allowed location for metalliferous minerals. The review of these withdrawals within the Bay planning area is addressed in this RMP/EIS. The revocation of the ANCSA 17(d)(1) withdrawals would remove the segregations and open the lands.

(i) Acquisitions

BLM Anchorage Field Office (AFO) does not anticipate acquiring lands within the Bay planning area during the life of this plan except perhaps through exchange or donations.

(j) Land Use Authorizations

A Land Use Authorization is an authorization issued by BLM to use BLM public lands. There are two kinds of authorizations. Category 1 includes leases, permits, and easements authorized under FLPMA; Category 2 is Rights-of-Way.

The State of Alaska and Native corporations have selected BLM-administered lands in the Bay planning area for conveyance. State and Native selections affect land use authorizations.

Selected and Unencumbered Lands

The term “selected lands” refers to selections on those BLM lands made in Alaska pursuant to the Alaska Statehood Act (1958) and ANCSA (1971). The selection serves to withdraw the lands from all forms of appropriation under the public land laws. Selected lands continue to be managed by BLM, but depending on the selecting entity, BLM is required to obtain concurrence or to seek and consider comments on any authorization to use the lands issued by BLM, depending on the selecting entity. The term “unencumbered lands” refers to lands that are managed by BLM without these constraints.

- **Native-selected lands.** Prior to issuing a use authorization the views of the Native corporation shall be obtained and considered. Monies received for any use authorization on Native-selected lands would go into an escrow account to be disbursed to the Native corporation upon conveyance.
- **State-selected lands.** In accordance with 906(k) of ANILCA, BLM must receive a letter of concurrence from the State of Alaska prior to issuance of any use authorization. BLM may then incorporate State terms and conditions in the use authorization if they comply with Federal laws and regulations. Money received for any use authorization on State-selected lands would go into an escrow account to be disbursed to the State upon conveyance. If the State objects to the use authorization, BLM would not issue it. If the proposal is for an authorization on land that has been top-filed by the State, pursuant to 906(e) of ANILCA, a letter of concurrence is not required if it has been determined to have no effect.

(k) FLPMA Leases

Stipulations and Required Operating Procedures would apply, and NEPA compliance is necessary for FLPMA Leases.

All FLPMA leases would be at fair market value rental. Cabins or permanent structures used for private recreation cannot be authorized under this authority. Proposals for leases for commercial use cabins would be considered on a case-by-case basis. Currently there are no commercial use cabins located on BLM lands in the Bay planning area. 43 CFR 2920.1-1 clarifies when a lease, permit, or easement is required.

(l) FLPMA Permits

FLPMA permits are short-term revocable authorizations to use public lands for a specific purpose. Permits are also issued at fair market value rental. According to 43 CFR 2920.2-2, they may be granted for a land use if BLM determines that the use is in conformance with the agency plans, policies, and programs, local regulations, and other requirements, and will not cause appreciable damage or disturbance to the public lands, their resources, or improvements.

In general:

- Cabins or permanent structure permits would not be issued for private recreation purposes.
- Trapping shelters would be authorized with short-term (maximum three year) permits renewable at the discretion of BLM.
- Shelters, tent platforms, and other temporary facilities and equipment used for hunting and fishing are allowed on BLM lands under Section 1316 of ANILCA, as stated above.

(m) FLPMA Easements

A FLPMA easement is an authorization for a non-possessory, non-exclusive interest in lands that specifies the rights of the holder and the obligation of BLM to use and manage the land in a manner consistent with the terms of the easement. Each proposal for an easement would be considered on a case-by-case basis and, as established in 43 CFR 2920.7, would contain terms and conditions protecting the environment and public health and safety.

(n) Rights-of-Way

A Right-of-Way is public land authorized to be used or occupied pursuant to a Right-of-Way grant. These grants are non-exclusive and authorize the holder to construct, operate, and maintain a project for a specified use for a specified amount of time. Rental fees for the Rights-of-Way would be at fair market value. BLM may exempt, waive or reduce rent for a grant under certain circumstances except that there are no reductions or waivers for Mineral Leasing Act authorizations. The construction of new roads and Rights-of-Way would recognize valid existing rights.

Rights-of-Way for oil or gas pipelines and their related facilities are issued under the authority of Section 28 of the Mineral Leasing Act (1920). In accordance with 43 CFR 2880, BLM shall place stipulations on these Rights-of-Way requiring:

- Restoration, revegetation, and curtailment of erosion.
- Compliance with air and water quality standards.
- Control or prevention of damage to the environment, to public or private property, and hazards to public health and safety.
- Protection of the subsistence interests of those living along the Right-of-Way.

Stipulations and Required Operating Procedures (located in Section E of this chapter), and project-specific requirements would apply.

Title V of FLPMA authorizes the issuance of Rights-of-Way for other uses, such as transportation systems (roads and trails), water pipelines and reservoirs, systems for generation and transmission of electric energy (hydro power and wind energy), and various types of communication sites. According to 43 CFR 2800 and ANILCA, BLM may grant such Rights-of-Way provided that:

- The natural resources located on public lands administered by a government agency, where the public lands are adjacent to private or other lands, are protected.
- Unnecessary and undue environmental damage to the lands and resources are prevented.
- The utilization of Rights-of-Way in common with respect to engineering and technological compatibility, national security and land use plans is promoted.
- Coordination, to the fullest extent possible, takes place with the State, local governments, interested individuals and appropriate non-governmental entities.
- Transportation corridors and communication sites will be considered on a case-by-case basis.

(o) Unauthorized Use

Unauthorized cabins may become the property of the U.S. Government and be managed as administrative sites, as emergency shelters, or as public use cabins. Possible management actions with respect to unauthorized cabins include removal of the structure, relinquishment to the U.S. Government for management purposes, and authorization by lease or permit for legitimate uses if they are consistent with identified area objectives.

Possible management actions for cabins under lease and permits would be the same as the latter two cases listed above. Criteria for prioritizing unauthorized cases are:

- Situations involving new unauthorized construction, public safety, or public complaints.
- Areas identified for long-term Federal management.
- Selected lands on which resources are being removed without authorization or where resource damage is occurring.
- Other selected lands.

(p) 17(b) Easements

Section 17(b) of ANCSA provided for the reservation of easements across Native village and Native corporation lands to provide public access to publicly owned lands or major waterways for the purpose of communication, transportation, utilities, and other similar public uses. BLM is responsible for identifying and reserving these easements during the conveyance process. The management of these easements lies with BLM or, under a Memorandum of Understanding, the appropriate Federal land manager. BLM does not have a similar agreement for transferring easement management to the State of Alaska. Consequently, BLM retains management responsibilities for easements reserved to access State lands.

BLM would continue to administer ANCSA Section 17(b) easements that have been reserved in patents or interim conveyances to ANCSA corporations as staffing and budgets allow. ANCSA 17(b) easement management will be transferred to the NPS or the USFWS for those easements that access lands administered by these agencies or are wholly within the boundaries of the park, preserve, Wild and Scenic River corridor, or refuge. On BLM-administered lands, BLM will continue to locate, mark and sign, GPS survey, map, and monitor ANCSA 17(b) easement locations as staffing and budgets allow. BLM reserves easements to ensure access to Federal, State, and municipal corporation lands as ANCSA conveyances occur. BLM would continue to identify, sign, map, monitor use, and realign ANCSA 17(b) easements, with priority based on:

- Easements with safety hazards.
- Easements accessing lands that are permanently managed by BLM or are important to BLM programs.

- Easements receiving high use.
- Easements required to implement an activity or implementation plan.
- Easements where land owners have made a request.
- Easements where environmental damage is occurring.

(q) Conservation Easements

BLM would continue to manage conservation easements for the specific purpose for which they were acquired. Currently there are no conservation easements on BLM-administered lands in the Bay planning area.

(4) Alternative B

Under Alternative B five isolated parcels in the planning area would be identified for exchange in order to consolidate BLM long-term holdings. Existing ANCSA 17(d)(1) withdrawals would be revoked. Avoidance or exclusion areas would be identified on a case-by-case basis. Required Operating Procedures and Stipulations would apply to permitted activities.

(5) Alternative C

Under Alternative C no lands would be identified for disposal or land exchange. Existing ANCSA 17(d)(1) withdrawals would be revoked, except that those on proposed wild river segments of the Alagnak River, Goodnews River mainstem, and Goodnews River Middle Fork would be retained until Congressional action is completed. The Carter Spit ACEC and the Bristol Bay ACEC would be identified as avoidance areas for Land Use Authorizations. Required Operating Procedures and Stipulations would apply to permitted activities.

(6) Alternative D

Under Alternative D, as in Alternative B, five isolated parcels in the planning area would be identified for exchange. Existing ANCSA 17(d)(1) withdrawals would be revoked. The Carter Spit ACEC would be identified as an avoidance area for Land Use Authorizations. Required Operating Procedures and Stipulations would apply to permitted activities.

Tables 2.11 and 2.15 provide the comparison of Alternatives for Lands and Realty.

Table 2.11. Comparison of Alternatives - Lands and Realty

Management Actions	Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred Alternative
Withdrawals	ANCSA 17(d)(1) withdrawals would be retained. Withdrawals other than ANCSA 17(d)(1) would be retained (3,999 acres).	ANCSA 17(d)(1) withdrawals would be revoked. Withdrawals other than ANCSA 17(d)(1) would be retained (3,999 acres).	Same as Alternative B. Existing (d)(1) withdrawals on proposed Wild River segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork would be retained (15,125 acres) until Congress has opportunity to act on the nominations (Figures 2.9 and 2.10).	Same as Alternative B.

Management Actions	Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred Alternative
Land Use Authorizations	Land Use Authorizations: Right-of-Way avoidance areas, or exclusion areas, would be identified on a case-by-case basis.	Same as Alternative A.	Same as Alternative A. The proposed Carter Spit ACEC (62,862 acres) and the proposed Bristol Bay ACEC (989,202 acres) would be identified as avoidance areas for Land Use Authorizations.	Same as Alternative A. The proposed Carter Spit ACEC would be identified as an avoidance area for Land Use Authorizations (62,862 acres).
Disposal or Land Exchange	No lands identified for disposal or land exchange.	Five parcels would be identified in the Iliamna East planning block for land exchange: Chulitna River, T1N, R32W. Sections 21, 23, 28 (2,559 acres). Chekok Creek, T2 and 3 S, R30W. (14,676 acres). T11S R37W Sec. 2, 3, 4, 9, 10; Sec. 16, 21 portions. (3,532 acres). T9S R72W Sec. 18. BLM land that is not State selected but may be topfiled; however, it is not priority (605 acres). Aleknagik Vicinity, T10S R53W Sec. 7, 18, if not conveyed out of Federal ownership.	Same as Alternative A.	Same as Alternative B.

3. Special Designations

a) Areas of Critical Environmental Concern

(1) Goals

To highlight areas where special management attention is needed to protect and prevent irreparable damage to important historic, cultural, and scenic values, fish and wildlife resources or other natural systems or processes through designation of ACECs.

(2) Alternative A

Alternative A is a continuation of current management practices. Currently there are no SMAs designated for BLM-administered lands in the Bay planning area. Under this Alternative, there would be no designated ACECs.

(3) Management Common to All Action Alternatives (B, C, and D)

- Designation of an ACEC would not encumber selected lands within the proposed boundary. Selected lands would be managed to maintain the resource values of the lands until conveyance. The ACEC management prescription would not attach to conveyed lands. Following adjudication of all selections, Special Management Area boundaries may be adjusted.
- Additional site-specific actions or monitoring needed to manage ACECs would be made through ACEC-specific planning.
- A mining Plan of Operations would be required on any mining activity within an ACEC. Required Operating Procedures and project-specific requirements would be in effect.

(4) Alternative B

Under this Alternative, no areas would be proposed for designation as an ACEC.

(5) Alternative C

Under Alternative C, 1,052,065 acres would be designated as ACECs in two separate areas (Figures 2.7 and 2.8). BLM has identified two areas that contain lands, should they remain in long-term BLM ownership, which will benefit from a more focused management approach that would be provided by a designation as Special Management Areas. The proposal will not encumber any State-selected or Native-selected lands but will provide BLM with the necessary tools to devote additional resources to management through more site-specific planning for these areas should they remain in long term BLM ownership.

(a) Carter Spit ACEC

The Carter Spit and adjacent spits and wetlands would be designated as an ACEC to include 62,863 acres, all of which are BLM lands unencumbered by a valid selection currently in place. Should some adjacent lands currently selected not be conveyed but remain in BLM administration for the long term, they may be added to the ACEC after all conveyances are finalized. In addition to measures described in Section E, Required Operating Procedures and Stipulations, measures identified within the ACEC to protect scenic, wildlife, fisheries, botanical, and cultural values would include:

- Limiting OHVs to designated trails
- Opening the area to leasable mineral entry subject to Required Operating Procedures, Stipulations, and project-specific requirements such as subject to seasonal closures
- Opening the area to locatable mineral entry but closing it to mineral materials, subject to Required Operating Procedures and project-specific requirements
- Designating the area as a Right-of-Way avoidance area

- Closing the area to grazing

(b) Bristol Bay ACEC

The Bristol Bay blocks of BLM land would be designated as an ACEC to include 989,202 acres, all of which are BLM lands unencumbered by a valid selection currently in place. Should some adjacent lands currently selected not be conveyed but remain in BLM administration for the long term, they may be added to the ACEC after all conveyances are finalized. In addition to measures described in Section E of this Chapter, Required Operating Procedures and Stipulations, measures identified within the ACEC to protect scenic, wildlife, fisheries, botanical, and cultural values would include:

- OHVs would be limited to designated trails.
- The area would be open to leasable mineral entry subject to Required Operating Procedures, Stipulations, and project-specific requirements such as subject to seasonal closures.
- The area would be open to locatable mineral entry but closed to mineral materials, subject to Required Operating Procedures and project-specific requirements.
- The area would be designated as a Right-of-Way avoidance area.
- The area would be closed to grazing.

(6) Alternative D

Under this Alternative, 62,863 acres would be designated as an ACEC in one area. BLM has identified an area that contains lands, should they remain in long-term BLM ownership, which will benefit from a more focused management approach that would be provided by a designation as a Special Management Area. The proposal will not encumber any State-selected or Native-selected lands but will provide BLM with the necessary tools to devote additional resources to management through more site-specific planning for this area should it remain in long-term BLM ownership.

(a) Carter Spit ACEC

The Carter Spit and adjacent spits and wetlands would be designated as an ACEC to include 62,863 acres, all of which are BLM lands unencumbered by a valid selection currently in place. Should some adjacent lands currently selected not be conveyed but remain in BLM administration for the long term, they may be added to the ACEC after all conveyances are finalized. In addition to measures described in Section E of this Chapter, Required Operating Procedures and Stipulations, measures identified within the ACEC to protect scenic, wildlife, fisheries, botanical, and cultural values would include:

- OHVs would be limited to designated trails.
- The area would be open to leasable mineral entry subject to Required Operating Procedures, Stipulations, and project-specific requirements such as subject to seasonal closures.
- The area would be open to locatable mineral entry but closed to mineral materials, subject to Required Operating Procedures and project-specific requirements.
- The area would be designated as a Right-of-Way avoidance area.
- The area would be closed to grazing.

The preceding information is summarized in Table 2.12 and Table 2.15.

Table 2.12. Comparison of Alternatives - Special Management Areas.

Management Actions	Alternative A (Current Management)	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Recreation Management Areas	No recreation management areas would be established.	All BLM lands in the Bay planning area would be managed as an Extensive Recreation Management Area.	Same as Alternative B.	Same As Alternative B.
Wild and Scenic Rivers	No National System designations would be recommended.	Same as Alternative A.	The following river segments would be recommended for National WSR System designation: Bristol Bay Region (Figure 2.9): Alagnak River, portion (Wild, Recreational)(626 acres) Goodnews Bay Region (Figure 2.10): Goodnews River, mainstem (Wild)(7,138 acres) Goodnews River, middle fork, portion (Wild)(7,361 acres). 17 (d)(1) withdrawals for these river segments would be retained as an interim measure to provide an opportunity for Congressional action.	Same as Alternative A.
Area of Critical Environmental Concern	No Areas of Critical Environmental Concern would be recommended.	Same as Alternative A.	The following areas of unencumbered BLM land would be proposed as Areas of Critical Environmental Concern* (Figures 2.7 and 2.8): <ul style="list-style-type: none"> • Bristol Bay ACEC (989,202 acres) • Carter Spit ACEC (62,862 acres) 	The following area of unencumbered BLM land would be proposed as an Area of Critical Environmental Concern.* (Figure 2.8): <ul style="list-style-type: none"> • Carter Spit ACEC (62,862 acres).
* Should the contiguous block of selected land to the south of the proposed Carter Spit ACEC be returned to BLM administration, all or a portion of it would be included in the Carter Spit ACEC.				
Wildlife and Wildlife Habitat	BLM would manage wildlife habitat and address concerns on a case-by-case basis during review of permits.		Same as Alternative A. In addition, BLM would develop a habitat management plan for the proposed Carter Spit ACEC.	

(b) Wild and Scenic Rivers

i. Goals

- Identify and recommend for designation any rivers in the planning area that are suitable for designation as components of the National WSR System.
- Identify and develop protection strategies for outstanding river-related values in the planning area.
- Protect water quality.

What is the Role of the RMP Process in the Wild and Scenic River Designation Process?

BLM identifies rivers in the planning area that are *eligible* and *suitable* for inclusion in the National WSR System.

Eligibility is based on the physical attributes of a river. *Eligible* rivers are free-flowing and possess one or more “outstandingly remarkable values” such as exemplary scenery, recreation opportunities, or characteristics that are unusual enough to attract visitors to the region, geologic features that are rare or unique to the region, and regionally or nationally important fish or wildlife.

Suitability is a management determination of the appropriateness of adding eligible rivers to the National WSR System. BLM assesses a number of factors, including the manageability of adding the river to the system (cost, legal jurisdiction), support for designation, and the compatibility of designation with other overall management of the area.

If BLM determines that a river is eligible and suitable as part of the National WSR System, it will recommend its designation in the Record of Decision (ROD) for the RMP. The Secretary of the Interior can choose to forward or change the recommendation, and Congress and the President must ultimately decide whether to make the river part of the system.

Alternative A would continue current management practices. Under this Alternative, no rivers, river segments, lakes, or streams would be evaluated for eligibility or suitability for inclusion in the National WSR System.

iii. Alternative B

Under Alternative B no rivers would be recommended as suitable for designation under the Wild and Scenic Rivers Act.

iv. Alternative C

Under Alternative C, three river segments, a portion of the Alagnak River, a portion of the Goodnews River mainstem, and a portion of the Goodnews River Middle Fork would be found eligible and suitable for recommendation to Congress for designation as Wild Rivers in the National WSR System (Figures 2.9 and 2.10). ANCSA 17(d)(1) withdrawals would be retained at these locations until Congress had an opportunity to act on the recommendation, precluding oil, gas, and solid mineral exploration or development.

v. Alternative D

Alternative D would be the same as Alternative B.

The rationale for not carrying the eligible and suitable rivers identified in Alternative C forward to Alternative D is due to the complexity of managing three river segments located where there is a patchwork of land ownership, where the proposed water bodies are short segments of larger rivers, and (based on formal scoping) where there is a demonstrated lack of support by residents using the rivers.

Recommendations for Wild and Scenic River (WSR) designation under each Alternative are summarized in Tables 2.12 and 2.15. (Figures 2.9 and 2.10).

4. Social and Economic

a) Public Safety: Abandoned Mine Lands and Hazardous Materials

(1) Goals

- Protect public health and safety and environmental resources by minimizing environmental contamination from chemical, biological and radiological sources on public lands and BLM-owned or operated facilities.
- Comply with Federal and State hazardous materials standards and that all Federal and State mandates, laws, Executive Orders, regulations and policies are met.
- Maintain the health of ecosystems through location, assessment, cleanup, and restoration of contaminated sites.
- Manage oil and hazardous materials related risks, costs and liabilities.
- Integrate environmental protection and compliance with all environmental statutes into all BLM activities.

(2) Alternative A

BLM would continue to comply with Federal and State oil and hazardous materials management laws and regulations. As sites were discovered, they would be remediated. The Southwest MFP does not provide any guidance on hazardous materials management or abandoned mine lands.

(3) Management Common to All Action Alternatives (B, C, and D)

(a) Management Decisions

- Impacts caused by past hazardous materials management on BLM lands will be mitigated subject to the availability of funds.
- BLM will prevent creation of new hazardous material sites through implementation of best management practices for all land use permits, leases, ROW, and mining claims and will include pollution prevention measures in all permits, leases, and grants of ROW.

(b) Land Use Requirements

BLM will coordinate and consult with appropriate regulatory agencies for all cleanup plans, and will notify and coordinate hazardous materials activities with specific Native corporations on Native-selected lands.

b) Subsistence

(1) Goals

- Maintain and protect subsistence opportunities.
- Determine how the management actions, guidelines, and allowable uses prescribed in response to the other issues will affect subsistence opportunities, resources, and the socio/economic environment.
- Maintain sufficient quality and quantity of habitat to support healthy populations of important subsistence species of fish and wildlife.

- BLM will effectively manage subsistence harvests through regulations established by the Federal Subsistence Board, and in cooperation with ADF&G, other Federal agencies, the Subsistence Regional Advisory Councils, and the subsistence users.
- Ensure that rural residents engaged in subsistence use have reasonable access to subsistence resources on public lands.
- To the extent possible, minimize displacing resources from traditional harvest areas due to permitted activities.
- Avoid user conflicts over multiple use resources. Involve subsistence users in issue identification and conflict resolution.

(2) Alternative A

Under this Alternative, the BLM would continue to manage subsistence in accordance with sec. 802 of ANILCA. Before the BLM approves of any action, the effect of such use, occupancy, or disposition on subsistence uses and needs would be evaluated in compliance with Sec. 810 of ANILCA. The Southwest MFP (1981), applicable to the Goodnews Block only, does not provide any specific direction on subsistence management. However, the decisions under wildlife to protect wildlife habitat and to mitigate impacts of other uses on wildlife provides support for the subsistence program. Under this Alternative, most activities would be analyzed on a case-by-case basis and few uses would be limited or excluded. This Alternative provides few constraints on activities that have the potential to negatively affect subsistence resources.

(3) Management Common to All Alternatives (A, B, C, and D)

The opportunity for subsistence uses by rural residents on Federal public lands in Alaska is assured by law [sec. 802(1) of ANILCA]. Decisions made within this RMP will not affect BLM's role in administration of subsistence on Federal public lands. Under all Alternatives, BLM will continue to carry out or participate in the following administrative functions:

- **Involve Subsistence Users in Issues Identification.** Ten Subsistence Regional Advisory Councils (SRACs) were established in Section 100.22 of the Subsistence Management Regulations for Public Lands in Alaska as an administrative structure to provide a “meaningful voice for subsistence users in the management process. The Bay planning area encompasses parts of the Bristol Bay and Yukon Kuskokwim Delta Federal Subsistence Regions. BLM field staff members as well as those of other agencies meet twice each year with both Subsistence Regional Advisory Councils to identify emerging issues in conservation, allocation, and appropriate regulation of subsistence harvests.
- **Manage Land/Habitat; Assess Impacts to Subsistence.** ANILCA Section 810 establishes a distinct set of requirements for assessment of potential impacts to subsistence from Federal land decisions. These supplement the discussion of potential impacts to subsistence resources and uses found as part of conventional NEPA environmental reviews.
- **In a Multi-agency Setting, Monitor Resource Populations Used for Subsistence Purposes.** When these monitoring efforts are focused on key subsistence resources, they are a major contribution to the quality of subsistence management efforts.
- BLM will work cooperatively with ADF&G and other Federal agencies to implement the Mulchatna Caribou Herd Monitoring Plan, the Western Brown Bear Management Area planning group, the Unit 18 Goodnews/Arolik Moose Moratorium and Restoration Plan, the migratory bird MOU, Boreal Partners in Flight Conservation Plan, and other cooperative management efforts of which BLM is a part.
- **In a Multi-agency Setting, Manage Subsistence Harvests through regulations established by the Federal Subsistence Board.** With heavy reliance on SRAC input and interagency coordination, the development of subsistence regulations is a multi-step process.

(4) Land Use Requirements

- BLM will consult with USFWS and NMFS under Section 7 of the ESA for all actions that may affect listed species or designated critical habitat, or confer if actions are likely to jeopardize the continued existence of a proposed species or result in the destruction or adverse modification of proposed critical habitat.
- All permitted activities would operate under the Stipulations, Required Operating Procedures, and Standard Lease Terms provided in Section E of this Chapter. These procedures were developed through the EIS process and are based on current knowledge of resources in the planning area and current permitting procedures. All oil and gas leases would be subject to the Oil and Gas Leasing Stipulations listed in Section E.

E. Required Operating Procedures, Stipulations, and Standard Lease Terms

1. Introduction

The Alaska Statewide Land Health Standards (AK LHS) were developed by the BLM Resource Advisory Council and signed by the State Director on March 2, 2004 (I.M. AK 2004-023). These offer guidance in achieving plan objectives, meeting the standards, and fulfilling the fundamentals of land health. Guidelines are applied in accordance with the capabilities of the resource in consultation, cooperation, and coordination with permittees or lessees, public land users, and the interested public. Guidelines enable managers to adjust management on public lands to meet current and anticipated climatic and biological conditions, while considering cultural and local economic needs. The general guidelines under the AK LHS were used to develop the objectives in the following sections.

a) Required Operating Procedures

Required operating procedures (ROPs) are requirements, procedures, management practices, or design features developed through the BLM planning process and NEPA process, that are implemented and enforced at the operational level for all authorized activities. They will be common to all action Alternatives. ROPs will apply to all permitted activities as appropriate, including FLPMA leases and permits, Special Recreation Permits, oil and gas operations, coal exploration, mining Plans of Operation, and Right-of-Way authorizations. Obviously, not all ROPs will apply to all permitted activities. Vegetation management practices will be conducted consistent with these guidelines. ROPs have been developed to ensure that the AK LHS are met in carrying out permitted activities and management practices.

b) Oil and Gas Leasing Stipulations

Stipulations are specific to oil and gas exploration, development, and production. They are conditions or demands to be made under a lease only when the environmental and planning record demonstrates the necessity for the stipulations. Stipulations place specific limits on lease rights based on potential conflicts between lease development and various other resources, and constitute significant restrictions on the conduct of operations under a lease. For example, a stipulation that does not allow permanent facilities (e.g. production pad) within one-fourth mile of a bird nest could result in a well being located far enough from the (lessee's) optimum site that it prevents an oil reservoir from being fully developed. Such restrictions must be attached to the lease. Restrictions attached to a lease as stipulations are part of the lease terms and are accepted as such by the lessee when a lease offer is filed. All oil and gas activity permits subsequently issued to a lessee would comply with the lease stipulations appropriate to the activity under review. In all cases, use of the stipulations requires identification of specific resource values to be protected, and description of the specific geographic area covered.

The Authorized Officer (AO) may add additional or more-restrictive stipulations as determined necessary through further NEPA analysis and as developed through consultation with other Federal and State regulatory and resource agencies. Laws or regulations may require other Federal, State, and local government permits for an oil and gas project to proceed. Specific State permits are required when the State has authority, under Federal or State law or regulation, to enforce the provisions in question. Specific permits issued by Federal agencies other than BLM may include permit conditions that are more stringent than those included in this section.

Land use plans and/or NEPA documents establish the guidelines by which future exceptions, modifications, and waivers to stipulations may be granted. Surface stipulations are excepted, modified, or waived by the Authorized Officer. An exception exempts the holder of the land use authorization document from the stipulation on a one-time basis. A modification changes the language or provisions of a surface stipulation, either temporarily or for the term of the lease. A waiver permanently exempts the surface stipulation.

The environmental analysis document prepared for oil and gas development (e.g., Applications for Permit to Drill [APDs] or sundry notices) would address proposals to exempt, modify, or waive a surface stipulation. To exempt, modify, or waive a stipulation, the environmental analysis document would need to show that: 1) the circumstances or relative resource values in the area had changed following issuance of the lease; or 2) less restrictive requirements could be developed to protect the resource of concern; or 3) operations could be conducted without causing unacceptable impacts; or 4) the resource value of concern does not occur within the lease area.

c) Standard Lease Terms

The Standard Lease Terms are contained in Form 3100-11, Offer to Lease and Lease for Oil and Gas, U.S. Department of the Interior, BLM, October 1992 or later addition (BLM 1992). Form 3100-11 is standard nationwide and is applied to every lease issued by the BLM. The Standard Lease Terms provide the lessee the right to use the leased land as needed to explore for, drill for, extract, remove, and dispose of oil and gas deposits located under the leased lands. Operations must be conducted in a manner that minimizes adverse impacts to the land, air, water, cultural, biological, and visual elements of the environment, as well as other land uses or users. Federal environmental protection laws such as the Clean Water Act, Endangered Species Act, and Historic Preservation Act will be applied to all lands and operations and are included in the Standard Lease Terms. If threatened or endangered species; objects of historic, cultural, or scientific value; or substantial unanticipated environmental effects are encountered during construction, all work affecting the resource will stop, and the land management agency will be contacted.

Standard Lease Terms provide for reasonable measures to minimize adverse impacts to surface resources. It is important to recognize that the Authorized Officer has the authority to modify the site location and design of facilities, specify interim/final reclamation measures, control the rate of development and timing of activities as well as require other mitigation under Sections 2 and 6 of the Standard Lease Terms (BLM Form 3100-11) and under 43 CFR 3101.1-2. However, Standard Lease Terms may not require the lessee to relocate drilling rigs or supporting facilities by more than 200 meters, require that operations be sited off the leasehold, or prohibit new surface-disturbing operations for more than 60 days each year (43 CFR part 3101.1-2).

2. Required Operating Procedures

Table 2.13. Required Operating Procedures Common to Alternatives A-D

Objective	Required Operating Procedure																																			
SOILS																																				
<p>Soils - 1 Minimize soil erosion by stabilizing disturbed areas as soon as possible. Where permitted operations result in surface disturbance, return land to its pre-disturbance condition to the extent possible.</p>	<p>ROP Soils-1a All organic material will be saved in a separate area from overburden for future use. ROP Soils-1b All overburden will be stockpiled and saved for respreading over tailings. ROP Soils-1c All overburden piles will be shaped and stabilized to prevent erosion. ROP Soils-1d Final shape of respread tailing and overburden will approximate the shape of the surrounding terrain. ROP Soils-1e Disturbed stream banks will be recontoured, revegetated, or other protective measures will be taken to prevent soil erosion into adjacent waters. ROP Soils-1f Roads, well pads, and other disturbed areas shall be recontoured and revegetated as per an approved reclamation plan or Plan of Operations. Revegetation will occur through seeding of native seed or by providing for soil conditions that allow the site to re-vegetate naturally, whichever provides the most effective means of reestablishing ground cover and minimizing erosion. The final land surface will be scarified to provide seed traps and erosion control.</p>																																			
<p>Soils - 2 Engineer, construct, and maintain roads and trails in a manner that minimizes the effect on landscape hydrology; concentration of overland water flow, subsurface water flows; minimizes erosion, and minimizes sediment transport.</p>	<p>ROP Soils-2a Roadways will be ditched on uphill side and culverts or low water crossings installed at suitable intervals. Spacing of drainage devices and water bars will be dependent on road gradient and soil erodibility. ROP Soils-2b Road shall be designed for minimal disruption of natural drainage patterns. ROP Soils-2c Roads should avoid areas with unstable or fragile soils. ROP Soils-2d Water bars will be placed across reclaimed roads. Spacing will be dependent on road gradient and soil erodibility as shown in the following table.</p> <p>Table 2.13.1 Recommended Water Bar Spacing</p> <table border="1"> <thead> <tr> <th colspan="4">Water Bar Spacing (in feet)</th> </tr> <tr> <th rowspan="2">Gradients (%)</th> <th colspan="3">Erosion Class</th> </tr> <tr> <th>High</th> <th>Moderate</th> <th>Low</th> </tr> </thead> <tbody> <tr> <td>3-5</td> <td>200</td> <td>300</td> <td>400</td> </tr> <tr> <td>6-10</td> <td>150</td> <td>200</td> <td>300</td> </tr> <tr> <td>11-15</td> <td>100</td> <td>150</td> <td>200</td> </tr> <tr> <td>16-20</td> <td>75</td> <td>100</td> <td>150</td> </tr> <tr> <td>21-35</td> <td>50</td> <td>75</td> <td>100</td> </tr> <tr> <td>36+</td> <td>50</td> <td>50</td> <td>50</td> </tr> </tbody> </table>	Water Bar Spacing (in feet)				Gradients (%)	Erosion Class			High	Moderate	Low	3-5	200	300	400	6-10	150	200	300	11-15	100	150	200	16-20	75	100	150	21-35	50	75	100	36+	50	50	50
Water Bar Spacing (in feet)																																				
Gradients (%)	Erosion Class																																			
	High	Moderate	Low																																	
3-5	200	300	400																																	
6-10	150	200	300																																	
11-15	100	150	200																																	
16-20	75	100	150																																	
21-35	50	75	100																																	
36+	50	50	50																																	

Objective	Required Operating Procedure
VEGETATION	
<p>Vegetation - 1 Treatments to alter the vegetative composition of a site, such as prescribed burning, seeding, or planting will be based on the potential of the site and will: retain or promote infiltration, permeability, and soil moisture storage; contribute to nutrient cycling and energy flow; protect water quality; help prevent the introduction and spread of noxious weeds; contribute to the diversity of plant communities, and plant community composition and structure; and support the conservation of threatened and endangered species, other special status species, and species of local importance.</p>	<p>ROP Veg-1a Vegetation treatments will be designed to achieve desired conditions clearly described in individual burn, project, or activity plans. Desired conditions will be based on the ecological capability of a given site and will be expressed as cover types or seral stages within cover types, based on management objectives.</p> <p>ROP Veg-1b Vegetation treatments will be designed to prevent introduction of noxious weeds. Project, burn, or activity plans will contain a segment on known occurrence of noxious weeds within planned treatment area and strategy for post-burn monitoring or treatment.</p> <p>ROP Veg-1c Any plant seed used on BLM-administered lands will be handled in accordance with The BLM Manual Section 1745 (1992), and the 1999 Executive Order No. 13112 on Invasive Species. Seed used on public shall not contain noxious weed seed, and must meet certified seed quality. Prior to BLM accepting seed from any source, all seed must be tested for noxious weed seed at official state seed analysis labs.</p> <p>ROP Veg-1d Seeding and planting non-native vegetation may be used in those cases where native species are not available in sufficient quantities; where native species are incapable of maintaining or achieving the objective; or where non-native species are essential to the functional integrity of the site, with specific approval from the Authorized Officer.</p> <p>ROP Veg-1e In order to eliminate, minimize, or limit the spread of noxious weeds, only certified feed and mulch (hay cubes, hay pellets, straw, etc.) will be permitted on BLM lands.</p> <p>ROP Veg-1f Operators must prevent and control noxious weed infestations. Noxious weeds in Alaska are listed under Alaska Statute 11 AAC 34.020 or other statewide lists that may be developed in the future.</p>
<p>Vegetation - 2 Minimize disturbance to vegetative resources from permitted activities.</p>	<p>ROP Veg-2a Whenever possible, existing roads and trails will be utilized.</p> <p>ROP Veg-2b Bull-dozing of tundra mat and vegetation is prohibited, unless there is no feasible Alternative (lode mining), as approved by the Authorized Officer. If trenching is required, use equipment that minimizes trench width. Clearing of drifted snow is allowed to the extent that the tundra mat is not disturbed</p> <p>ROP Veg-2c Location of winter trails should be designed to minimize breakage or compaction of vegetation.</p> <p>ROP Veg-2d The location of winter ice roads shall be designed and located to minimize compaction of soils and the breakage, abrasion, compaction, or displacement of vegetation. Offsets may be required to avoid using the same route or track in the subsequent year.</p> <p>ROP Veg-2e Whenever possible ground operations shall be allowed only when frost and snow covers are at sufficient depths to protect the tundra. Ground operations shall cease when the spring snowmelt begins. The exact dates will be determined by the Authorized Officer. Whenever possible, overland moves that are a part of permitted operations will occur when frost and snow cover is sufficient to minimize soil disturbance and compaction.</p> <p>ROP Veg-2f When ground operations are required in snow-free months, select routes that utilize naturally hardened sites and avoid the need for trail braiding. The permittee will work with the Authorized Officer on specifying vehicle types and methods to minimize vegetation and soil disturbance, such as use of air or</p>

Objective	Required Operating Procedure
	<p>water craft, utilizing existing roads or trails, or use of low ground pressure vehicles.</p> <p>ROP Veg-2g Permanent oil and gas facilities will be designed and located to minimize the development footprint.</p> <p>ROP Veg-2h Off-highway Vehicle use associated with permitted activities will comply with OHV designations in the area. The use of OHVs associated with permitted activities will be allowed under appropriate stipulations as approved by the Authorized Officer.</p> <p>ROP Veg-2i Permitted livestock grazing will be conducted in a manner that maintains long term productivity of vegetation. Animals will not be picketed in riparian areas. In areas of low grass production, operators will pack in weed-free hay or concentrated feed.</p> <p>ROP Veg-2j Require Special Recreation Permit holders, reindeer herders, dog mushers, and other BLM permit holders to use certified weed-free products on BLM lands.</p>
WATER, RIPARIAN, AND WETLANDS	
<p>Water - 1 Manage human use to achieve and maintain water quality standards and avoid waste management problems and water quality impacts.</p>	<p>ROP Water-1a Projects will be designed to protect water quality and comply with Federal and State water quality standards.</p> <p>ROP Water-1b Human use will be managed to achieve and maintain water quality standards and to avoid management problems and water quality impacts. Specific management practices will include public education and construction of toilet facilities where appropriate.</p>
<p>Water - 2 Land management practices will be directed to avoid or minimize adverse impacts upon the hydrological, habitat, subsistence, and recreational values of public wetlands.</p>	<p>ROP Water-2a Activities in wetlands will comply with Federal and State permit requirements for alteration of wetlands.</p> <p>ROP Water-2b Utilize winter access whenever possible and avoid road or trail construction in wetlands.</p> <p>ROP Water-2c In snow-free months, if wetlands cannot be avoided, low ground pressure vehicles should be used wherever possible.</p>
<p>Water - 3 Minimize disturbance to riparian areas and facilitate rehabilitation of riparian areas.</p>	<p>ROP Water-3a Streams must be diverted around mining operations using an appropriately sized bypass channel.</p> <p>ROP Water-3b All process waters and any ground waters seeping into the operating area must be diverted into the settling pond system for treatment prior to re-entering the natural water system.</p> <p>ROP Water-3c Settling ponds will be cleaned out and maintained at appropriate intervals to comply with water quality standards. Fine sediment captured in the settling ponds will be protected from washout and left in a stable condition at the end of each mining season to prevent unnecessary and undue degradation to the environment during periods of non-operation.</p> <p>ROP Water-3d Riparian areas between the mined ore deposit and the watercourse will be maintained in order to serve as a buffer strip between mining operations and watercourses: to protect integrity of stream banks, provide water temperature control, and for filtration of sediment from surface run-off. All roads, bunkhouses, offices, equipment storage, and maintenance facilities should be sited in upland areas. Overburden should be placed on the uplands or on the upland side of the mine pit. This is not intended to preclude activities which by nature must occur within riparian areas, such as placer mining.</p> <p>ROP Water-3e Streams that have been altered by channeling, diversion, or damming shall be restored to</p>

Objective	Required Operating Procedure
	<p>a condition that will allow for proper functioning of the riparian zone and stream channels. Active streams will be returned to the natural water course or a new channel shall be created at its lowest energy state (valley bottom) that approximates the old natural channel in shape, gradient, and meander frequency using a stable channel design. The new channel will be designed consistent with the capabilities of the reclaimed site.</p> <p>ROP Water-3f Riparian vegetation, if removed during operations, will be re-established.</p>
<p>Water - 4 To the extent feasible and prudent, channeling, diversion, or damming that will alter the natural hydrological conditions and have a significant adverse impact upon riparian habitat will be avoided.</p>	<p>ROP Water-4a All permitted operations will be conducted in such a manner as not to block any stream, or drainage system and to comply with State (Alaska Dept. of Environmental Conservation) and Federal (Environmental Protection Agency) water quality standards. This is not intended to preclude activities which by nature must occur within riparian areas, such as hydropower dams or placer mining.</p> <p>ROP Water-4b New road construction within floodplains will be avoided. Where necessary, roads will cross riparian areas perpendicular to the main channel.</p>
<p>Water - 5 Provide for maintenance of proper functioning condition in riparian areas and protection of water quality by minimizing impacts of other permitted activities and vegetation treatments.</p>	<p>ROP Water-5a Structural and vegetative treatment in riparian and wetland areas will be compatible with the capability of the site, including the system's hydrologic regime, and will contribute to maintenance or restoration of proper functioning condition.</p> <p>ROP Water 5b Refueling of equipment will not be conducted in riparian areas or within 500 feet of the active floodplain of any fish-bearing waterbody or within 100 feet from non-fish bearing waterbodies. The Authorized Officer may allow storage and operations at areas closer than the stated distance if properly designed to account for local hydrologic conditions.</p> <p>ROP Water 5c Crossing of waterway courses will be made using a low-angle (perpendicular) approach. Snow and ice bridges will be removed, breached, or slotted before spring break-up. Ramps and bridges will be substantially free of soil and debris.</p> <p>ROP Water 5d New structures will be located away from riparian or wetland areas if they conflict with achieving or maintaining riparian or wetland function. Existing structures will be used in a way that does not conflict with riparian or wetland functions or be relocated or modified when incompatible.</p>
SPECIAL STATUS SPECIES	
<p>Special Status Species - 1 Fish, wildlife, sensitive plants, and habitat will be managed to ensure compliance with the Endangered Species Act (ESA) and to ensure progress towards recovery of listed threatened or endangered species.</p>	<p>ROP SS-1a The planning area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status. BLM may recommend modifications to proposals to further its policy of avoiding BLM-approved activity that will contribute to a need to list such a species. BLM may either require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed, threatened, or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the ESA as amended, 16 U.S.C. 1531 et seq., including completion of any required procedure for conference or consultation.</p> <p>ROP SS-1b A 200-meter (656 feet) buffer will be maintained around flightless molting and molting groups from June 1 to October 30 and nest sites from May 20 to August 1 of spectacled and Steller's eiders. A 200 meter buffer within the mean high tide line will be maintained from April 1 to May 30 (spring) and from</p>

Objective	Required Operating Procedure
	<p>July 1 to November 30 (fall) for migrating flocks, staging flocks and habitats of these species. Special permits are required for 1) vehicle and foot traffic, except on existing roads; 2) construction of permanent facilities, placement of fill, or alteration of habitat; and 3) introduction of high noise levels from May 20 through August 1 (March 1 to May 20 for migratory, staging flocks and habitats) including, but not limited to, blasting, compressor stations, heavy equipment operation, and low flying aircraft overflights.</p> <p>ROP SS-1c Within the breeding range of Kittlitz’s murrelet, habitat in the project area should be assessed to determine if murrelets are likely to use the area for nesting. If nests are found, minimize ground-level disturbance and activity within identified areas of suitable habitat from June to August.</p> <p>ROP SS-1d Where practical, use will be redirected, as necessary, to protect Federal and State listed and candidate Threatened and Endangered species habitat, to enhance indigenous animal population, and to otherwise maintain public land health through avoidance of sensitive habitat.</p> <p>ROP SS-1e Where populations or individual sensitive status plant species are located, take measures to protect these populations or individuals through site-specific buffers or management prescriptions.</p>
<p>Special Status Species - 2 Minimize the take of species listed under the ESA and minimize the disturbance of other species of interest from direct or indirect interaction with large mining facilities or oil and gas development.</p>	<p>ROP SS-2a In accordance with the guidance below, before the approval of facility construction, aerial surveys of breeding pairs of the following species shall be conducted within any area proposed for development within the breeding range of these species.</p> <p>Spectacled and/or Steller’s Eiders (a) Surveys shall be conducted by the lessee for at least three years before authorization of construction, for spectacled and Steller’s eiders. Results of aerial surveys and habitat mapping may require additional ground nest surveys. Spectacled and/or Steller’s eider surveys shall be conducted following accepted BLM-protocol during the second week of June. b) If spectacled and/or Steller’s eiders are determined to be present within the proposed development area, the applicant shall consult with the FWS and BLM in the design and placement of roads and facilities in order to minimize impacts to nesting and brood-rearing eiders and their preferred habitats. Such consultation shall address timing restrictions and other temporary mitigating measures, construction of permanent facilities, placement of fill, alteration of eider habitat, aircraft operations, and introduction of high noise levels. c) To reduce the possibility of spectacled and/or Steller’s eiders from striking above-ground utility lines (power and communication), such lines shall either be buried in access roads, or suspended on vertical support members, to the extent practical. Support wires associated with communication towers, radio antennas, and other similar facilities, shall be clearly marked along their entire length to improve visibility for low flying birds. Such markings shall be jointly developed through consultation with FWS.</p> <p>Kittlitz’s Murrelet The candidate species Kittlitz’s Murrelet is potentially present in the Bay planning area, but it is considered to be rare. It might be found during the nesting season on the talus slopes of the higher mountains adjacent to the Carter Spit area and adjacent spits and coastal wetlands in the Goodnews Block. Habitat in the project area should be assessed to determine if murrelets are likely to use the area for nesting. If</p>

Objective	Required Operating Procedure
	nests are found, minimize ground-level disturbance and activity within identified areas of suitable habitat during May 10 to September 15.
<p>Special Status Species - 3 Use ecological mapping as a tool to assess wildlife habitat before development of permanent facilities associated with oil and gas, coal, coal-bed methane or other large mineral developments, to conserve important habitat types, including wetlands, during development.</p>	<p>ROP SS-3a An ecological land classification map of the development area shall be developed before approval of facility construction. The map will integrate geomorphology, surface form, and vegetation at a scale, level of resolution, and level of positional accuracy adequate for detailed analyses of development Alternatives. The map shall be prepared in time to plan one season of ground-based wildlife surveys, if deemed necessary by the Authorized Officer, before approval of exact facility location and facility construction.</p>
FISH AND WILDLIFE	
<p>Fish and Wildlife - 1 Avoid human-caused increases in populations of predators of ground nesting birds.</p>	<p>ROP FW-1a The best available technology shall be used to prevent permanent facilities from providing nesting, denning, or shelter sites for ravens, raptors, and foxes in areas where ground nesting populations are sensitive to increased predation.</p>
<p>Fish and Wildlife - 2 Maintain and protect fish and wildlife habitat on public lands and provide for the habitat needs of fish and wildlife resources necessary to maintain or enhance such populations.</p>	<p>ROP FW-2a The Department of Natural Resources should be consulted in addition to the ADF&G for many of these operations (e.g., OHMP for anadromous stream crossings and diversions, MLW for navigable waterways, dam construction).</p> <p>ROP FW-2b No road crossings shall be permitted in crucial spawning habitat, unless no feasible Alternative exists and it can be demonstrated that no adverse effects will occur. Stream crossings (culverts, bridges, and fords) shall be designed to:</p> <p>(a) Pass a peak flow that at least corresponds to the 50-year return interval. When determining the size of culvert needed to pass a peak flow corresponding to the 50-year return interval, operators shall select a size that is adequate to preclude ponding of water higher than the top of the culvert.</p> <p>(b) Allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs.</p> <p>An exception to the requirements in subsection (2)(a) of this rule is allowed to reduce the height of fills where roads cross wide flood plains. Such an exception shall be allowed if:</p> <ul style="list-style-type: none"> • The stream crossing site includes a wide flood plain; • The stream crossing structure matches the size of the active channel and is covered by the minimum fill necessary to protect the structure; • Except for culvert cover, soil fill is not placed in the flood plain; and • The downstream edge of all fill is armored with rock of sufficient size and depth to protect the fill from eroding when a flood flow occurs. <p>Bridge and culvert construction shall be conducted in accordance with specifications provided by BLM engineering, hydrology, and fisheries staff and the Alaska Department of Fish and Game so that constriction and subsequent scour of the channel is minimized during the projected life of the road.</p> <p>ROP FW-2c Travel up and down streambeds is prohibited.</p>

Objective	Required Operating Procedure
	<p>ROP FW-2d This guidance lays out six basic strategies to choose from for providing fish passage, which should be considered in the following order of preference:</p> <ol style="list-style-type: none"> 1. Remove/abandon stream crossing (re-route the road; find an alternative route) 2. Channel-spanning structures (long and short-span bridges; open-bottom arches) 3. Fords (low-traffic crossings only) 4. Streambed simulation (sunken and embedded culverts) 5. Bare culvert placed at a zero grade (culvert at $\leq 0.5\%$ gradient and sunken for backwatering) 6. Hydraulic design (weir and baffle culvert designs) <p>ROP FW-2e In general, fords should only be considered on small streams for low traffic roads that have infrequent use. A reasonable measure of infrequent use is a level of traffic that does not cause a noticeable increase in turbidity (i.e. visible with the eye) that persists downstream of the crossing.</p> <p>ROP FW-2f Stream and wetland crossings shall be designed and constructed to ensure free passage of fish, maintain natural stream bedload movement and sediment transport, and minimal adverse effects to natural stream flow.</p> <p>ROP FW-2g All water intakes will be screened and designed to prevent fish intake.</p> <p>ROP FW-2h Exploratory drilling (oil and gas or coal) is prohibited in fish-bearing rivers and streams, as determined by the active floodplain, and fish-bearing lakes, except where the lessee can demonstrate on a site-specific basis that impacts would be minimal or it is determined that there is no feasible or prudent alternative.</p> <p>ROP FW-2i Water withdrawal from lakes may be authorized on a site-specific basis depending on size, water volume, depth, and fish population and species diversification.</p>
<p>Fish and Wildlife - 3 Avoid heavy concentration of activities in sensitive fish, wildlife, and plant habitats.</p>	<p>ROP FW-3a Whenever possible, operations that require vegetation removal will avoid the migratory bird-nesting period of April 15 to August 15. If no feasible alternatives exist, assessment will be conducted to determine bird species present, significance of potential impacts, and possible mitigation measures.</p> <p>ROP FW-3b ROP FW-3c Within the Mulchatna, Northern Alaska Peninsula and Nushagak caribou herd calving aggregations and areas during peak calving periods (May 15 to June 15), post calving aggregations (June 15 to July 15) and insect relief aggregations (June 15 to August 31), the following uses would not be permitted unless a field evaluation has been conducted by qualified personnel: 1) caribou disturbing activities, including but not limited to, foot and vehicle travel; 2) surface disturbing activities, construction of facilities, habitat modification; 3) introduction of high noise levels, including but not limited, to blasting, heavy equipment operation, blasting, compressor and generator operation; 4) FLPMA leases, permits, or other authorizations that exceed 14 days of activity; 5) aircraft operations associated with permitted activities will avoid areas near observed caribou calving, post calving and insect relief aggregations and maintain a minimum distance of one mile or 2000 feet AGL unless doing so would endanger human life or violate safe flying practices.</p> <p>ROP FW-3c Within defined Mulchatna, Northern Alaska Peninsula, and Nushagak insect relief areas, aircraft shall maintain an altitude of at least 2,000 feet AGL (except for takeoffs and landings), June 15-August 15, unless doing so would endanger human life or violate safe flying practices.</p>

Objective	Required Operating Procedure
<p>Fish and Wildlife - 4 Minimize disruption of wildlife movement and subsistence use.</p>	<p>ROP FW-4a Bridges and culverts shall be large enough to accommodate or positioned to avoid altering the direction and velocity of stream flow or interfering with migrating, rearing, or spawning activities of fish and wildlife. Bridges and culverts should span the entire non-vegetated stream channel.</p> <p>ROP FW-4b Pipelines and roads shall be designed to allow the free movement of wildlife and the safe, unimpeded passage of the public while participating in traditional subsistence activities. Listed below are the currently accepted design practices: 1) Above ground pipelines shall be elevated a minimum of seven feet as measured from the ground to the bottom of the pipeline at vertical support members; 2) In areas where facilities or terrain may funnel caribou movement, ramps over pipelines, buried pipelines, or pipelines buried under roads may be required by the Authorized Officer after consultation with Federal, State, and Borough regulatory and resource agencies as appropriate, based on agency legal authority and jurisdictional responsibility; and 3) To minimize disruption of caribou movement, a minimum distance of 500 feet between above-ground pipelines and roads should be maintained when feasible. Separating roads from pipelines may not be feasible within narrow land corridors between lakes and where pipelines and roads converge on a drill pad or processing facility.</p>
<p>Fish and Wildlife - 5 Minimize the potential for disease transmission from livestock to wildlife.</p>	<p>ROP FW-5a For the prevention of spreading diseases and parasites in at-risk wildlife populations (e.g., caribou, sheep, and goats), the use of domestic goats, alpacas, llamas, and other similar species used as pack animals will not be permitted.</p> <p>ROP FW-5b Within one-quarter mile of lakes, ponds, or marshes with trumpeter swan nests, the following uses will not be permitted from May 1 to August 31: a) ground disturbance or surface use exceeding 14 days; b) FLPMA leases or permits where surface use exceeds 14 days; c) overland access to permitted activities. The Authorized Officer may grant an exception to this ROP for mining operations where no feasible alternative exists and where mitigation measures can be identified to minimize impacts.</p> <p>ROP FW-5c Within one-quarter mile of bald eagle nests, the following uses will not be permitted from April 1 to August 31: a) surface disturbing activities; b) FLPMA leases or permits. Aircraft associated with permitted activities will maintain an altitude of 1,500 feet within one-half mile of documented eagle nests. The Authorized Officer may grant an exception to this ROP for mining operations where no feasible alternative exists and where mitigation measures can be identified to minimize impacts. Appropriate buffers around other raptor nests will be determined based on site-specific analysis.</p>
<p>Fish and Wildlife - 6 Minimize the potential for electrocution of raptors.</p>	<p>ROP FW-6a Unless otherwise agreed to in writing by the Authorized Officer, power lines shall be constructed in accordance with standards outlined in “Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 1996” (APLIC 1996). The holder shall assume the burden and expense of proving that pole designs not shown in the above publication are “raptor safe.” Such proof shall be provided by a raptor expert approved by the Authorized Officer. BLM reserves the right to require modifications or additions to all power line structures, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.</p>

Objective	Required Operating Procedure
SUBSISTENCE	
<p>Subsistence - 1 Prevent unreasonable conflicts between subsistence use and permitted activities on BLM managed lands.</p>	<p>ROP Sub-1a In order to eliminate, minimize, or limit the effects of permitted activities on subsistence use, BLM may recommend modifications to proposed activity to further its policy of effective subsistence management.</p> <p>ROP Sub-1b Permittees may be required to provide information to potentially affected subsistence communities regarding the timing, siting, and scope of the proposed activity.</p> <p>ROP Sub-1c Permittees may be required to consult with potentially affected subsistence communities to receive input regarding way to minimize impacts to subsistence, and the permittee will be required to provide documentation of their consultation efforts to the BLM.</p> <p><i>Also see FW-4b.</i></p>
CULTURAL AND PALEONTOLOGICAL	
<p>Cultural- 1 Management practices will consider protection and conservation of known cultural resources, including historical sites and prehistoric sites.</p>	<p>ROP C-1a Cultural resource protection for oil and gas activities is covered under Section 6 (Conduct of Operations) of the standard lease terms (see section D).</p> <p>ROP C-1b For permitted activities, cultural resource protection and conservation will be consistent with 1) Sections 106, 110, and 101d of the Historic Preservation Act, 2) procedures under BLM's 1997 Programmatic Agreement for Section 106 compliance, and 3) the BLM's 1998 implementing Protocol in Alaska between BLM and the Alaska State Historic Preservation Officer.</p> <p>ROP C-1c If necessary, mitigation measures shall be implemented according to a mitigation plan approved by the Authorized Officer. Mitigation plans will be reviewed as part of Section 106 consultation for National Register eligible or listed properties. The extent and nature of recommended mitigation shall be commensurate with the significance of the cultural resource involved and the anticipated extent of the damage. Reasonable costs for mitigation will be borne by the land use applicant. Mitigation must be cost effective and realistic.</p>
<p>Paleontological - 2 Avoid damage to significant paleontological resources where possible, and mitigate unavoidable damage.</p>	<p>ROP P-2a For all actions, evaluate the impacts of proposed actions to known resources and avoid damage to already-identified significant paleontological resources by avoidance.</p> <p>ROP P-2b If avoidance is not possible, then perform scientific examination of the to-be-impacted significant resources followed by appropriate mitigation. That may include the professional collection and analysis of significant specimens by scientists.</p>
VISUAL RESOURCE MANAGEMENT	
<p>Visual Resource Management - 1 Manage permitted activities to meet Visual Resource Management Class Objectives described below.</p> <p>Class I: Natural ecological changes and very limited management activity are allowed. The level of change to the characteristic</p>	<p>ROP VRM-1a To the extent practicable, all permanent facilities will be located away from roadsides, rivers, or trails, thereby using distance to reduce the facility's visual impact.</p> <p>ROP VRM-1b Access roads and permanent facilities will be designed to meet the visual resource objective using such methods as minimizing vegetation clearing, and using landforms to screen roads and facilities.</p> <p>ROP VRM-1c Permanent facilities will be designed to be screened behind trees or landforms if feasible so they will blend with the natural surroundings.</p> <p>ROP VRM-1d The modification or disturbance of landforms and vegetative cover will be minimized.</p> <p>ROP VRM-1e Permanent facilities will be designed so their shapes, sizes, and colors harmonize with the scale and character of the surrounding landscape.</p>

Objective	Required Operating Procedure
<p>landscape should be very low and must not attract attention.</p> <p>Class II: The level of change to the characteristic landscape should be low. Management activities may be seen, but should not dominate the view of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</p> <p>Class III: The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</p> <p>Class IV: The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.</p>	<p>ROP VRM-1f In open, exposed landscapes, development will be located in the opposite direction from the primary scenic views, if feasible.</p>
FIRE MANAGEMENT	
<p>Fire Management - 1 Reduce impacts to water quality, riparian habitat, vegetation, soils, and fish habitat from fire suppression activities.</p>	<p>ROP FM-1a Permittees and casual users will be held financially responsible for any actions or activity that results in a wildland fire. Costs associated with wildland fires include but are not limited to damage to natural or cultural resources and costs associated with any suppression action taken on the fire.</p> <p>ROP FM-1b The Federal government shall not be held responsible for protection of permittees structures or their personal property. It is the responsibility of permittees and lessees to mitigate and minimize risk to their personal property and structures from wildland fire, if allowed by their permit.</p>

Objective	Required Operating Procedure
	<p>ROP FM-1c Gas powered equipment shall be equipped with manufacturer approved and functional spark arrestors.</p> <p>ROP FM-1d To avoid the potential impacts to aquatic life the use of fire retardant is prohibited except when necessary to protect:</p> <ul style="list-style-type: none"> • Human life, • Permanent year-around residences, • National Historic land marks, • Structures on or eligible for the National Register of Historic Places • Government Facilities, and • Other designated sites or structures or if necessary to protect high value resources on adjacent lands under other than BLM administration or ownership. <p>Even if one of the above listed resources is being threatened, water should be used instead of fire retardant whenever possible or appropriate. The use of fire suppressant foams is prohibited.</p> <p>ROP FM-1e Use of tracked or off-road vehicles in fire suppression or management activities will be conducted in a manner that does not cause erosion, damage to riparian areas, degradation of water quality or fish habitat, or contribution to stream channel sedimentation.</p> <p>ROP FM-1f Use of heavy equipment and other motorized vehicles off road requires approval of Authorized Officer or designee.</p> <p>ROP FM-1g Rehabilitate fires as needed, guided by the fire specific rehabilitation plan provided by the resource area to the suppression agency.</p> <p>ROP FM-1h Helicopters used for any activity during snow free conditions, which requires landing in wildland fuels, should have the exhaust/cooling system located high on the fuselage. Helicopters, which have exhaust/cooling systems that are located low on the fuselage and expels the exhaust straight back or downward, should only be landed in areas with no fuel such as areas of bare soil, gravel bars, or other areas of low combustibility.</p>
FORESTRY	
<p>Forest - 1 Forest resources will be managed to ensure biodiversity, long-term productivity, and a wide spectrum of multiple uses, including scenic values, recreation, fish and wildlife habitat, watershed protection, and where feasible, harvest of forest products.</p>	<p>ROP Forest-1a Timber sales will rely to the extent possible, on natural regeneration through proper site preparation.</p> <p>ROP Forest-1b Timber sales will include buffers to prevent disturbance of fish habitat and possible sedimentation into streams. Buffer widths will be dependant on harvest method, season of harvest, equipment used, slope, vegetation, and soil type. Winter operations will be encouraged in order to minimize impacts to riparian areas.</p>

Objective	Required Operating Procedure
MINERAL MATERIALS	
<p>Mineral Materials - 1 Minimize the impact of mineral materials mining activities on air, land, water, fish, and wildlife resources.</p>	<p>ROP MM-1a When responding to a request for a material sale or identifying a source for materials on public lands, the highest priority shall be given to using existing upland material sources that meet suitability and economic needs. Using material from wetlands, lakes, and active or inactive floodplains should be avoided unless no feasible public upland alternative exists. Sales or permits for gravel extraction will not be permitted in known fish spawning or rearing areas.</p> <p>ROP MM-1b Avoid habitats limiting local fish or wildlife populations (i.e. Fish spawning and over wintering, calving areas, raptor nesting sites). Sites directly affecting these habitats should not be considered unless alternative sites are not available.</p> <p>ROP MM-1c Avoid key geomorphic features such as the beach barrier dune, river cut banks and associated riparian zones, root zones of spits, tombolos and barrier islands, springs, active channels of small, single channel rivers, wetlands and other Federal, State and private lands with specific use and regulation.</p> <p>ROP MM-1d When possible, avoid vegetated habitats. If mining in vegetated areas, all overburden, vegetative slash, and debris shall be saved for use during site reclamation to facilitate vegetative recovery. This material should be piled or broadcast so that it will not be washed away.</p> <p>ROP MM-1e When scraping gravel in active or inactive floodplains, maintain buffers that will constrain active channels to their original locations and configurations.</p>
MINING LAW ADMINISTRATION	
<p>Mining Law Administration - 1 All mining operations and access to these sites shall be conducted and reclaimed in a manner that prevents undue and unnecessary degradation of the environment and its natural resources.</p>	<p>ROP MLA-1a Existing access routes will be used as available and used in accordance with season of use for which the access was developed. New access or upgrading existing access shall be planned in consultation with the Authorized Officer for minimum widths needed for passage and shall follow natural contours where practicable to minimize cut and fill.</p> <p>ROP MLA-1b All tailings, dumps, mining improvements, deleterious materials and substances, solid waste including scrap steel derelict mining machinery and parts shall be disposed of so as to prevent undue and unnecessary degradation in accordance with applicable Federal and State Laws and in consultation with the Authorized Officer.</p> <p>ROP MLA-1c Hazardous substances and used petroleum products shall be converted by onsite use or contained and backhauled for disposal at a proper facility for that material. Storage of fuels and petroleum products shall be in accordance with State of Alaska Department of Environmental Conservation.</p> <p>ROP MLA-1d Sanitation efforts including gray water and kitchen wastes shall be directed in accordance with the State of Alaska Department of Environmental Conservation General Mine Permit or plan specifically developed in consultation with that Agency.</p> <p>ROP MLA-1e Water quality of both surface and underground waters shall be regulated by terms and conditions of The U.S. Environmental Protection Agency's National Pollution Discharge Elimination Permit (NPDES).</p>

Objective	Required Operating Procedure
<p>Mining Law Administration - 2 Occupancy of unpatented mining claims on the public land by those involved in prospecting or exploration, mining or processing operations are limited by level of that activity deemed reasonably incident to mining and approved by the Authorized Officer.</p>	<p>ROP MLA-2a Activities (prospecting, mining or processing operations) on the mining claim in order to be reasonably incident includes those actions or expenditure of labor and resources by a person of ordinary prudence to prospect, explore define, develop, mine, or beneficiates a valuable mineral deposit using methods, structures and equipment appropriate to the geological terrain, mineral deposit and stage of development.</p> <p>ROP MLA-2b These on the ground activities must be "substantially regular" meaning that save for seasonal shutdown, climatic extremes or equipment maintenance, repair or replacement, or the isolated nature of the site, the work directly benefits the mineral property.</p>
<p>HAZARDOUS MATERIALS AND WASTE MANAGEMENT</p>	
<p>Hazardous Materials and Waste Management - 1 Protect the health and safety of permittees, lessees, and the general public by avoiding the disposal of solid waste and garbage near areas of human activity.</p>	<p>ROP Hazmat-1a Areas of operation shall be left clean of all debris.</p> <p>ROP Hazmat-1b Hazardous and other regulated wastes shall be properly managed by the generator as required by all applicable Federal and State laws and regulations.</p>
<p>Hazardous Materials and Waste Management - 2 Minimize impacts on the environment from non-hazardous waste generation.</p>	<p>ROP Hazmat-2a All feasible precautions shall be taken to avoid attracting wildlife to food and garbage.</p> <p>ROP Hazmat-2b Current requirements prohibit the burial of garbage. All putrescible waste shall be incinerated, backhauled, or composted in a manner approved by the Authorized Officer. All unburnable solid waste shall be disposed of in an approved waste-disposal facility in accordance with U.S. Environmental Protection Agency (EPA) and Alaska Department of Environmental Conservation (ADEC) regulations and procedures.</p> <p>ROP Hazmat-2c No disposal of domestic wastewater is allowed into bodies of fresh, estuarine, and marine water, including wetlands, unless authorized by the National Pollution Discharge Elimination System (NPDES) or State permit.</p> <p>ROP Hazmat-2d Wastewater must be managed in accordance with Title 18 Alaska Administrative Code, Chapter 72, (18 AAC 72) Wastewater Disposal. Wastewater is defined as Human Waste (sewage), and Gray Water (water which has been used for personal hygiene, washing clothing or equipment, or sanitizing cooking and eating materials). If the standards for Pit Privies found at 18 AAC 72.030 cannot be met, all wastewater must be collected and transported to a state approved disposal facility. Upon closure of the campsite the Pit Privy must be completely back-filled with the surface area covered and re-graded to approximate original appearance.</p> <p>ROP Hazmat-2e Pit privies will be located a minimum of at least 100 feet from the high-water mark of streams, rivers, or lakes. Pit privies will be sprinkled with lime and then backfilled with a minimum of two feet of over-material when the pit has reached capacity or the operation is terminated. All Pit privies must comply with ADEC Standards.</p> <p>ROP Hazmat-2f For oil and gas operations, all pumpable solid, liquid, and sludge waste shall be disposed by injection in accordance with EPA, ADEC, and the Alaska Oil and Gas Conservation Commission</p>

Objective	Required Operating Procedure
	<p>regulations and procedures. The Authorized Officer may permit alternate disposal if the lessee demonstrates that subsurface disposal is not feasible or prudent and the alternative method will not result in adverse environmental effects.</p> <p>ROP Hazmat-2g For oil and gas operations, produced water shall be disposed of into injection wells as approved by the AOGCC under EPA regulations and the UICC program. The Authorized Officer may permit alternate disposal methods if the lessee demonstrates that subsurface disposal is not feasible or prudent and the alternative method will not result in adverse environmental effects.</p>
<p>Hazardous Materials and Waste Management - 3 Minimize the impacts to fish, wildlife, and the environment, from hazardous materials, oil spills, and other chemical spills.</p>	<p>ROP Hazmat-3a For oil and gas operations and mining Plans of Operation, a Hazardous Materials Emergency Contingency Plan shall be prepared and implemented before transportation, storage, or use of fuel or hazardous substances. The plan shall include a set of procedures to ensure prompt response, notification, and cleanup in the event of a hazardous substance spill or threat of a release. The plan shall include a list of resources available for response (e.g., heavy-equipment operators, spill-cleanup materials or companies), and names and phone numbers of Federal and State contacts.</p> <p>ROP Hazmat-3b Plans of Operations will include a disclosure of the components in any hydraulic fracturing materials to be used, the volume and depths at which such materials are expected to be used, and the volume capacity of the vessels to be used to store such materials.</p> <p>ROP Hazmat-3c For oil and gas operations and mining Plans of Operation, the operator will maintain Material Safety Data Sheet (MSDS) information on all chemical and hazardous substances brought on site by the operator in accordance with 29 CFR § 1910.1200.</p> <p>ROP Hazmat-3d Before initiating any operation, including but not limited to, field research/surveys, seismic operations, construction of any facility or mine, lessees/permittees shall develop a comprehensive spill prevention and response contingency plan per 40 CFR 112 if the total cumulative capacity to store, in 55-gallon or larger containers, exceeds 1,320 gallons of oil or hazardous substances.</p> <p>ROP Hazmat-3e For oil and gas operations, mining operations, and other leases and permits, sufficient oil-spill cleanup materials (absorbents, containment devices, etc.) shall be stored at all fueling points and vehicle-maintenance areas and shall be carried by field crews on all overland moves, seismic work trains, and similar overland moves by heavy equipment. All personnel shall be trained to properly respond to spills.</p> <p>ROP Hazmat-3f Fuel and other petroleum products shall be stored at a location approved by the Authorized Officer and within an impermeable lined and diked area capable of containing 110 percent of the stored volume or within approved alternate storage containers.</p> <p>ROP Hazmat-3g Liner material shall be compatible with the stored product and capable of remaining impermeable during typical weather extremes expected throughout the storage period.</p> <p>ROP Hazmat-3h Fuel and other petroleum products and hazardous materials shall be stored in containers designed to hold that product. All fuel containers, including barrels and propane tanks, shall be marked with the responsible party's name, product type, and year filled and purchased.</p> <p>ROP Hazmat-3i Hazardous materials/toxic substances, as defined by EPA (i.e., used oils/petroleum products, batteries), will be handled and disposed of in accordance with EPA and ADEC guidelines.</p> <p>ROP Hazmat-3j The Responsible Party shall immediately clean-up all oil or hazardous substance spills,</p>

Objective	Required Operating Procedure
	<p>taking precedence over all other matters, except the health and safety of personnel. Clean-up shall be conducted in accordance with 18 AAC 75.</p> <p>ROP Hazmat-3k Notice of any reportable spill (as required by 40 CFR 300.125 and 18 AAC 75.300) shall be given to the Authorized Officer as soon as possible, but no later than 24 hours after occurrence and such other Federal and State officials as are required by law to be given such notice including ADEC at (907) 478-9300.</p> <p>ROP Hazmat-3l Surface discharge of reserve-pit fluids and produced water is prohibited unless authorized by applicable NPDES, ADEC, and Borough permits and is approved by the Authorized Officer.</p>
RECREATION/VISITOR SERVICES	
<p>Recreation/Visitor Services - 1 Provide quality recreation/visitor services which also meet the objectives of other relevant areas of concern, such as wildlife, fisheries, and subsistence values.</p>	<p>ROP Rec-1a A Special Recreation Permit (SRP) will be required for all recreational commercial use, competitive use, vending, group activities, and organized group activity. This will include river guides, hunting guides, fishing guides and tour operators.</p> <p>ROP Rec-1b The SRP will be valid only for Federal lands under the jurisdiction of the BLM as specified in the permit. It is the responsibility of the permittee to obtain permission to use any non-Federal lands. Permission must be obtained in writing and submitted to the BLM before a permit is issued. (e.g. Letter of non-objection from respective Native Corporations and 906K concurrence letter for State Selected lands.)</p> <p>ROP Rec-1c A permit will be required for all commercial filming activities on public lands. Commercial filming is defined as the use of motion picture, videotaping, sound recording, or other moving image or audio recording equipment on public lands that involves the advertisement of a product or service, the creation of a product for sale, or the use of actors, models, sets, or props, but not including activities associated with broadcasts for news programs. Creation of a product for sale includes a film, videotape, television broadcast, or documentary of participants in commercial sporting or recreation event created for the purpose of generating income.</p> <p>ROP Rec-1d For permit compliance and wildlife management, Latitude and Longitude or Township, Range, and Section coordinates must be taken from all base camps, spike camps, and/or aircraft landing areas and submitted to the BLM by the permittee.</p> <p>ROP Rec-1e A Post Use Report given to each authorized SRP must be completed and submitted to the BLM thirty (30) days after the last trip/event of the year.</p> <p>ROP Rec-1f Permittee holders accept responsibility for the existing condition of any campsite and aircraft landing area used and will be liable for all site damages, which occur as a result of the activity. Three days after use, the sites will be restored including the removal of any markers, fire rings, personal property and firewood. If the permittee fails to restore the site in the specified manner, they will be held liable for the cost of restoration and they will be placed on probation with additional field compliance checks.</p> <p>ROP Rec-1g All refuse will be hauled out by the permittee and disposed of in a proper landfill, dumpster, or trashcan. This includes any partially burned items such as cans, glass, plastics and other non-combustible/non-degradable materials. Disposal of gray water and human waste will be done away from any water, at least 100 feet beyond the ordinary high water mark of any water body. Do not bury refuse. When possible, the use of portable toilet systems (e.g. porta-potties and ammo cans) is encouraged.</p> <p>ROP Rec-1h All campsites will be kept in a neat and sanitary condition at all times. Only the use of dead</p>

Objective	Required Operating Procedure
	<p>and down trees for campfires is permitted. This permit does not authorize the cutting of live trees, except in life-threatening situations. Permittee shall make their employees and clients aware of responsible low-impact practices and techniques outlined within the Leave No Trace Alaska Wildlands Skills & Ethics booklet given to each permittee.</p> <p>ROP Rec-1i All campsites shall be located out of sight of raptor nest sites, including peregrine falcons, bald eagles and red-tail hawks. There are several signs which advertise raptor occupancy. In cliff areas along river shorelines, rocks stained with feces (whitewash) are the primary feature.</p> <p>ROP Rec-1j Permits do not authorize construction of new aircraft landing areas, because actual construction of new landing areas by extensive clearing would require conformance with Federal Aviation Administration guidelines and a long-term authorization. Minor improvements, such as moving rocks or logs, to allow an area to be used for aircraft landing must be conducted under the limitations of 43 CFR 8365.1-5 to limit impacts to vegetation and soils. These limitations state no person shall: Willfully deface, remove or destroy any personal property, or structure, or any scientific, cultural, archaeological or historic resource, natural object or area; willfully deface, remove or destroy plants or their parts, soil, rocks or minerals or cave resources. This permit does not authorize exclusive use of landing areas on Public Lands.</p> <p>ROP Rec-1k To avoid conflicts with bears, the use of sealed bear proof containers will be required for food and unburned waste until such waste can be removed from all base and spike camps. Meat and animal parts will be removed from all camps as soon as possible to avoid attracting bears.</p> <p>ROP Rec-1l Report to the Alaska Department of Fish and Game, the taking of bears or other wildlife in defense of life or property.</p> <p>ROP Rec-1m All BLM commercial recreation permittees must have a State of Alaska business license and business insurance to conduct operations on BLM-managed lands in Alaska. Commercial hunting guides must have a current Alaska Guide License. Current copies of licenses and insurance shall be submitted to the BLM before authorization can be approved.</p> <p>ROP Rec-1n The permittee shall comply with all Federal, State, Borough and local laws, ordinances, regulations, orders, postings, or written requirements applicable to the area or operations covered by the SRP. The permittee shall ensure that all persons operating under the authorization have obtained all required Federal, State, and local licenses or registrations (e.g. hunting and fishing licenses). The permittee shall make every reasonable effort to ensure compliance with these requirements by all agents of the permittee and by all clients, customers, participants, or spectators under the permittee's supervision.</p> <p>ROP Rec-1o An SRP authorizes special uses of the Federal Public Lands and related waters and, should circumstances warrant, the permit may be modified by the BLM at any time, including the amount of use. The Authorized Officer may suspend an SRP if necessary to protect public resources, health, safety, the environment, or noncompliance with permit stipulations.</p> <p>ROP Rec-1p Unless expressly stated, the SRP does not create an exclusive right of use of an area by the permittee. The permittee shall not interfere with other valid uses of the Federal land by other users. The United States reserves the right to use any part of the area for any purpose.</p> <p>ROP Rec-1q A permittee or permittee's representative may not assign, contract, or sublease any portion</p>

Objective	Required Operating Procedure
	<p>of the permit authorization or interest therein, directly or indirectly, voluntarily or involuntarily. However, the Authorized Officer may approve contracting of equipment or services in advance, if necessary to supplement a permittee's operations. Such contracting should not constitute more than half the required equipment or services for any one trip and the permittee must retain operational control of the permitted activity. If equipment or services are contracted, the permittee shall continue to be responsible for compliance with all stipulations and conditions of the permit. Permits may not be reassigned or transferred by the permittee without authorization from the BLM.</p> <p>ROP Rec-1r The permit, or copies thereof, shall be kept with the authorized individual and presented to any BLM representative upon request as proof of authorization. If required, the permittee must display a copy of the permit or other identification tag on equipment used during the period of authorized use.</p> <p>ROP Rec-1s Camping associated with commercial, competitive, vending, special use areas, and organized group activities and event use would be prohibited without written authorization from the BLM. To help satisfy recreational demand in an equitable and enjoyable manner while minimizing adverse impacts and user conflicts, short term camping not associated with the above activities shall be limited to 14 days within a 28-day period. After a camp has been occupied for 14 days, the camp must be moved at least 28 miles. Other existing occupancy and use limits on all public lands are established under 43 CFR 8365.1-2.</p> <p>ROP Rec-1t Recreational vehicle use within all areas of the Bay planning area shall be designated as limited, allowing travel on existing roads and trails only. The number of vehicles and designated roads and trails shall be restricted if visitor conflicts become known and/or if resource damage is observed. Open cross-country travel is permitted for snow-machines when adequate snow cover is present. Motorized vehicles exceeding 2,000 (Gross Vehicle Weight Rating) are prohibited without written authorization from the BLM. Pioneering new trails with any motorized vehicle is prohibited.</p> <p>ROP Rec-1u Field compliance shall be performed by uniformed Recreation and Ranger Staff on authorized permits. Multi-year permits shall be validated annually. All permittees must achieve at least a satisfactory annual performance rating, otherwise probationary actions or suspension of a permit shall occur.</p>
LANDS AND REALTY	
<p>Lands and Realty - 1 Use and develop BLM-administered public lands in a responsible manner which benefits the public while preventing unnecessary degradation to the land.</p>	<p>ROP LR-1a The Holder shall not allow any use of the right-of-way by another entity without the prior written authorization of the Authorized Officer. Prior to authorizing additional uses within the right-of-way, the Authorized Officer will consult the Holder, and determine whether the use will interfere with the purposes for which this right-of-way was issued.</p> <p>ROP LR-1b Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the Holder or any person working on his behalf on public or Federal land will be immediately reported to the Authorized Officer. The Holder will suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The Holder will be responsible for the cost of evaluation. Any decision as to proper mitigation measures will be made by the Authorized Officer, after consulting with the Holder.</p>

Objective	Required Operating Procedure
	<p>ROP LR-1c Use of pesticides will comply with the applicable Federal and State laws. Pesticides will be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the Holder will obtain from the Authorized Officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the Authorized Officer. The plan should be submitted no later than December 1st of any calendar year to cover the proposed activities for the next fiscal year. Emergency use of pesticides will be approved in writing by the Authorized Officer prior to such use.</p> <p>ROP LR-1d No burning of trash, litter, trees, brush or other vegetative material generated by clearing the right-of-way will be allowed.</p> <p>ROP LR-1e The Holder will comply with applicable State standards for public health and safety, environmental protection and siting, construction, operation and maintenance, if these State standards are more stringent than Federal standards for similar projects.</p> <p>ROP LR-1f The Holder will comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated regarding toxic substances or hazardous materials. In any event, the Holder will comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 will be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances will be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.</p> <p>ROP LR-1g The Holder of this right-of-way or the Holder's successor in interest will comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.) and the regulations of the Secretary of Interior issued pursuant thereto.</p> <p>ROP LR-1h All heavy equipment moves will be conducted under the requirements of State and Federal laws and regulations pertaining, but not limited to: waste management, fuel storage and handling, anadromous fish streams and fish and game utilization. In addition, the Permittee and his assistant will comply with all conditions attached to the permit.</p> <p>ROP LR-1i Minimum snow depth requirements are 18 inches with a frost depth of six inches. Temperature must be below 25° F.</p> <p>ROP LR-1j No blading of soils or vegetation is permitted during an overland move of equipment. Blading of snow drifts is permitted only when blades remain a minimum of 18 inches above the ground surface.</p> <p>ROP LR-1k Snow ramps may be constructed at stream crossings. No blading of cut banks will be permitted during an overland move of equipment. Any ramps which may cause stream blockages during breakup will be removed after crossings are completed.</p> <p>ROP LR-1l Heavy equipment moves will be conducted, as closely as possible, on existing trails. In areas</p>

Objective	Required Operating Procedure
	<p>where the trail is heavily overgrown and significant vegetation disturbance would be caused by following the trail, the Permittee may travel immediately adjacent to the trail, preferably on the up slope side.</p> <p>ROP LR-1m All motorized equipment shall travel under its own power or be towed on an appropriate size sled. Any inoperative equipment will be repaired on-site and not towed unless a break down occurs while crossing a river, lake or pond.</p> <p>ROP LR-1n New segments of trails will be routed to avoid heavy stands of tall shrub or timber vegetation.</p> <p>ROP LR-1o No fuel barrels, waste oil, garbage or equipment are to be abandoned along any trails.</p> <p>ROP LR-1p The permittee will notify the BLM when starting a project such as an overland move and when the project is completed.</p> <p>ROP LR-1q Fuel will be stored in a containment dike that will hold 110% of the fuel being stored on the ground.</p> <p>ROP LR-1r Wastewater disposal must comply with Title 18 Alaska Administrative Code, Chapter 72 (18 AAC 72, excerpts attached); fuel discharge or releasing must comply with Title 18 Alaska Administrative Code, Chapter 75 (18 AAC 75, excerpts attached).</p> <p>ROP LR-1s Helicopter operations should avoid areas of observed concentrations of caribou (for example wintering concentrations or large migrating groups) by maintaining a minimum distance of one mile or 2000 feet AGL, unless doing so would endanger human life or violate safe flying practices.</p> <p>ROP LR-1t To accommodate the breeding and nesting activities of migratory birds and to allow for brood fledging and subsistence harvest activities in the spring, activities should be restricted between the dates of May 1 and July 31 in wetlands and lake areas. Closures are required for the migratory bird nesting period of April 10-July 15 for forest and woodland habitat types in Bristol Bay, May 1-July 15 for open or shrub habitat types, May 10-September 15 for seabird colonies and April 15-August 15 for raptors. These closures would be dependent upon the actual location of the species in question.</p>

3. Oil and Gas Leasing Stipulations

Table 2.14. Oil and Gas Leasing Stipulations

Objective	Stipulation	Areas Where Stipulations Apply	Exception, Modification, Waiver
Protect fish-bearing rivers, streams and lakes from blowouts, and minimize alteration of aquatic and riparian habitat.	Stip-1: Exploratory drilling is prohibited in rivers and streams, as determined by the active floodplain, and fish-bearing lakes, except where the lessee can demonstrate on a site specific basis that impacts would be minimal or it is determined that there is no feasible or prudent alternative. Floodplain maps are generated by the Bureau of Reclamation but have not been developed for most of Alaska; onsite determination by a qualified hydrologist is necessary.	Fish bearing rivers, streams, and lakes	Exception: Authorized Officer may grant exception if lessee can demonstrate that impacts would be minimal or there is no feasible or prudent alternative Modification: None Waiver: None
Protect fish-bearing water bodies, water quality and aquatic habitats.	Stip-2: The design and location of permanent oil and gas facilities within 500 feet of fish-bearing or 100 feet of non-fish-bearing water bodies will only be approved on a case-by-case basis if the lessee can demonstrate that impacts to fish, water quality, aquatic and riparian habitats are minimal.	Areas open to oil and gas leasing	Exception: Authorized Officer may grant exception if the lessee can demonstrate that impacts to fish, water quality, and aquatic and riparian habitats are minimal. Modification: None Waiver: None
Protect threatened, endangered, or other special status species and their habitats.	Stip-3: The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened or endangered species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their	All BLM-managed lands	Exception: None. Modification: None. Waiver: None.

Objective	Stipulation	Areas Where Stipulations Apply	Exception, Modification, Waiver
	<p>habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed TES species or result in the destruction or adverse modification of a designated or proposed critical habitat.</p>		
<p>Ensure that the final disposition of the land meets the current and future needs of the public.</p>	<p>Stip 4: Upon abandonment or expiration of the lease, all oil- and gas-related facilities shall be removed and sites rehabilitated to as near the original condition as practicable, subject to the review of the Authorized Officer. The Authorized Officer may determine that it is in the best interest of the public to retain some or all facilities.</p>	<p>Areas open to oil and gas leasing</p>	<p>Exception: The Authorized Officer determines that it is in the best interest of the public to retain some or all facilities. Modification: None. Waiver: None</p>
<p>Minimize surface impacts from exploratory drilling.</p>	<p>Stip 5: Exploratory drilling shall be limited to temporary facilities such as gravel pads, gravel and/or ice roads and temporary platforms, etc.</p>	<p>Areas open to oil and gas leasing</p>	<p>Exception: The lessee demonstrates that construction of permanent facilities such as gravel airstrips, storage pads, and connecting roads is environmentally preferable or that exploring from temporary facilities is not practical or economically feasible. Modification: None. Waiver: None</p>
<p>Minimize disturbance to calving caribou.</p>	<p>Stip-6: No exploration or development activities from May 15 to June 15. Production activities may occur (with the exception of workover rigs). This stipulation would not apply under Alternative B.</p>	<p>Mulchatna Caribou Herd (MCH), Nushagak, Northern Peninsula, and other caribou calving concentration areas. Some of these caribou herds are very traditional in use of calving areas. The MCH has shifted to other calving areas in some years.</p>	<p>Exception: Authorized Officer may grant exception for exploration if review indicates that calving caribou no longer occupy site-specific area. Modification: The season of no exploration, no development, or workover rigs may be extended based on actual occupancy of the area.</p>

Objective	Stipulation	Areas Where Stipulations Apply	Exception, Modification, Waiver
			<p>The period of exploration and development activity may be modified to include all or part of the May 15-June 15 period based on actual real time field verification and assessment of caribou calving use of the proposed activity area. Monitoring would be based on actual on-site field verification prior to activity startup and concurrent radio telemetry data indicating the aggregation of calving caribou is not using the proposed area of activity during that operational period.</p> <p>Waiver: None</p>
<p>Minimize disturbance to caribou during aggregation periods (insect relief and post calving and migration periods).</p>	<p>Stip-7: No exploration activities from May 20 to August 15 and periods characterized by large numbers of migrating caribou in localized site-specific areas. Construction of development and production phase facilities and activities may occur (no workover rigs). This stipulation would not apply under Alternative B.</p> <p>To the extent that impacts from mining operations would be substantially different or greater than those associated with normal drilling operations, lessor reserves the right to deny approval of such operations.</p>	<p>Mulchatna Caribou Herd (MCH) crucial insect relief areas, migration and post calving aggregations. MCH and other caribou herds in the Bay Planning area periodically may shift use areas. Long term fidelity to seasonal use areas is cyclic or may be unpredictable and inconsistent but occurs in multiple year periods. Field verification and assessment/monitoring are necessary for exploration actions and development activity.</p>	<p>Exception: Authorized Officer may grant exception if review indicates that caribou do not occupy site-specific area in a given year. Exceptions may be granted for work-over rigs on a case-by-case basis depending on duration of activity and actual caribou occupancy of area.</p> <p>Modification: Season may be shortened or extended based on actual occupancy of the area. In years where caribou activity is absent, modification to the stipulation to allow exploration and development may be allowed.</p> <p>Waiver: None. Exceptions may be granted for work-over rigs on a case-by-case basis depending on duration of activity and actual caribou occupancy of area.</p>

Objective	Stipulation	Areas Where Stipulations Apply	Exception, Modification, Waiver
Minimize soil erosion.	Stip-8: Surface disturbing proposals involving construction and heavy equipment operation on slopes greater than 25 percent would include an approved erosion control strategy, topsoil segregation/restoration plan, be properly surveyed and designed by a certified engineer and approved by the BLM prior to construction and maintenance. Restore wildlife cover, forage, spatial and water conditions existing before disturbance.	All slopes greater than 25% within the planning area.	Exception: If after an environmental analysis the Authorized Officer determines that it would cause undue or unnecessary degradation to pursue other placement alternatives, occupancy area may be authorized. Modification: May be granted if a more detailed analysis (Order I soil survey) finds that surface disturbance could occur without accelerated erosion. Waivers: None.
Minimize impact on the human environment.	Stip-9: The operator will construct drill pads at least 500 feet and compressor stations at least 1,500 feet from occupied structures. Visual, auditory and other intrusions upon adjacent property owner values will be reduced to the degree possible. Subject to best technological means, reduce by cryptic painting, noise abatement devices and property owner consultation buffers can be modified by on site analysis and Authorized Officer approval. (Other private property value and owner concerns may arise, whether it is a structure, occupied or not).	Areas open to oil and gas leasing	Exception: The Authorized Officer may grant an exception if the operator obtains the consent of the owner of the structure and agrees to perform appropriate mitigation as per consent of the adjacent property owner. Modification: None. Waivers: None.
Minimize impact on sensitive and recovering anadromous and fresh water habitat on three streams.	Stip-10: To protect sensitive and recovering anadromous and freshwater fish habitat, provide a 300 ft. buffer from mining operations on BLM-administered lands on either side of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River.	Areas Open to Oil and Gas Leasing: East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River only.	Exceptions: None Modification: None Waivers: None.

4. Standard Lease Terms for Oil and Gas (BLM Form 3100-11)

Section 1. Rentals

Rentals shall be paid to proper office of lessor in advance of each lease year. Annual rental rates per acre or fraction thereof are:

- (a) Noncompetitive lease, \$1.50 for the first 5 years; thereafter \$2.00;
 - (b) Competitive lease, \$1.50, for the first 5 years; thereafter \$2.00;
 - (c) Other, see attachment,
- or as specified in regulations at the time this lease is issued.

If this lease or a portion thereof is committed to an approved cooperative or unit plan which includes a well capable of producing leased resources and the plan contains a provision for allocation of production, royalties shall be paid on the production allocated to this lease. However, annual rentals shall continue to be due at the rate specified in (a), (b), or (c) for those lands not within a participating area.

Failure to pay annual rental, if due, on or before the anniversary date of this lease (or next official working day if office is closed) shall automatically terminate this lease by operation of law. Rentals may be waived, reduced, or suspended by the Secretary upon a sufficient showing by lessee.

Section 2. Royalties

Royalties shall be paid to proper office of lessor. Royalties shall be computed in accordance with regulations on production removed or sold. Royalty rates are:

- (a) Noncompetitive lease, 12 ½ percent;
 - (b) Competitive lease, 12 ½ percent;
 - (c) Other, see attachment; or
- as specified in regulations at the time this lease is issued.

Lessor reserves the right to specify whether royalty is to be paid in value or in kind, and the right to establish reasonable minimum values on products after giving lessee notice and an opportunity to be heard. When paid in value, royalties shall be due and payable on the last day of the month following the month in which production occurred. When paid in kind, production shall be delivered, unless otherwise agreed to by lessor, in merchantable condition on the premises where produced without cost to lessor. Lessee shall not be required to hold such production in storage beyond the last day of the month following the month in which production occurred, nor shall lessee be held liable for loss or destruction of royalty oil or other products in storage from causes beyond the reasonable control of lessee.

Minimum royalty in lieu of rental of not less than the rental which otherwise would be required for that lease year shall be payable at the end of each lease year beginning on or after a discovery in paying quantities. This minimum royalty may be waived, suspended, or reduced, and the above royalty rates may be reduced, for all or portions of this lease if the Secretary determines that such action is necessary to encourage the greatest ultimate recovery of the leased resources, or is otherwise justified.

An interest charge shall be assessed on late royalty payments or underpayments in accordance with the Federal Oil and Gas Royalty Management Act of 1982 (FOGRMA) (30 U.S.C. 1701). Lessee shall be liable for royalty payments on oil and gas lost or wasted from a lease site when such loss or waste is due to negligence on the part of the operator, or due to the failure to comply with any rule, regulation, order, or citation issued under FOGRMA or the leasing authority.

Section 3. Bonds

A bond shall be filed and maintained for lease operations as required under regulations.

Section 4. Diligence, rate of development, unitization, and drainage

Lessee shall exercise reasonable diligence in developing and producing, and shall prevent unnecessary damage to, loss of, or waste of leased resources. Lessor reserves right to specify rates of development and production in the public interest and to require lessee to subscribe to a cooperative or unit plan, within 30 days of notice, if seemed necessary for proper development and operation of area, field, or pool embracing these leased lands. Lessee shall drill and produce wells necessary to protect leased lands from drainage or pay compensatory royalty for drainage in amount determined by lessor.

Section 5. Documents, evidence, and inspection

Lessee shall file with proper office of lessor, not later than 30 days after effective date thereof, any contract or evidence of other arrangement for sale or disposal of production. At such times and in such form as lessor may prescribe, lessee shall furnish detailed statements showing amounts and quality of all products removed and sold, proceeds therefrom, and amount used for production purposes or unavoidably lost. Lessee may be required to provide plats and schematic diagrams showing development work and improvements and reports with respect to parties in interest, expenditures, and depreciation costs. In the form prescribed by lessor, lessee shall keep a daily drilling record, a log, information on well surveys and tests, and a record of subsurface investigations and furnish copies to lessor when required. Lessee shall keep open at all reasonable times for inspection by any Authorized Officer of lessor, the leased premises and all wells, improvements, machinery, and fixtures thereon, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or in the leased lands. Lessee shall maintain copies of all contracts, sales agreements, accounting records, and documentation such as billings, invoices, or similar documentation that supports costs claimed as manufacturing, preparation, and/or transportation costs. All such records shall be maintained in lessee's accounting offices for future audit by lessor. Lessee shall maintain required records for six years after they are generated or, if an audit or investigation is underway, until released of the obligation to maintain such records by lessor.

During existence of this lease, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Section 6. Conduct of operations

Lessee shall conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee shall take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or rights-of-way. Such uses shall be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee.

Prior to disturbing the surface of the leased lands, lessee shall contact lessor to be apprised of procedures to be followed and modifications or reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor. If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee shall immediately contact lessor. Lessee shall cease any operations that would result in the destruction of such species or objects.

Section 7. Mining operations

To the extent that impacts from mining operations would be substantially different or greater than those associated with normal drilling operations, lessor reserves the right to deny approval of such operations.

Section 8. Extraction of helium

Lessor reserves the option of extracting or having extracted helium from gas production in a manner specified and by means provided by lessor at no expense or loss to lessee or owner of the gas. Lessee shall include in any contract of sale of gas the provisions of this section.

Section 9. Damages to property

Lessee shall pay lessor for damage to lessor's improvements, and shall save and hold lessor harmless from all claims for damage or harm to persons or property as a result of lease operations.

Section 10. Protection of diverse interests and equal opportunity

Lessee shall: pay when due all taxes legally assessed and levied under laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; and take measures necessary to protect the health and safety of the public.

Lessor reserves the right to ensure that production is sold at reasonable prices; and to prevent monopoly. If lessee operates a pipeline, or owns controlling interest in a pipeline or a company operating a pipeline, which may be operated accessible to oil derived from these leased lands, lessee shall comply with section 28 of the Mineral Leasing Act of 1920.

Lessee shall comply with Executive Order No. 11246 of September 24, 1965, as amended, and regulations and relevant orders of the Secretary of Labor issued pursuant thereto. Neither lessee, nor lessee's subcontractors shall maintain segregated facilities.

Section 11. Transfer of lease interests and relinquishment of lease

As required by regulations, lessee shall file with lessor any assignment or other transfer of an interest in this lease. Lessee may relinquish this lease or any legal subdivision by filing in the proper office a written relinquishment, which shall be effective as of the date of filing, subject to the continued obligation of the lessee and surety to pay all accrued rentals and royalties.

Section 12. Delivery of premises

At such time as all or portions of this lease are returned to lessor, lessee shall place affected wells in condition for suspension or abandonment, reclaim the land as specified by lessor and, within a reasonable period of time, remove equipment and improvements not deemed necessary by lessor for preservation of producible wells.

Section 13. Proceedings in case of default

If lessee fails to comply with any provisions of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation unless or until the leasehold contains a well capable of production of oil or gas in paying quantities, or the lease is committed to an approved cooperative or unit plan or communitization agreement which contains a well capable of production of unitized substances in paying quantities. This provision shall not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time. Lessee shall be subject to applicable provisions and penalties of FOGPMA (30 U.S.C. 1701).

Section 14. Heirs and successors-in-interest

Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to the heirs, executors, administrators, successors, beneficiaries, or assignees of the respective parties hereto.

F. Comparison of Alternatives

Table 2.15. Alternative Summary Table

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Fish and Wildlife Habitat		Proposed permitted or authorized uses analyzed through the NEPA process on a case-by-case basis. Mitigation measures developed to minimize impacts from proposed activities would be included in the permit that authorized use.	Same as Alternative A. Stipulations, Required Operating Procedures, and project-specific requirements would apply.	Same as Alternative B. Stipulations, Required Operating Procedures, and project-specific requirements would apply. In addition, a Fish and Wildlife Habitat Management Plan would be developed for the Carter Spit ACEC and the Bristol Bay ACEC.	Same as Alternative B. Stipulations, Required Operating Procedures, and project-specific requirements would apply. In addition, a Fish and Wildlife Habitat Management Plan would be developed for the Carter Spit ACEC.
				For Fluid Leasable Minerals, Goodnews, Koggiling, Yellow Creek, Kvichak, Iliamna West, Alagnak, and Klutuk Blocks would be open to leasing subject to seasonal restrictions or other constraints.	For Fluid Leasable Minerals, Goodnews, Koggiling, Yellow Creek, Kvichak, Iliamna West, Alagnak, and Klutuk Blocks would be open to leasing subject to seasonal restrictions or other constraints.
				A 300-foot minimum setback on BLM unencumbered lands on segments of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River would be required. This setback would protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.	A 300-foot minimum setback on BLM unencumbered lands on segments of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River would be required. This setback would protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Fire Management and Ecology		This Alternative would allow Wildland fire use for resource benefit and to meet land use and resource management objectives.	Same as Alternative A.	Same as Alternative A. Fire strategies would be developed for Carter Spit and Bristol Bay ACECs.	Same as Alternative A. Fire strategies would be developed for Carter Spit ACEC.
Cultural and Paleontological Resource Management		This Alternative would identify, protect, and preserve significant cultural and paleontological resources; and manage cultural and paleontological resources for a variety of scientific, conservation, public education, interpretation, traditional, and experimental use.	Same as Alternative A.	Same as Alternative A. Develop cultural and paleontological resource strategies and priorities for Carter Spit and Bristol Bay ACECs.	Same as Alternative A. Develop cultural and paleontological resource strategies and priorities for Carter Spit ACEC.

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Visual Resource Management	VRM Classifications	No VRM Classes would be established within the Bay planning area.	All lands within the Bay planning area would be managed as VRM Class IV.	<p>BLM lands in the full visible foreground based on GIS analysis up to 5 miles from established winter trail/road systems would be managed at VRM Class III including:</p> <p>Goodnews Bay block:</p> <ul style="list-style-type: none"> • Goodnews to Quinhagak coastal and Arolik River routes • Goodnews Bay to Dillingham <p>Nushagak/Kvichak/Alagnak Drainages</p> <ul style="list-style-type: none"> • Dillingham to Aleknagik • Dillingham to Koliganek • Ekwok to Naknek • New Stuyahok to Levelock • Naknek to King Salmon <p>BLM lands in the full visible foreground up to 5 miles from main river travel routes would be managed at VRM Class III including the navigable portions of:</p> <p>Goodnews Bay block:</p> <ul style="list-style-type: none"> • North Fork Goodnews River • Middle Fork Goodnews River • South Fork Goodnews River • East Fork Arolik River <p>Nushagak/Kvichak/Alagnak Drainage</p> <ul style="list-style-type: none"> • Nushagak River • Kvichak River • Lower Mulchatna River • Alagnak Wild River <p>BLM lands in the full visible foreground up to five miles from the boundaries of Togiak NWR, Becharof NWR, Katmai NPP, and Lake Clark NPP would be managed at VRM Level III.</p> <p>All other BLM lands would be managed as VRM Class IV.</p>	<p>BLM lands in the full visible foreground based on GIS analysis up to 1/2 mile from established winter trail/road systems would be managed at VRM Class III including:</p> <p>Goodnews Bay block:</p> <ul style="list-style-type: none"> • Goodnews to Quinhagak coastal and Arolik River routes • Goodnews Bay to Dillingham <p>Nushagak/Kvichak/Alagnak Drainages</p> <ul style="list-style-type: none"> • Dillingham to Aleknagik • Dillingham to Koliganek • Ekwok to Naknek • New Stuyahok to Levelock • Naknek to King Salmon <p>BLM lands in the full visible foreground up to 1/2 mile from main river travel routes would be managed at VRM Class III including the navigable portions of:</p> <p>Goodnews Bay block:</p> <ul style="list-style-type: none"> • North Fork Goodnews River • Middle Fork Goodnews River • South Fork Goodnews River • East Fork Arolik River <p>Nushagak/Kvichak/Alagnak Drainage</p> <ul style="list-style-type: none"> • Nushagak River • Kvichak River • Lower Mulchatna River • Alagnak Wild River <p>BLM lands in the full visible foreground up to one mile from the boundaries of Togiak NWR, Becharof NWR, Katmai NPP, and Lake Clark NPP would be managed at VRM Class III.</p> <p>All other BLM lands would be managed as VRM Class IV.</p>

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
	VRM Classifications in Special Mgmt Areas		Proposed Carter Spit and Bristol Bay ACECs would be managed at VRM Class III	Proposed Carter Spit and Bristol Bay ACECs would be managed at VRM Class III. Proposed National WSR Alagnak River and Kvichak River (Wild, Recreational) would be managed at VRM Class III. Proposed National WSR Goodnews River and Middle Fork Goodnews River (Wild) would be managed at VRM Class II.	Proposed Carter Spit ACEC would be managed at VRM Class III.
Livestock and Reindeer Grazing		Alternative A would continue current management. Livestock grazing would be managed on a case-by-case basis as permits were received. Livestock permitted would be limited to reindeer.	Same as Alternative A. Permits subject to Required Operating Procedures.	Same as Alternative A. Permits subject to Required Operating Procedures	Same as Alternative A. Permits subject to Required Operating Procedures
	Grazing Management in Special Management Areas	Grazing would be permitted in the Bay planning area.	Grazing would be permitted in the Bay planning area.	No grazing or domestic pack animals would be allowed in Carter Spit ACEC, Bristol Bay ACEC, or designated WSRs.	No grazing or domestic pack animals would be allowed in Carter Spit ACEC.

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Fluid Leasable Minerals	Areas Open to Fluid Mineral Leasing Subject to Standard Lease Terms	No BLM-administered lands would be open for fluid mineral leasing.	2,499,941 acres (99%), 1,327,671 acres of which are State or Native selected. Existing withdrawals (excluding those lands under ANCSA 17(d)(1), of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing.	1,432,752 acres (57%), all of which are State-selected or Native-selected. Existing withdrawals (excluding those lands under withdrawals other than ANCSA 17(d)(1) of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing.	1,447,877 acres (58%), 1,176,629 of which are State-selected or Native-selected.
		Notwithstanding the provisions listed within this management action, BLM may lease lands in cases where oil and gas is being drained from the Federal subsurface estate by wells drilled on adjacent lands.			
		Oil and Gas Stipulations and Required Operating Procedures described in Section E apply to all BLM-managed lands in the Bay planning area open to oil and gas leasing.			

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
	Areas Closed to Fluid Mineral Leasing	All BLM lands would be closed to fluid mineral leasing.	Existing withdrawals other than ANCSA 17(d)(1) of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing.	<p>Approximately 19,124 acres (>1%) which are unencumbered BLM lands.</p> <p>Existing withdrawals of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing</p> <p>Proposed Wild River segments of the Alagnak, Goodnews and Goodnews Middle Fork rivers (15,125 acres). ANCSA 17(d)(1) withdrawals would be retained for these river segments as an interim measure to provide an opportunity for Congressional action.</p>	Existing withdrawals other than ANCSA 17(d)(1), of approximately 3,999 unencumbered acres would remain withdrawn from fluid mineral leasing.

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
	Areas Open to Fluid Mineral Leasing Subject to Seasonal or Other Minor Constraints	No Federal leases would occur on BLM-managed lands within the Bay planning area.	No acres are subject to seasonal or other minor constraints. Stipulations #6 and #7, Section E, do not apply under this Alternative.	1,052,065 acres (42%), none of which are State-selected or Native-selected. Carter Spit ACEC (62,862 acres). Bristol Bay ACEC (989,202 acres). To protect caribou and their habitat, oil and gas exploration and development activities would be limited on identified aggregation areas (insect relief, post calving, and migration) between May 20 and August 15. To minimize disturbance to calving caribou, oil and gas exploration and development activities will be restricted from May 1 to June 15.	1,052,065 acres (42%), none of which are State-selected or Native-selected. Carter Spit ACEC (62,862 acres). BLM unencumbered lands on the Bristol Bay Plain (989,202 acres). To protect caribou and their habitat, oil and gas exploration and development activities would be limited on identified aggregation areas (insect relief, post calving, and migration) between May 20 and August 15. To minimize disturbance to calving caribou, oil and gas exploration and development activities will be restricted from May 1 to June 15.
	Areas Open to Fluid Mineral Leasing Subject to No Surface Occupancy Constraint	No Federal leases would occur on BLM-managed lands within the planning area.	0 acres. Stipulations #6 and #7, Section E, do not apply under this Alternative.	2,355 acres (>.1 %). A 300-foot minimum setback on BLM unencumbered lands on segments of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River. This setback would protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.	2,355 acres (>.1 %). A 300-foot minimum setback on BLM unencumbered lands on segments of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River. This setback would protect riparian areas and soils adjacent to sensitive habitat for salmon and freshwater fish.

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Locatable Minerals		<p>152,746 acres would be identified as open for locatable mineral entry.</p> <p>Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANSCA 17(d)(1).</p>	<p>ANCSA 17(d)(1) withdrawals would be revoked.</p> <p>Approximately 1,176,269 acres of unencumbered lands would be available for locatable mineral entry.</p> <p>Selected lands would be made available if the selection is revoked or relinquished.</p> <p>Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>	<p>Same as Alternative B, except the following lands would be closed to locatable mineral entry:</p> <p>Exceptions (Selected):</p> <p>Proposed wild river segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres).</p> <p>Exceptions (Unencumbered):</p> <p>Proposed Carter Spit ACEC (62,863 acres) and Bristol Bay ACEC (989,202 acres) would be closed to mineral entry.</p> <p>ANCSA 17(d)(1) withdrawals for these river segments would be retained as an interim measure to provide an opportunity for Congressional action.</p> <p>Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>	<p>Same as Alternative B, except the following lands would be closed to locatable mineral entry:</p> <p>Exceptions (Unencumbered):</p> <p>Proposed Carter Spit ACEC (62,863 acres) would be open but would be subject to more stringent Required Operating Procedures.</p> <p>Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>
		<p>Approved Plans of Operation would contain stipulations based on site-specific resource concerns.</p>	<p>Same as Alternative A, with the addition that an approved Plan of Operations will contain guidelines as listed in the Required Operating Procedures in Section E.</p>		

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Salable Minerals		<p>Approximately 1,176,269 acres of unencumbered lands would be available for sale of mineral materials.</p> <p>Selected lands would be made available if the selection were revoked or relinquished.</p> <p>Within the Bay planning area, approximately 3,999 acres of unencumbered lands would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>	<p>Same as Alternative A</p> <p>Within the Bay planning area, approximately 3,999 acres of unencumbered lands would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>	<p>The following lands would be closed to sale:</p> <p>Exception (unencumbered):</p> <ul style="list-style-type: none"> Proposed Carter Spit ACEC (62,862 acres) Proposed Bristol Bay ACEC (989,202 acres) <p>Exceptions (Selected):</p> <ul style="list-style-type: none"> Proposed Wild river segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres.) <p>ANCSA 17 (d)(1) withdrawals would be retained for these river segments as an interim measure to provide an opportunity for Congressional action.</p> <p>Within the Bay planning area, approximately 3,999 acres of unencumbered lands would remain withdrawn from mineral entry due to withdrawals other than 17(d)(1).</p>	<p>The following lands would be closed to sale:</p> <p>Exception (unencumbered):</p> <ul style="list-style-type: none"> Proposed Carter Spit ACEC (62,862 acres) <p>Within the Bay planning area, approximately 3,999 acres of unencumbered lands would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1).</p>
		<p>Approved Plans of Operation would contain stipulations based on site-specific resource concerns.</p>	<p>Same as Alternative A, with the addition that approved Plans of Operations would contain guidelines as listed in the Required Operating Procedures in Section E.</p>		

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Designation of BLM-administered unencumbered lands for Off-Highway Vehicle Use		There would be no OHV designations on BLM-managed lands within the planning area.	All unencumbered BLM-managed lands within the planning area would be designated as "open" for OHV use.	<p>All unencumbered BLM-managed lands would be designated as "limited" for OHV use.</p> <p>The "limited" designation is the same as the "Generally Allowed Uses on State Land," which among other things requires OHVs to stay on existing trails whenever possible (Appendix F).</p>	<p>All unencumbered BLM managed lands would be designated as "limited" to OHV use.</p> <p>The "limited" designation is the same as the "Generally Allowed Uses on State Land," which among other things requires OHVs to stay on existing trails whenever possible (as described in Appendix F).</p> <p>Limitations within the proposed Carter Spit ACEC would be defined through the development of activity plans to meet the objectives of the proposed Special Management Area.</p>
		No route restrictions; cross-country travel allowed everywhere on BLM lands within the planning area.	Same as Alternative A.	OHV use would be limited to existing roads and trails. This limitation is the same as the <i>Generally Allowed Uses on State Land</i> , which requires OHVs to stay on existing trails whenever possible.	Same as Alternative C.

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Designation of Interim BLM-administered encumbered lands for Off-Highway Vehicle Use		There would be no OHV designations on BLM-managed lands within the planning area.	All interim BLM-managed encumbered lands within the planning area would be designated as “open” for OHV use.	All interim BLM-managed encumbered lands would be designated as “limited” for OHV use. The “limited” designation is the same as the “Generally Allowed Uses on State Land,” which among other things requires OHVs to stay on existing trails whenever possible (Appendix F).	All interim BLM-managed encumbered lands would be designated as “limited” to OHV use. The “limited” designation is the same as the “Generally Allowed Uses on State Land,” which among other things requires OHVs to stay on existing trails whenever possible (as described in Appendix F). Limitations within the proposed Carter Spit ACEC would be defined through the development of activity plans to meet the objectives of the proposed Special Management Area.
Designation of BLM-administered Unencumbered Lands for Recreation Experience Opportunities		Manage as “Roaded Natural” under the Recreation Opportunity Spectrum.	Same as Alternative A.	Manage the entire recreation area setting as Semi-Primitive Motorized.	Same as Alternative C.

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
Lands and Realty	Disposal or Land Exchange	No lands would be identified for disposal or land exchange.	<p>Parcels would be identified for land exchange:</p> <p>Chulitna River, T1N R32W Sec. 21, 23, 28. 2,559 acres.</p> <p>Chekok Creek, T2 and 3 S R30W. 14,676 acres.</p> <p>T11S R37W Sec. 2, 3, 4, 9, 10; Sec. 16, 21 portions. 3,532 acres.</p> <p>T9S R72W Sec.18. BLM land that is not State selected but may be topfiled but is not priority. 605 acres.</p> <p>Aleknagik Vicinity, T10S R53W Sec. 7, 18, if not conveyed out of federal ownership.</p>	Same as Alternative A.	Same as Alternative B.
	Withdrawals	<p>ANCSA 17(d)(1) withdrawals would be retained.</p> <p>Withdrawals other than ANCSA 17(d)(1) would be retained (3,999 acres).</p>	<p>Existing ANCSA 17(d)(1) withdrawals would be revoked.</p> <p>Withdrawals other than ANCSA 17(d)(1) would be retained (3,999 acres).</p>	<p>Same as Alternative B. Existing ANCSA 17(d)(1) withdrawals on proposed wild river segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork would be retained until Congressional action is completed (97,344 acres).</p> <p>Withdrawals other than ANCSA 17(d)(1) would be retained (3,999 acres).</p>	<p>Same as Alternative B.</p> <p>Withdrawals other than ANCSA 17(d)(1) would be retained (3,999 acres).</p>

		Alternative A - Current Management	Alternative B	Alternative C	Alternative D - Preferred
	Land Use Authorizations	Avoidance or exclusion areas would be identified on a case-by-case basis.	Same as Alternative A.	<p>Same as Alternative A.</p> <p>The proposed Carter Spit ACEC would be identified as an avoidance area for Land Use Authorizations (62,862 acres).</p> <p>The proposed Bristol Bay ACEC would be identified as an avoidance area for Land Use Authorizations (989,202 acres).</p>	<p>Same as Alternative A.</p> <p>The proposed Carter Spit ACEC would be identified as an avoidance area for Land Use Authorizations (62,862 acres).</p>

		Alternative A - Current Management	Alternative B - Resource Development	Alternative C - Resource Conservation	Alternative D - Preferred
	Recreation Management Areas	No Recreation Management Areas would be established.	All BLM lands in the Bay planning area would be managed as an Extensive Recreation Management Area (Appendix D).	Same as Alternative B	Same as Alternative B
Special Management Area Designations	Wild and Scenic Rivers	No National System designations would be recommended.	Same as Alternative A.	<p>The following river segments would be recommended for WSR designation: *</p> <ul style="list-style-type: none"> • Alagnak River (Wild/Recreational) • Goodnews River mainstem (Wild) • Goodnews River Middle Fork (Wild) <p>* All of the river segments included in this Alternative have been selected for conveyance by the State or ANCSA Corporations. These selected segments would not be recommended for WSR designation without the support of the selecting entity, or the relinquishment of the selection.</p>	Same as Alternative A.

		Alternative A - Current Management	Alternative B - Resource Development	Alternative C - Resource Conservation	Alternative D - Preferred
	Area of Critical Environmental Concern	No Areas of Critical Environmental Concern would be recommended.		<p>The following areas of unencumbered BLM land* would be proposed as Areas of Critical Environmental Concern:</p> <ul style="list-style-type: none"> • Carter Spit ACEC (62,863 acres) • Bristol Bay ACEC (989,202 acres) 	<p>The following area of unencumbered BLM land* would be proposed as an Area of Critical Environmental Concern:</p> <ul style="list-style-type: none"> • Carter Spit ACEC (62,863 acres)
		*Should the contiguous block of selected land adjacent to the proposed ACECs be returned to BLM administration, all or a portion of it would be included in the ACECs.			

Table 2.16. Summary and Comparison of Effects on Resources by Alternative

Alternative A	Alternative B	Alternative C	Alternative D
Effects to Air Quality			
<p>Much of the Bay planning area is designated as unclassifiable, with regard to air resources (USEPA 2004a). Impacts to air quality would be low and air quality should remain in attainment throughout the planning area. Leasable mineral exploration and development would not occur; some locatable mineral exploration and development would be possible. Smoke from wildland fire would have short-term effects on air quality and visibility. Mining may have localized impacts on air quality due to dust and airborne deposition of heavy metals.</p>	<p>Much of the Bay planning area is designated as unclassifiable, with regard to air resources (USEPA 2004a). Alternative B may result in a greater magnitude of impacts due to potential locatable mineral development or OHV activity. Natural gas development would occur, potentially leading to air quality impacts from the emissions of hydrocarbons and windborne particulates. Flaring, a flow test, would contribute gaseous byproducts of combustion briefly during the test. Impacts from OHV activity will be localized and would be expected to dissipate quickly. Air quality should remain in attainment throughout the planning area. Smoke from wildland fire would have short-term effects on air quality and visibility.</p>	<p>The level of impact would be similar to Alternative B. Impacts to air quality would be low and air quality should remain in attainment throughout the planning area. Both locatable mineral development and natural gas development would occur and impacts from these activities would be the same, including wind-blown particulates, smoke and exhaust. Flaring, a flow test used in natural gas development, would contribute gaseous byproducts of combustion briefly during the test. Smoke from wildland fire would have short-term effects on air quality and visibility. There might be an increase in OHV activity; effects would be localized and temporary.</p>	<p>The level of impact would be similar to Alternative B. Impacts to air quality would be low and air quality should remain in attainment throughout the planning area. Both locatable mineral development and natural gas development would occur, and impacts from these activities would be the same, including wind-blown particulates, smoke and exhaust. Flaring, a flow test used in natural gas development, would contribute gaseous byproducts of combustion briefly during the test. Smoke from wildland fire would have short-term effects on air quality and visibility. There might be an increase in OHV activity; effects would be localized and temporary.</p>
<p>Cumulative Effects: Cumulative air quality impacts may result from the emissions of hydrocarbons or gaseous byproducts of combustion, which may add to the region's atmosphere increased concentrations of specific pollutants, or may contribute to chemical reactions that form ozone, which may degrade air quality. However, only one small natural gas project is proposed for BLM lands in the planning area over the life of the plan. Ambient air quality in western Alaska is relatively pristine, and it is expected that it will remain so for the foreseeable future. Projects for development of locatable minerals on BLM lands are expected to be small; however, other large mining projects are proposed in the area, and cumulatively could contribute to increased wind-borne particulates including heavy metals and other hazardous materials. Development of infrastructure, including regional roads and access would have impacts throughout the area of activity, including increased airborne particulates, especially during construction.</p>			
Effects to Water Resources			
<p>Impacts to water resources would remain low. No leasable mineral exploration or development would</p>	<p>Impacts to water resources would remain low, but might be slightly higher than in Alternative A.</p>	<p>Impacts would be similar to Alternative B. Impacts to water resources would remain low, but</p>	<p>Impacts would be similar to Alternative B. Impacts to water resources would remain low, but</p>

Alternative A	Alternative B	Alternative C	Alternative D
<p>occur. Approximately 6% of BLM-administered lands would be open to locatable mineral development. The most likely mineral development to occur would be placer mining. Disturbance to soil could result in soil erosion, sedimentation and turbidity of water bodies. Other effects could include ponding, diversion or blockage of stream flow, water contamination by human waste or a variety of toxic chemicals, and alteration of natural lake chemistry. OHV use for stream crossings may cause streambank erosion, sedimentation and turbidity.</p>	<p>Leasable mineral exploration would most likely occur in the Koggiling Block. Water resources would be drawn from nearby streams or lakes for the operation. Except for withdrawals other than 17(d)(1), BLM unencumbered lands are open for locatable mineral exploration and development. The most likely mineral development to occur would be placer mining in the Goodnews Block. Disturbance to soil could result in soil erosion, sedimentation and turbidity of water bodies. Other effects could include ponding, diversion or blockage of stream flow, water contamination by human waste or a variety of toxic chemicals, and alteration of natural lake chemistry. OHV use for stream crossings may cause streambank erosion, sedimentation and turbidity.</p>	<p>might be slightly higher than in Alternative A. Leasable mineral exploration would most likely occur in the Koggiling Block. Water resources would be drawn from nearby streams or lakes for the operation. Except for withdrawals other than 17(d)(1), BLM unencumbered lands are open for locatable mineral exploration and development. The most likely mineral development to occur would be placer mining in the Goodnews Block. Disturbance to soil could result in soil erosion, sedimentation and turbidity of water bodies. Other effects could include ponding, diversion or blockage of stream flow, water contamination by human waste or a variety of toxic chemicals, and alteration of natural lake chemistry. OHV use for stream crossings may cause streambank erosion, sedimentation and turbidity.</p>	<p>might be slightly higher than in Alternative A. Leasable mineral exploration would most likely occur in the Koggiling Block. Water resources would be drawn from nearby streams or lakes for the operation. Except for withdrawals other than 17(d)(1), BLM unencumbered lands are open for locatable mineral exploration and development. The most likely mineral development to occur would be placer mining in the Goodnews Block. Disturbance to soil could result in soil erosion, sedimentation and turbidity of water bodies. Other effects could include ponding, diversion or blockage of stream flow, water contamination by human waste or a variety of toxic chemicals, and alteration of natural lake chemistry. OHV use for stream crossings may cause streambank erosion, sedimentation and turbidity.</p>
<p>Cumulative Effects: Past and present actions affecting fresh water resources within and adjacent to the Bay planning area have included climate change, mining activities, transportation projects and transportation-related accidents, military activities, industrial and domestic activities and related disposal of hazardous materials, and construction of facilities. A recent climate trend toward warming and drying has affected water levels in rivers and lakes, causing them to lower. Cumulative effects from locatable mineral exploration and development can include substantial decrease in water supplies in local aquifers, alteration of drainage patterns, and degradation of water quality. Cumulative effects from oil and gas exploration and development could include those effects already listed and disturbance of stream banks or lake shorelines, temporary blockage of natural channels and disruption of drainage patterns, increased sedimentation and turbidity, the removal of water from lakes or streams for ice roads and pads, and removal of gravel from riverine pools and lakes.</p>			
<p>Effects to Soils</p>			
<p>Impacts to soils would be low. Leasable mineral exploration and development would not occur;</p>	<p>Alternative B may result in a greater magnitude of impacts than Alternative A due to potential</p>	<p>The level of impact would be similar to Alternative B. Alternative C may result in a</p>	<p>The level of impact would be similar to Alternative B. Alternative D may result in a</p>

Alternative A	Alternative B	Alternative C	Alternative D
<p>some locatable mineral exploration and development would be possible. Wildland fire and containment and cleanup operations could have adverse effects on soil, including loss of vegetative cover and removal of topsoil. Locatable mineral exploration and development would have localized effects including loss of vegetative cover, erosion, rutting, ponding, mechanical removal of soil, and compaction of soils from vehicles, heavy equipment, and development of social trails. Impacts from OHV activity would be localized but could include a proliferation of trails that could result in scarring of the terrain, soil compaction, erosion, and rutting.</p>	<p>leasable mineral (natural gas) exploration in one area only, and potential locatable mineral exploration and development in two areas. Impacts to soils would be low, would be localized, and would include loss of vegetative cover, removal of topsoil, melting of permafrost, erosion, rutting, and ponding. A weight limit for OHVs would be imposed. Impacts from OHV activity would be localized but could include a proliferation of trails that could result in scarring of the terrain, soil compaction, erosion, and rutting. Wildland fire and containment and cleanup operations could have adverse effects on soil, including loss of vegetative cover and removal of topsoil.</p>	<p>greater magnitude of impacts than Alternative A due to potential leasable mineral (natural gas) exploration in one area only, and potential locatable mineral exploration and development in two areas. Impacts to soils would be low, would be localized, and would include loss of vegetative cover, removal of topsoil, melting of permafrost, erosion, rutting, and ponding. Impacts from OHV activity would be localized, a weight limit imposed, and traffic would be restricted to existing trails, meaning fewer impacts to soils than in Alternatives A or B. Impacts from OHV use could include soil compaction, erosion, and rutting. Wildland fire and containment and cleanup operations could have adverse effects on soil, including loss of vegetative cover and removal of topsoil.</p>	<p>greater magnitude of impacts than Alternative A due to potential leasable mineral (natural gas) exploration in one area only, and potential locatable mineral exploration and development in two areas. Impacts to soils would be low, would be localized, and would include loss of vegetative cover, removal of topsoil, melting of permafrost, erosion, rutting, and ponding. Impacts from OHV activity would be localized, a weight limit imposed, and traffic would be restricted to existing trails, meaning fewer impacts on soils than in Alternatives A or B. Impacts from OHV use could include soil compaction, erosion, and rutting. Wildland fire and containment and cleanup operations could have adverse effects on soil, including loss of vegetative cover and removal of topsoil.</p>
<p>Cumulative Effects: Cumulative effects to soil would largely result from surface disturbing activities that degrade the vegetative cover, compact soils, and expose ice-rich permafrost soils to thermokarst erosion and subsidence where permafrost is present. Wetland soils, stream bank and lakeshore soils are particularly vulnerable to erosion and ice scouring. Spills of oil, gasoline, or diesel requiring cleanup could impact the soils by requiring their removal, which could have greater impact than the spill itself. Development of oil and gas well pads, access roads, and regional roads would impact soils by compaction, erosion, and rutting.</p>			
<p>Effects to Vegetation</p>			
<p>Mineral development may negatively impact vegetation by removing the vegetative mat, re-routing water flow, covering vegetation with gravel, and compacting soils. Long term surface disturbance increases the</p>	<p>Effects would be similar to Alternative A but would occur over a larger area as the level of mineral exploration and development would have the opportunity to increase. Both leasable and locatable mineral</p>	<p>Effects would be similar to Alternative A but would occur over a larger area as the level of mineral exploration and development would have the opportunity to increase. Both leasable and locatable mineral</p>	<p>Effects would be similar to Alternative A but would occur over a larger area as the level of mineral exploration and development would have the opportunity to increase. Both leasable and locatable mineral</p>

Alternative A	Alternative B	Alternative C	Alternative D
<p>potential for introduction of noxious and invasive plants. OHV use may destroy the vegetation at, compact soils, accelerate permafrost melt, and lead to soil erosion and ponded water, crushing plants and degrading their habitats. Should livestock grazing take place, it may negatively impact vegetation by trampling, cratering to soil, and over-grazing. These impacts would be localized and minor. Impacts from other activities would be negligible.</p>	<p>exploration and development would be expected to be localized to the Koggiling Block and the Goodnews Block during the life of this plan. Potential effects of oil development include compression of the vegetation mat, broken shrubs and crushed tussocks from seismic activity; mortality of plants due to oil, gasoline, or diesel spills; compression of the tundra mat and localized die-off of plants under access roads and pads; and destruction of vegetation at the location of facility development. OHV designations would not be restrictive, allowing for free movement of OHVs.</p>	<p>exploration and development would be expected to be localized to the Koggiling Block and the Goodnews Block during the life of this plan. Potential effects of oil development include compression of the vegetation mat, broken shrubs and crushed tussocks from seismic activity; mortality of plants due to oil, gasoline, or diesel spills; compression of the tundra mat and localized die-off of plants under access roads and pads; and destruction of vegetation at the location of facility development. OHV designations would not be restrictive, allowing for free movement of OHVs. Required Operating Procedures and Stipulations would apply.</p>	<p>exploration and development would be expected to be localized to the Koggiling Block and the Goodnews Block during the life of this plan. Potential effects of oil development include compression of the vegetation mat, broken shrubs and crushed tussocks from seismic activity; mortality of plants due to oil, gasoline, or diesel spills; compression of the tundra mat and localized die-off of plants under access roads and pads; and destruction of vegetation at the location of facility development. OHV designations would not be restrictive, allowing for free movement of OHVs. Required Operating Procedures and Stipulations would apply.</p>
<p>Cumulative Effects: Increased levels of mineral development on State and private lands, combined with similar activities on BLM-managed lands could result in cumulative surface disturbance with adverse effects on riparian and tundra vegetation over the long-term. Blowing dust and contaminants from projects on non-BLM-administered lands that are deposited on vegetation could have negative effects to the vegetation and to the animals and subsistence users dependent upon it. Dispersed recreation effects, OHV travel, remote landing sites for bush aircraft, and campsites could have minor adverse and cumulative impacts to riparian and tundra vegetation on BLM-managed lands. The potential for displacement of native vegetation by noxious and invasive weeds will increase as the level of surface disturbance to once-intact habitat rises.</p>			
<p>Effects to Fish</p>			
<p>Permitted activities, including exploration and development of locatable minerals, road construction, and use of OHV trails and stream crossings would impact fish and aquatic habitat. Currently BLM lands in the planning area are closed to leasable mineral exploration and development and all but 6% of BLM lands are closed to locatable</p>	<p>Under Alternative B, all BLM unencumbered lands would be available for leasable mineral exploration and development and locatable mineral exploration and development unless they were withdrawn under other than 17(b)(1) withdrawals. Potential impacts would be greater than those under Alternative A, and would include gas exploration</p>	<p>Under Alternative C, all BLM unencumbered lands would be available for leasable mineral exploration and development and locatable mineral exploration and development unless they were withdrawn under other than 17(b)(1) withdrawals. Potential impacts would be greater than those under Alternative A, and would include gas exploration</p>	<p>Under Alternative D, all BLM unencumbered lands would be available for leasable mineral exploration and development and locatable mineral exploration and development unless they were withdrawn under other than 17(b)(1) withdrawals. Potential impacts would be greater than those under Alternative A, and would include gas exploration</p>

Alternative A	Alternative B	Alternative C	Alternative D
<p>minerals. There is no restriction on OHV travel or weight limits, and it is from OHV activity that the most serious impacts would come. Wildland fires could affect fish populations by removing vegetative cover, changing nutrient input, increasing siltation, and altering water quality and water temperatures. Fire can have long-term beneficial effects as well as negative impacts.</p>	<p>activities in Koggiling Creek Block, placer mining activities in Goodnews Block, potential infrastructure development, and OHV travel. A beneficial effect would be the imposition of a 2,000 pound OHV weight limit. Wildland fires could affect fish populations by removing vegetative cover, changing nutrient input, increasing siltation, and altering water quality and water temperatures. Fire can have long-term beneficial effects as well as negative impacts.</p>	<p>activities in Koggiling Creek Block, placer mining activities in Goodnews Block, potential infrastructure development, and OHV travel. A beneficial effect would be the imposition of a "limited" OHV designation and a 2,000 pound OHV weight limit. Wildland fires could affect fish populations by removing vegetative cover, changing nutrient input, increasing siltation, and altering water quality and water temperatures. Fire can have long-term beneficial effects as well as negative impacts. Designation of two ACECs and three WSR segments would also have beneficial effects.</p>	<p>activities in Koggiling Creek Block, placer mining activities in Goodnews Block, potential infrastructure development, and OHV travel. A beneficial effect would be the imposition of a "limited" OHV designation and a 2,000 pound OHV weight limit. Wildland fires could affect fish populations by removing vegetative cover, changing nutrient input, increasing siltation, and altering water quality and water temperatures. Fire can have long-term beneficial effects as well as negative impacts. Designation of one ACEC would also have beneficial effects.</p>
<p>Cumulative Effects: Any changes of current water and land use practices, by private, State, and other Federal agencies in the planning area, would continue to affect fish habitat within the planning area, including on BLM-administered lands. Currently a number of locatable mineral projects are proposed for State lands at the headwaters of the Kvichak and Nushagak rivers. BLM-administered lands lie downstream of those projects in the two watersheds in question, and sediment and water quality issues that influence the quality of fish habitat downstream from the source could continue to be a concern. Should OHV use increase it could also be a concern for the same reason. Coordinating with regional planning actions and conducting interagency watershed planning efforts could help protect important fisheries values in the Bristol Bay and Goodnews Bay watersheds.</p>			
<p>Wildlife</p>			
<p>Low levels of mineral exploration, land use authorizations, and dispersed recreational and OHV use would have minor localized effects on wildlife. Impacts would include stress and disturbance of wildlife, and degradation of habitat. Impacts would not have population level effects.</p>	<p>Increased mineral exploration and development in the Goodnews Block and the Koggiling Block would increase the level of impacts to wildlife and their habitat in localized areas. Impacts from OHV use would be similar to Alternative A. ROPS and Stips would apply.</p>	<p>Leasable mineral exploration and development in the Koggiling block would increase impacts to wildlife and habitat in localized areas. Locatable mineral exploration and development would be more limited than in Alternative B. Impacts from OHV use would be less due to a "limited" designation for access and a 2,000 pound GWVR weight</p>	<p>Leasable and locatable mineral exploration and development in the Koggiling block and Goodnews Block would increase impacts to wildlife and habitat in localized areas. Locatable mineral exploration and development would be more limited than in Alternative B. Impacts from OHV use would be less due to a "limited" designation for access</p>

Alternative A	Alternative B	Alternative C	Alternative D
		limit. Two ACECs would be designated to provide additional management emphasis in important wildlife habitats. ROPS and Stips would apply.	and a 2,000 pound GWVR weight limit. One ACEC would be designated to provide additional management emphasis in important wildlife habitats. ROPS and Stips would apply.
<p>Cumulative Effects: The combination of ongoing and future oil and gas development occurring on both State and Federal lands as well as the possibility of solid mineral exploration and development in the planning area would have cumulative impacts on wildlife and wildlife habitat. With respect to the MCH. Depending on the location of development, these impacts may include short or long-term disturbance to caribou calving habitat, insect relief habitat, and migratory routes; disruption of caribou movements; stress and disturbance impacts to caribou during all seasons of the year; possible reductions in herd productivity. Any new development would result in additive impacts to the herd. If significant activity occurred within the calving grounds or important insect relief habitat, these impacts could be significant. Construction of additional roads would also affect caribou movements and would greatly increase access into caribou habitat. Privatization of State or Native corporation lands has the potential to negatively affect wildlife and wildlife habitat by opening up areas to private development. Impacts would include habitat fragmentation, increased access into wildlife habitats, increased disturbance impacts, increased potential for mortality from road kills, and possible alteration of behavior or movement patterns of wildlife.</p>			
<p>Effects to Cultural Resources</p>			
<p>Few impacts to cultural resources would be anticipated from authorized activities due to the remoteness of most BLM-managed lands and the nature of most permitted activities. Currently the primary permitted activity in the planning area is Special Recreation Permits for big game guides, with little potential for impacts. Significant conflicts with cultural resources have not occurred. OHVs would be the greatest source of impact from authorized uses.</p>	<p>There could be an increase in potential for impacts under Alternative B. Exploration for leasable minerals and development of locatable minerals in the form of placer mining would result in substantial surface disturbance in limited areas of Koggiling Block and Goodnews Block. Exploration for leasable minerals involves little potential for impacts (720 acres of ground disturbing construction). BLM would require inventory and appropriate mitigation in advance of ground-disturbing activities. The greatest impact from authorized activities exists in the “open” designation for OHVs on BLM lands.</p>	<p>Impacts to cultural resources would be much the same as in Alternative B, although they would be expected to be fewer. A “limited” designation for OHVs under this Alternative would also provide beneficial impacts for cultural resources since OHV will be confined to existing trails. Beneficial effects to cultural resources would be expected with the proposed Carter Spit ACEC, the proposed Bristol Bay ACEC, and the proposed Wild and Scenic Rivers.</p>	<p>Impacts to cultural resources would be much the same as in Alternative B, although they would be expected to be fewer. A “limited” designation for OHVs under this Alternative would also provide beneficial impacts for cultural resources since OHV will be confined to existing trails. Beneficial effects to cultural resources would be expected with the proposed Carter Spit ACEC.</p>

Alternative A	Alternative B	Alternative C	Alternative D
<p>Cumulative Effects: Cumulative impacts to cultural resources could occur through incremental degradation of the resource base from a variety of sources which reduce the information and interpretive potential of historic and prehistoric properties, or which affect traditional cultural values important to Alaska Natives.</p>			
<p>Effects to Paleontological Resources</p>			
<p>Federal undertakings and unauthorized uses may cause irreversible disturbance and damage to paleontological resources. Impacts from authorized use would be mitigated through project redesign and specimen recovery. Geologic formations with exposures containing vertebrate and non-vertebrate fossils would be impacted from natural agents, unauthorized public collection, and vandalism. Impacts would stem almost exclusively from unauthorized uses and natural causes. Lack of knowledge about paleontological resources in the planning area makes it difficult to estimate the extent and nature of impacts.</p>	<p>Impacts to paleontological resources from uses other than mineral development would be negligible. Anticipated development associated with leasable and locatable minerals in the Goodnews Block and the Koggiling Block could have adverse impacts on paleontological resources.</p>	<p>Impacts to paleontological resources would be the same as Alternative A.</p>	<p>Impacts to paleontological resources would be the same as Alternative B.</p>
<p>Cumulative Impacts: Cumulative impacts to paleontological resources could result from development on non-BLM managed lands and from natural agents and unauthorized uses throughout the area.</p>			
<p>Effects to Visual Resources</p>			
<p>Visual resources would be managed on a project-by-project basis as no visual management classes would be established. Surface altering activities and events such as fire, mineral development and OHV use, and authorizations that result in facility or infrastructure construction such as powerlines or roads can alter or</p>	<p>Alternative B anticipates the greatest amount of resource development and adopts the least-restrictive VRM classes. Effects to visual resources could occur over a larger area than under Alternative A due to increased mineral development. Impacts from activities associated with exploration for gas would primarily</p>	<p>Alternative C is similar to Alternative B, except that the proposed Bristol Bay ACEC and Carter Spit ACEC would be closed to locatable mineral exploration or development. OHVs would be restricted to existing trails.</p>	<p>Alternative D is similar to Alternative B, except that OHVs would be restricted to existing trails.</p>

Alternative A	Alternative B	Alternative C	Alternative D
negatively impact visual resources. Few impacts are anticipated from authorized activities due to the remoteness of these BLM-managed lands and the nature of most permitted activities.	be associated with the construction of support facilities.		
<p>Cumulative Effects: Continued development of OHV trails, roads, infrastructure, mining activities, overland explorations, and fire management may lead to changes to existing visual resources by altering basic visual elements of form, line, color and texture at the landscape level. These changes will influence the design of similar projects on adjacent BLM lands where repeating these basic elements is an objective of the visual resource management class.</p>			
<p>Effects to Leasable Minerals</p>			
<p>No BLM-administered lands would be open for fluid mineral leasing due to the retention of ANCSA 17(d)(1) withdrawals. Under this Alternative no oil and gas exploration and development would occur, rendering these resources unavailable for future generations.</p>	<p>Alternative B provides the greatest opportunity for leasable mineral development. Approximately 2,499,941 acres (99%), 1,327,671 acres of which are State-selected or Native-selected, would be available for mineral leasing subject to Standard Lease Terms. Approximately 3,999 unencumbered acres, withdrawn under withdrawals other than ANCSA 17(d)(1), would remain withdrawn from fluid mineral leasing.</p>	<p>Under Alternative C, approximately 1,432,752 acres (57%) of which 1,432,752 of which are State-selected or Native-selected, would be available for mineral leasing subject to Standard Lease Terms, Required Operating Procedures, and Stipulations. Areas closed would be the proposed Wild River segments of the Alagnak, Goodnews and Goodnews Middle Fork rivers (15,125 acres), where existing ANCSA 17(d)(1) withdrawals would be retained until Congress has had an opportunity to act. 1,768,450 acres (42%), none of which are State-selected or Native-selected, would be open to mineral leasing subject to seasonal or other minor constraints. These constraints would limit exploration and development during specific time periods and increase recovery</p>	<p>Under Alternative D, approximately 1,447,877 acres (58%), of which 1,176,629 acres are State-selected or Native-selected, would be available for mineral leasing subject to Standard Lease Terms, Required Operating Procedures, and Stipulations. Existing withdrawals other than ANCSA 17(d)(1), of approximately 3,999 unencumbered acres, would remain withdrawn from fluid mineral leasing. 1,768,450 acres (42%), none of which are State-selected or Native-selected, would be open to mineral leasing subject to seasonal or other minor constraints. These constraints would limit exploration and development during specific time periods and increase recovery costs. 2,355 acres (>1%) of BLM unencumbered lands on the Arolik River, Faro Creek, and South Fork Goodnews River would be subject</p>

Alternative A	Alternative B	Alternative C	Alternative D
		<p>costs. 2,355 acres (>1%) of BLM unencumbered lands on the Arolik River, Faro Creek, and South Fork Goodnews River would be subject to NSO. These areas are low potential for oil and gas, and low potential for leasable mineral development. Closing these areas to leasing would preclude oil and gas development and render these resources unrecoverable.</p>	<p>to NSO. These areas are low potential for oil and gas, and low potential for leasable mineral development. Closing these areas to leasing would preclude oil and gas development and render these resources unrecoverable.</p>
<p>Cumulative Effects: Cumulative impacts to leasable mineral development would include retention of withdrawals, imposition of minor or major constraints, and requirements of Required Operating Procedures and Stipulations. There could be a reduction in lease value resulting from the application of stipulations and regulations and increased operating costs. Restrictions on Federal leases could impact leasing and development of adjacent non-Federal leasable minerals. An area in the beginning stages economical development could become non-profitable by imposing restrictive guidelines, resulting in the displacement of mineral activities to adjacent landowners.</p>			

Alternative A	Alternative B	Alternative C	Alternative D
Effects to Locatable Minerals			
<p>ANCSA 17(d)(1) withdrawals and withdrawals other than ANCSA 17(d)(1) would remain in place. 152,746 acres (6%) would be identified as open for locatable mineral entry. These withdrawals would continue to discourage mining interests and prevent exploration and evaluation of mineral potential. Much of this land has been unavailable for mineral assessment for more than 30 years. In the meantime markets for new commodities have developed, ore deposit theory has advanced significantly, and new mining and milling processes which are less expensive, more efficient and environmentally friendly have been developed.</p>	<p>This Alternative would have the fewest impacts to locatable mineral development. ANCSA 17(d)(1) withdrawals would be revoked. Approximately 1,172,270 acres of unencumbered lands (99%) would be open to locatable mineral entry. 3,999 acres of withdrawals other than (d)(1) would remain withdrawn from mineral entry. Administration of Notices and Plans of Operations, compliance, and mine reclamation would continue.</p>	<p>Under this Alternative, 1,071,189 acres (91%) would remain closed to locatable mineral entry, due to withdrawals other than ANCSA 17(d)(1), retained (d)(1) withdrawals, and proposed ACECs. ANCSA 17(d)(1) withdrawals would be retained for the nominated Wild and Scenic River segments to provide opportunity for Congressional action. The proposed Carter Spit ACEC and Bristol Bay ACEC would be closed to mineral entry. Restrictions would discourage further expenditure of funds in the planning area. The BLM would continue to regulate surface disturbing activities on valid Federal claims through Notices and Plans of Operations, and Required Operating Procedures would be implemented.</p>	<p>Alternative D is the same as Alternative B. Under this Alternative, 3,999 acres (>1%) would remain closed to locatable mineral entry due to withdrawals other than ANCSA 17(d)(1). However, the proposed Carter Spit ACEC (62,863 acres) would be subject to more stringent Required Operating Procedures. Administration of Notices and Plans of Operations, compliance, and mine reclamation would continue. Required Operating Procedures would be implemented.</p>
<p>Cumulative Effects: Impacts that are individually minor may cumulatively reduce exploration and production of commodities from BLM-managed land. Factors that affect mineral extraction and prospecting, such as permitting and permitting delays, regulatory policy, public perception, travel management, transportation, mitigation measures, proximity to sensitive areas, low commodity prices, taxes, and housing and other necessities for workers are mostly issues over which BLM has no control. These factors result in additional costs or permitting delays that can individually or cumulatively add additional costs to projects. Lack of access could reduce the amount of mineral exploration and development that may occur. Mineral resources in other ownerships may not be developed if the adjacent BLM lands are withdrawn from mineral entry because the deposit may not be economically feasible to develop if only a portion is available for development. Overall, Alternatives A and C would be the most restrictive to mineral development and could result in the most cumulative impacts.</p>			
Effects to Mineral Materials			
<p>Development of mineral materials sites would not be constrained except as restricted by the interim management guidelines for selected lands. No</p>	<p>Impacts would be the same as Alternative A except the ROPS would apply to mineral material sales.</p>	<p>Development of mineral materials sites on BLM-managed lands would be severely constrained under Alternative C. Unencumbered BLM lands in the</p>	<p>Impacts would be the same as Alternative B. Carter Spit ACEC would be closed to mineral materials development. (62,863 acres).</p>

Alternative A	Alternative B	Alternative C	Alternative D
unencumbered Federal lands would be closed to mineral material sales and permits.		Bristol Bay ACEC and Carter Spit ACEC would be closed to mineral materials development (1,052,065 acres).	
Cumulative Effects: Under Alternative C the closure of two ACECs to sale/ permit of mineral materials would essentially close BLM managed land in the planning area to mineral materials development and production.			
Effects to Recreation Management			
No SRMAs would be designated under Alternative A. BLM land in the planning area would be managed as "Roaded Natural."	Same as Alternative A.	Same as Alternative A, except the entire recreation area setting would be managed as Semi-primitive Motorized.	Same as Alternative C.
Cumulative Effects: The planning area currently provides diverse recreation opportunities which are expected to continue over the life of the plan regardless of the Alternative selected.			
Effects to Travel Management/OHV			
There are no OHV designations in the planning area.	The planning area would be designated as "open" to OHV use. There would be a 2,000 pound GVWR weight limit. More lands would be open to mineral entry under this Alternative, potentially creating improved access. Given the level of mineral development anticipated, effects would be minor.	The planning area would be designated as "Limited" for OHV use. There would be a 2,000 pound GVWR weight limit. Proposed restrictions would impact users by strictly limiting OHV use where no limits have been in place before. In designated ACECs further limitations may be placed upon OHV use. Effects of this Alternative on OHV users is expected to be minimal, since users access BLM-administered lands primarily by boat and aircraft.	The planning area would be designated as "Limited" for OHV use. There would be a 2,000 pound GVWR weight limit. Proposed restrictions would impact users by strictly limiting OHV use where no limits have been in place before. In designated ACECs further limitations may be placed upon OHV use. Effects of this Alternative on OHV users is expected to be minimal, since users access BLM-administered lands primarily by boat and aircraft.
Cumulative Effects: BLM-administered lands are somewhat remote from the villages and hubs in the planning area. Most users access BLM lands by boat or by aircraft. Decisions made in this plan would not be expected to have impacts on OHV users.			
Effects to Lands and Realty			
Management of vegetation, fish, wildlife, Special Status Species, cultural and paleontological resources may result in restrictions or additional	Impacts in Alternative B would be similar to those in Alternative A. In addition, a 2,000 pound GVWR weight restriction would be implemented for OHVs.	Impacts in Alternative C would be similar to those in Alternative B. Additional restrictions would include no Land Use Authorizations in the proposed	Impacts in Alternative D would be similar to those in Alternative B. Additional restrictions would include no Land Use Authorizations in the proposed

Alternative A	Alternative B	Alternative C	Alternative D
mitigation, increasing the cost of projects.	Requirements to meet VRM management classes could increase project cost, although VRM classes are the least restrictive under this Alternative. More lands would be available for mineral development due to revocation of ANCSA 17(d)(1) withdrawals, potentially resulting in a greater demand for land use authorizations such as ROWs. However, given the level of development likely to occur, these additional impacts would be minor. ROPS and Stips would restrict land uses in certain areas.	Carter Spit ACEC and Bristol Bay ACEC. Under this Alternative, five parcels would be proposed for land exchange. They would need to be inventoried for the presence of hazardous materials. The presence of contaminants could lead to modification or abandonment of a land action, or to remediation in the form of cleanup and removal of the contaminants. ROPS and Stips would restrict land uses in certain areas.	Carter Spit ACEC. Under this Alternative, five parcels would be proposed for land exchange. They would need to be inventoried for the presence of hazardous materials. The presence of contaminants could lead to modification or abandonment of a land action, or to remediation in the form of cleanup and removal of the contaminants. ROPS and Stips would restrict land uses in certain areas.
<p>Cumulative Effects: Effects from any exchange proposal in any Alternative for BLM-managed lands in the planning area are minor compared to conveyances to Native corporations and the State of Alaska. The recently signed Alaska Lands Transfer Acceleration Act (P.L. 108-452) will facilitate the conveyance process, with a target of completing conveyances by 2009. Once entitlements are met, land exchanges may be considered to consolidate land ownership patterns. The number of land use authorizations, particularly Rights-of-Way and permits, is a function of demand for these uses. Additional future development of adjacent Federal, State, and private lands would likely result in additional requests for and approval of land use authorizations for facilities such as roads, utilities, and communication sites.</p>			
<p>Effects to Areas of Critical Environmental Concern</p>			
No ACECs exist in the planning area	No ACECs would be proposed	Two ACECs would be managed to protect relevant and important values (Appendix A). Impacts to these values are discussed under the various resource management programs such as Fish and Wildlife.	One ACEC would be managed to protect relevant and important values (Appendix A). Impacts to these values are discussed under the various resource management programs such as Fish and Wildlife.
<p>Cumulative Effects: Cumulative impacts could have a wide range of effects on the different resources that are intended to benefit from the various ACECs proposed. These impacts largely stem from actions that are not guided by BLM management decisions. Values within certain ACECs could be diminished by cumulative impacts in the unlikely scenario in which numerous development projects occur within or adjacent to them.</p>			
<p>Effects to Social and Economic Conditions</p>			
Income generated by BLM expenditures and permitted activities would have minimal effects on the regional economy.	Natural gas exploration in the Koggiling Block is not expected to take place within the life of the plan; however, should it go	Same as Alternative B.	Same as Alternative B.

Alternative A	Alternative B	Alternative C	Alternative D
	<p>forward, it would be expected to have negligible and temporary effect on the economy. Up to three placer mining operations could be developed in the Goodnews Block. A small number of workers could be employed. Mineral developments could have a negative impact on the existing subsistence economy, the commercial fishing industry, and the sports hunting and fishing guiding industries.</p>		
<p>Cumulative Effects: Under Alternatives B, C, and D, natural gas exploration and locatable mineral exploration and development on BLM-unencumbered lands in the planning area might generate a small amount of income for the region; however, such developments taken cumulatively with other developments on State and Native-owned lands could have a negative impact on the existing subsistence economy, the commercial fishing industry, and the sports hunting and fishing guiding industries.</p>			
<p>Effects to Environmental Justice</p>			
<p>The Altuiiq, Athabaskan, and Central Yup'ik Native people predominate in 25 villages in the Bay planning area. Under Alternative A, BLM-administered lands would remain closed to leasable and most locatable mineral exploration and development. Residents' main livelihood is dependent upon a mix of subsistence hunting and fishing, commercial fishing, sports hunting and fishing guiding, and support services for those activities.</p>	<p>Alternative B would allow leasable and locatable mineral exploration and development on BLM lands in areas previously closed to those activities. Year round activities from these sources could increase the amount of area affected, the duration of effects, and spread the effects where development occurs. Disturbances to residents' current economic pursuits from these sources would be greater than in Alternative A.</p>	<p>Alternative B would allow leasable and locatable mineral exploration and development on BLM lands in areas previously closed to those activities. Year round activities from these sources could increase the amount of area affected, the duration of effects, and spread the effects where development occurs. Disturbances to residents' current economic pursuits from these sources would be greater than in Alternative A.</p>	<p>Alternative B would allow leasable and locatable mineral exploration and development on BLM lands in areas previously closed to those activities. Year round activities from these sources could increase the amount of area affected, the duration of effects, and spread the effects where development occurs. Disturbances to residents' current economic pursuits from these sources would be greater than in Alternative A.</p>
<p>Cumulative Effects: Alaska Natives are the predominant residents of southwestern Alaska, the area potentially most affected by activities under Alternatives B, C, and D and other activities associated with cumulative projects in Alaska. Effects on Alaska Natives could occur because of their reliance on subsistence foods, and potential effects could impact subsistence resources and harvest practices. Potential cumulative effects from noise, disturbance, and spills on subsistence resources, harvest practices and socio-cultural patterns would focus on communities throughout the planning area. The commercial fishing industry has long since affected considerable changes in the cultures of southwest Alaska. Expanded oil and gas exploration and development, locatable mineral exploration and development, and development of supporting infrastructure would bring</p>			

Alternative A	Alternative B	Alternative C	Alternative D
<p>about disturbances to subsistence species and harvest patterns cumulatively. Southwestern Alaska still has vast undisturbed areas, but the subsistence hunting environment continues to change in response to increased visitation and development.</p>			
<p>Effects to Subsistence</p>			
<p>Impacts from authorized activities such as exploration or development of locatable minerals, leases, permits, and OHV use may include temporary displacement of wildlife from harvest areas, access constraints, or increased competition for resources. These impacts would be minimal. Conflicts due to increasing recreational use levels would not be addressed. Wildlife used for subsistence purposes may be temporarily stressed or displaced. Direct impacts to subsistence use result from increased competition for resources by sport hunters and guides in heavily-used areas such as the Alagnak-Kvichak-Nushagak river drainages. Subsistence hunters may be reluctant to hunt in areas used for development purposes or for intensive recreational activities, as demonstrated by the historic and current hunting patterns summarized in Chapter 3. Subsistence users tend to shift away from their traditional harvest areas when too much activity from outside sources occurs. There would be no limits on OHV use or weights.</p>	<p>Impacts would be the same as Alternative A, but would have a slightly larger footprint than in Alternative A. The Koggiling Block is projected to be the location of any leasable mineral exploration, and while all BLM unencumbered lands in the planning area would be open to locatable mineral exploration and development, the most likely scenario during the life of the plan would be the development of pre-existing placer claims in the Goodnews Block. There would be no limits on where OHVs could travel, but weight limits would be at 2,000 pounds. BLM-administered lands would be managed as an Extensive Recreation Management Area with few restrictions. Access by subsistence users could be hindered by a pipeline or other infrastructure. Subsistence hunters may be reluctant to hunt in areas used for development purposes or for intensive recreational activities, as demonstrated by the historic and current hunting patterns summarized in Chapter 3. Subsistence users tend to shift away from their traditional harvest areas when too much activity from outside sources occurs.</p>	<p>Impacts would be the same as Alternative A, but would have a slightly larger footprint than in Alternative A. The Koggiling Block is projected to be the location of any leasable mineral exploration, and while all BLM unencumbered lands in the planning area would be open to locatable mineral exploration and development, the most likely scenario during the life of the plan would be the development of pre-existing placer claims in the Goodnews Block. There would be limits on where OHVs could travel, and weight limits would be at 2,000 pounds. BLM-administered lands would be managed as an Extensive Recreation Management Area with few restrictions. Access by subsistence users could be hindered by a pipeline or other infrastructure. The proposed Carter Spit ACEC, Bristol Bay ACEC, and three WSR segments might provide some benefit to subsistence resources. Subsistence hunters may be reluctant to hunt in areas used for development purposes or for intensive recreational activities, as demonstrated by the historic and current hunting patterns summarized in Chapter 3.</p>	<p>Impacts would be the same as Alternative A, but would have a slightly larger footprint than in Alternative A. The Koggiling Block is projected to be the location of any leasable mineral exploration, and while all BLM unencumbered lands in the planning area would be open to locatable mineral exploration and development, the most likely scenario during the life of the plan would be the development of pre-existing placer claims in the Goodnews Block. There would be limits on where OHVs could travel, and weight limits would be at 2,000 pounds. BLM-administered lands would be managed as an Extensive Recreation Management Area with few restrictions. Access by subsistence users could be hindered by a pipeline or other infrastructure. The proposed Carter Spit ACEC might provide some benefit to subsistence resources. Subsistence hunters may be reluctant to hunt in areas used for development purposes or for intensive recreational activities, as demonstrated by the historic and current hunting patterns summarized in Chapter 3. Subsistence users tend to shift away from their traditional harvest</p>

Alternative A	Alternative B	Alternative C	Alternative D
		Subsistence users tend to shift away from their traditional harvest areas when too much activity from outside sources occurs.	areas when too much activity from outside sources occurs.
<p>Cumulative Impacts: Mineral development, privatization of land, and development of regional infrastructure would have cumulative impacts on subsistence. These activities have the potential to negatively affect wildlife resources, and consequently subsistence. Development of regional infrastructure such as roads may improve access for non-local hunters, increasing competition for subsistence resources. Improved access may concentrate hunting efforts, depleting subsistence resources and potentially altering harvest.</p>			

Insert Figure 2.1 here (11x17 fold-in)

Insert Figure 2.2 here (11x17 fold-in)

Insert Figure 2.3 here (11x17 fold-in)

Insert Figure 2.4 here (11x17 fold-in)

Insert Figure 2.5 here (11x17 fold-in)

Insert Figure 2.7 here (11x17 fold-in)

Insert Figure 2.8 here (11x17 fold-in)

Insert Figure 2.9 here (11x17 fold-in)

Insert Figure 2.10 here (11x17 fold-in)

Chapter III: Affected Environment

A. Introduction	3-3
1. How to Read This Chapter	3-3
2. Geographic Scope	3-3
B. Resources.....	3-12
1. Geography and Climate.....	3-12
2. Air Quality	3-14
3. Soil Resources.....	3-15
4. Water Resources	3-26
5. Fish and Wildlife	3-65
6. Special Status Species.....	3-137
7. Fire Management and Ecology.....	3-144
8. Cultural Resources	3-154
9. Paleontological Resources	3-163
10. Visual Resources.....	3-164
C. Resource Uses	3-168
1. Forest Products	3-168
2. Livestock and Reindeer Grazing	3-171
3. Minerals	3-172
4. Recreation Management	3-195
5. Travel Management.....	3-201
6. Renewable Energy	3-212
7. Lands and Realty	3-213
D. Special Designations	3-288
1. Areas of Critical Environmental Concern.....	3-288
2. Wild and Scenic Rivers.....	3-289
E. Social and Economic	3-291
1. Public Safety.....	3-291
2. Social and Economic Conditions	3-294
F. Subsistence.....	3-305
1. Definition of Subsistence	3-305
2. The Federal Subsistence Program.....	3-305
3. Historic Subsistence Use Patterns, Social Organization and Sharing Patterns.....	3-307
4. Sociocultural, Socioeconomic and Cosmological Aspects of Subsistence Lifeways	3-308
5. Historic and Contemporary Subsistence Use Patterns	3-309
6. Resources Harvested	3-310

This page intentionally left blank.

Chapter III: Affected Environment

A. Introduction

1. How to Read This Chapter

This chapter contains background information about the physical, biological, and socioeconomic resources, resource uses, and programs that exist or occur on the Bureau of Land Management (BLM) lands managed by the Anchorage Field Office (AFO) in the Bristol Bay and Goodnews Bay regions. This information is provided to establish the environmental baseline that will serve as the basis for analysis of the direct, indirect, and cumulative effects analyses presented in Chapter IV. Chapter III is organized topically; the order in which topics are addressed is not intended to imply relative importance of the topic.

Section B discusses the affected environment for resources, Section C covers the affected environment for resource uses, Section D is dedicated to special designations, Section E provides background on the social and economic environment, and Section F presents the subsistence environment.

2. Geographic Scope

The Bay planning area consists of 23 million acres, approximately 2,551,608 acres of which are administered by BLM. These lands include large blocks and a few scattered tracts of BLM unencumbered land, State-selected and Native-selected lands. BLM administers 1,197,688 acres of unencumbered land, 40,571 acres of subsurface estate (where the surface is in other ownership), and 1,313,349 acres of Native-selected and State-selected lands. Table 1.1 provides information on acreage for BLM managed lands in the planning area. The selected lands are often referred to as interim conveyed lands and will remain under the management of BLM until all land conveyances are complete by the 2009 schedule. BLM Alaska is also responsible for managing both surface and subsurface resources and uses for BLM-administered public lands. For the purposes of the following discussion, the Bay planning area is addressed in terms of two sub-regions, the Bristol Bay area and the Goodnews Bay area.

The Bay planning area is approximately an hour away by air from Anchorage. The planning area lands extend over 250 miles east-west and 150 miles north-south with virtually no road system access to Bureau administered lands. Nearly all access is accomplished using specialized aircraft supported by small tundra-tire equipped planes, float planes, ski planes, helicopters, and boats. Commercial air travel from Anchorage is required to reach hub communities served by the BLM's Anchorage Field Office (AFO).

Management of BLM-administered lands within the Bay planning area is confounded by questions of land ownership due to the ongoing land selection and conveyance process to Alaskan Native groups and the State of Alaska, as directed by Congress under the Alaska Native Claims Settlement Act (1971) and the Alaska Statehood Act. Resolution of the land ownership is moving ahead rapidly, and is expected by 2010 or earlier under a fast track land conveyance review process. However, until clear ownership of each parcel of land has been determined, BLM will continue to actively manage these selected lands under current management practices. Figures 3.1, 3.2, and 3.3 show BLM unencumbered lands in the planning area that will be the major focus of discussion in this chapter.

This page intentionally left blank.

Insert Figure 3.1 here (11x17 fold-in).

Insert Figure 3.2 here (11x17 fold-in).

Insert Figures 3.3 here (11x17 fold-in).

3. *The Planning Process and Existing Management*

a) The Planning Process and Public Participation

The Resource Management Plan (RMP) is the primary tool used by BLM to manage lands within BLM jurisdiction. Land use plans and planning decisions are the basis for every on-the-ground action the BLM undertakes. They ensure that the public lands are managed and used in accordance with the intent of Congress as stated in the Federal Land Policy and Management Act (FLPMA) (43 USC 1701 et seq.), and under the principles of multiple use and sustained yield. They also provide a process and a framework to ensure that land use plans and implementation decisions remain consistent with applicable laws, regulations, orders and policies. The RMP planning process is also integrated within the requirements of the National Environmental Policy Act (NEPA). The Environmental Impact Statement (EIS) process requires an agency to identify potential impacts that implementation of the RMP may have on the environment.

The planning process involves public participation. Public involvement entails “The opportunity for participation by affected citizens in rule making, decision making, and planning with respect to the public lands, including public meetings or hearings...or advisory mechanisms, or other such procedures as may be necessary to provide public comment in a particular instance” (FLPMA, Section 103(d)). Scoping is a collaborative public involvement process to identify planning issues to be addressed in the planning process. Planning issues are disputes or controversies about existing and potential land and resource allocations, levels of resource use, production, and related management practices. Issues include resource use, development, and protection opportunities for consideration in the preparation of the RMP. Scoping also involves the introduction of preliminary planning criteria to the public for comment.

The BLM has documented the results of scoping in a formal scoping report that was made available to the public in fall 2005. The issues and actions defined during the scoping process have been analyzed and have guided the organization of Chapter 3 with the following goals in mind:

- Identify the relevant physical, biological, social and economic resources.
- Review the literature, personal communications with resource specialists, and documentation of available information on identified resources.
- Conduct a past/present effects analysis.
- Define an environmental baseline for identified resources.

b) Existing Management

Following is a list of management decisions and their source. For the Bay planning area, the only existing plan is the Southwest Planning Area Management Framework Plan (1981) that covers the Goodnews Block only. There are no amendments to this plan. No plan has been written for the remainder of the Bay planning area. Note that in the Southwest Management Framework Plan some resources have not had any management decisions established for the Goodnews block.

Table 3.1 lists the only plan that influences current management of the Bay planning area.

Table 3.1. List of Relevant Federal Plans and Amendments for the Bay Planning Area

Document Title	Year	Other Relevant Information
Southwest Planning Area Management Framework Plan	1981	The Goodnews Block is the only relevant section to the Bay Plan.

B. Resources

1. *Geography and Climate*

a) Physiographic Regions

The boundaries of the Bay planning area include a varied landscape that includes portions of the Aleutian Range of mountains and two other mountain ranges, five major lake and river systems, and both coastal and interior environments. Within the area are a variety of ecosystems, largely only perturbed by natural disturbances. The planning area is part of two physiographic or geographic regions, the Pacific mountain system and the central upland and lowland region (Wahrhaftig 1965). Within this same area, a number of ecoregions have been identified. Ecoregions are based on perceived patterns of a combination of factors including land use, land surface form, potential natural vegetation, and soils (Gallant 1996). They are:

- Interior Forested Lowlands and Uplands
- Ahklun and Kilbuck Mountains
- Subarctic Coastal Plain
- Bristol Bay-Nushagak Lowlands
- Alaska Peninsula Mountains
- Alaska Range

b) Environmental Change

Climate trends over the last three decades have shown considerable warming (USDA 2004; UAF 1999; AMAP 1997). This has already led to major changes in the environment and in Alaska's ecosystems. Alaska has experienced the largest regional warming of any state in the U.S., with a rise in average temperature of about five degrees Fahrenheit since the 1960s and eight degrees Fahrenheit in winter (UAF 1999). This has led to extensive melting of glaciers, thawing of permafrost and reduction of sea ice (UAF 1999).

Alaska's warming is part of a larger warming trend throughout the Arctic. The warming has been accompanied by increases in precipitation of roughly 30 percent between 1968 and 1990 in some areas. Other areas have experienced drying (UAF 1999; McClenahan 2006, Pers. Comm.). Projections suggest that the strong warming trend will continue, particularly warming during the winter months (UAF 1999). Some anticipated changes in weather patterns include intensification in the Aleutian low-pressure system, which may shift slightly southward. Alaska would then continue to grow wetter, with annual precipitation increases of 20-25% in the north and northwest, but little change from present conditions in the southeast. Winters are anticipated to be wetter in the east and drier in the west, with summers being drier in southeast Alaska and wetter elsewhere. Winter soil moisture changes with precipitation, but summer increased evaporation from a warmed climate exceeds any projected increases in precipitation, and soils are dry everywhere (UAF 1999).

Tree growth in the boreal forest depends on temperature and precipitation. Boreal forests may be at risk from climate change associated with regional warming. Potential impacts may include decreases in effective moisture sufficient for forest growth, tree mortality from insect and disease outbreaks, probability of an increase in wildland fires, changes caused by permafrost thawing and invasion of trees, shrubs and other plant species that are adapted to the new conditions (USDA 2004; UAF 1999).

Regional environmental changes are observed to be impacting the entire Bay planning area, including coastal areas. The reduced sea ice along Alaska's coasts and rising sea level are rapidly eroding the coastal soil. Some of these locations contain archaeological and paleontological sites. (UAF 1999; McClenahan 2006, Pers. Comm.). Coastal wetlands are being affected by rising sea level and increased storm surges as salt water and beach gravel are being moved inland (UAF 1999; McClenahan 2006,

Pers. Comm.), filling coastal ponds (J. Denton 2005, Pers. Comm.). These are natural processes, but should be monitored on BLM-administered lands for effects on a wide variety of resources.

The following impacts have been observed in Alaska in recent years:

- The warmer, drier climate has caused forest problems such as increased tree mortality, fire frequency and insect outbreaks (USDA 2004; Juday 1996; Fleming and Volney 1995).
- Spruce bark beetle outbreaks in Alaska have recently become one of the most widespread infestations observed to date, surpassed recently in Alaska by the aspen leaf miner and the birch leaf miner (USDA 2004). Such infestations of bark beetle have been observed in the forests near Iliamna and those around Dillingham and Aleknagik in the Bay planning area (McClenahan 2006, Pers. Comm.).
- A warmer climate has lengthened the growing season and growing degree days by 20% (UAF 1999).
- Boreal forests are expanding north at the rate of 60 miles for each 2 degrees Fahrenheit increase (UAF 1999).
- Shrubs and trees are expanding into arctic tundra (Starfield and Chapin 1996; UAF 1999).
- Vegetation communities are being converted to communities with taller, denser vegetation (Starfield and Chapin 1996; Rupp et al. 2000a; Rupp et al. 2000b).
- Concerns about invasion of non-native plants are increasing statewide.

The following effects are anticipated should the current trend continue:

- There is an ever increasing risk of wildland fires in areas that to date have seen few fires (USDA 2004; UAF 1999).
- One projection (Rupp et al. 1999), for example, shows a 200% increase in the total area burned per decade, leading to a deciduous forest-dominated landscape on the Seward Peninsula, presently dominated by tundra vegetation.
- Burning of the vegetative cover may increase the risk of soil erosion (McClenahan 2006, Pers. Comm.).
- Changes in temperature and precipitation will affect coastal forest hydrology and salmon spawning streams important to subsistence, commercial and sport fisheries (UAF 1999).
- Hydrologic changes in forested watersheds include warmer stream temperatures and lower summer flow from low elevation streams, higher flow from higher elevation streams (already being reported from the New Koliganek region)(BLM 2005; UAF 1999).
- There are likely to be changes in the range of vertebrate animals and changes in productivity of aquatic ecosystems (UAF 1999). As the boreal forest intrudes further north at the expense of tundra and shrub communities, there will be changes in habitats and the distribution and density of a number of wildlife species on land (UAF 1999).
- Long-term effects might include general treeline advance in elevation as well as latitude; colonization of formerly glaciated lands; and transition of tree species and ecotypes (UAF 1999).
- Regional environmental warming is affecting areas traditionally underlain by permafrost, melting frost wedges, changing drainage patterns, and drying up small lakes and wetland complexes within the Bay planning area. (UAF 1999; McClenahan 2006, Pers. Comm.; J. Denton 2005, Pers. Comm.)
- The nature and composition of soils in this region probably will be affected over time by these changes should the warming trend continue (Birkeland 1999).
- With so much melting of glaciers and permafrost, mechanisms such as slump, soil creep, and mass wasting (i.e. avalanches) can become more active (UAF 1999; McClenahan 2004).

2. Air Quality

Air is a ubiquitous resource vital to most life on earth. Air resources consist of the gaseous atmosphere. The air resources within the Bay planning area are constantly changing as winds and climatic systems move air masses across the globe.

The Air Resources Program oversees this resource according to Federal and State laws. A primary function of the Air Resources Program is to evaluate proposed actions on jurisdictional Federal lands according to the National Environmental Policy Act. There are no specific BLM-AK goals and objectives, other than compliance with Federal and State laws.

The management/enforcement of the air quality standards falls in the jurisdiction of the U.S. Environmental Protection Agency (EPA), which has the primary responsibilities under the Federal Clean Air Act (CAA). The EPA has transferred a number of responsibilities to the states and in most cases, to regional air quality management districts. The Alaska Department of Environmental Conservation, Division of Air Quality, has responsibility for air quality in Alaska. These responsibilities include monitoring, permitting, enforcement, and issuing air advisories for hazardous health conditions when necessary.

To identify an area by its air quality, all geographic areas in the state are designated by the Federal administrator as “attainment,” “nonattainment,” or “unclassifiable.” An area is designated “attainment” for a particular contaminant if its air quality meets the ambient air quality standard for that contaminant. If there is insufficient information to classify an area as attainment or nonattainment for a particular contaminant, the area is designated “unclassifiable” for that contaminant. The Bay planning area has been designated unclassifiable/attainment. For air quality monitoring purposes, Alaska has been divided into four “air quality regions.” The Bay planning area falls within the South Central Alaska Intrastate Air Quality Control Region.

The air resources within the planning area are generally considered pristine or of very good quality, except during summer when wildfires may increase the airborne particulates. This resource may be affected by other natural and human-related activities locally, regionally, or globally. Natural conditions can temporarily degrade air quality. Ash and gases from volcanic eruptions and wind blown glacial till or sand can also degrade air quality. Most of this region is very sparsely populated. Impacts to human inhabitants are generally localized and temporary.

Increasing population and development can stress air resources due to increased emissions from aircraft and vehicle internal combustion engines, burning of wood and fossil fuels, and industrial facilities that emit a broad spectrum of chemical by-products into the air. Portions of this region may continue to experience population growth and a corresponding increase in commercial, residential, and industrial development, which will exert increased demands on the regional air resources.

Primary stressors or sources of air pollution that may degrade local air resources more often will not come from BLM lands, but from surrounding lands within the Bay planning area, based on current and projected land use patterns. Except for issues of smoke from wildland fires or controlled burns, wind-blown dust from infrastructure development (for example, dust from newly developed roads with heavy traffic running at high speeds) and airborne contaminant dispersion and deposition (for example, from new or existing mining operations) there are no other known current public issues regarding air quality within the Bay planning area. The State of Alaska Department of Environmental Conservation monitors these activities for air quality violations.

a) Smoke Management

The Alaska Department of Environmental Conservation (ADEC) is responsible for declaring air episodes and for issuing air quality advisories, as appropriate, during periods of poor air quality or inadequate

dispersion conditions. ADEC is a member of the Alaska Wildland Fire Coordinating Group. During periods of wildland fire activity, the Multi-Agency Coordinating Group, a sub-group of the Alaska Wildland Fire Coordinating Group, addresses air quality and smoke management issues. As ADEC develops its State Implementation Plan for regional haze, changes may be necessary to address additional fire tracking and emission management needs based upon policies and guidelines developed by the Western Regional Air Partnership. Under State law, all agencies, corporations, and individuals that burn 40 or more acres of land require written approval from ADEC prior to burning. The Enhanced Smoke Management Plan being developed by ADEC will outline the process and items that must be addressed by land management agencies to help ensure that prescribed fire activities minimize smoke and air quality problems. The Enhanced Smoke Management Plan will also address elements required by the EPA's Interim Air Quality Policy on Wildland and Prescribed Fire (EPA 1998).

b) Critical Thresholds

During the NEPA process, air resources are evaluated for impacts. According to the Clean Air Act, each Federal agency must demonstrate that decisions or actions comply with applicable air quality requirements. Non-compliance with the Clean Air Act is a critical threshold that could stop a proposed action. State air quality regulations may also be considered a threshold. If a proposed action is expected to degrade air quality, additional information or further study may be required to quantify the amount of degradation (amount of pollutants released), to analyze the impact the action would have on the air resource (including impacts on human and ecological populations), and to evaluate the action's compliance with Federal and State regulations.

3. *Soil resources*

The Soil Resources Program is responsible for the protection, restoration, and enhancement of soils on BLM-administered lands. Inventory and monitoring are the typical means used to assess the condition of the resource.

a) Soils Inventory

Except for three soils studies and a number of archaeologically-related soils investigations, no detailed soil resource inventories are known to have been done in the Bay planning area, and none have taken place on BLM-administered lands. However, soils in the Bay planning area have been surveyed on a very broad scale (USDA SCS 1979) (Figures 3.4 and 3.5). This survey is best used for general land use planning and as a guide to areas for a specific purpose. Map units are very large and lacking in detail. Alaska has been divided into fifteen major land resource areas. The Bay area is comprised of portions of the Alaska Peninsula, the Kuskokwim Highlands, and the Western Alaska Coastal Plains and Deltas.

This page intentionally left blank.

Insert Figure 3.4 here (11x17 fold-in)

Insert Figure 3.5 here (11x17 fold-in)

Insert Figure 3.6 here (11x17 fold-in)

Intensive soil surveys have been done on limited areas, most notably in the Nondalton area (Hinton and Neubauer 1966), the King Salmon-Naknek area (Furbush and Wiedenfeld 1970), and the Dillingham area (Rieger 1965). A brief summary of the major soil associations (USDA SCS 1979) in the Bay planning area (based on soils maps, Figures 3.5 and 3.6) are as follows:

(1) Inceptisols (Figure 3.4)

Sixty-four percent of the Bay planning area soils is Inceptisols. An Inceptisol is a type of soil in which there has been only relatively minor modification of the parent material by soil-forming processes. There has been enough modification to be able to tell an Inceptisol from an Entisol, but not intense enough to form the kinds of soil horizons (soil layers) that are required for classification in other soil orders. Generally, poorly drained soils with permafrost are considered to be Inceptisols even though they have no diagnostic horizon other than an epipedon. Most soils in Alaska are Inceptisols (USDA SCS 1979:35).

(2) Spodosols (Figure 3.4)

Nineteen percent of Bay planning area soils is Spodosols. In Spodosols organic carbon, aluminum, and in most places, iron, have been leached by percolating water from the upper part of the soil and deposited or precipitated at greater depth to form a spodic horizon. Most Spodosols in Alaska have a surface mat of organic litter, which is at least partially decomposed and a gray mineral horizon (an albic horizon) above the spodic horizon. Spodosols are dominant on uplands in areas with high precipitation, where moisture in excess of that required by the natural vegetation moves completely through the soil. Except in very coarse material and in special situations in tundra areas, Spodosols in Alaska normally occur only where mean annual precipitation exceeds 15 inches. Spodosols are most common in forested areas, but a few occur in western Alaska tundra areas (USDA SCS 1979:46).

(3) Histosols (Figure 3.4)

Only 2% of lands within the Bay planning area contain soils known as Histosols, which are made up completely or in large part of organic material. The organic material accumulates under wet conditions, in depressions or other low areas that are nearly always inundated, on slopes affected by seepage, or as a blanket on rolling hills in areas of very high rainfall. Examples of this type of soils can be found at Brooks Lake in Katmai National Park (USDA SCS 1979:30).

(4) Entisols (Figure 3.4)

Only one percent of soils within the Bay planning area are classified as Entisols. In Entisols there is little or no evidence of change as a result of soil-forming processes. Most of them have few diagnostic horizons. Wet mineral soils are classified as Entisols. In Alaska, Entisols occur most commonly on flood plains and outwash plains which receive new deposits of sediment at frequent intervals, on uplands adjacent to major rivers where new material blown from the river beds is deposited, in other young material, such as recently exposed glacial moraines, and in very cold or very steep areas where vegetation is sparse, where soils are unstable, or where parent material is exceptionally resistant to chemical weathering (USDA SCS 1979:15).

(5) Rough Mountainous Land (Figure 3.4)

Fourteen percent of the Bay planning area consists of Rough Mountainous Land (RM1) and Cinder Land (CL). Rough mountainous land is made up of steep rocky slopes, ice fields, and glaciers. Some slopes in the mountains support sparse shrubby vegetation, but most are barren. Thin soils occur in the vegetated areas on lower slopes and in valleys, but almost all are stony and shallow over bedrock or bouldery deposits (USDA SCS 1979:150-151).

Cinder lands can be found on the Alaska Peninsula and on the western Alaska coastal plains and deltas. Areas of fresh volcanic ash and cinder flows occur on slopes of active volcanoes on the Alaska Peninsula. These areas have little or no vegetation except for willows and grasses in deeply incised drainageways, such as the Valley of Ten Thousand Smokes in Katmai National Park. The loose ash is highly subject to disturbance by wind. Because of the instability of the volcanic material and the possibility of future depositions, they are poor sites for roads or buildings. The paucity of vegetation restricts their value for most wildlife (USDA SCS 1979:56). These areas are unsuitable for agriculture, forestry or building construction. A more detailed breakdown of specific soil types is provided in Figure 3.5.

Table 3.2. Soils Found in Bay Planning Area BLM Unencumbered Lands: Suitability and Limitations for Selected Uses

Planning Block, BLM Unencumbered Land	Soil Associations Present	NRCS Suitability and Limitations for Selected Uses (SCS (NRCS) 1979)
Klutuk Creek Block	IA13, IQ2	Unsuitable for livestock grazing; moderate to very severe drawbacks for locating roads, constructing low buildings, slight to very severe drawbacks for recreation and off-road trafficability. Unsited for commercial forestry. Some areas (IA13) suitable for crops, all areas suitable for caribou.
Iliamna (West) Block	IA7, IA4, IA9, HY5, HY4	Unsuitable for crops, slight to very severe drawbacks for locating roads, constructing low buildings, recreation, and off-road trafficability. Unsited for commercial forestry. Fair to unsuitable for domestic livestock grazing; suitable for caribou; primarily valuable for natural water storage and wildlife habitat.
Iliamna (East) Block Chekok Creek Chulitna River	RM1, IA7, SO7 SO7, RM1	Unsuitable for crops, slight to very severe drawbacks for locating roads, constructing low buildings, recreation, and off-road trafficability. Poor to unsited for commercial forestry. Fair to unsuitable for domestic livestock grazing; suitable for caribou.
Alagnak Block	IQ2, IA4, IA9	Unsuitable for crops, domestic cattle and sheep grazing; severe to very severe drawbacks for locating roads, constructing low buildings, recreation, and off-road trafficability. Unsited for commercial forestry. Sited for caribou and other wildlife habitat.
Kvichak Block	RM1, IQ2, IA4, HY5, IA7	Unsuitable for crops, slight to very severe drawbacks for locating roads, constructing low buildings, recreation, and off-road trafficability. Poor to unsited for commercial forestry. Fair to unsuitable for domestic livestock grazing; suitable for caribou.
Koggiling Creek Block	IQ2, IA3	Unsuitable for crops, slight to very severe drawbacks for locating roads, constructing low buildings, recreation and off-road trafficability. Unsited for commercial forestry. Fair to unsuitable for domestic livestock grazing; good for caribou.
Yellow Creek Block	EF1, IA13, IQ2, IA3	Exceptionally high quality of habitat for a large variety of wildlife. Unsuitable for livestock grazing; moderate to very severe drawbacks for locating roads, constructing low buildings, slight to very severe drawbacks for recreation and off-road trafficability. Unsited for commercial forestry. Some areas suitable for crops.
Goodnews Block	IU1, IU2, IU3, IQ6	Fair to unsited for crops, poor to unsited for grazing domestic cattle and sheep; moderate to very severe drawbacks for locating roads, constructing low buildings, recreation, and off-road trafficability. Generally unsited for commercial forestry. Generally good for caribou.

b) Soils Overview

The soil resources within the planning area are generally considered pristine or unaltered by human activity, except in areas adjacent to villages and urban areas. This resource may be affected by natural forces such as wind and water erosion and from human activities such as road building and mining. A primary function of the Soil Resources Program is to evaluate proposed actions on jurisdictional Federal lands according to the National Environmental Policy Act. For all authorized activities in the area, required operating procedures and stipulations mitigate to the extent possible potential sources of soil degradation.

c) Permafrost

A dominant factor in defining soils is the presence or absence of permafrost. Permafrost is defined as soil, sand, gravel, or bedrock that has remained below 32 degrees Fahrenheit for two or more years (Muller 1945). Intermittent throughout the planning area, permafrost can exist as massive ice wedges and lenses in poorly drained soils or as a relatively dry matrix in well-drained gravel or bedrock. During the short arctic summer, these soils thaw, forming a shallow unfrozen zone termed the active layer. Permafrost forms a confining barrier that prevents infiltration of surface water and keeps the active layer of soils saturated. Permafrost also provides the structural integrity to hillsides and stream channel banks. Figure 3.6 shows the distribution of permafrost in the planning area.

While permafrost is an integral component of the soils in the planning area, any surface disturbance, including forest fires, that removes the overlying vegetation can initiate melting of ice-rich permafrost and result in surface subsidence (termed thermokarsting), drastically altering the surface topography, hydrological regime, and temperature of the underlying soils. As permafrost begins to thaw near the surface, it warms to greater depths, forming thaw ponds, gullies, and beaded streams. The hydrologic and thermal regime of the soil is the primary factor controlling the vegetation. These changes to the thermal regime of the soil initiate a long process of recovery with perhaps 20 to 50 years of cumulative impacts (Hinzman et al. 2000).

Soils and glacial residues in the Bay planning area contain isolated masses of intermittent permafrost. In the Bristol Bay Coastal Plain, permafrost underlies nearly all areas except the southern part of the plain. It is deep or absent in sand dunes and natural levees along streams, except in the case where tall grasses and deep sod exist (NRCS 1979; McClenahan 2006, Pers. Comm.) The region is undergoing a warming and drying trend that probably has affected the locations and depth of permafrost as well as the seasonal freeze-up of surface soils. Because no in-depth soil surveys have been accomplished for BLM lands in the Bay planning area, it is not known how future activities, for example, attempts to build ice roads to haul equipment and gravel for carrying out oil and gas exploration activities, will affect vegetation and soils (Figure 3.6).

d) Soils Demand Analysis and Forecast

Soil is an important resource in the proposed planning area in that it supports habitat important to the abundant wildlife present in the Bay planning area, promotes stream bank stability and habitat important to the myriad anadromous and freshwater fish that inhabit the region, and provides commercial resources such as timber. Subsistence, commercial, and recreational uses are all related directly or indirectly in some way to soil use.

At the present time, the activities that demand the most from the soil in the Bay planning area are subsistence and recreational in nature, particularly the use of all-terrain vehicles. Marked winter trails between villages have the potential to become summer 4-wheeler trails. A trail from Kokhanok to Katmai National Preserve that crosses BLM lands, used by 4-wheelers, has created some erosional problems. Another 4-wheeler trail has been created from a lodge on the Alagnak River in Katmai National Preserve, to Sugarloaf Mountain, with access across BLM lands. It has not yet been investigated by BLM staff. The trail that follows the Goodnews River and crosses BLM lands should be monitored for its condition.

Two types of contamination of the soil can occur with any human activities. The first is introduction of hazardous materials, for example, from a fuel spill. The second is other types of pollution, for example, silting. However, no evidence for these types of soil contamination currently exists for BLM lands within the Bay planning area.

Currently no commercial timber harvesting activities are being carried out on BLM lands in the Bay planning area, and it is anticipated that commercial timber harvesting will not be a major source of impact to soils in the future.

Soils have a role to play in wetlands, which are lands transitional between terrestrial and aquatic systems, and are generally described as lands where saturation with water is the dominant factor in determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface (Cowardin 1979).

Soil resources have a role in the social and cultural aspects of rural Alaskans. The resource indirectly affects and is used for subsistence and personal use. In the past, a fine blue clay often found adjacent to the rivers in the planning area (i.e. upper Naknek River at Lake Camp) was used historically and prehistorically in the region to make bisque-fired pottery lamps and bowls (McClenahan 1994).

e) Critical Thresholds

Physical soil characteristics that may limit the degree to which reclamation may take place include sandy soils, clayey soils, soils with large coarse fragments, including glacial rubble, a shallow depth to parent material, soils with low organic matter content, and hydric soils with a shallow depth to groundwater (McClenahan 2006, Pers. Comm.).

4. Water Resources

BLM managed lands within the Bay planning area contain many hydrologic features that contribute to the area's diverse water resources. Figures 3.1, 3.2, and 3.3 provide the major water bodies in the planning area. Major watersheds throughout the United States are assigned a name and an 8-digit hydrologic unit code (HUC). Six major watersheds are incorporated within the boundary of the Bay planning area. These watersheds include: Mulchatna River (19030302); Lower Nushagak River (19030303); Wood River (19030304); Togiak (19030305); Lake Iliamna (19030306); and Kuskokwim Delta (19030502). These watersheds are composed of a complex network of streams, wetlands, and lakes that combine to support wildlife, plants, and a multitude of human activities. Subsistence, commercial, and recreational uses are all related in some way to water use. National Weather Service data suggest the variable annual precipitation amounts throughout the region range from 25-120 inches (Figure 3.7). Generally, it is believed that the surface water in these watersheds is of good quality. There are no water bodies on BLM managed lands within the Bay RMP planning area that are classified as impaired by the State of Alaska (Clean Water Act, section 303d).

Insert Figure 3.7 here (11x17 fold-in).

Minimal water quality information is available on most waterbodies in the planning area. Most preliminary water quality samples were gathered in conjunction with fisheries and riparian studies in the Goodnews Bay and Bristol Bay areas. For all authorized activities in the area, enforcement of State water quality standards is a required stipulation to the authorization.

No streams are monitored for water quantity within the planning area by BLM. Two stations established by the USGS are currently collecting hydrologic data within the planning area. The USGS has identified suggested locations for additional stream monitoring stations for this region, some on BLM lands. Current management practice under the Southwest Planning Area (SPA) Management Framework Plan (MFP), section W-2.1, for the Goodnews block only, identifies the need to “Perfect legal water rights to the water resource on public lands in support of Bureau programs, and in compliance with the Alaska Water Use Act” and to “Protect existing water rights of the U.S.” Also, within the SPA-MFP, section W-3.1 states the need to “Identify floodplains and wetlands in the planning area.”

Water resources will continue to have a significant role in the social and cultural aspects of rural Alaskans. This may become increasingly true if the State of Alaska becomes more involved with the licensing of small hydroelectric dams under 10 MW as they are in the process of doing. The resource is used extensively for subsistence and personal use. Within the planning area, major programs that can generate point or non-point water quality problems are mineral development, recreation, forest development, and fire.

a) Mineral Development

Currently, there is only one active mining operation within the Bay planning area. Hanson Industries utilizes a block of mining claims under Federal regulations located near Platinum. This placer mine operation has traditionally used the bucket-line dredge method for mineral extraction along the Salmon River. Due to decades of mining the hydrology within the Salmon River valley is extremely complex due to alterations in the geology and soils. Tailings composed of porous gravel and cobble sized material as high as 50 feet now occupy the area once filled with fine particulate material necessary to support proper river functions. During periods of low flow, the Salmon River becomes a discontinuous river in sections where the tailing porosity is too great to support the surface flow of the river. This discontinuity of river flow at times prevents access to spawning grounds for anadromous fish species. All placer and hardrock mining activities occurring on BLM managed lands are required to operate under 43 CFR 3809 regulations which require compliance with all Federal and State water quality laws. There are no active coal or oil and gas leases within the Bay planning area.

b) Recreation

The primary types of regulated recreational activities in the planning area are guided hunting, sport fishing, and float trips. All of these activities have the potential to impact water resources; however, none of these recreational activities has been determined to be detrimental to water quality in the area. During scoping the issues of garbage and human waste left on some of the rivers in the planning area and their effects on water quality were raised. No such problems are known for the streams and rivers flowing on BLM unencumbered lands in the planning area.

Recreation within the planning area covers a wide range of activities including OHV use, camping, raft and canoe float trips, and sightseeing. Many of these activities may provide short-term and localized effects to water quality through increased human occupancy on streambanks resulting in degradation of vegetation. Should OHV use increase the effects on water quality have the potential to be more widespread, primarily due to streambank and trail erosion if wetland and riparian vegetation is degraded.

c) Fire Management

Although a large portion of the area generally lacks the fuels required to support watershed damaging wildfires, some potential does exist in areas of dense spruce forests. Depending on its intensity, fire can

exert measurable effects on basic soil resources, leading to increased erosion and reduced land stability. This is manifested primarily as increased overland water flow and greater sedimentation of rivers and streams.

While wildfires have little effect on watershed values, major erosion frequently results from the use of mechanized fire equipment on ice-rich, fine-grained, permafrost soil. Complete removal of all of the vegetation and organic material during fireline construction causes much deeper permafrost melting than occurs in adjacent burned areas. Runoff channels and deep gulleys frequently form, and siltation can result.

d) Forest Products

No BLM-administered lands in the Bay planning area are known to have been disturbed by forest product harvesting. Because of the nature of the forests in the planning area, no commercial timber harvests and minimal to no non-commercial timber product usage is expected to take place on BLM lands.

5. Vegetation

This section describes the occurrence and current vegetation classes derived from satellite imagery within the planning area. Alaska Earth Cover Classification divides major vegetation types into categories derived from satellite imagery and verified by site visits to improve the accuracy of the categories. There are few detailed plant inventories for the planning area. These more intensive studies were done for limited areas, including the Goodnews Bay region and the Ahklun Mountains (Lipkin 1994, Parker 2004), and the northwestern Alaska Peninsula (Batten and Parker 2004). Most of the plant species in the planning area are widely distributed and common; however, there are some species of limited distribution and numbers, as this is typical of plant distributions. Additionally, there are likely to be some undesirable plants that are not native to the ecosystems in the planning area. These are referred to as weeds.

Forestry and fire as they relate to vegetation will be covered in separate sections.

a) Alaska Earth Cover Classification

Vegetation on most all of the BLM lands of the Bay planning area was mapped on a broad scale using satellite imagery. Four joint USDI BLM/ FWS-Ducks Unlimited, Inc. projects, Kvichak Earth Cover Classification (2002), Goodnews Bay Earth Cover Classification (2003), Naknek Military Operations Area Earth Cover Classification (2001), and Iliamna Earth Cover Classification (1994) provide a baseline inventory. This mapping generalizes vegetation and therefore is best utilized for general land use planning and as a guide to areas for further analysis. More intensive studies have been done for limited areas, including the Goodnews Bay region and the Ahklun Mountains (Lipkin 1994, Parker 2004), and the northwestern Alaska Peninsula (Batten and Parker 2004). Since the Earth Cover Classification covers most of the BLM lands covered in this plan, these classifications are used to define the vegetation within the plan boundaries.

The classification scheme consists of 10 major categories and 27 subcategories. A classification decision tree and written descriptions were developed in support of the classification. The classification was based primarily on Level III of the Viereck (and others) classification of 1992.

Classes that could not reliably be discerned from satellite imagery were merged into a more general class. Because of the importance of lichen for site characterization and wildlife forage, and because the presence of lichen can be detected by satellite imagery, shrub and forested classes with and without a component of lichen are distinguished.

A few classes from Level IV of the Viereck classification were mapped because of their identifiable satellite signature and their importance for wildlife management. These Level IV classes are tussock tundra, low shrub tussock tundra and low shrub willow/alder.

b) The Natural Vegetation Cover

Table 3.3 provides the Earth Cover Classes for vegetation for the areas that were covered in the planning area, and Table 3.4 gives the percentage of BLM unencumbered lands in the planning area in each land cover type. The vegetation in the Bay planning area is for the most part unimpacted by humans. Based on the studies cited above, the vegetation in the four vegetation study areas, Naknek, Kvichak, Iliamna, and Goodnews, comprises the following percentages of each general category (Figures 3.8 a-d, 3.9 a-d, 3.10 a-d, and 3.11 a-d). These study areas do not completely correspond to BLM lands.

Table 3.3. Earth Cover Classes for Vegetation in Portions of the Bay Planning Area.

Vegetation Type	Needleleaf	Deciduous	Mixed	Tundra	Tussock/Wet Tundra
Study Region					
Naknek	21%	14%	5%	51%	3%
Kvichak	10%	14%	5%	40%	6%
Iliamna	2%	3%	1%	20%	47%

Table 3.4 . Percentage of Planning Block in Major Land Cover Types Bay Planning Area BLM Unencumbered Lands

Planning Block	Forest	Clear Water	Grass/Forb	Riparian	Wetlands	Coastal Graminoid	Salt Water Estuary
Alagnak	19%	4%	32%	8%	33%	4%	0%
Goodnews	1%	5%	46%	22%	23%	3%	1%
Iliamna West	33%	7%	28%	14%	19%	0%	0%
Chulitna River	78%	1%	15%	3%	3%	0%	0%
Klutuk Creek**	15%	3%	47%	4%	32%	0%	0%
Koggiling Creek**	20%	10%	32%	8%	30%	0%	0%
Kvichak	20%	8%	35%	10%	26%	0%	0%
Yellow Creek	14%	10%	41%	5%	31%	0%	0%

**Portions of the western edges of these planning blocks were outside of the study area.

c) Wetlands, Herbaceous Tundra, and Forests in the Bay Planning Area

Land cover, taken with data about food sources, water, shelter, and living space, is used by biologists to model habitat for wildlife. The existing classifications, discussed above, have been utilized to produce maps of wetlands (Figure 3.10a-d), grasslands (Figure 3.8a-d), forest landcover (Figure 3.9a-d), and lichens (Figure 3.11a-d). As indicated by Table 3.4, wetlands vegetation plays a large role on BLM-administered unencumbered lands in the planning area. All of the BLM planning blocks have between 19% and 33% wetlands land cover except the Chulitna River block, which may account in part for the presence of large numbers of migratory waterfowl and other water-dependent birds there. Except for the Goodnews block, these areas are also extensively used by caribou. Wetlands vegetation decreases and

forest vegetation increases in the planning blocks to the north and east in the Kvichak study area. Riparian vegetation is more prevalent in the Goodnews block and the Iliamna West block, where it makes up from 14% to 22% of landcover; however, some riparian areas comprising up to 10% of the land cover are present in all of the planning blocks.

**Insert Figure 3.8a. (11x17 fold-in).
Map of Grassland Areas in the Bay Planning Area (USDI and Ducks Unlimited, Inc.
1994, 2000, 2003, 2004).**

Insert Figure 3.8b. (11x17 fold-in).

Insert Figure 3.8c. (11x17 fold-in).

Insert Figure 3.8d. (11x17 fold-in).

Insert Figure 3.9 a (11x17 fold-in)

Map of Forested Areas in the Bay Planning Area (USDI and Ducks Unlimited, Inc. 1994, 2000, 2003, 2004).

Insert Figure 3.9b (11x17 fold-in)

Insert Figure 3.9c (11x17 fold-in)

Insert Figure 3.9 d (11x17 fold-in)

Insert Figure 3.10 a (11x17 fold-in).
Map of Wetlands in the Bay Planning Area (USDI and Ducks Unlimited, Inc. 1994, 2000, 2003, 2004).

Insert Figure 3.10 b (11x17 fold-in).

Insert Figure 3.10c (11x17 fold-in).

Insert Figure 3.10d (11x17 fold-in).

Insert Figure 3.11 a (11x17 fold-in)
Map of Lichens in the Bay Planning Area (USDI and Ducks Unlimited, Inc. 1994, 2000, 2003, 2004).

Insert Figure 3.11b (11x17 fold-in)

Insert Figure 3.11c (11x17 fold-in)

Insert Figure 3.11d (11x17 fold-in)

d) Noxious and Invasive Plant Species in the Planning Area

Public concern about the harmful effects of invasive non-native plants continues to increase. Unacceptable levels of these undesirable plants could adversely affect crop and forage production, wilderness, wildlife habitat, visual quality, recreation opportunities, and land value. Invasive non-native plants and legally designated noxious weeds are more prevalent near areas of human disturbance and they are increasing in wildland areas as well. It is the BLM's responsibility to ensure that management actions do not increase the spread of invasive plants and noxious weeds. Prevention measures should be considered where soil is disturbed on or adjacent to BLM managed lands. One prevention measure is the use of weed free seed and mulch. To maintain ecological site integrity, native species are used in any revegetation efforts on BLM-administered lands where practicable.

e) Vegetation in Terms of Forestry and Fire in the Bay Planning Area

Prescribed fires may be used to meet vegetative resource objectives when and where the money spent on prescribed fires is commensurate with the value of the resource being maintained or enhanced.

5. Fish and Wildlife

a) Wildlife

With the exception of Federal subsistence areas, consumptive uses of the wildlife resource are regulated by the Alaska Board of Game through season setting and harvest level regulations. Unique to Alaska, however, is the Federal subsistence mandate that ensures subsistence uses of natural resources, including wildlife, receive the highest priority use above recreational or commercial uses. The Federal Subsistence Board manages the fish and wildlife harvest on Federal Reserved waters for fish and Federal lands, including BLM unencumbered lands, for wildlife through harvest regulations. The State and Federal land manager (e.g. BLM, National Park Service, and Fish and Wildlife Service) may comment on these regulations, and close coordination of State and Federal regulations is sought by both entities. Here the term "wildlife" is used to indicate wildlife species in general, and the term "habitat" is used to describe the natural environment occupied by a given species or species group of all game and non-game vertebrates and invertebrates utilizing BLM lands in the Bay planning area.

BLM has responsibilities in the planning area for habitat management, and cooperatively manages habitat with the State of Alaska under a Master Memorandum of Understanding between the Alaska Department of Fish and Game and the Bureau of Land Management (1983) (Appendix G).

In collaboration with the State of Alaska's and adjacent Federal land managers' identified wildlife population management objectives, Anchorage Field Office (AFO) emphasizes wildlife habitat management to maintain, enhance and restore habitats.

Table 3.5 provides a list of all mammal and amphibian species within the Bay planning area. Table 3.6 is a list of all bird species known to occur in the Bay planning area, and Table 3.7 presents the variety of marine invertebrates that may be present in the coastal parts of the Bay planning area. Some of the mammals and many of the birds are migratory species.

Table 3.5. Table of Amphibian and Mammal Species Present in the Bay Planning Area (ADF&G CPDB 2005, Foster 1991, Mountaineers 1994, Udvardy 1977, Whitaker 1980, Jacobsen 2004, USFWS 2005)

Common Name	Scientific Name	Common Name	Scientific Name
Amphibian		Wolverine	<i>Gulo gulo</i>
Wood Frog	<i>Rana sylvatica</i>	Masked Shrew	<i>Sorex cinereus</i>
Land Mammals		Dusky Shrew	<i>Sorex monticolus</i>
Large Land Mammals		Arctic Shrew	<i>Sorex arcticus</i>
Black Bear	<i>Ursus americanus</i>	Pygmy Shrew	<i>Microsorex boyi</i>
Brown Bear	<i>Ursus arctos</i>	Tundra Shrew	<i>Sorex tudrensis</i>
Caribou	<i>Rangifer tarandus</i>	Little Brown Bat	<i>Myotis lucifugus</i>
Moose	<i>Alces alces</i>	Hoary Marmot	<i>Marmota caligata</i>
Dall Sheep	<i>Ovis dalli</i>	Red Squirrel	<i>Tamiasciurus hudsonicus</i>
Small Land Mammals		Northern Red-Backed Vole	<i>Clethrionomys rutilus</i>
Beaver	<i>Castor Canadensis</i>	Meadow Vole	<i>Microtus pennsylvanicus</i>
Coyote	<i>Canis latrans</i>	Tundra Vole	<i>Microtus oeconomus</i>
Red Fox	<i>Vulpes vulpes</i>	Singing Vole	<i>Microtus gregalis</i>
Arctic Fox	<i>Alopex lagopus</i>	Brown Lemming	<i>Lemmus sibiricus</i>
Alaskan (Tundra) Hare	<i>Lepus othuss</i>	Northern Bog Lemming	<i>Synaptomys borealis</i>
Snowshoe Hare	<i>Lepus americanus</i>	Collared Lemming	<i>Dicrostonyx torquetus</i>
River Otter	<i>Lontra canadensis</i>	Meadow Jumping Mouse	<i>Zapus hudsonius</i>
Lynx	<i>Lynx canadensis</i>	Marine Mammals	
Marten	<i>Martes americana</i>	Northern Fur Seal	<i>Callorhinus ursinus</i>
Mink	<i>Mustela vison</i>	Bearded Seal	<i>Erignathus barbatus</i>
Ermine	<i>Mustela erminea</i>	Harbor Seal	<i>Phoca vitulina</i>
Least Weasel	<i>Mustela erminea</i>	Ringed Seal	<i>Phoca hispida</i>
Muskrat	<i>Ondatra zibethicus</i>	Ribbon Seal	<i>Phoca fasciata</i>
Porcupine	<i>Erethizon dorsatum</i>	Spotted Seal	<i>Phoca largha</i>
Parka Squirrel (Arctic Ground Squirrel)	<i>Spermophilus parryii</i>	Steller Sea Lion	<i>Eumetopias jubatus</i>
Wolf	<i>Canis lupus</i>	Walrus	<i>Odobenus rosmarus</i>
		Beluga Whale	<i>Delphinapterus leucas</i>
Red-throated Loon	<i>Gavia stellata</i>	Short-billed Dowitcher	<i>Limnodromus griseus</i>
Pacific Loon	<i>Gavia pacifica</i>	Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>
Common Loon	<i>Gavia immer</i>	Wilson's Snipe	<i>Gallinago gallinago</i>
Yellow-billed Loon	<i>Gavia adamsii*</i>	Red-necked Phalarope	<i>Phalaropus lobatus</i>
Horned Grebe	<i>Podiceps auritus</i>	Red Phalarope	<i>Phalaropus fulicaria*</i>
Red-necked Grebe	<i>Podiceps grisegena</i>	Pomarine Jaeger	<i>Stercorarius pomarinus</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Long-tailed Jaeger	<i>Stercorarius longicaudus</i>
Pleagic Cormorant	<i>Phalacrocorax pelagicus</i>	Bonaparte's Gull	<i>Larus piladelphia</i>
Red-faced Cormorant	<i>Phalacrocorax urile</i>	Mew Gull	<i>Larus canus</i>
Tundra Swan	<i>Cygnus columbianus</i>	Herring Gull	<i>Larus argentatus</i>
Trumpeter Swan	<i>Cygnus buccinator</i>	Glaucous Gull	<i>Larus hyperbor</i>
Greater White-fronted Goose	<i>Anser albifrons</i>	Glaucous-winged Gull	<i>Larus glaucescens</i>
Snow Goose	<i>Chen caerulescens</i>	Slaty-backed Gull	<i>Larus schistisagus</i>
Emperor Goose	<i>Philacte canagica</i>	Black-legged Kittiwake	<i>Rissa tridactyla</i>
Cackling Goose	<i>Branta canadensis minima</i>	Sabine's Gull	<i>Xema sabini</i>
Brant	<i>Branta bemicia</i>	Arctic Tern	<i>Stema paradisaea</i>
Mallard	<i>Anas platyrhynchos</i>	Aleutian Tern	<i>Stema aleutica</i>
Gadwell	<i>Anas strepera</i>	Common Murre	<i>Uria aalge</i>

**Table 3.6. Table of Resident, Migratory, Wintering, Rare* and Accidental Bird Table 3.6.
(ADF&G CPDB 2005, Foster 1991, Udvardy 1977, USFWS 2005**

Common Name	Scientific Name	Common Name	Scientific Name
Green-winged Teal	<i>Anas crecca</i>	Thick-billed Murre	<i>Uria lomvia</i>
Baikal Teal	<i>Anas formosa*</i>	Pigeon Guillemot	<i>Cephus colomba</i>
American Wigeon	<i>Anas americana</i>	Marbled Murrelet	<i>Brachyramphus marmoratus</i>
Eurasian Wigeon	<i>Anas Penelope*</i>	Parakeet Auklet	<i>Aethia psittacula</i>
Northern Pintail	<i>Anas acuta</i>	Kittlitz's Murrelet	<i>Brachyramphus brevirostris</i>
Blue-winged Teal	<i>Anas discors*</i>	Horned Puffin	<i>Fratercula comiculata</i>
Garganey	<i>Anas querquedula*</i>	Tufted Puffin	<i>Fratercula cirrhata</i>
Canvasback	<i>Aythya valisineria</i>	Short-eared Owl	<i>Asio flammeus</i>
Redhead	<i>Aythya Americana</i>	Great Horned Owl	<i>Bubo virginianus</i>
Ring-necked Duck	<i>Aythya collaris*</i>	Snowy Owl	<i>Bubo scandiaca</i>
Tufted Duck	<i>Aythya fuligula*</i>	Northern Saw-whet Owl	<i>Aegolius acadicus*</i>
Greater Scaup	<i>Aythya marila</i>	Northern Hawk Owl	<i>Sumia ulula</i>
Lesser Scaup	<i>Aythya affinis</i>	Boreal Owl	<i>Aegolius funereus</i>
Common Eider	<i>Somateria mollissima</i>	Belted Kingfisher	<i>Ceryle alcon</i>
King Eider	<i>Somateria spectabilis</i>	Northern Flicker	<i>Colaptes auratus</i>
Spectacled Eider	<i>Somateria fischeri</i>	Downy Woodpecker	<i>Picoides pubescens</i>
Steller's Eider	<i>Polysticta stelleri</i>	Hairy Woodpecker	<i>Picoides villosus</i>
Black Scoter	<i>Melanitta nigra</i>	American Three-toed Woodpecker	<i>Picoides dorsalis</i>
White-winged Scoter	<i>Melanitta deglandi</i>	Black-backed woodpecker	<i>Picoides arcticus</i>
Surf Scoter	<i>Melanitta perspicillata</i>	Olive-sided Flycatcher	<i>Contopus cooperi</i>
Harlequin	<i>Histrionicus histrionicus</i>	Alder Flycatcher	<i>Empidonax alnorum</i>
Long-tailed Duck	<i>Clangula hyemalis</i>	Say's Phoebe	<i>Sayomis saya</i>
Barrow's Goldeneye	<i>Bucephala islandica</i>	Northern Shrike	<i>Lanius excubitor</i>
Common Goldeneye	<i>Bucephala clangula</i>	Gray Jay	<i>Perisoreus canadensis</i>
Bufflehead	<i>Bucephala albeola</i>	Black-billed Magpie	<i>Pica hudsonia</i>
Common Merganser	<i>Mergus merganser</i>	Common Raven	<i>Corvus corax</i>
Red-breasted Merganser	<i>Mergus merganser</i>	Horned Lark	<i>Eremophilla alpestris</i>
Osprey	<i>Pandion haliaetus</i>	Tree Swallow	<i>Tachycineta bicolor</i>
Northern Harrier	<i>Circus cyaneus</i>	Violet-green Swallow	<i>Tachycineta thalassina</i>
Golden Eagle	<i>Aquila chrysaetos</i>	Bank Swallow	<i>Riparia riparia</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Black-capped Chickadee	<i>Poecile hudsonica</i>
Northern Goshawk	<i>Accipiter laingi</i>	Boreal Chickadee	<i>Parus hudsonica</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Red-breasted Nuthatch	<i>Sitta canadensis</i>
Rough-legged Hawk	<i>Buteo lagopus</i>	Brown Creeper	<i>Certhia Americana</i>
American Kestrel	<i>Falco sparverius</i>	Winter Wren	<i>Troglodytes troglodytes</i>
Merlin	<i>Falco columbarus</i>	American Dipper	<i>Cinclus mexicanus</i>
Perigrine Falcon	<i>Falco peregrines</i>	Golden-crowned Kinglet	<i>Regulus saarapa</i>
Gyrfalcon	<i>Falco rusticolus</i>	Ruby-crowned Kinglet	<i>Regulus calendula</i>
Spruce Grouse	<i>Falcipennis canadensis</i>	Arctic Warbler	<i>Phylloscopus borealis*</i>
White-tailed Ptarmigan	<i>Lagopus leucura</i>	Northern Wheatear	<i>Oenanthe oenanthe</i>
Rock Ptarmigan	<i>Lagopus muta</i>	Gray-cheeked Thrush	<i>Catharus minimus</i>
Willow Ptarmigan	<i>Lagopus lagopus</i>	Swainson's Thrush	<i>Catharus ustulatus</i>
Lesser Sandhill crane	<i>Grus canadensis</i>	Hermit Thrush	<i>Catharus guttatus</i>
Black-bellied Plover	<i>Pluvialis squatarole</i>	Varied Thrush	<i>Ixoreus naevius</i>
American Golden Plover	<i>Pluvialis dominica</i>	American Robin	<i>Turdus migratorius</i>
Pacific Golden Plover	<i>Pluvialis fulve</i>	Eastern Yellow Wagtail	<i>Motacilla flava tschutschensis</i>
Semipalmated Plover	<i>Charadrius semipalmatus</i>	American Pipit	<i>Anthus rubescens</i>
Lesser Sand Plover	<i>Charadrius mongolus*</i>	Bohemian Waxwing	<i>Bombycillagarrulus</i>

Common Name	Scientific Name	Common Name	Scientific Name
(Mongolian Plover)			
Black Oystercatcher	<i>Haematopus bachmani</i>	Orange-crowned Warbler	<i>Vermivora celata</i>
Greater Yellowlegs	<i>Tringa melanoleuce</i>	Yellow-rumped Warbler	<i>Dendroica coronata</i>
Lesser Yellowlegs	<i>Tringa flavipes</i>	Townsend's Warbler	<i>Dendroica townesndi</i>
Wandering Tattler	<i>Heteroscelus incanus</i>	Blackpoll Warbler	<i>Dendroica striata</i>
Solitary Sandpiper	<i>Tringa solitaria</i>	Yellow Warbler	<i>Dendroica petechia</i>
Spotted Sandpiper	<i>Actitis macularius</i>	Wilson's Warbler	<i>Wilsonis pusilla</i>
Whimbrel	<i>Numenius phaeopus</i>	Northern Waterthrush	<i>Seiurus noveboracensis</i>
Bristle-thighed Curlew	<i>Numenius tahitiensis</i>	American Tree Sparrow	<i>Spizella arborea</i>
Black-tailed Godwit	<i>Limosa lapponica</i>	Fox Sparrow	<i>Passerella iliaca</i>
Hudsonian Godwit	<i>Limosa haemastica</i>	Savannah Sparrow	<i>Passerculus sandwichensis</i>
Black Turnstone	<i>Arenaria melanocephala</i>	Lincoln's Sparrow	<i>Melospiza lincolni</i>
Ruddy Turnstone	<i>Arenaria interpres</i>	Song Sparrow	<i>Melospiza melodia</i>
Surfbird	<i>Aphriza virgata</i>	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Rock Sandpiper	<i>Calidris ptilocnemis</i>	Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>
Red Knot	<i>Calidris canutus*</i>	Slate-colored Junco	<i>Junco hyemalis</i>
Sanderling	<i>Calidris alba*</i>	Lapland Longspur	<i>Calcarius lapponicus</i>
Dunlin	<i>Calidris alpine</i>	Snow Bunting	<i>Plectrophenax nivalis</i>
Semipalmated Sandpiper	<i>Calidris pusilla</i>	McKay's Bunting	<i>Plectrophenax hyperboreus*</i>
Western Sandpiper	<i>Calidris pusilla</i>	Rusty Blackbird	<i>Euphagus carolinus</i>
Least Sandpiper	<i>Calidris minutilla</i>	Red Crossbill	<i>Loxia curvirostra</i>
Baird's Sandpiper	<i>Calidris bairdii*</i>	White-winged Crossbill	<i>Loxia leucoptera</i>
Long-toed Stint	<i>Calidris subminuta*</i>	Pine Grosbeak	<i>Pinicola enucleator</i>
Red-necked Stint	<i>Calidris ruficollis*</i>	Pine Siskin	<i>Carduelis pinus</i>
Pectoral Sandpiper	<i>Calidris melanotos*</i>	Gray-crowned Rosy Finch	<i>Leucosticte tephrocotis</i>
Sharp-tailed Sandpiper	<i>Calidris acuminata*</i>	Common Redpoll	<i>Carduelis flammea</i>
Buff-breasted Sandpiper	<i>Tryngites subruficollis*</i>	Hoary Redpoll	<i>Carduelis homemanni</i>

Table 3.7. Table of Marine Invertebrate Species of Subsistence or Recreational Interest Present at Coastal Locations Potentially Present in the Bay Planning Area (ADF&G CPDB 2005, Mountaineers 1994, Foster 1991)

Common Name	Scientific Name	Common Name	Scientific Name
Nutclams	<i>Nucula tenuis</i>		<i>Clinocardium californiense</i>
	<i>Nuculana minuta</i>		<i>Serripes groenlandicus</i>
	<i>Nuculana permula</i>	Gapers and Surfclams	<i>Macromeris polynyma</i>
	<i>Nuculana radiate</i>	Razor Clams	<i>Siliqua alta</i>
	<i>Nuclana fossa</i>	Tellins and Macomas	<i>Tellina modesta</i>
Yoldias	<i>Yoldia scissurate</i>		<i>Tellina lutea</i>
	<i>Yoldia myalis</i>		<i>Macoma calcarea</i>
Mussels	<i>Mytilus edulis</i>		<i>Macoma oblique</i>
	<i>Musculus discors</i>		<i>Macoma middendorffi</i>
	<i>Musculus corrugatus</i>		<i>Macoma moesta</i>
	<i>Musculus olivaceus</i>		<i>Macoma lama</i>
	<i>Musculus niger</i>		<i>Macoma inquinata</i>
	<i>Modiolus modiolus</i>		<i>Macoma balthica</i>
Scallops	<i>Patinopecten caurinus</i>	Venus Clams	<i>Liocyma fluctuosa</i>
	<i>Chalmys rubida</i>	Butter Clams	<i>Saxidomus giganteus</i>
Jingles	<i>Pododesmus macroschisma</i>	Turtons	<i>Turtona minuta</i>
Axinopsids	<i>Axinopsida serricata</i>	Softshells	<i>Mya arenaria</i>
Diplodons	<i>Diplodonta aleutica</i>		<i>Mya pseudoarenaria</i>
Kellyclams	<i>Kellia suborbicularis</i>		<i>Mya truncate</i>
Mysellas and Montacutids	<i>Boreacola vadosus</i>	Hiatellas and Roughmyas	<i>Cyrtodaria kurriana</i>
	<i>Mysella tumida</i>		<i>Hiatella arctica</i>
	<i>Pseudopythina compressa</i>		<i>Panomya priapus</i>
Carditas	<i>Crassocardia crassidens</i>		<i>Panomya ample</i>
	<i>Cyclocardia ovata</i>		<i>Panomya arctica</i>
	<i>Cyclocardia crebricostata</i>	Piddocks	<i>Zirfaea pilsbryi</i>
Astartes	<i>Astarte esquimalti</i>		<i>Penitella penita</i>
	<i>Astarte alaskensis</i>	Shipworms	<i>Bankia setacea</i>
	<i>Astarte borealis</i>	Thracias	<i>Thracia myopsis</i>
	<i>Astarte montagui</i>	Lyonsias	<i>Lyonsia arenosa</i>
Cockles	<i>Clinocardium ciliatum</i>	Pandoras	<i>Pandora glacialis</i>
	<i>Clinocardium nuttalli</i>		

As well as BLM-administered lands, two National Wildlife Refuges, two National Parks and Preserves, four NPS-administered Wild and Scenic Rivers, three State parks and special habitat management areas and two Western Hemispheric Shorebird Reserve Network (WHSRN) special management habitat areas are also present in the Bay planning area.

A wide variety of wildlife species are found in southwestern Alaska. Only those species of wildlife considered important as a subsistence resource, economically important to the region, or otherwise high profile, will be covered specifically.

The Bristol Bay region where BLM unencumbered lands are located is dominated by four major watersheds, the Kvichak River, the Alagnak River, the Naknek River, and the Nushagak River drainages. The Kvichak River flows from Lake Iliamna to Kvichak Bay in a west-southwest direction. Major tributaries include the Alagnak River, Ole Creek, Levelock Creek, Ben Courtney Creek, and Kaskanak Creek (Figures 1.1, 3.22, 3.25 and 3.20).

The Alagnak River is located to the south of the Kvichak River, and drains into it just above Cape Horn and immediately before the Kvichak empties into Kvichak Bay. The Alagnak is a designated Wild River by Title VI, Section 601(25) and 603(44) of ANILCA, which preserves the upper 56 miles of the river in a free-flowing condition. It is administered by the National Park Service. It originates from upland streams that

feed into Kukaklek and Nonvianuk Lakes, located near the northwestern corner of Katmai National Park and Preserve.

The Nushagak River begins in the Nushagak Hills and flows generally southward to tidewater at the head of Nushagak Bay. The valley floor of the Nushagak River is an abandoned flood plain sloping southward and is dotted with hundreds of small lakes. Large tributaries of the Nushagak include the Nuyakuk, Wood, Snake, and Igushik rivers. According to current usage, the mouth of the Nushagak River is considered to be directly east of Dillingham and just south of the mouth of the Wood River. However, only from Black Point, about 20 miles to the southeast, does the river begin to maintain a continuous downstream current. Tides affect the Nushagak as far upstream as the Keefer Cutoff, approximately 43 miles above the mouth of the river, where the lowithla River flows into the Nushagak on its west side. Tidal waters, though having maxima of only 19 and 21 feet, respectively, at Clarks Point and Dillingham, pile up in the narrow waterways of the lower parts of the Wood and Nushagak Rivers and raise the water levels upstream several feet higher. The tidal currents are strong, the ebb bring the stronger on account of the current from the Nushagak and Wood Rivers (Mertie 1938).

The Nushagak is navigable at an average stage of water for small boats for more than 250 miles upstream (Mertie 1938). Other tributaries flowing into the Nushagak from the west include Koggiling Creek, Lower Klutuk Creek, the Mulchatna River, and Cranberry Creek. Tributaries entering the Nushagak from the east above the lowithla include Koklong Creek, Upper Klutuk Creek, and Napatoli Creek.

The Naknek River is the southeasternmost major river in the Bay planning area. Its headwaters are in the western mountains of the Aleutian Range. It flows westward from Naknek Lake and empties into Bristol Bay. The communities of King Salmon, Naknek, and South Naknek are located on its shores. BLM lands in this vicinity are all either State- or Native-selected and are not expected to return to BLM.

The blocks of BLM unencumbered land in the Bristol Bay region can be found in Game Management Units (GMUs) 9(B), 9(C), 17(B) and 17(C). Uniform Coding Units (UCUs) are smaller units within GMUs (Figures 3.19 a, b, and c).

Insert Figure 3.19a here (11x17 fold-in).

Insert Figures 3.19b here (11x17 fold-in).

Insert Figures 3.19c here (11x17 fold-in).

GMU 9(B) is located just west of Lake Iliamna, and is 2,004,000 mi². It is dominated by the Kvichak River and its tributaries, all three of which cross BLM-administered lands and provide drainage for them. Thousands of large and small shallow lakes and ponds dot the landscape and provide riparian habitat, summer water-dependent vegetative habitat, and tundra. BLM-administered lands in this GMU are nearest to the communities of Port Alsworth, Nondalton, Pedro Bay, Iliamna, Newhalen, Kokhanok, Igiugig, and Levelock.

A portion of GMU 9(C) is in the Bay planning area. In its entirety, 9(C) is 818,000 mi². Unencumbered BLM-administered lands in this GMU are located adjacent to the Alagnak Wild River on the south side of the river. To the east, elevations rise to as much as 2,085 feet asl at Sugarloaf Mountain. BLM lands in the area are drained by a large number of small streams that empty into the Alagnak River, and the entire area is interrupted by numerous large and small lakes. Vegetation is predominantly wet tundra. The southernmost extent of BLM lands crosses into the Naknek River drainage at the headwaters of deciduous brush-lined Pauls Creek. GMU 9(C) includes the communities of Naknek, King Salmon, and South Naknek.

GMU 17(B) is drained by the Nushagak and Mulchatna rivers, their tributaries, lakes and ponds. BLM-administered lands in this important GMU are limited to the southcentral portion of the unit near the community of Koliganek. This area is part of the extensive glacially defined Bristol Bay Plain. BLM-administered lands sit at elevations of from 200 to 600 feet asl, and are drained primarily by Klutuk Creek and other streams that empty into the Nushagak River. The rolling terrain has many kettle lakes, and is covered with wet tundra.

GMU 17(C) is contiguous to 17(B), extending southward and westward. It includes BLM-administered lands in the middle and lower Nushagak river drainage and its tributaries, nearest the communities of Koliganek, New Stuyahok, Ekwok, and Portage Creek. At a slightly greater distance, but still within their subsistence use areas, are the communities of Ekuk, Clarks Point, Dillingham, Aleknagik, and Manokotak. Many small lakes and ponds dominate the landscape in this region that is a continuation of the Bristol Bay Plain. To the north, north of the lowithla River, are the Muklung Hills. North of Dillingham and Aleknagik are the headwaters of the Wood River and the Wood-Tikchik lakes.

b) The Role of Fish and Wildlife Habitats in the Bay Planning Area

Salmon is the single most important subsistence food in the diets of Bay planning area residents in 25 communities, who practice a mixed subsistence-cash economy lifestyle based largely on traditional subsistence hunting and fishing and commercial fishing (ADF&G 2005a) (Figures 3.32 a, b, c, and d). Alaska's 2005 commercial exports to other countries were led by Alaskan seafood at 53% of the state's total exports. Southwest Alaska is the home to the most productive and well-managed fisheries in the world (SWAMC 2005). In a recent 5-year average from 2000 to 2004 of salmon harvests for selected Alaska commercial salmon fisheries, Bristol Bay, the Alaska Peninsula and the Aleutian Islands ranked a close second to Southeast Alaska and Yakutat. During this period, Bristol Bay, the Alaska Peninsula, and the Aleutian Islands brought in 153,057,263 pounds of salmon worth \$69,765,000, or 30% of the total value of the state fishery (Woodby et al. 2005).

This page intentionally left blank

Insert Figures 3.32 a here (11x17 fold-in).

Insert Figures 3.32 b here (11x17 fold-in).

Insert Figures 3.32 c here (11x17 fold-in).

Insert Figures 3.32 d here (11x17 fold-in).

The Bristol Bay commercial salmon district provided a harvest of approximately 26 million salmon of all kinds in 2005, at a value of over \$93,000,000. The 1985-2004 average sockeye salmon harvest for the Naknek-Kvichak district was 7,800,000 fish, or approximately 33% of the total sockeye take in all of the Bristol Bay districts, and the average sockeye salmon harvest for the Nushagak district for the same time period was 4,000,000 fish or 17% of the total. The 2005 Naknek-Kvichak district harvest was slightly less than average at 6,700,000 sockeye, and the Nushagak district harvest was more at 7,100,000 sockeye (ADF&G 2005c).

In addition to subsistence and commercial use of fish in the region, in 2004 there were 140 registered freshwater fishing guides on Bristol Bay freshwater streams and lakes, according to the Alaska Department of Fish and Game (ADF&G 2004). Recreational angler effort in this region has risen steadily from 1977 to the present. In 1995, angler effort in the South West Management Area was 4.6% of the total angling effort in Alaska (Minard et al. 1998 with references). Sockeye, Chinook and coho salmon are the most frequently harvested species, followed by Dolly Varden/Arctic char, rainbow trout, and Arctic grayling. Recreational fisheries in Southwest Alaska provide the angler with a unique combination of high quality salmon and rainbow trout fishing in a pristine wild and roadless setting. In 1997 the sport fishery was estimated at over \$50,000,000 (Minard et al. 1998).

The State's Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes - Southwestern Region lists many of the streams and rivers that cross BLM lands in the Bay planning area (Johnson et al. 2004). In order to hatch and grow, fish require healthy watersheds, and BLM unencumbered lands in Bristol Bay are central to these important drainages.

In addition to their commercial value, in completing their life cycles anadromous fish bring back nutrients and deposit them in the terrestrial environment. Salmon are a keystone species in vertebrate communities (Willson and Halupka 1995). Salmon feeding in the ocean put on approximately 90% of their body weight there, incorporating and accumulating nutrients from the marine environment in their body tissues (Finney et al. 2000). A massive movement of marine-derived nutrients then occurs from ocean to freshwater and terrestrial ecosystems via their migrations (Levy 1997). After spawning, salmon die and their carcasses fertilize the freshwater systems with marine-derived nutrients which are important nutrient sources for riparian vegetation and terrestrial fauna such as bears, wolves, birds, and small mammals (Juday et al. 1932; Willson et al. 1998; Cederholm et al. 1999). "Anadromous salmon provide a rich, seasonal food resource that affects the ecology of terrestrial and aquatic consumers, and indirectly affects the entire food-web that knits the water and land together" (Cederholm et al. 2000).

Caribou are second in importance only to salmon in the subsistence diets of the residents of the Bay planning area (ADF&G 2005a). They are also important to hunters from other regions of Alaska and to guided and unguided hunters from outside of Alaska. According to ADF&G Harvest records for caribou from 1983-2002, Game Management Units (GMUs) 9 and 17 provided approximately 25% of all caribou harvested in the state. This is an impressive number for a largely roadless area. Unencumbered BLM lands in the planning area provide prime caribou habitat and comprise a small but vital portion of these GMUs (Figure 3.12).

This page intentionally left blank

Insert Figure 3.12 here (11x17 fold-in).

Insert Figure 3.13 here (11x17 fold-in).

The Bristol Bay region has in the past decades experienced the expansion and more recent decline of the Mulchatna Caribou Herd (MCH). It has provided seasonal habitats, and the entire BLM block is important caribou habitat over the long term. The area has in various years provided winter range, calving aggregations and post-calving aggregation habitats for caribou (Hinkes et al. 2005).

The most significant wintering area for the MCH during the 1980s and early 1990s was along the west side of Iliamna Lake north and west of the Kvichak River, including the areas of BLM unencumbered lands there. More recently, the MCH has wintered scattered throughout its expanded range due to overgrazing of the traditional winter range areas (Woolington 2003).

Since 1993, the MCH has shifted its core calving grounds to an area near unencumbered BLM lands on the upper Nushagak and Mulchatna Rivers (Hinkes et al. 2005; Woolington 2003). The MCH does not move as one body, as a distinct herd. It is not predictable as to being in particular places at definite times. Biologists have noted, however, that a trend has been established in recent years. Most of the herd moves to the western side of its range during the fall, back to the middle part of its range for calving, into the upper Mulchatna River drainage for postcalving aggregations, widely dispersed throughout its range in late summer, after which it forms into large groups to once again move westward in fall (Woolington 2003). Study of the MCH distribution map in relation to unencumbered BLM lands places the MCH squarely (but not exclusively) on BLM unencumbered lands in the western Iliamna-Kvichak-Nushagak-Mulchatna watersheds for much if not for all of the year (Hinkes et al. 2005) (Figures 3.12 and 3.13).

Moose run a close third in importance in the subsistence diets of Bay planning area residents, although moose are relative newcomers to the region and may not yet have populated all available habitat (ADF&G 2005a). ADF&G Harvest records between 1983 and 2002 indicate that Game Management Units 9 and 17 provided 7% of the total moose harvest in Alaska (ADF&G 2004). Moose hunting in this region by hunters from outside of Alaska provides an exceptional setting for those seeking a remote fly-in or boat-in experience and a trophy harvest. The entire Kvichak-Iliamna-Alagnak BLM land block is important moose habitat. Although many riparian areas along rivers and streams lie outside BLM unencumbered lands, nevertheless BLM lands in this block also provide winter, calving and breeding habitat as well as providing for yearlong and migratory movements to and from seasonal ranges (Figures 3.14 and 3.15). Both riparian and wetlands vegetation types are important for moose. During fall and winter, moose eat large quantities of willow, birch, and aspen twigs, which draw them to the riparian zones. Spring is a time when moose graze as well as browse, and they take advantage of sedges, horsetail, pond weeds, and grasses. During summer moose rely on vegetation in the many shallow ponds, including those on BLM lands in this block, also eating forbs, and birch, willow and aspen leaves (Rausch and Gasaway 1994) (Figures 3.14 and 3.15).

This page intentionally left blank

Insert Figure 3.14 here (11x17 fold-in).

Insert Figures 3.15 here (11x17 fold-in).

Insert Figure 3.16 here (11x17 fold-in).

Brown bears are found throughout the planning area, and are sought after by trophy hunters and occasionally by subsistence hunters (Figure 3.16). Game Management Units 9 and 17 together produced 25% of the state's brown bear harvest during the reporting period (ADF&G 2004). As with moose, non-Alaska resident hunters seek a remote hunting experience and a trophy harvest (Figure 3.16).

Records of the numbers of caribou, moose, and brown bears taken specifically on BLM-administered lands from year to year are not kept. Patterns of use for humans and animals can shift over time. Examples of such shifts in the Bay planning area include the long-term changes in patterns of widespread range use that the Mulchatna caribou display, and the fact that not all prime moose habitat may currently be utilized. Alaska Department of Fish and Game Community Profile Database and Harvest Records (ADF&G 2004b) are the primary source for the following discussion. Information about General Management Units and Uniform Coding Units have been included as a means to orient the reader to the location of the discussion within the planning block(s) and to link the information to its source.

c) Wildlife and Wildlife Habitat Relative to Specific BLM Unencumbered Lands in the Bay Planning Area

(1) Iliamna Block (6 blocks) (Portions of GMU 9(B); UCUs 0202, 0203, 0301, 0303, 0701)(Portion of GMU 9(C); UCU 0701)(Figure 3.2).

The Iliamna area is mountainous terrain which includes glaciers and ice fields of the Neacola, Aleutian, and Chigmit Mountains to the northeast of Iliamna Lake, with alpine tundra giving way as elevation decreases to dense tall willow and alder shrub thickets, coniferous and mixed conifer/deciduous forested glacially carved river valleys and rounded bedrock hills. Large, deep glacially carved lakes are scattered throughout the glacier scoured bedrock hills. Iliamna Lake and Lake Clark are examples of the very large glacially carved lakes that dominate the region.

The BLM lands that lie west and south of the communities of Iliamna, Iguigig and Kokhanok are dominated by terminal moraines that reflect the succession of major glacial periods since the early Pleistocene (Biekman 1980). The youngest of these moraine features occurs in a wide arc within 20-25 miles of the lower portions of Iliamna Lake and is a terrace of repeating small broken terminal moraines deposited as the last glaciers receded (Biekman 1980). Conifer timber consisting of black spruce in bogs with hundreds of lakes and associated narrow riparian shorelines, patchy deciduous forest on well-drained sites and wet tundra wetlands dominate the habitats found here (USDI BLM 1994). This moraine is drained by Kaskanak, Ole, and Ben Courtney Creeks, all of which flow into the Kvichak River that is the outlet of Iliamna Lake (Figures 3.20 and 3.21). South of the Iliamna block, the Alagnak River, locally known as the Branch River, flows around the southern boundary of this most recent moraine complex (Figure 1.2). This morainal area is a transition zone between the habitats of tundra and trumpeter swan population distributions. Trumpeter swans are a Special Status Species.

The substantial salmon fishery resources in this area and the large lakes provide for high densities of brown bear. Bears can be found everywhere in the planning area, predictably near the most abundant resources available at the time. In spring caribou and moose calves attract them, and in summer they congregate on salmon streams, following the salmon upriver into tributary streams. They are opportunistic omnivores and they range widely.



Figure 3.20 Kaskanak Creek, Northwest Iliamna Block. View North.



Figure 3.21. Tundra Lake on BLM Lands West of Lake Iliamna.



Figure 3.22. Ole Creek, Southwest Iliamna Block.

Kaskanak Creek crosses and provides drainage for BLM-administered lands (Figure 3.20). BLM blocks of land are dotted with thousands of large and small shallow lakes and ponds that provide moisture for riparian habitat, summer water-dependent vegetative habitat, and tundra (Figure 3.21).

Residents of the communities of Pedro Bay, Port Alsworth, Aleknagik, Dillingham, Ekwok, Igiugig, Iliamna, Kokhanok, Levelock, Manokotak, Nondalton, and New Stuyahok use BLM lands in the Iliamna Block for a wide variety of subsistence hunting and gathering activities during their yearly round of seasonal activities (Wright et al. 1985; Morris 1983, 1985, 1986, 1991; Endter-Wada and Levine n.d.; Fall et al. 1986; Chythlook and Fall 1988; Schichnes and Chythlook 1985; ADF&G 2004b) (Appendix D).

- Nondalton (Iliamna East) - trapping, hunting black bear, moose, and caribou
- Pedro Bay (Iliamna East) - hunting brown bear, moose, and sheep
- Port Alsworth (Iliamna East) - gathering berries, hunting moose, caribou, black bear, waterfowl
- Iliamna (Iliamna East and West) - hunting caribou, moose, waterfowl, and trapping
- Igiugig (Iliamna East) - hunting moose, caribou, waterfowl, and trapping

In Game Management Unit 9(B), UCUs 0202 and 0203 include two large blocks of BLM unencumbered land located immediately west of Lake Iliamna. Except for one, the BLM Special Use Permit holders in this area have operations on either Native-selected or State-selected BLM lands in the Lake Iliamna area (Figures 3.2 and 3.23).



Figure 3.23. Chekok Creek, View North East. BLM lands in the background are in GMU 9(B) UCU 0303.

A smaller block of BLM unencumbered land is located in Iliamna East in UCU 0303, on the northeast side of Lake Iliamna on Chekok Creek (Figure 3.2). UCU 0303 comprises only 206 mi², of which 10% is BLM unencumbered lands, located in the Chekok Creek drainage (Figure 3.23). One of six Special Use Permit guides maintains a camp on BLM unencumbered lands in this UCU, which is accessed by aircraft for hunting caribou, moose, and brown bear. However, there is also some use of boats for hunting brown bear. Six percent of all brown bears harvested in GMU 9(B) during the reporting period 1983 - 2002, were harvested in UCU 0303. The majority of them were taken by hunters from outside of Alaska. This region is known for trophy bear hunting opportunities. Subsistence hunting for brown bear in this region does not usually take place every year, but is more likely to occur once every several years. The only GMU 9(B) community recorded as having hunted brown bear in this UCU is Iliamna.

These three UCUs are second in importance for moose harvests in GMU 9(B) for the reporting period from 1983 - 2002. UCUs 0202 and 0203 vary in size from 463 mi² to 580 mi², and each is comprised of between 34% and 39% BLM unencumbered lands. Over half of the hunters have been from out of state in the southern UCU, and from outside of the region in Alaska for the northern UCU. Approximately 9% of moose hunters in these UCUs are local residents of the communities of Igiugig, Iliamna, King Salmon, Naknek, South Naknek and Pedro Bay. Moose harvest in this area was declining through 2002. Approximately $\frac{3}{4}$ of moose hunters are accessing UCU 0202 by aircraft and $\frac{1}{4}$ by boat. Moose hunters are accessing UCU 0203 primarily by boat, closely followed by fly-ins.

In East Iliamna one or two hunters from out of state have been consistently present to hunt moose. In addition, Alaskans from outside the region hunted moose in this area. Until 1999 residents of this GMU were also hunting moose in the Chekok Creek area. The local moose hunters are residents of Iliamna and Port Alsworth. In addition, subsistence use area map data gathered in 1982 for Pedro Bay suggest that members of that community subsistence hunt Dall sheep on BLM unencumbered lands in the Chekok Creek drainage, along with moose and brown bear (Morris 1986). There are no ADF&G Harvest records

further documenting sheep hunting in UCU 0303. However, the fact that Dall sheep have been hunted in this area by Pedro Bay residents was also reported to McClenahan by community members in the 1990s (McClenahan 2004, Pers. Comm.). Harvest records indicate that the Unit 9(B) communities of Iliamna, Nondalton, and Port Alsworth and the Unit 9(C) communities of King Salmon and Naknek hunt sheep in Unit 9(B). It is possible, if not recorded, that these communities have also used UCU 0303 to hunt sheep in the past (Figure 3.17).

This page intentionally left blank.

Insert Figure 3.17 here (11x17 fold-in).

The southern portion of the West Iliamna blocks were second in importance for caribou harvest between 1983 and 2002. Over half were taken by non-local Alaska residents. Over one-quarter were harvested in the southern portion of the block by local subsistence hunters from residents of Igiugig, Kokhanok, King Salmon, Naknek, and South Naknek. A lesser number of hunters from out of state were harvesting in the northern part of the block. The general trend for caribou harvests in the northern portion is downward as of 2002. The overall trend for hunters from outside of this region hunting in the southern portion seems to be declining, while attempts by local subsistence users appeared to be increasing as of 2002 in the southern portion. At the same time, the numbers of animals in the Northern Alaska Peninsula Caribou Herd nearest to the Unit 9(C) communities have been in serious decline, precluding much opportunity to hunt them. Caribou hunters are hunting caribou in this area primarily using aircraft, with some use of boats.

A small but significant part of the southwesternmost portion of the Iliamna blocks is within GMU 9(C) UCUs 0701 and 0703. This area is to the north of the Alagnak River drainage, and is discussed under the Alagnak Block.

A small isolated piece of BLM unencumbered land that makes up less than 2% of 808 mi² UCU 0301 is located in the northernmost corner of the Iliamna Block at the Chulitna River (Figure 3.2). Another small isolated piece of land is located south of Lake Iliamna near Gibraltar Lake where it makes up less than 1% of 761 mi² UCU 0701 (Figure 3.2). Due to their size they will not be detailed here.

(2) Alagnak Block (2 blocks) (portions of GMU 9(C) in UCUs 0701 and 0703)(Figure 3.1.)

The Alagnak Blocks of BLM unencumbered lands lie in a strategic and picturesque region east of Kvichak Bay and south of the Alagnak River (Figure 3.1). Residents of the communities of King Salmon, Naknek, South Naknek, Egegik, Levelock, and Kokhanok use BLM lands in this block for a wide variety of subsistence pursuits during their annual round of seasonal subsistence activities (Wright et al. 1985; Morris 1983; Wright, Morris, and Schroeder 1983; Krieg et al. 1996; Endter-Wada and Levine n.d.; Fall et al. 1988; Chythlook and Fall 1988; Schichnes and Chythlook 1985; ADF&G 2004b) (Appendix B).

- Levelock - hunting caribou, moose, waterfowl, trapping, and gathering vegetation
- King Salmon - hunting moose and trapping
- Naknek - hunting moose and caribou and trapping
- South Naknek - hunting moose, caribou, and waterfowl and gathering vegetation

Hunters hunting in these UCUs access them primarily by aircraft for moose, caribou, and brown bear hunting, except for caribou in UCU 0701, where snowmachines and 4 wheelers are the principal modes of transportation. A small number of boats are used in both UCUs for moose hunting, and in UCU 0701 for brown bear hunting.



Figure 3.24. Coffee Creek.

UCU 0701 is 598 mi² and is 50% BLM unencumbered lands adjacent to the Alagnak River. UCU 0703 is 478 mi² and contains 4% BLM unencumbered lands adjacent to the Alagnak River. This portion of GMU 9(C) has been a moderately productive area for moose during the reporting period from 1983 - 2002, particularly the westernmost block. However, harvests have declined since peaks between 1990 and 1994. The majority of hunters trying to harvest moose in this portion of the block since 1990 have been subsistence users, residents primarily of the GMU 9(C) communities of King Salmon, Naknek, and South Naknek, but also several residents of the GMU 9(B) communities of Kokhanok, Igiugig and Levelock, the Unit 9(D) community of Cold Bay, and the Unit 9(E) community of Chignik. Subsistence hunters have been less consistent in their use of the eastern portion of area, but their efforts picked up between 1988 and 2002. Nonresident moose hunting has been four nonresident hunters per year attempting to harvest, declining in recent years. The remainder, Alaska resident hunters from outside of the region, is made up of one or two hunters per year between 1999 and 2002.

Caribou harvests in the area of the western portion of this block were robust in 1992, 1993, and 1998. However, the numbers of caribou harvested in the area have been declining since the 1990s. The hunters most actively seeking to harvest caribou in this area are the Unit 9(C) residents of King Salmon and Naknek, followed by Alaska residents from other GMUs. Only since 1999 have hunters from outside of Alaska attempted to harvest caribou here, up to 15 per year in the eastern portion. Hunting effort has been declining.

Harvest of brown bears has been strongest in the eastern portion of the area, primarily by hunters from outside of Alaska, and harvest effort is increasing. Since 1997, the majority of hunters in the western portion of the area have been residents of GMUs 9(B) and 9(C), from the communities of Iliamna, Levelock, King Salmon, and Naknek. Subsistence hunters do not take bears every year, but may once every several years. Bear fat is greatly appreciated, particularly by the Elders, and is shared throughout a broad sharing network.

(3) Kvichak blocks (8 blocks) (portions of GMU 9(B) in UCU 0201, 0202 and 0203)(Figure 3.1)

These smaller but very important blocks of BLM unencumbered lands are most proximate to the Kvichak River, but for the most part are not located immediately on the river. The two next-to-most northern pieces of land in this block are crossed by Ben Courtney Creek. The area consists of rolling tundra-covered hills and open spruce parklands, with wide floodplains vegetated with wet tundra, grasses, and deciduous brush (Figures 3.25 and 3.26).

The following Bay area communities use BLM lands in the Kvichak Block for several subsistence pursuits (Morris 1983; Endter-Wada and Levine 1992; Fall et al. 1984; Wolfe et al. 1984; ADF&G 2004b) (Appendix D).

- Iliamna - hunting moose and waterfowl, trapping, gathering vegetation
- Igiugig - trapping, hunting waterfowl, caribou, and moose
- Dillingham - hunting caribou and moose

Portions of the 554 mi² GMU 9(B) UCU 0201 are located in the Kvichak Blocks as well as the Yellow Creek Block of BLM unencumbered land. The BLM unencumbered blocks taken together comprise 32 percent of the UCU, with the Kvichak blocks being smaller than the Yellow Creek block. The two Kvichak blocks are located in the southwestern portion of this UCU. A complete description of the moose harvest in this UCU is provided under the heading, "Yellow Creek Block," below, and will not be repeated here. Bear Creek crosses the southwesternmost piece of land in this block (Figure 1.4).



Figure 3.25. Confluence of Branches of Ben Courtney Creek.



Figure 3.26. Headwaters of Ben Courtney Creek.

Portions of UCU 0202 contain two blocks in the southeastern portion of unencumbered BLM land in the Kvichak Block. Since portions of UCU 0202 are also located in the Iliamna Block, the activities in this UCU will not be repeated here.

UCU 0203 contains the northernmost four small blocks within the Kvichak Block. Since a portion of the Iliamna Block is also within UCU 0203 and has already been discussed in that section, the reader is referred to the Iliamna Block discussion for details. Some of these more northerly Kvichak blocks are more likely to be vegetated by the substantial riparian areas of the Kvichak River and the confluences of its major tributaries than are the southern blocks, which are somewhat removed from the river banks. That would suggest a higher probability of moose concentrations as well as a greater chance that boat-traveling moose hunters would harvest moose on these BLM lands during the times of the year that moose are on the river utilizing the riparian areas.

(4) Yellow Creek Block (one block of unencumbered land) (portions of GMU 9(B) in UCU 0201 and GMU 17(C) in UCUs 0901 and 0501)(Figure 3.27).

The Yellow Creek Block is located in a relatively flat, slightly elevated area of the Bristol Bay Plain between the Nushagak and Kvichak River drainages. The area is dominated by thousands of large and small kettle lakes and small drainages. Yellow Creek, one of the most prominent tributaries of the Kvichak River, drains the eastern portion of this piece of BLM land in a southeasterly direction (Figure 3.27). In the western portion, the land is drained by Klutuk Creek and other small creeks that flow to the west and empty into the Nushagak River. Copses of spruce dot the landscape, which is dominated by wet tundra. The lakes and drainages support mixed deciduous growth (Figures 3.29 and 3.30).

Residents of the communities of New Stuyahok, Manokotak, Levelock, Kokhanok, Iliamna, Igiugig, Ekwok, Dillingham, and Platinum use the Yellow Creek Block of BLM lands to carry out a wide variety of subsistence activities during their yearly round. The following communities use the Yellow Creek Block

for the following subsistence purposes (Morris 1983, 1991; Schichnes et al. 1990; Schichnes and Chythlook 1987; Wolfe et al 1987; Wright et al 1987; Fall et al. 1984; ADF&G 2004b) (Appendix B).

- Iliamna - trapping
- Aleknagik - hunting caribou
- Ekwok - hunting caribou and moose
- Dillingham - trapping and gathering wild vegetables
- Platinum - hunting caribou



Figure 3.27. Upper Yellow Creek , View North West.

Yellow Creek block is located in the UCUs that are the most significant for harvesting moose of all those containing BLM unencumbered blocks in the Bay planning area. In GMU 9(B) UCU 0201 is 32% BLM unencumbered land in this 554 mi² area. GMU 17(C) UCU 0501 is 1326 mi² and includes 26% BLM unencumbered land, and UCU 0901 is 505 mi² and is 40% BLM unencumbered land. Yellow Creek block shares UCUs 0801 and 0901 with Klutuk Block.

Fifty-four percent of moose hunters in the northern part of the area were subsistence users, local residents from Igiugig and Levelock in GMU 9(B), and from King Salmon, Naknek, and South Naknek in GMU 9(C). Seventeen percent were non-local Alaska residents, and 27% were non-residents, making this area important for resident hunting for nearby villages, but also somewhat important for guided and non-guided hunting by hunters from outside of Alaska. Moose hunters access this area primarily by boat, with some use of aircraft.

Between 1983-2002, 829 moose were harvested from UCU 0501. Hunting in the western portion of this area steadily increased during the reporting period between 1983 and 2002. Between 1983 and 1989, between 9 and 20 moose were harvested annually; between 1990 and 1995 annual harvest numbers were from between 13 and 46 animals. Between 1996 and 2002, annual moose harvest numbers were between 34 and 105 animals, with the greatest numbers falling in 2001 and 2002. Hunters from outside of Alaska have played a very small role in harvests in this area, and have made no effort since 1994. Residents of GMU 17(C) communities Aleknagik, Clarks Point, Dillingham, Ekwok, Manokotak, New Stuyahok, and Portage Creek were the principal harvesters. Other GMU 9 and 17 communities harvesting in this area are King Salmon, Koliganek, Naknek, Pilot Point, Port Moller, and Togiak. The remainder are Alaska residents from outside of the region. Moose, caribou, and brown bear hunters access this area with a mix of boats, snowmachines, and aircraft.

The northern area is also very important for the residents of GMU 17, who accounted for 74% of the hunters attempting to harvest moose, and for 78% of the moose harvested during the reporting period 1983 - 2002. Residents of GMU 17(C) communities included those from Dillingham, Clarks Point, Ekwok, and New Stuyahok, from the 17(B) community of Koliganek, and the 17(A) community of Togiak. Hunters from outside of Alaska accounted for 6% of those hunting for moose in this area, and for 7% of the moose harvested during the reporting period. The remainder were Alaska residents from outside of the region. Moose harvests peaked in this UCU in the late 1990s and have been declining. Moose hunters access this area using boats, snowmachines, and aircraft.

Caribou hunters in the western part of this unit were successful during the reporting period 1983 - 2002, but harvest numbers declined to 19 animals in 2002. Leading in harvest are the residents of the GMU 17(C) communities of Aleknagik, Clarks Point, Dillingham, Ekwok and Portage Creek. Other GMU 9, 17, and 18 communities harvesting in this area are Chevak, King Cove, and Koliganek. Hunters from outside of Alaska account for only 19% of the harvest for the reporting years. The northern portion of this planning block lies in an area where hunters have also been very successful. This portion and the equally promising western section are discussed in the "Klutuk Creek" section, below.

Only 15 brown bears were harvested in the western portion during the reporting period 1972-1999, four of them by hunters from outside of Alaska and the rest (where the residency is known) by residents of the GMU 17(C) community of Dillingham. Hunting effort has remained at one or two hunters per year during the reporting period. Hunting success in the other areas were roughly similar during the reporting period.

(5) Koggiling Creek Block (portions of GMU 9(B) in UCU 0101 and portions of GMU 17(C) in UCU 0501 (Figure 3.28).

As one proceeds west across the Nushagak River to the Koliganek area, and southward to the shores of Bristol Bay, the character of the habitat changes to older, more eroded moraines that are more gently rolling terrain and lowlands dominated by wet tundra, small patches of deciduous and mixed forest and once again thousands of large and small lakes with their associated riparian shorelines (Figure 3.28). The Koggiling Creek Block, like the Yellow Creek Block, is situated at the juncture of the Nushagak and Kvichak river drainages. The block is drained to the east by King Salmon Creek and Copenhagen Creek, which flow into the upper reaches of Kvichak Bay, and to the west by Koggiling Creek which flows into the Nushagak River to the north of Keefer Cutoff (Figure 3.28). The western portion of this area transitions to spruce woodland as one travels west toward Wood-Tikchik lakes. This region hosts high-density tundra swan nesting populations, and is one of the five high productivity waterfowl production areas in Alaska (USFWS 2005). The communities of New Stuyahok, Levelock, Dillingham, and Naknek use BLM lands in the Koggiling Creek Block for a variety of subsistence activities (ADF&G 2004). The following communities use these BLM lands for the following subsistence resources (Schichnes and Chythlook 1991; Wolfe et al. 1983; Wright et al. 1985; Fall et al. 1984; Wolfe et al. 1983; Morris 1985; Krieg et al. 1998; ADF&G 2004a) (Appendix D).

- New Stuyahok - caribou and waterfowl hunting, trapping
- Dillingham - trapping
- Naknek - hunting waterfowl

Activities in GMU 9(B) UCU 0101 are discussed in detail under the Yellow Creek and Klutuk Creek Blocks, and will not be repeated here. Hunters access this area to hunt caribou and brown bear using aircraft, and moose using a mix of boats and some aircraft. In the southern portion, hunters use a mix of boats, snowmachines, and aircraft to hunt moose, caribou and brown bear.



Figure 3.28. King Salmon Creek.

(6) Klutuk Creek Block (Two blocks) (portions of GMU 17(B) in UCU0101 and GMU 17(C) in UCUs 0801 and 0901 (Figures 3.29 and 3.30).

BLM unencumbered lands in the Klutuk Creek Block are also part of an older glacially formed landscape of more eroded moraines and gently undulating terrain of wet tundra-dominated lowlands, copses of spruce, and fewer large and small lakes and ponds than are found in the Yellow Creek Block. As one proceeds westward, the size of the trees and the density of the spruce forests and mixed deciduous forests increase. The larger block of BLM land is drained to the southwest into the Nushagak River most prominently by Klutuk Creek (Figures 3.29 and 3.30). The smaller block, situated to the southwest, sits adjacent to the Kakwok River and one of its main tributaries, which also flows into the Nushagak River. The residents of the communities of New Stuyahok, Manokotak, Ekwok, and Dillingham use the Klutuk Block of BLM lands for a wide variety of subsistence resources in their annual round of seasonal subsistence activities (Chichnes and Chythlook 1987; Wolfe et al. 1987; Wright et al. 1987; ADF&G 2004b) (Appendix B).

ADF&G Subsistence Division subsistence use area maps drawn up in the 1980s and 1990s indicate that the following communities were utilizing the following subsistence resources on BLM lands:

- Ekwok - caribou and moose hunting
- Aleknagik - caribou hunting
- Dillingham - caribou and moose hunting



Figure 3.29. Klutuk Creek.

BLM-administered unencumbered lands in the important GMU 17(B) are limited to the southcentral part of the GMU, to a portion of UCU 0101, near the community of Koliganek. This UCU comprises 454 mi² and is made up of 31% BLM unencumbered lands. In the western portion of this block and in surrounding lands, GMU 17(C) 0801 is 198 mi² and is 29% BLM unencumbered land. In the southeast portion of the block and surrounding lands, GMU 17(C) 0901 is 505 mi² and contains 40% BLM unencumbered lands.

During the reporting period 1983-2002, the northern area provided a good moose harvest. The overall moose harvest trend has been upward since 1983; the number of moose harvested per year between 1995 and 2002 doubled, or in a few cases more than doubled the number taken per year between 19983 and 1994. This northern area is important to local residents, who took 55% of the moose reported harvested there. Hunters from the GMU 17(C) communities of Dillingham, New Stuyahok, and Ekwok, the 17(B) community of Koliganek, the 17(A) community of Togiak, and the 9(C) community of King Salmon hunted for moose in this area. It is also important to guided and nonguided hunters from outside of Alaska, who harvested 29% of the moose taken in this area. 11% were taken by Alaska residents from outside this region. Moose hunters use aircraft and boats to hunt moose in this area, as well as some snowmachines.

Caribou hunting in this northern area was the best of all areas where BLM unencumbered lands are located in the Bay planning area for the reporting period 1998-2002. The nonresident hunter numbers trying were consistently larger than those of Alaska residents, with nonresident numbers declining from a high in 1999. The second highest number of caribou hunters in this area was Alaska residents from outside the region. GMU 9 and 17 residents accounted for the smallest number of hunters hunting in this area, with a marked increase in 2002. They were from the GMU 17(B) community of Koliganek, the 17(C)

community of New Stuyahok, the 17(A) community of Togiak, the 9(C) community of King Salmon, and the 9(D) community of King Cove. Residents of the lower Alaska Peninsula communities sometimes subsistence hunt and fish in Bristol Bay when they are present on breaks during the commercial fishing season. Caribou hunters primarily use aircraft for access in this area, followed by boats, four-wheelers, and snowmachines.

During the reporting period 1984 - 2001 only 9 brown bears were harvested in this northern area. Hunters were fairly balanced among hunters from outside of Alaska, Alaska residents from outside of the region, and residents of GMU 17 (Dillingham and Koliganek). Bear hunters primarily use aircraft to access this area; however, some use boats and snowmachines.

In the western portion of this area, a total of 160 moose were reported harvested during the reporting period 1983-2002, with 333 hunters attempting to harvest during the same period. Only a very small number of hunters from outside of Alaska attempted to hunt moose in the western area during the reporting period. Rather, this is most important for moose hunters from the Bristol Bay region, for the GMU 17(C) communities of Dillingham, Aleknagik, Ekwok, Manokotak and New Stuyahok, the 17(B) community of Koliganek, the 9(B) community of Pedro Bay, and the 9(C) community of King Salmon. Hunters from these communities harvested 73% of all the moose taken in this area during the reporting period. Moose are primarily hunted by accessing the area by boat, followed by snowmachines and aircraft.

The western area is also good for harvesting caribou. During the reporting period 1998-2002, 51% of hunters were from outside of Alaska, 37% were residents of the Bristol Bay region, and only 12% were Alaska residents from outside of the region. Local communities harvesting in this area include the GMU 17(C) communities of Dillingham, Ekwok, and New Stuyahok, the 17(B) community of Koliganek, and the 9(C) community of King Salmon. Caribou harvest trends in this western area have been downward since 1998. Access to this UCU for caribou hunting is primarily by aircraft, with some use of boats, 4 wheelers, and snowmachines.

During the reporting period 1985-2001 only a few bears were harvested in the western area, three by residents from outside of Alaska, and two by GMU 17(C) residents of Ekwok and New Stuyahok. The residency of the remainder of hunters is not known. Bear hunting has remained consistent at one or two bears harvested a year in this area. Access for bear hunting occurs using aircraft and boats.

The southeast area has also been good for moose harvesting. However, nearly twice as many hunters attempted to harvest than were actually able to harvest a moose during the reporting period 1983 - 2002. This southeast area is very important for the residents of GMU 17, who accounted for 74% of the hunters attempting to harvest moose, and for 78% of the moose harvested. Residents of GMU 17(C) communities included those from Dillingham, Clarks Point, Ekwok, and New Stuyahok, from the 17(B) community of Koliganek, and the 17(A) community of Togiak. Hunters from outside of Alaska accounted for 6% of those hunting for moose in this area, and for 7% of the moose harvested during the reporting period. The remainder were Alaska residents from outside of the region. Moose harvests peaked in this area in the late 1990s and have been declining. Moose hunters access this area using boats, snowmachines, and aircraft.

Caribou hunting effort and the 300 caribou harvested in the southeast area during the reporting period from 1998 to 2002 are fairly evenly divided among nonresidents, Alaska residents from outside of the region, and local residents. Hunters from outside of Alaska accounted for 37% of hunters trying for caribou in this area, and for 40% of the caribou harvested. Residents of GMUs 9 and 17 accounted for 32% of hunters attempting to harvest, and for 30% of the caribou harvested during the reporting period. The remainder are accounted for by Alaska residents from outside the region. The GMU 17(C) communities of Aleknagik, Dillingham, Ekwok, Manokotak, and New Stuyahok used the southeast area during this period, as did the 17(B) community Koliganek, the 9(C) communities of King Salmon and Naknek, and the 9(B) community Port Alsworth. The greatest majority of caribou hunters access the area by using aircraft, but a few use snowmachines, boats, and 4-wheelers.

Hunters from outside of Alaska accounted for the harvest of the majority of the brown bears harvested in the southeast area during the reporting period from 1990 to 1997. No harvests by residents of the Bristol Bay region were reported during this period. Bear harvests in this area dropped off after 1994. Access for brown bear hunting is by aircraft.



Figure 3.30 . Klutuk Creek in regional perspective.

Only a very small portion of GMU 18, and all of the unencumbered BLM-administered land lies within the westernmost part of the Bay planning area. The communities closest to BLM-administered lands in this region are Goodnews Bay, Platinum, Quinhagak, Togiak and Twin Hills, and these are the communities primarily using BLM lands in this block for a wide variety of subsistence resources during the yearly round of seasonal subsistence activities (ADF&G 2004). ADF&G Subsistence Division subsistence use area maps gathered in the 1980s and 1990s indicate that the community of Platinum was using BLM lands in the Goodnews Block for hunting waterfowl, trapping, and gathering plants.

(7) Goodnews Bay Block (GMU 18; UCUs 1701 and 1801)(Figures 1.3, 3.3 and 3.31)

The Goodnews block lies on Alaska's west coast and is surrounded by the Togiak National Wildlife Refuge. Habitats are varied, and include beaches, ocean spits, tidal mud flats, coastal salt marshes, and coastal wetlands in a narrow zone between Kuskokwim Bay and the front of the Ahklund Mountains (Figures 1.3 and 3.31). This narrow complex of habitats forms a funnel for large numbers of migratory waterfowl and shorebirds from the Yukon Delta, Western Alaska and the North Slope. These migratory birds include T&E Species. The area is important nesting, molting and brooding habitat for several special status species including Steller's eider and bristle-thigh curlew, white-front geese, emperor geese,

and numerous sea ducks (Seppi 1997, Peterson et al. 1991, Shaw et al. 2005). The Carter Spit area is on the southern fringes of the Yukon Kuskokwim Delta WHSRN site, which is of global importance. This and adjacent unnamed spits and wetlands are important for the abundance and variety of birds and plants. Sea bird nesting colonies also occur on BLM-managed lands in Goodnews Bay (Peterson et al. 1991, Shaw et al. 2005). The Ahklun Mountains are non-forested alpine tundra with willow-lined drainages and tall shrub (willow and alder) thickets skirting the bases of the hills and occurring in scattered patches throughout.



Figure 3.31. Takiketak, View South.

UCU 1701 is 2,308 miles², of which 10% is BLM unencumbered lands within the Bay planning area. There is less than one percent moose habitat on these lands, and only one moose was recorded killed during the recording period 1983-2002, although 25 hunters attempted to harvest a moose. All of the hunters except one were from the GMU 18 communities of Bethel and Quinhagak. Currently there is a moratorium on hunting moose in this region, with a multi-entity effort to grow the moose population. In the past, moose hunters accessed this area by boat. UCU 1801 contains 1,495 mi², of which 5% is BLM unencumbered land. Less than 2% of this UCU is suitable moose habitat. During the reporting period, only 15 hunters attempted to harvest moose and only six moose were harvested during the reporting period from 1983 to 2002. Of the six moose harvested, five were taken by GMU 18 residents of Bethel and Goodnews Bay. The remainder of the hunters in this area were from Alaska communities outside of this region. This area is also part of the moratorium on moose hunting. In the past, moose hunters used boats and some aircraft to access the area.

For the most part, caribou have been largely absent from most of GMU 18 for over 130 years and have only recently begun to drift back in. Caribou were not plentiful in UCU 1701 during the reporting period 1994-2002, and only 46 were harvested during that time. Eight were taken in 1994, followed by a general decline and low harvest numbers until 2000, when 15 were harvested. An additional 12 were harvested in 2002. Few hunters from outside of Alaska attempted to harvest caribou in this UCU. A great majority of

them were harvested by the GMU 18 communities of Bethel, Goodnews Bay, Kasigluk, and Quinhagak, the 17(A) communities of Togiak and Twin Hills, and the 17(C) community of Dillingham. Transportation for caribou hunting is by aircraft, boat, and snowmachine.

During the reporting period between 1994 and 2002, 32 caribou were harvested in UCU 1801. Only four were harvested by hunters from outside of Alaska. The largest number, 22 or 69% were harvested by residents of the region, including residents of the GMU 18 communities of Bethel, Chevak, and Goodnews Bay, the GMU 17(C) communities of Aleknagik, and Manokotak, and the 17(A) communities of Togiak and Twin Hills. Hunting effort increased dramatically in 2002. Caribou hunters use aircraft, boats, and snowmachines to access this UCU.

The harvest of brown bears in UCU 1701 has varied from one to three animals taken approximately every other year during the reporting period 1984-2002. During that time, 16 brown bears were harvested by hunters from outside of Alaska, and only one was harvested by a resident of the GMU 18 community of Bethel. The remaining five were harvested by Alaska residents from outside the region. Aircraft and some boats are used to access the area.

Between 1971 and 2002, 18 brown bears were reported harvested in UCU 1801. The harvest of brown bears in UCU 1801 has varied from one to three animals taken approximately every other year during the reporting period 1971-2002 except for 1984, when ten were harvested. Only two bears were taken by hunters from outside of Alaska during the reporting period, and the rest were harvested by residents of the GMU 18 communities of Goodnews Bay and Platinum. Snowmachines, aircraft and boats are all used by bear hunters as modes of transport to this UCU.

d) Large Mammals

(1) Caribou

Caribou (*Rangifer terandus*) inhabit treeless tundra, high mountain, and coastal areas in the Bay planning area, where they have occupied various regions in cycles of up to 150 to 200 years (ADF&G 2005; Whitaker 1980). When boreal forests are available, herds may choose to winter there. Calving areas are usually located in mountains or on open, coastal tundra. Caribou tend to calve in the same general areas year after year, but migration routes may vary. Being herd animals, caribou must use a wide area to find food. Large herds may migrate long distances of up to 400 miles between summer and winter ranges. In summer, caribou eat the leaves of willows, sedges, flowering tundra plants and mushrooms. Beginning in September, they eat lichens, dried sedges, and small shrubs such as blueberry (Valkenburg 1999). Figures 3.8, 3.9, 3.10, and 3.11 show vegetation types for many BLM lands in the planning area. Figures 3.12 and 3.13 provide information about caribou ranges. Their chief predators are humans and wolves, but brown (grizzly) bears, wolverines, lynx and golden eagles may prey on the young (Whitaker 1980).

Two large caribou herds occupy tundra habitats on BLM lands in the Bay planning area. They are the Mulchatna Caribou Herd (MCH) and the Northern Alaska Peninsula Caribou Herd (NAPCH). A third, smaller more resident herd, the Nushagak Peninsula Caribou Herd (NPCH) is currently occupying the Nushagak Peninsula on the Togiak NWR. Numbers for all herds combined in the Bay planning area have ranged between 200,000-350,000 over the last decade, but in the last 3 years herds have experienced significant declines to between 85,000-100,000 animals (Woolington 2003; Woolington 2005, Pers. Comm).

The 1999 photo census of the MCH indicated a population size of 160-180,000. The aerial photocensus in 2002 provided a minimum estimate of 147,000 caribou in the MCH, and the 2004 photo census indicated a population estimate of 85,000 (Woolington 2003; Woolington 2005, Pers. Comm.)

The MCH has demonstrated somewhat unusual behavior in making significant shifts in calving ranges and winter ranges in the last two decades. The traditional way to identify caribou herds has been the discrete and consistent use of long term calving areas (Valkenberg 1999). During the 2000-2002

reporting period, the MCH did not move into the traditional wintering areas along the west side of Iliamna Lake, north of the Kvichak River, but animals scattered throughout their range. Approximately 10,000 to 20,000 caribou spent most of their winter in southern GMU 9(B) and southeastern GMU 17(B). In March, 2002, many of these caribou moved south to the King Salmon-Naknek area for a short time before returning to the lower Mulchatna River area (Woolington 2003).

While an objective assessment of the condition of the MCH winter range has not been made, Taylor (1989; Woolington 2003) reported that the carrying capacity of the traditional wintering areas had been surpassed and that in order to continue growing, the herd had to seek other range. The 2003 ADF&G Caribou Management Report noted that portions of the range were showing signs of heavy use in the form of extensive trailing along migration routes, trampling and heavily-grazed vegetation in some summer/fall range near the Tikchik lakes. Signs of heavy use are also evident on traditional winter range on the north and west sides of Iliamna Lake (Woolington 2003). Arctic tundra vegetation can take from 35 to over 100 years to recover.

All of the Bay planning area communities are dependent on these caribou herds as a staple in subsistence diets. Based on information from one study year, for the 17 Bay planning area communities that were surveyed, large land mammals (caribou, moose, bear, and Dall sheep) comprised 24% of the subsistence diet, and 13% was caribou (ADFG 2005). Harvest pressure on the MCH may increase as caribou become more plentiful near the villages; however, less pressure may be put on the local moose populations (Woolington 2003). Wolf densities follow the fluctuations in caribou numbers (Skoog 1968). Wolf predation rates traditionally were low, but probably increased as the herd grew and provided a more stable food source for wolves. Many local residents in the Bay planning area report an increase in wolf populations in the past several years (Woolington 2003).

The Northern Alaska Peninsula Caribou Herd (NAPCH) is distributed throughout the northern Alaska Peninsula and the eastern Bristol Bay regions, primarily in Game Management Units 9(C) and 9(E). The NAPCH is an important subsistence resource for the residents of this region. (Woolington 2003). The herd is currently restricted to limited permit hunts and a bag limit of 1 bull. This herd has fluctuated from a high of 20,000 animals in the early 1940s to a current population of 1,200 or fewer (Sellers 2003a). Current habitat condition, nutritional deficiencies, parasites, and diseases are believed to be the primary problems causing the decline (Squibb 2005, Pers. Comm.). Scientific studies carried out between 1995 and 2001 demonstrate that the NAPCH is under moderate nutritional stress (Valkenburg et al. 1996; Sellers et al. 1998a, 1998b, 1999, 2000; Woolington 2003).

The low bull:cow ratios noted in the last 4 years (i.e. 25.7 bulls to 100 cows in fall 2002) in the MCH have been reflected in the trend of composition of fewer bulls and more cows in the harvest as well. Opportunity to harvest large bulls has declined, and this also is contributing to decline in hunter demand and participation (Woolington 2005).

Nushagak Peninsula caribou are localized and harvest is governed by a limited permit system for local subsistence users only. Demand is expected to remain high from local users (Aderman 2004, Pers. Comm.). Currently Nushagak caribou are hunted under limited drawing permit hunts only.

Current management practices allow for annual monitoring at a moderate level in order to document the short and long term fluctuations in productivity, disease, seasonal habitat selection, movements, population trends, accessibility for the major herds only, providing significant contributions to local, regional, and State economies and life styles. ADF&G has limited specific baseline or monitoring guidelines, goals, and objectives that are measurable or achievable have been established for habitat, species populations, or uses of caribou in the Bay planning area. No specific BLM management guidelines have been established. Consistent BLM criteria to define and determine resource condition are not available at this time.

ADF&G management goals and objectives for caribou in Game Management Units 9 and 17 include (Sellers and McDonald 2003; Woolington and McDonald 2003):

- Reduce the Northern Alaska Peninsula Caribou Herd midsummer population objective of 15,000 - 20,000 caribou to 12,000 - 15,000 with an October sex ratio of at least 25 bulls: 100 cows.
- Maintain the Mulchatna Caribou Herd at a population of 100,000 - 150,000 with a minimum bull:cow ratio of 35:100.
- Manage the Mulchatna Caribou Herd for a maximum opportunity to hunt caribou.
- Manage the Mulchatna Caribou Herd in a manner that encourages range expansion west and north of the Nushagak River.

(2) Moose

Moose (*Alces alces*), a relative newcomer to this region, occupy or appear to be moving into suitable habitats throughout the Bay planning area and are a high value recreational and subsistence species. Moose is the world's largest member of the deer family, and those found in Alaska are the largest of all moose.

Moose are found throughout the Bay planning area particularly in riparian habitats. They are most abundant in areas that have recently burned, in areas that contain willow and birch shrubs, on timberline plateaus, in well-watered wetland tundra areas in small lakes and ponds, and along rivers and streams. They are generally limited by their requirements for food, availability for cover, and the depth of winter snow. In fall and winter moose eat large amounts of willow, birch, and aspen twigs. In spring and summer they graze on grasses, forbs and the leaves of trees and shrubs as well as various aquatic plants (Rausch and Gasaway 1994). In summer and fall moose use wetland areas, lakes and ponds. Moose habitats are more restricted to high forage value riparian and tall shrub/mixed open forest types in winter, where they browse on woody plants, including willow, aspen, and birch. Calving and rutting concentrations take place in winter range habitats.

Moose populations are stable to increasing in the western portion of the planning area especially notable on the Togiak Refuge in GMU 17(A) and the Goodnews drainage and is stable to decreasing in GMU 9 (Aderman 2001, 2005). Recent radio tracking of GMU 19 moose north of the Bay planning area indicate significant movement into the planning area from GMU 19 during the winter period.

No intensive field surveys have been carried out on BLM-administered lands in the Bay planning area. Figures 3.8, 3.9, 3.10 and 3.11, provide information about vegetation types on most BLM-administered lands in the planning area. Figures 3.14 and 3.15 show moose range. A preliminary study of riparian areas on BLM lands in the Bristol Bay area suggests that of 2,193,902 acres of BLM lands, 12,852 acres are estimated to be riparian habitat. In the Goodnews Bay riparian study area of 315,052 acres of BLM lands, approximately 7,996 acres are estimated to be riparian habitat. No previous study has defined riparian areas for this region (BLM AFO 2006).

Today much of moose habitat in the Bay planning area is believed to be pristine. The distribution of habitat quality and quantity that supports moose populations may decline in localized areas, especially those adjacent to village areas, while that of less populated areas will fluctuate with natural events such as fires or succession, as well as any future increased levels of human use and infrastructure development. In most years, the most important natural force responsible for enhancing moose habitat has been the scouring of gravel bars and low-lying riparian areas by ice and water during spring thaw, especially on the Nushagak and Mulchatna rivers and the lower reaches of their major tributaries (Woolington 2002). In the past, lightning-caused fires have not been prevalent in the Bay planning area (Cella 1996, Pers. Comm.; Figures 3.34a,b and 3.35). However, the region currently is experiencing a warming and drying trend that may produce more fire-favorable conditions. In addition, the current trend is encouraging expansion of the type of tall shrub growth that moose prefer.

In portions of the Bay planning area moose are currently among the most productive herds in Alaska and are expanding to new habitats in the western portion of the Bay planning area in the Nushagak, Togiak and Goodnews Bay drainages. Moose numbers appear to be in decline in the eastern portion of the Bay planning area west of the Kvichak drainage (BLM 2002 unpublished data). These animals are highly

valued for subsistence and general hunting as well as non-consumptive uses. The Bay planning area includes all or portions of State Game Management Units (GMUs) 9(B), 9(C), 17(A), 17(B), 17(C) and 18.

Unit 9(C) outside Katmai National Park had approximately 500 to 600 moose, and there were approximately 200 moose in Unit 9(B) in 2001 (ADF&G 2002). The moose population in Unit 17(A) was 652 in 2001 (Aderman and Woolington 2003), the population in 17(B) was estimated to be 1953 in the western portion of the unit (Woolington 2004), and the population in 17(C) north of the Igushik River was estimated to be approximately 3,000 moose in 1999 (Woolington 2004). A gross estimated population in the Bay planning area is around 7,500 to 10,000 moose.

Moose are the most visible large mammal for viewing in Alaska for residents and visitors. Overall consumptive and non-consumptive demand for moose is generally increasing due to a great many factors. The supply is stable to increasing in GMU 17, and is especially notable recently in the Goodnews drainage in GMU 18 (Aderman 2001, 2005) and is stable to decreasing in GMU 9. Generally, demand occurs in areas where moose habitat is accessible by boat and aircraft. Competition for this resource indicates overall that supply generally meets demand. The situation may intensify in the future in localized areas and regions should there be increased access and infrastructure development that extend into currently remote areas with limited accessibility. Consumptive users target areas exhibiting high success and accessibility. These areas may become over harvested in a matter of a few years. Refugia in inaccessible remote areas allow natural selection to operate naturally.

Consistent criteria to define and determine moose habitat and resource conditions have not been established by BLM AFO, and so are not available at this time.

Alaska Department of Fish and Game Goals and Objectives for moose management in GMUs 9, 17, and 18 include (Seavoy and Bente 2004):

- Allow the Unit 18 moose populations to increase to the levels the habitat can support.
- Maintain healthy age and sex structures for moose populations within the Yukon and Kuskokwim river drainages (this includes the Goodnews Block of BLM lands).
- Determine population size, trend, and composition of Unit 18 moose populations.
- Achieve a continual harvest of bulls without hindering population growth.
- Improve harvest reporting and compliance with hunting regulations.
- Minimize conflicts among user groups interested in moose within and adjacent to Unit 18.
- ADF&G population objectives are not comparable between GMUs but fall within a gross cumulative range of approximately 10,000 to 10,500 moose (ADF&G 1999).
- Allow the lower Kuskokwim River moose population to increase above its estimated size of 75-250 moose to at least 2,000 moose.
- Maintain the current age and sex structure with a minimum of 30 bulls: 100 cows for the Kuskokwim River moose.
- Conduct seasonal sex and age composition surveys for the Kuskokwim River moose as weather allows.
- Conduct winter census and recruitment surveys in the established Unit 18 survey areas.
- Conduct fall and/or winter trend counts in Unit 18 to determine population trends.
- Conduct hunts consistent with population goals.
- Improve educational outreach and hunter contacts.

(3) Brown (Grizzly) Bears

Brown/Grizzly bears (*Ursus arctos*) are found throughout the Bay planning area with seasonal aggregations at sites of abundant food, including at caribou and moose calving locations in spring and on the many productive salmon rivers and streams in the summer. In fall they take advantage of the seasonally available berries. Den sites are used in winter, and are usually located at higher elevations. Denning areas appear to be used consistently from year to year. After bears emerge from their dens anywhere from April until June they graze on sedges and grasses and scavenge for whatever might

present itself. Current habitat in the Bay planning area is highly productive and sustains a vigorous and relatively stable bear population at this time (Figure 3.16). Considerable tolerance of bears in bush communities occurs as bears are common visitors to local dumps, fish camps and homes.

Bear management is a primary function of the various agencies in the Bay Planning area. GMUs 9(B), 17(A), 17(B), 17(C), and 18 fall within the Western Brown Bear Management Area where Federal and State agencies coordinate annual management and monitoring efforts. The Togiak NWR, ADF&G, BLM, and Regional Office of the USFWS are in the process of finalizing the Togiak Refuge and BLM Goodnews Bay brown bear density and population estimate. ADF&G, USFWS, NPS and BLM coordinate other bear census and density estimates as well as harvest monitoring.

Southwestern Alaska brown bears are the most sought-after brown bear populations globally due to accessibility, large size and trophy quality. Commercial guiding, outfitting and viewing for brown bear is a significant contributor to stability, diversification and value of regional and local economies and personal income. The Bay planning area overlaps Game Management Units 9(B), 9(C), 17(A), 17(B), 17(C) and 18. Guides/outfitters are required for out-of-State brown bear hunters, and brown bear opportunity contributes to the Bay planning area economy. The planning area encompasses Katmai National Park and other bear viewing areas that draw thousands of visitors annually as well as provide a reservoir of harvestable bears that venture outside the Park. Up to 2500 brown bears two years old and older occupy the Bay planning area (ADF&G 1998, 1999). This resource provides for up to 90 hunters annually for a harvest range of approximately 60-80 bears annually.

Area management varies from drawing permits to registration permits, alternate year open seasons and general open hunting depending on specific area, demand, accessibility and brown bear population status. Public demand for brown bears is in most cases being met and trends appear to be increasing bear populations (ADF&G 2000). Current local concern in specific rural areas regarding brown bear predation on caribou and moose and the impact to those dependent upon subsistence resource populations has contributed to incentives to reduce large predators, including brown bears.

Sustained yield. The management practices the past decade have resulted in a generally stable yield of high quality bear opportunity and harvest. Current situations involving declining caribou and moose populations are causing a reassessment of bear management from a focus on trophy and high quality bear resource to one of predator reduction to enhance other species of high interest.

Consistent BLM criteria to define and determine brown bear habitat and ecosystem condition are not available at this time. However, brown bear habitat in the eastern portion of the Bay planning area is believed to be good to excellent, based on the number of bears inhabiting the area, and habitat in the western portion is believed to be good as well, though bear densities appear to drop off as one moves west in the planning area (Dewhurst 2000).

Consistent BLM criteria to define and determine brown bear habitat and ecosystem condition are not available at this time. The Alaska Department of Fish and game management objective for brown bear in these units is (Woolington and McDonald 2001):

- Maintain a brown bear population that will sustain an annual harvest of 50 bears composed of at least 50% males.

(4) Black Bears

Black bears (*Ursus americanus*) inhabit riparian areas and forested uplands which overlap with brown bear habitats to large degree. Black bears (*Ursus americanus*) are distributed throughout suitable habitat in the Bay planning area but do not extend southward beyond the Alagnak River or into the Goodnews Bay area at this time. Forest provides escape cover for black bears. From November to late April black bears are in their dens, a specialized seasonal habitat requirement. Black bears are omnivorous. Most of

the diet consists of vegetation, grubs, beetles, crickets and ants. Bears also eat small to medium-size mammals or other vertebrates and a variety of fish.

No interagency or non-governmental collaborative effort or focus on black bear management is in place at this time.

Black bears are not a popular game animal in the Bay planning area, but they are used to some extent for subsistence purposes. In this remote region, the non-resident makes up 72 to 85% of the hunters, other Alaska residents comprise around 15 to 22% of hunters, and local residents up to 6%. Reported harvest and defense of life and property (DLP) mortality for the past 10 years has varied from 13 to 30 animals, and has increased as greater numbers of hunters seeking Mulchatna caribou have incidentally taken black bears (ADF&G 1998, 1999, 2000).

International involvement in gall bladder and illegal bear parts trade can unfortunately be a demand of local consequence. No objective data are available for the population of black bears, nor for their densities, key denning areas, or other aspects of bear populations in GMUs 9, 17 or 18. However, local resident' concerns indicate that black bear populations in some areas are declining (ADF&G 1999, 2000). Brown bear-dominated habitats occur in GMU 9 and 18, where black bear densities are very low and black bears are limited by lack of favorable black bear habitat, as well as by brown bear predation and competition for food sources, although it must be said that both bears are omnivorous and seldom fail to find something to eat (Whitaker 1980; ADF&G 1999). Black bears are in low demand in the Bay planning area for the commercial tourism industry or for watchable wildlife opportunities for Alaskans. Neither illegal harvest nor unreported harvest data are gathered or estimated for black bears by ADF&G.

Under existing black bear management, sustainable levels of harvest, population characteristics and abundance, distribution, or habitat are established for some areas. Guidelines and thresholds that would initiate other management opportunities or options are not established for all areas within the Bay planning area. Populations are generally moderate to high in suitable habitats. Harvests are generally below levels that are considered to be sustainable. Interest in black bears also involves the predation black bears may be responsible for relative to ungulate populations and is a damage control issue and/or nuisance bear issue in and around areas of human habitation. Subsistence harvest and utilization of black bear in the planning area is limited although the majority of the harvest is local resident oriented. Black bear bag limits are liberal (two to three bears per year) in those Game Management Units (GMUs) within the planning area. The black bear scenario is expected to remain stable in the near future and depending upon natural factors such as declines in brown bear populations or expansion of black bear habitat, capable of increasing ranges and numbers.

(5) Dall Sheep

Dall Sheep (*Ovis dalli*) in the Bay planning area occupy habitats in the southwestern portions of the Alaska Range in the northeast planning area including Lake Clark National Park and Preserve, extending as far south as the mountains between Lake Clark and Lake Iliamna. Historically sheep were present in portions of Katmai National Park until the volcanic eruption of 1912 displaced them. Sheep prefer rocky mountainous areas (Figure 3.17).

Sheep are very loyal to their home ranges. Ewes lamb in particularly rugged cliffs in their spring range, where they remain a few days until the lambs are strong enough to travel (Heimer 1994). In winter the entire herd feeds together on woody plants that include dry frozen grasses, willow, sedge stems, sage, crowberry, cranberry, and sometimes lichen and mosses. Foods available for consumption vary from range to range. In spring the herd splits into two groups. One consists of ewes, lambs, and yearling rams, and the other is made up of older rams. The oldest member of the group is its leader. Their summer forage is grasses, sedges and forbs. In late fall the rams compete as they try to gather harems of ewes. Wolves are the main predator, but lynx, wolverine, bears, and eagles also prey on sheep (Whitaker 1980).

The Bay planning area supports populations of Dall sheep only in Lake Clark National Park today, although historic accounts report Dall sheep in other areas of the western portion of the Bay planning area, and simple carved sheep horn spoons (that is, too plain to be trade goods) were located in the PaugVik village site located in Naknek, occupied from at least 1100 A.D. until 1910 (Dumond and VanStone 1995). Sheep may have been more widespread in the mountainous eastern portions of the Bay planning area in the past, and opportunity for restoration may be a remote possibility in suitable habitats.

The general remoteness and inaccessibility of BLM sheep habitats and current management of habitat and harvest is anticipated to remain unchanged in the future. Dall sheep populations and habitats are largely pristine. In the Bay planning area, sheep are primarily affected by natural events in their current habitats and distribution. The Dall sheep resource is expected to remain healthy and vigorous. However, Heimer (1994) suggests that they are extremely susceptible to disease introduced by domestic livestock.

(6) Wolf

Wolves (*Canis lupus*) are considered both big game and furbearers in Alaska. Wolf populations and densities are dependent on many factors the most important being the presence and abundance of prey species. Large ungulates, particularly newborns and calves (or lambs) of the year, including moose, caribou, and Dall sheep provide late fall, winter and spring prey in the Bay planning area. During the summer when wolf pups are in or near the den or rendezvous sites beaver, ground squirrels, lemmings, hares, birds including upland game birds and fish are important dietary items.

Densities of wolves and pack structure and territory size depend on prey abundance and distribution. In the Bay planning area wolves are widespread. Estimates by ADF&G (2000) suggest a Bay planning area population of 780-835 wolves in 40-60 packs. Wolves are a valuable fur animal and used for personal use and Native crafts.

For GMU 17, wolves are reported to prefer the major drainages of the Nushagak and Mulchatna rivers, where they are believed to live in established territories where they take advantage of the caribou as they migrate through these territories (Woolington 2003). In that portion of interest for Bay planning purposes, wolves inhabit the Kilbuk Mountains from Whitefish Lake to the southernmost tip of Unit 18 near Cape Newenham. Wolf distribution is believed to change with caribou availability. Some resident wolf packs remain throughout the year but must shift to other dietary resources when caribou return to Unit 17 to calve (Seavoy 2003). Caribou distribution on the upper Alaska Peninsula is predominantly on the Bristol Bay Plain.

Wolves are carnivorous, and moose, caribou and to a more limited extent Dall sheep are their primary prey. Wolves also dine on salmon when they are available. During summer, small mammals including voles, lemmings, ground squirrels, snowshoe hares, beaver, and occasionally birds and fish are eaten (Stephenson 1994). Wolves serve an important function in maintaining the herd health and equilibrium with their habitats of large herbivores. They are considered a highly valued component of Alaska's fauna (Stephenson 1994).

Wolf density has been estimated to be up to one wolf per 25 square miles in favorable habitats (Stephenson 1994). Between 1992 and 1999 wolf estimates ranged from 780 to 835 animals, and the number of wolf packs were estimated at between 40 and 60 for the Bay planning area (ADF&G 2000). Based on the increasing trend in reported harvest, trapper questionnaire data, reported sightings, other reports by the public, and anecdotal information, the wolf population in the Bay planning area increased between 1999 and the most recent published estimates in 2001. In all of GMUs 9, 10, 17, and 18 it is estimated that there were between 1,050 and 1,200 wolves in from 77 to 96 packs in 2001 (Woolington 2003; Sellers 2003b; Seavoy 2003).

Wolves as well as wolverines are classified as fur bearers in addition to being game species in Alaska. Over the last decade harvests of wolves have varied widely and are a reflection of fur prices, access, predator control concerns and population changes. An overall estimate of populations is not available for

the BLM management units in the planning area. Wolves are hunted and trapped primarily by local residents, but wolves are also harvested opportunistically by non-local hunters. Successful wolf harvests have been the result of relatively few participants, which have steadily increased since 1996. From 50 to 260 wolves were harvested each year from 1992 to 1999 in Game Management Units (GMUs) within the Bay planning area (ADF&G 2000). During this time, between 40 and 98 trappers/hunters were responsible for the majority of the documented harvest in the Bay planning area (ADF&G 2000).

Harvest methods vary widely from area to area depending on access methods, climatic conditions, terrain, and population availability. In some areas, wolves are readily accessible with snow machines whereas in other areas aircraft access for trapping or shooting is the major method of taking. Wolf hunting methods such as same-day airborne hunting, aerial gunning, bounty systems, poisons and a wide variety of predator control methods are still in demand; however, these are still limited by highly polarized public support. An unknown number of wolves are harvested for subsistence that is not reported. They are used for clothing and Native cultural and craft purposes. This unreported harvest may be significant in some areas, but varies with year, access and abundance of wolves.

Fluctuations in wolf numbers are expected to continue, and adaptive management of wolves and their prey bases is necessary to balance predator/ prey (moose and caribou) relationships with the high demand of human use for both groups of species. No current BLM activity is directed at maintaining minimum or viable wolf populations or maintaining subsistence opportunity for harvest. Overall, the management of wolves is moving toward a more planned approach that is dependent upon specific data.

e) Furbearers

Furbearers include those species of mammals that are routinely sought after by licensed trappers who place commercial value on the animals' pelts. Furbearers found in the planning area include wolverine, wolf, coyote, red fox, Arctic fox, Canada lynx, marten, otter, mink, weasel, beaver, and muskrat (ADF&G 2005; Whitaker 1980).

Wolverines (*Gulo gulo*) are widely distributed and travel widely throughout their range.

Wolverines are still of high value in the fur market and are pursued by trappers and hunters for that reason. The Bay planning area enjoys widespread distribution of wolverines and in some cases expanding and increasing populations, based on contacts with local residents and trappers. GMUs 9 and 17(B) produce the greater harvest of wolverines from the GMUs in the Bay planning area.

Beaver (*Castor canadensis*) are widely distributed and increasing in the Bay planning area in streams and lakes in riparian and aquatic habitats. In many areas beaver also occur in treeless tundra areas where tall and low shrub materials are available near streams. Beaver eat the bark of favored deciduous trees and shrubs. Currently beaver are widespread and abundant throughout their available habitat. The Goodnews area has a rare phenotype pelt coloration that is unique and only occurs in that area. (Van Dael 2005, Pers. Comm.)

Muskrat (*Ondatra zibethica*) are widely distributed throughout the wetland habitats in the Bay planning area but are currently uncommon to scarce in most areas. Minor use of muskrat for food and personal use of fur occurs but the price for muskrat pelts is very low and the quality of muskrat fur from this region is moderate to poor. Harvest is very low.

Coyote (*Canis latrans*) arrived in Alaska around 1915 and have rapidly expanded since that time. Coyotes are widespread the Bay planning area and occur west to Goodnews Bay. Coyotes are not abundant or common in the planning area. A few are harvested incidental to hunting or trapping fox, wolverine, wolf or lynx. Healthy wolf populations tend to dampen the rate of increase and movement of coyotes into new areas.

Arctic fox (*Alopex lagopus*) occur along the west coast of the Bay planning area along marine beaches primarily. Foxes eat carrion, microtine rodents, lemmings as well as seasonally available birds and eggs. Population densities are linked to fluctuations in small rodent populations, with periodic peaks

approximately every 4 years. Arctic foxes are occasionally taken in the Bay planning area but are used for subsistence and personal use and normally are not sold as fur.

Red fox (*Vulpes vulpes*) including red, cross and black color phases, occur in the Bay planning area. Red fox are omnivorous and diets often change seasonally but may consist of carrion, plant material, rabbits and other small mammals, ptarmigan, birds, eggs, and invertebrates.

Canada lynx (*Lynx Canadensis*) are classified as a furbearer in Alaska.

River otter (*Lutra canadensis*) are abundant and widespread throughout the Bay planning area and inhabit stream and lake riparian habitats. They primarily prey on the rich fishery resources as well as mussels, clams, insects, frogs, small mammals, birds or eggs, and vegetable matter.

Both least and short-tailed weasel (ermine) occur in the Bay planning area. Least weasels are sparsely distributed and utilize forest and tundra habitats where they feed on mice, voles, insects, small birds and worms. Short-tailed weasels occur throughout a wide variety of habitats but prefer brushy, forested and broken terrain. Prey includes microtine rodents, mice, shrews, birds, eggs, ptarmigan, hares, fish and insects. Weasels are also preyed upon by a variety of avian and mammalian predators including owls, hawks, lynx, fox, coyote and mink. Fur value is low but ermine is popular to trim parkas, and Native craft items and tourist items.

Fur bearer populations in the Bay planning area are assumed to be healthy and are under the present circumstances under-harvested, according to anecdotal information. This is a diverse group of species and each is unique in its habitat requirements, productivity, distribution and population dynamics.

The popularity of trapping fur bearers has declined in recent years due to price declines and world demand declines. These species also play an important role in ecosystem functions. Demand for fur bearers is significantly dependent upon fur prices, population fluctuations, access, weather conditions, personal use, Native crafts, raw material needs, and accessibility of the resource.

Commercial and subsistence demand are primary drivers for fur bearer harvest, however; much of this harvest does not require reporting and harvest is not monitored. Required sealing (wolverine, wolf, marten, river otter, beaver and lynx) and monitoring do not account for subsistence take for personal use. Fur bearer species not requiring sealing are harvested but data provide only gross minimum estimates. Currently no monitoring of demand is being conducted. Poor fur prices have decreased participation in recent years (ADF&G 1998). The lack of efficient means to estimate and directly monitor populations, general low overall demand and participation, and lack of reliable snow conditions for fur harvest in the Bay planning area hampers development of population objectives for furbearers. Voluntary trapper questionnaires, opportunistic observation and sealing requirements are the current management tools in use. This appears sufficient at this time for the relatively low trapping effort.

f) Small Mammals

Small mammals include a wide variety of shrews, mice, microtine rodents (lemmings, meadow voles), non-game and small game species such as pika and porcupine. These species and their fluctuating abundance and cycles are keystone to the ecosystem function.

g) Marine Mammals

Marine mammal species occur in nearshore and offshore areas of the Bay planning area, but do not occur on coastal BLM lands, with the possible exception of beluga whale which may travel miles up rivers in pursuit of salmon prey.

h) Birds

Public lands in Alaska encompass the breeding grounds, migration and staging sites and seasonal habitats for many species of resident and migratory birds. The Bay planning area includes breeding areas important for the production of migratory waterfowl, shorebirds and land birds that represent large portions of the North American populations that winter in Central and South America, as well as long distant migrant shorebird species that utilize wintering areas as distant as Hawaii, Tahiti, New Zealand and Southern Asia (Marchant et al. 1986). Some of these breeding, staging and migration areas are on Public lands managed by BLM in the Bay Planning area (Goodnews Bay, Kvichak Bay areas).

(1) Landbirds

At least 50 species of migrant and 23 species of resident landbirds breed in the unbroken forests, shrub field and tall riparian shrub habitats that exist on BLM administered lands in the Bay planning area (Handel et al. 1998). The area's migrant land birds winter in the lower 48 states and Central and South America. Land birds play a significant ecological role on both the breeding and wintering grounds, and many species are considered indicators of environmental and ecological changes, including global climate change (Maley et. al. 2003). The demand for landbird species involves a growing public interest nationwide in viewing, field identification and life history of landbirds, as well as ecological research related to habitat conservation. Four migrant species (olive-sided flycatcher, blackpoll warbler, gray-cheeked thrush, Townsend's warbler) occur in the Bay planning area and are considered sensitive species. Although it is not currently on BLM's Special Status Species list, the rusty blackbird has experienced a dramatic decline recently and monitoring is recommended (Hannah 2004, Andres 1999).

A number of rare Asian species are occasional visitors to some portions of the planning area (Petersen et al. 1991) and are highly sought by birders seeking to add rare North American species to their list.

The demand for landbirds as a game species is low, however harvest regulations do allow for the taking of landbirds for food or traditional clothing under the Migratory Bird treaty Act (Office of Subsistence Management 2004/2005). The harvest of landbirds in the Bay planning area is unknown.

(2) Waterfowl

At least 25 species of migratory waterfowl (ducks, geese and swans) breed or use migration staging areas in the Bay planning area, (Bellrose 1980), and involve consumptive use demands for both resident and non-resident hunters. Wintering areas are in coastal Alaska and Canada, the western and southern United States, and Mexico. Spring and fall migration staging areas for waterfowl include the Goodnews Bay/Carter Spit area and the Kvichak Bay coastal areas. Inland waterfowl breeding wetlands and estuaries are found on large blocks of public lands in the Kvichak River and Alagnak River area and represent some of the highest waterfowl breeding densities in the State (Connant and Groves, 1993) (Figure 3.18).

This page intentionally left blank.

Insert Figure 3.18 here (11x17 fold-in).

Wetlands in this region are associated with an extensive glacial moraine and are unique with respect to limnological characteristics and water chemistry which affects their use by breeding waterfowl (Seppi 1997). Alaska overall produces approximately 50% of the annual waterfowl production in the Pacific Flyway, with the coastal wetlands of Goodnews Bay and Carter Spit and Kvichak Bay being important migration staging sites in Alaska. Demands for waterfowl in the region include spring subsistence hunts and gathering of eggs from ducks and geese and fall hunts of several species. Resident and non-resident hunting in Alaska of all species of ducks, geese and swans occurs throughout the Bay planning area during fall migration. Three migratory species, the tule white-fronted goose, the dusky Canada goose, and the trumpeter swan are considered sensitive species. Sport hunting of waterfowl produced in the planning area continues as birds migrate through Canada and the lower 48 states to wintering areas in the southern states and Mexico. Subsistence hunting also occurs in regions south of the United States on wintering grounds. The Steller's eider is listed as threatened, yet is subsistence hunted in the Bay planning area in spring and during fall migration. Steller's eiders winter in coastal areas of the Alaska Peninsula, and use the Goodnews Bay area for staging and fall migration (Seppi 1997).

(3) Upland Game Birds

Upland game birds are hunted for recreation and for subsistence. However, access limits the harvest and use of this resource except near communities and road systems. Five grouse species occur in the Bay planning area. Spruce and ruffed grouse inhabit forested areas, rock ptarmigan are on higher elevation barren habitats and tundra, and willow ptarmigan in willow and alder thickets. Demand and harvest levels of grouse in the bush is largely unknown, but is considered light in relation to the distribution and abundance of these birds. Most take is likely opportunistic in association with other hunting and subsistence activities.

(4) Shorebirds and other Waterbirds

Most shorebird species migrate and stage on coastal mudflats and nest in coastal or inland habitats, depending on the species. Sandhill cranes use these same habitats, which can be found throughout the Bay planning area and are of regional and hemispheric importance to these and many other species of wildlife.

There are at least 17 species of shorebirds that breed or migrate within or through the Bay planning area (National Geographic Society 1987), using alpine, tundra and forest edge habitats for breeding and coastal mud flats for foraging, staging and migration. Most shorebird species are long distant migrants, breeding in arctic and sub-arctic habitats in Alaska and wintering in Central and South America, while other species complete transoceanic migrations to islands in the south pacific, Asia and Australia. Few shorebirds are taken for subsistence in Alaska, but birds produced in Alaska are hunted for food on wintering grounds in Central and South America. The numbers of shorebirds produced in the Bay planning area, or the numbers taken on wintering grounds is unknown. The designation of the Western Hemisphere Shorebird Reserve Network sites are within and adjacent to the Bay planning area. The Carter Spit and Goodnews Bay area has been proposed as a regional fall migration shorebird staging site, and the adjacent Kuskokwim Bay has been recognized as a world class hemispheric site for spring and fall shorebird migrations (Meyers et al. 1987).

Kvichak Bay is internationally recognized as a hemispheric migration stopover site for arctic nesting shorebirds, and host nine species of breeding and migrating shorebirds (Meyers et al. 1987). Within the Bay planning area, Goodnews Bay, Nanvak Bay, Carter Bay and the Kuskokwim River Delta are recognized as key areas for shorebird conservation by the U. S. shorebird conservation plan, of which BLM is a partner (Brown et. al 2001). Large numbers of migrant shorebirds, species diversity, and ecological importance of these sites make the region an attractive viewing area for birders. The bristle-thighed curlew and red-throated loon are BLM sensitive species potentially present in the planning area.

(5) Raptors

Raptors include various species of hawks, eagles, owls and falcons. The Bay planning area contains various habitats that host 21 species of raptors (National geographic society 1987), including the northern goshawk and the Arctic peregrine falcon, BLM special status species. Eagles are protected under the eagle protection Act, and all other raptors under the Migratory Bird treaty Act. Snowy owls are an exception, and are legal to subsistence hunt, but the numbers taken are likely low due to their relative rare occurrence. Owl, hawk, eagle and falcon species include both resident and migratory species that winter in coastal areas, the lower 48 states and Central America. Demand for raptors as watchable wildlife, especially during migration when birds pass through corridors where they can be counted and viewed, is large and growing. The population and productivity of raptors in the Bay planning area is unknown. The Bay planning area hosts 10 species of owls, 7 species of hawks, including osprey, 2 species of eagles and 4 falcons.

(10) Seabirds

Twenty species of seabirds are found in the Bay planning area, and include gulls, cormorants, kittiwakes, guillemots, auklets, murrelets, murre, puffins and terns. Many species are pelagic oceanic birds or coastal species that nest on coastal cliffs and fringes. Coastal tidal nesting habitats important to seabirds exist in the southern portion of the Bay planning area, with cliff nesting habitats at Goodnews Bay, Chagvan Bay. Demands for seabirds include subsistence uses and egg harvesting for some species where they are accessible. Population and harvest numbers for the Bay planning area are unknown. Sea birds on the Special Status Species list that may be found seasonally on BLM-administered lands include the marbled murrelet, harlequin duck, king eider, long-tailed duck, black scoter, black guillemot, black brant, and surf scoter.

i) Fish

Throughout the Bay planning area there is a lack of detailed baseline data related on the size of fish populations, fish spawning and rearing areas, and the productive capacity of the waters administered by the Bureau of Land Management. There are five major watersheds in the planning area that include the Goodnews which flows into Goodnews Bay, and the Kvichak, Alagnek, Nushagak and Naknek Rivers that flow into Bristol Bay.

Fish occurring in the planning area include all five species of Pacific salmon and a wide variety of resident species (Table 3.8). Maps (Figures 3.32a, b, c, and d) display known anadromous fish streams within the planning area.

Table 3.8. Common Fish Species Endemic to the Waters of the Bay Planning Area

Common Name	Scientific name	Subsistence /sport species
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	Sb/s
coho salmon	<i>Oncorhynchus kisutch</i>	Sb/s
sockeye salmon	<i>Oncorhynchus nerka</i>	Sb/s
chum salmon	<i>Oncorhynchus keta</i>	Sb/s
pink salmon	<i>Oncorhynchus gorbuscha</i>	Sb/s
rainbow trout	<i>Oncorhynchus mykiss</i>	Sb/s
Arctic grayling	<i>Thymallus arcticus</i>	Sb/s
Dolly Varden	<i>Salvelinus malma</i>	Sb/s
Arctic char	<i>Salvelinus alpinus</i>	Sb/s
northern pike	<i>Esox lucius</i>	Sb/s
Alaska blackfish	<i>Dallia pectoralis</i>	Sb
burbot	<i>Lota lota</i>	Sb/s
lake trout	<i>Salvelinus namaycush</i>	Sb/s
round whitefish	<i>Prosopium cylindraceum</i>	Sb
humpback whitefish	<i>Coregonus pidschian</i>	Sb
pygmy whitefish	<i>Prosopium coulteri</i>	Sb
Bering cisco	<i>Coregonus laurettae</i>	Sb

*Sb = Species harvested for subsistence.

*s = Species targeted for sport fishing.

Other species reported to occur in the planning area are smelt, sticklebacks, longnose sucker, the Arctic and Pacific lamprey, and including the ubiquitous slimy sculpin. Smelt and lamprey are subsistence species. Whitefish play an important role in the food chain as prey for other fish, as well as being a popular subsistence fish (ADF&G 2004).

Waters in the planning area provide a diverse array lotic and lentic fish habitat. Glaciers have influenced the geomorphology of the area and has provided for lakes ranging from small potholes to largest freshwater lake in Alaska, Illiamna. Streams types, include small steep high energy systems, large wide valley multiple channel systems, and slightly entrenched meandering streams. Most all waters in the planning area provide habitat to these fish species during all or some of their spawning, rearing and migrating life stages.

Small isolated lakes with depths greater than three feet deep are likely to provide habitat for Alaska blackfish and sticklebacks. Alaska blackfish utilize heavily vegetated freshwater swamps and ponds, but also are found in vegetated flowing waters and lakes. They can tolerate cold water and have the ability to breathe atmospheric oxygen, which helps them survive in stagnant, hypoxic muskeg or tundra pools (ADF&G 2004, Morrow 1980). Larger lakes connected to streams are important to juvenile sockeye salmon and northern pike utilize weed areas in lakes, sloughs, and flooded areas.

First and second order higher gradient streams are likely to be quality rearing habitat for juvenile char and coho salmon. Moderate sloped tributary streams with cobble and gravel substrate provide some of the best spawning habitat for salmon. The lower, middle and upper reaches of larger streams provide spawning and rearing habitat for chum, coho, and Chinook salmon. Lower reaches of the major rivers influenced by saltwater and whose substrate is fine material are used by salmon as migratory routes to access spawning areas in the upper reaches and tributaries streams.

The BLM has significant blocks of land in Southwestern and Southeast portions of the Bay planning area, including areas in the Goodnews, Nushagak, and Kvichak watersheds. Fish distribution is influenced by the physiographic provinces in this planning area.

National Hydrographic dataset is not available from the U.S. Geological Survey for the Hydrological Unit that comprises streams on BLM in the Southwestern portion of the planning area. Statistics on stream

miles for this area were derived from named streams in the planning area and may not include tributaries. Therefore, the total miles of streams in the BLM Bay planning area are underestimated.

The BLM manages 249 miles of streams in the Goodnews watershed and it manages less than 49 miles of these streams utilized as subsistence or sport fisheries. This includes four miles on the East Fork of the Arolik, 30 miles Goodnews River, eight miles of the Middle Fork of Goodnews River, and eight miles of South Fork of Goodnews River.

Most streams on BLM lands in the Goodnews area are remote with limited access. Exceptions are reaches of the Goodnews River and the Middle and South Forks of the Goodnews River. These reaches are accessible by boat and provide sport and subsistence opportunities for salmon and resident species. Also, the East Fork of the Arolik River is accessible by landing on its headwater lake.

Drainages in the Southwestern portion of the planning block are within the Ahklun Mountains Province. Streams slope gradient over most of the province range between zero and eight degrees (Gallant et al. 1995). Mountains in the province have elevations of approximately 1800 feet and are drained by shallow clear streams dominated with gravel and cobble substrate that flow directly to the Bearing Sea. The Goodnews River, a major drainage, flows into Goodnews Bay. During recent inventories, many first and second order streams were found to provide rearing habitat for coho salmon. Char and sculpin are also common in most of these higher elevation streams. In addition to coho rearing, small schools of adult sockeye salmon were observed spawning in some of the larger third and fourth order streams not associated with lakes. Resident species, char, rainbow trout, and Arctic grayling were also found to inhabit most of the larger streams on BLM lands. These observations were documented on ADF&G Freshwater Fish Inventory website (ADF&G 2005a, 2005b). The maps spatially display the location of sampling locations where fish have been collected or observed and also include electronic field data sheets and sampling location photos.

The BLM manages several large areas in the Southeast of Bay planning area. The physiography of this area is referred to as the Nushagak-Bristol Bay Lowlands and they have a large influence on fish distribution. The lowlands are underlain by outwash and morainal deposits that are mantled with silt and peat. The local relief of the lowlands is 50 to 250 feet and elevation ranges from sea level to about 300 feet with slope gradients of less than 2% (Wahrhaftig 1965, Gallant et al. 1995).

The majority of streams in the BLM Bay planning area lowlands are low gradient, low velocity, silt and peat substrate, and tannic colored water. Results of fish and habitat surveys by BLM and ADF&G of these low gradient streams with silt, sand, and/or small gravel substrate suggest they provide marginal habitat for salmon spawning and rearing (ADF&G 2005a, 2005b). Although, these lowland streams are connected to some of most productive salmon watersheds (Kvichak, Alagnek, Nushagak and Naknek) in the world (Minard et al. 1998) which arise from the mountains and lakes of this eco-region.

The Nushagak watershed is the largest in the Southeastern portion of the BLM Bay planning area, with a watershed area of 12,000 square miles with over 20,900 stream miles, of which the BLM manages 2,000 miles (10%). In the Alagnak and Naknek watershed there are 1,600 and 4,331 streams miles in each watershed, respectively, of which the BLM manages 547 (34%) and 358 (8%) miles. The Kvichak watershed is 5,915 square miles with over 6,500 miles of streams, of which the BLM manages 2,301 miles (34%).

Nushagak and Bristol Bay Lowlands are also dotted with moraine and thaw lakes (Wahrhaftig 1965). There are over 8,000 lakes between 2 and 150 acres and over 70 lakes greater than 150 acres in the BLM Bay planning area. Most are small internal drainages often with no outlet or inlet stream and very few have been inventoried. An inventory of six lakes in 2003 found they all contained northern pike, threespine stickleback, whitefish (probably least cisco) (Haas, 2004). In addition, char and sculpin were found in one of the lakes that had an outlet stream. This species assemblage is probably typical of these lowland lakes.

Small parcels of BLM managed lands of less than one or two townships make up most of the remaining BLM Bay planning area. There are more than 700 miles of streams and 620 lakes between 2 and 150 acres within these small parcels. Fish distribution data is not available for most these parcels.

6. Special Status Species

a) Special Status Plants

The Bay planning area is still poorly known botanically. However, inventory of the Ahklun Mountains and Goodnews Bay vicinity in 1990 and 2004, and the northwestern Alaska Peninsula in 2003 provided information about plants of the area. Taken together, the two surveys and the additional ALA holdings from the area documented 379 vascular plant species for the region. There are 47 plant species on the Alaska BLM Special Status Species list. The list is developed through a process that considers two factors - rarity and endangerment. Plants that are imperiled and critically imperiled in the state are considered for the list. Threatened or endangered species are on this list. However, not all rare plants are included. One plant on the Special Status Species list has been documented in the planning area (Table 3.9). Others may be added as the list is updated. Five plants that could be considered for the list were recently found (Table 3.10). The current Special Status Species list was last updated in 2003.

Table 3.9. Rare and Imperiled Plant Species on BLM Special Status Species Documented in the Planning Area

Common Name	Scientific Name	BLM SSS List	Status: AKNHP Ranking
Forbs			
Pearshaped smelowskia	<i>Smelowskia pyriformis</i> Drury and Rollins	Yes	S2

Table 3.10. Other Rare and Imperiled Plant Species Documented in the Planning Area

Common Name	Scientific Name	BLM SSS List	Status: AKNHP Ranking
Grass and Grasslike			
Kamchatka spikerush	<i>Eleocharis Kamtschatica</i> C.A. Meyer	No	S2S3
MacKenzie Valley mannagrass	<i>Glyceria pulchella</i> (Nash) Schum	No	S2S3
Forbs			
Fragile rockbrake	<i>Cryptogramma stelleri</i> (S.G. Gmel.) Prantl	No	S2S3
Chukchi primrose	<i>Primula tshuktschorum</i> Kjellm.	No	S2S3
Kamchatka buttercup	<i>Ranunculus Kamchaticus</i> DC	No	S2S3

As Alaska becomes more developed, BLM lands will become increasingly valuable to preserving plant species diversity. It is the BLM's policy to prevent management actions from causing a species to decline to a point where listing under the ESA would be warranted (BLM 2001) 6840 manual and the Special Status Species list is used to assist in meeting this policy.

The flora of this region appear to be a blend of coastal and interior floristic elements (Parker 2005). One plant, the Walpole poppy (*Papaver walpolei*), reported as rare in earlier studies (Lipkin 1996) was found to be present. According to Parker (2005) this tiny white-flowered poppy is often relatively abundant when found. A recommendation to designate the area as an ACEC on the basis of the occurrence of the Walpole poppy at Goodnews Bay was officially accepted in the Southwest Planning Area Management

Framework Plan, signed and published in 1981 based on the information about the poppy at that time. Because of the newer information on the poppy, the poppy as a basis for the ACEC is no longer supported in the current Bay RMP/EIS.

b) Special Status Fish

Sensitive Status Fish Species & Essential Fish Habitat. There are no threatened, endangered fish species, or sensitive fish species in the BLM Bay planning area.

On October 11, 1996, Congress passed the Sustainable Fisheries Act (Act) (Public Law 104-297), which amended the habitat provisions of the Magnuson-Stevens Act (MSFCMA). This 1996 reauthorization of the MSFCMA mandates that Federal agencies assess the effects of Federal programs or projects on essential fish habitat (EFH) for commercial fish stocks in all life stages and associated habitats. This Act also calls for direct action to stop or reverse the continued loss of fish habitats. The Act requires consultation between the National Marine Fisheries Service (NMFS), the Fishery Management Councils, and Federal agencies to protect, conserve, and enhance "essential fish habitat." The Act defines EFH as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Subpart J, Section 600.810 of the Act defines an "adverse effect" to EFH as "any impact, which reduces the quality and/or quantity of EFH."

According to NMFS, the EFH species of concern for the BLM Bay area RMP includes five species of Pacific salmon (Chinook, chum, coho, pink, and sockeye), and EFH habitat includes all of the anadromous waters listed in The State of Alaska, *Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fish* within the BLM Ring of Fire planning area.

c) Special Status Wildlife

(1) Threatened, Endangered, and Sensitive Species

The purpose of this BLM program is to provide policy and guidance, consistent with appropriate laws, for the conservation of special status species of plants and animals, and the ecosystems upon which they depend. By Special Status Species is meant species which are proposed for listing, officially listed as threatened or endangered, or are candidates for listing as threatened or endangered under the provisions of the Endangered Species Act (ESA); those listed by a State in a category such as threatened or endangered implying potential endangerment or extinction; and those designated by each State Director as sensitive (USDI BLM 2005). BLM objectives for Special Status Species are to ensure that actions authorized on BLM-administered lands do not contribute to the need to list a species under the Endangered Species Act provision, to conserve threatened or endangered species and the ecosystems on which they depend, and to assist efforts to de-list through conservation of existing habitats and populations.

"Addressing special status species is a requirement in our land use plans and environmental assessments to ensure that actions taken by the BLM are consistent with the conservation needs of special status species. This also ensures the BLM does not contribute to the need to list any special status species under the provisions of the Endangered Species Act of 1973, as amended." (USDOI BLM 2005).

Conservation of Special Status Species means the use of all methods and procedures which are necessary to improve the condition of Special Status Species and their habitats to a point where their special status recognition is no longer warranted (USDI BLM 2001).

(2) Federally Listed Threatened and Endangered Species and Designated Critical Habitats.

Table 3.11. Federally Listed Threatened and Endangered Animal Species Present in The Bay Planning Area

Species Common Name	Species Scientific Name
Eskimo Curlew*	<i>Numenius borealis</i>
Steller's Eider	<i>Polystricta stelleri</i>
Steller Sea Lion	<i>Eumetopias jubatus</i>
Spectacled eider	<i>Somateria fischeri</i>
Federally Listed Candidate Species That May be Present in The Bay Planning Area	
Kittlitz's Murrelet**	<i>Brachyramphus brevirostris</i>

* Eskimo Curlews have not been seen in Alaska since the mid-1800s.

**Rare in the Bay planning area.

There are no designated Critical Habitats in the Bay planning area. Two threatened species, Steller's eider and spectacled eider, and one candidate species, Kittlitz's murrelet, are found in the Bay planning area. They are listed in accordance with the Endangered Species Act. The Eskimo curlew has not been seen in Alaska since the mid-1800s. The Steller sea lion may be an occasional visitor to the coastal spits of Carter's Bay but there are no known haulouts located on BLM-administered land in the Bay planning area (Table 3.11).

BLM is consulting with the appropriate Federal agencies on potential impacts to threatened and endangered species as required under Section 7 of the ESA. These consultations are required during the development of a BLM land use plan and environmental impact statement.

Steller's Eider. Steller's eider occurs within the planning area only as a migrant. A few birds may summer in the wetlands of the Bay planning area along the flyway. The Alaska breeding population is listed as threatened (Federal Register 1997). Current breeding distribution includes the Arctic coastal regions of northern Alaska from Wainwright to Prudhoe Bay up to 56 miles inland, and Arctic coastal regions of Russia (Federal Register 1997). Historically, Steller's eider was a common breeder in the Yukon-Kuskokwim Delta but is now rarely found in the area. Preferred nesting habitat is tundra with numerous ponds of various sizes. They are not as closely tied to the coastal areas as the other eider species. A recovery plan has been developed for the species.

Spectacled Eider. The spectacled eider is listed as a threatened species throughout its range in Alaska (Federal Register 1993). Historically, spectacled eiders nested discontinuously along the coast of Alaska from Nushagak Peninsula on Bristol Bay to Barrow and eastward nearly to the Yukon border. Today, spectacled eiders' breeding distribution is mostly on the Yukon-Kuskokwim Delta, just to the north and west of the Bay planning area, but they are found in very low numbers breeding within the Bay planning area or passing through during migration, based on field observations (Seppi 1997). Steller's eiders winter in coastal areas of the Alaska Peninsula, and use the Goodnews Bay area for staging and fall migration (Seppi 1997). A flock of 100 to 150 molting Steller's eiders was discovered in the summer of 2004 on BLM lands on the Goodnews Bay North Spit, in an area where they were vulnerable to harvest (Shaw et al. 2005). These eiders use BLM lands, adjacent lands, and adjacent waters.

The recovery plan for the spectacled eider (FWS 1996) identifies recovery criteria and preliminary management actions needed for delisting. Because of the lack of basic information on spectacled eider distribution, abundance, and population ecology, interim recovery efforts focus on collecting this basic information and targeting known sources of mortality.

Specific guidelines for activities within the breeding range of spectacled eiders have been developed as part of the recovery plan (FWS 1996).

- Habitat in a proposed project area should be assessed to determine if eiders are likely to use the area for nesting or brood rearing.
- Ground level activity (by foot or vehicle) should be prohibited within 656 feet of spectacled eider nest sites from May 20 through August 1.
- Construction of permanent facilities, placement of fill, or alteration of habitat should be prohibited within 656 feet of spectacled eider nest sites.
- Introduction of high noise levels within 656 feet of nest sites (from activities at potentially greater distances) should be prohibited from May 20 through August 1. These may include but are not limited to airports, blasting, and compressor stations.

(3) Candidate Species

Consistent with existing laws, the BLM is required to implement management plans that conserve candidate species and their habitats and which will ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed. The Kittlitz's murrelet is a Federally-listed candidate species (Federal Register 2004) that may be present in the Bay planning area seasonally (Table 3.11).

Kittlitz's Murrelet. Kittlitz's murrelet is a Beringian species that nests along most coastal regions from southwestern to western Alaska (Day et al. 1999). In Alaska, the majority of the summer populations are found in Southeastern Alaska, Prince William Sound, and Cook Inlet (Day et al. 1999).

The scarcity of breeding records makes determination of exact breeding range difficult. Nesting habitat consists of unvegetated scree slopes or steep, rocky slopes. It nests rarely on cliff faces (Day et al. 1999). Nesting sites are most often inland, up to 16 miles from the coast (Kessel 1989). The winter marine range is poorly known. There is no reliable population information at this time. Indications are that a substantial proportion of the world population died as a result of the Exxon Valdez oil spill in 1989. One estimate of this mortality was 5 - 10% (Van Vliet and McAllister 1994). This species is sparsely distributed within the planning area. The only potential nesting area where a risk to the habitat might exist is on the scree-covered slopes of lode-bearing mountains on BLM-administered lands in the Goodnews block. To date no Kittlitz's murrelets have been observed nesting in that area.

(4) State Listed Species

It is BLM policy, found in the 6840 manual, to carry out management for the conservation of State listed plants and animals. Four species of neotropical migrant landbirds that are State of Alaska species of special concern occur in the Bay planning area (Table 3.12).

(5) BLM Sensitive Species

Fifteen birds and two mammals identified as BLM sensitive species occur within the planning area on more than an accidental basis (Table 3.12). Information on distribution, habitat condition, and population trends for most of these species is limited. Only those species occurring in the planning area on more than an accidental basis are discussed below.

Table 3.12. BLM Alaska Sensitive Animal Species Present in the Bay Planning Area

Species Common Name	Species Scientific Name	Known or Potential Presence on BLM Lands
Canada Lynx	<i>Lynx canadensis</i>	Yes
Harbor Seal	<i>Phoca vitulina</i>	Yes
Northern Goshawk	<i>Accipiter gentiles laingi</i>	Yes
Tule White-fronted Goose	<i>Anser albifrons elgasi</i>	Yes
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Not Known
Dusky Canada Goose	<i>Branta Canadensis occidentalis</i>	Not Known
Gray-cheeked Thrush	<i>Catharus minimus</i>	Yes
Olive-sided Flycatcher	<i>Contopus cooperi/borealis</i>	Yes
Trumpeter Swan	<i>Cygnus buccinator</i>	Yes
Blackpoll Warbler	<i>Dendroica striata</i>	Yes
Townsend's Warbler	<i>Dendroica townsendi</i>	Yes
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Yes rare in the plan area
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	Yes
Harlequin Duck	<i>Histrionicus histrionicus</i>	Yes
Bristle-thighed Curlew	<i>Numenius tahitiensis</i>	Yes
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Yes-accidental
King Eider	<i>Somateria spectabilis</i>	Yes
Long-tailed Duck	<i>Clangula hyemalis</i>	Yes
Black Scoter	<i>Melanitta nigra</i>	Yes
Black Guillemot	<i>Cephus grill</i>	Yes - offshore
Dovekie	<i>Alle alle</i>	Yes rare in the plan area
Red-throated Loon	<i>Gavia stellata</i>	Yes
Black Brant	<i>Branta bernicla</i>	Yes
Red Knot	<i>Calidris canutus</i>	Yes-but rare
Black-tailed Godwit	<i>Limosa limosa</i>	Yes-accidental
Surf Scoter	<i>Melanitta perspicillata</i>	Yes
McKay's Bunting	<i>Plectrophenax hyperboreus</i>	Visitors from St. Math. Is?
Marbled Godwit	<i>Limosa fedoa</i>	Not Known

Source: Armstrong 1995; Kaufman 2000; National Geographic Society 1987; Sibley 2000; Udvardy 1977; Seppi 1997, Peterson et al. 1991, Shaw et. al 2005; Whitaker 1980

Canada lynx. The Canada lynx (*Lynx Canadensis*) is the only indigenous wild cat in Alaska. Density, abundance, productivity and distribution of Canada lynx populations are dependent and upon the cyclic fluctuations of snowshoe hare and to a lesser degree other small mammal and upland game populations. Canada lynx are now Federally listed as a threatened species in the Rocky Mountains of the lower 48 states. For that reason, BLM Alaska considers the Canada lynx a sensitive species. At the same time, they are considered a furbearer, legal to harvest. Lynx can be found in the Bay planning area in forested habitat, where snowshoe hare populations are present. Hare habitat features grasses, green vegetation, berries, conifers, aspen, alder, and willow. Lynx will be found where they can primarily hunt snowshoe hare, and to a lesser degree, other small animal populations. Lynx populations expand and contract in direct response to snowshoe hare population cycles (Whitaker 1980).

Harbor seal. The harbor seal (*Phoca vitulina*) inhabits the coastal waters and river mouths of Alaska, including the Bay planning area. A population of seals resides permanently in the fresh water of Lake Iliamna. There are no harbor seal haulouts in the planning area; however, harbor seals may be found individually on the beaches in the Goodnews block. In the spring seals may follow salmon runs upriver for many miles, not returning to coastal waters until fall (Whitaker 1980).

Northern goshawk. The northern goshawk (*Accipiter gentilis liangi*) resembles the red-tailed hawk in shape but is gray and white in coloring. It inhabits taiga, the northern coniferous forests. It nests in a tall

tree in dense coniferous forest. It migrates and winters in lowlands as far south as northern Mexico. They feed mainly on grouse and smaller birds (Udvardy 1977).

Tule white-fronted goose. White-fronted geese, *Anser albifrons*, in Alaska nest mainly on the Yukon-Kuskokwim Delta, with smaller numbers in interior Alaska and the north slope. They are known to breed at Carter Bay in the Goodnews block of the Bay planning area (Seppi 1997), and Pacific flyway birds migrate through the Bristol Bay area in route to wintering grounds in the Central Valley of California (Bellrose 1980). White-fronted geese have declined in the Pacific flyway since the 1970's, but have rebounded to about 295,000 after the breeding season in 1993 (Rothe 1994).

Gray-cheeked thrush. The gray-cheeked thrush, *Catharus minimus*, uses a variety of habitats including willow and alder thickets, upland and riparian deciduous forests, and conifer forests (McCaffery 1996). Nests are typically 5-6 meters above ground in willow, alder, and spruce. The species has been found breeding in riparian zones in the Goodnews block (Seppi 1997), and in the Alagnak and Iliamna blocks in Bristol Bay (USFWS 1997). This thrush is a shy bird that feeds on beetles, weevils, ants, caterpillars, cicadas, berries, and invertebrates, generally on the ground. Alaska is an important breeding ground for this bird, which migrates the longest distance of all the small thrushes to Columbia, Venezuela, Peru, and northwestern Brazil in South America (DeGraaf and Rappole 1995). Breeding bird survey data suggests a population decline in eastern North America (Sauer and Droege 1992), but it is considered common in south coastal Alaska and the Alaska Peninsula, during the breeding season and in fall migration (Eskelin and Dewhurst 1996).

Olive-sided Flycatcher. The olive-sided flycatcher, *Contopus cooperi/borealis*, inhabits and breeds in low densities in coniferous boreal and coastal forests of Alaska. Their North American breeding range extends into Canada and the lower 48 states. They migrate from Alaska in early August and winter primarily in South America. Their current density, population trends, and distribution on BLM lands in the Bay planning area are not known; however, the species has been recorded in breeding bird surveys on BLM lands in the Alagnak and Iliamna blocks of the planning area (USFWS 1997), and in the adjacent Katmai National Park (USDI National Park Service 1995). Olive-sided flycatchers prefer to nest in spruce trees (Wright 1997) and are likely found in forested and riparian bottoms of the Bay planning area. Breeding bird survey data provide strong evidence for population declines of the species over most of its breeding range (Handel et al. 1998).

Trumpeter Swan. The trumpeter swan (*Cygnus buccinator*) occurs primarily in the northeasternmost Kvichak blocks of BLM-administered land in the planning area. They are normally found in forested areas but are casual breeders west of the taiga of interior Alaska (Hansen et al. 1971). Breeding swans prefer secluded wetland areas containing extensive areas of shallow lakes with abundant emergent vegetation. Adjacent waters and marshes are important for foraging. During a 1990 census they were found to number over 13,000 statewide (Mitchell 1994).

Blackpoll Warbler. The blackpoll warbler, *Dendroica striata*, also inhabits spruce forests of western Alaska, where it breeds. Habitat preferences include tall riparian shrubs, and coniferous or deciduous forest and in western Alaska in taiga/coastal tundra transition zones (McCaffery 1996). In August it migrates southward where it winters primarily outside the North American continent, in northern South America. It is largely insectivorous and prefers to nest low in spruce trees and occasionally on the ground. This species has been recorded breeding on BLM lands in the Goodnews block (Seppi 1997), and in the Alagnak and Iliamna blocks of Bristol Bay (USFWS 1997), and are considered a common breeder in these areas. Breeding bird survey data indicate a downward population trend in North America (Sauer et al. 1997).

Townsend's Warbler. Townsend's warbler, *Dendroica townsendi*, is a neotropical migrant found in summer in coastal locations in coniferous forests of Alaska, where it constructs a nest in a conifer at mid-story canopy and raises its young. It eats primarily insects and some seeds (Gough 2005). It departs Alaska in late August, and winters in Central America (Udvardy 1977). Its breeding habitat is largely restricted to mature forest with tall coniferous trees throughout its breeding range, and therefore is uncommon in the Bay planning area.

Arctic Peregrine Falcon. The Arctic peregrine falcon (*Falco peregrinus tundrinus*) can be found in low numbers throughout the planning area, nesting in areas with suitable habitat and migrating throughout the region. Falcons can be found in open country. Nesting habitat generally consists of bluffs or cliffs adjacent to water. Peregrines were listed as endangered in 1970, and the Arctic peregrine was delisted in 1994 (Federal Register 1994). Monitoring of Arctic peregrine indicates that populations have increased or remained stable since delisting (White et al. 2002).

Harlequin Duck. Harlequin ducks, *Histrionicus histrionicus*, are found in northeastern Siberia, the Kamchatka Peninsula, the Aleutian Islands and interior and south coastal Alaska (Bellrose 1980). Harlequins winter in the Aleutians and the Alaska gulf coast, coastal British Columbia and as far south as Washington and Oregon in coastal nearshore areas. The harlequin duck is widely distributed throughout the mountains of southwestern Alaska (Petersen et al 1991, McCaffery and Harwood 1994) and is associated with pristine turbulent waters to nest and raise broods throughout their range (Bellrose 1980). In spring they prefer nesting on mountain streams, especially they inhabit the upper portions of drainages. Their nests are usually built very close to water, on the ground in dense vegetation, in tree roots, or in rock crevices. They eat the larvae of aquatic insects that are found in the highly oxygenated waters of swift mountain streams, the eggs of spawning salmon, and herring spawn. Much of their habitat is pristine; however, while they are on the coast they are vulnerable to oil spills in their intertidal habitats close to shore (Rosenberg, Patten and Rothe 2005). Harlequin ducks are known to occur in the Goodnews Bay (Seppi 1997) and Kvichak blocks of the planning area (USFWS 1992), and have been reported in all major rivers in the Togiak Refuge, directly adjacent to BLM lands in the Goodnews blocks (McDonald 2003). Baseline spring inventories of breeding pairs are scheduled for the Goodnews Bay and Kvichak and Alagnak blocks of the Bay planning area in May 2006.

Bristle-thighed Curlew. The bristle-thighed curlew, *Numenius tahitiensis*, is a large shorebird that inhabit mountainous tundra in the Bay planning area in summer, and island beaches in winter. It is one of the rarest American birds. Its breeding area is limited to small mountainous areas of western Alaska. Its nests are made on a depression and lined with tundra mosses.

King Eider. King eider, *Somateria spectabilis*, have a circumpolar range, occurring throughout the arctic lands of coastal Canada, Alaska, Siberia, Russia, Scandinavia, Spitsbergen, and Greenland (Bellrose 1980). In Alaska, king eiders winter south along the Aleutian chain and southern coast of the Alaska Peninsula, or as far north as the sea remains ice free. In spring they nest on ponds on Arctic tundra, and when they are not breeding, they can be found in coastal waters. Their nests are inland on tundra and consist of a down-lined scrape, covered with down when the female leaves the nest (Udvardy 1977). Large flocks of king eiders have been found in nearshore areas of Carter Bay in the Goodnews block during spring migration (Larned 1995). Nearshore areas in the shoals of Kvichak Bay are also recognized as a major king eider staging area in spring (Larned 1998) and a molting area in summer (Larned and Tiplady 1998), directly adjacent to large blocks of BLM lands in the Kvichak and Nushagak watershed where breeding habitat exists and produce broods.

Long-tailed Duck. Long-tailed duck, *Clangula hyemalis*, are diving ducks that winter on upper Pacific coasts on inshore waters with shallow mussel banks and breed in Alaska on bays, lakes, tundra ponds and marshes. They nest near water on offshore islands along the coast or on tundra ponds and lakes. They eat aquatic invertebrates (mollusks, insects, crustaceans), fish, and some plant matter (Gough 2005; Udvardy 1977). Non-breeding birds have been documented in the planning area at Carter Spit (Seppi 1997) and in the Kvichak block (USFWS 1992).

Black Scoter. In Alaska, Black Scoters, *Melanitta nigra*, breed on the Yukon-Kuskokwim Delta and in Bristol Bay. They are considered a common breeder in the Carter Bay in the Goodnews block of the planning area (Seppi 1997), as well as in the Kvichak block in the Bristol Bay area (Seppi 1994). Black Scoters winter in nearshore areas along the Aleutian Islands and from the Gulf of Alaska to the Baja Peninsula (Udvardy 1977). Based on slight morphological differences, Pacific Coast birds come only from Alaska. In summer they breed and nest in tundra and boreal woodland settings that are interspersed with lakes or rivers.

Red-tailed Loon. Red-throated loon (*Gavia stellata*) breed within the Bay planning area. They breed largely in coastal areas throughout the state, and winter throughout the Aleutian Islands and in nearshore areas south to Mexico. It was found to be a common breeder on coastal ponds on BLM lands in the Goodnews block at Carter Bay and in the Kvichak and Alagnak Block in Bristol Bay (Seppi 1994, 1997).

Black Brant. Brant or black brant, *Branta bernicla*, are marine birds that breed on coastal tundra in Alaska and Canada, where they build nests close to the water. They are never far from salt water, and most nest along the Yukon Kuskokwim Delta coast. They live in bays and estuaries in winter. They are found on circumpolar Arctic shores of Eurasia and North America. Brant that breed in Alaska winter on the Pacific coast from Vancouver Island to Baja California. Their chief food is eelgrass and sea lettuce. Brant are threatened by the steady loss of their winter habitats. Small numbers of brant were recorded on vegetated intertidal areas and mudflats in August during fall staging and migration at Carter Spit (Seppi 1997).

Surf Scoter. The surf scoter (*Melanitta perspicillata*) is found in coastal locations in much of Alaska and British Columbia. In the Bay planning area, it breeds along the western coast of the Bering Sea as far south as the Goodnews block. Its distribution is not completely known. In the breeding season it inhabits tundra and forest bogs, where it lays its eggs in a down-lined scrape on the tundra. It can be found in coastal waters some distance from shore in the winter (Udvardy 1977).

7. Fire Management and Ecology

a) Wildland Fire and Fuels

The Wildland Fire and Fuels Management program supports identified land use and resource management objectives and wildland fire is used to protect, maintain, and enhance natural resources and, as nearly as possible, function in its natural ecological role. Wildland fire management options recognize fire as an essential ecological process and natural change agent of many Alaskan ecosystems and provide for the protection of human life and site-specific values. In areas where the objective is to exclude fire or minimize fire size, vegetation manipulation by various methods is a resource management tool to safeguard identified sites and maintain species diversity.

(1) Fire Policy in Alaska

The BLM participated with other Federal and State land management agencies and Native groups in completing 13 interagency fire management plans between 1980 and 1988. Plans for areas applicable to the Bay RMP are:

- Alaska Interagency Fire Management Plan, Kuskokwim-Iliamna Planning Area (1983)
- Alaska Interagency Fire Management Plan, Kodiak-Alaska Peninsula Planning Area (1986).

These plans provide a cost effective, coordinated, statewide, landscape scale approach to fire management. Each plan contains a description of the local environmental and socioeconomic conditions, natural and cultural resources, fire history and behavior, and local subsistence activities. The plans also provide a consistent interagency approach to operational procedures and the identification and prioritization of values to be protected. The four management options defined in the plans are flexible enough to allow different agencies to manage fire on their lands according to policies and mandates exclusive to their agencies.

In order to comply with the National Fire Plan and the 2001 Review and Update of the 1995 Federal Wildland Fire Management Policy (IFWFPR Working Group 2001), the BLM Alaska amended all of its land use plans in July 2005. the Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska (BLM 2004, 2005) identifies land use and resource objectives, wildland fire suppression options, and fuels (vegetation) management activities that achieve those objectives. Management options as

defined in the interagency plans were incorporated. The amendment is applicable to all BLM-managed lands in Alaska until such time as new RMPs are completed.

(2) Fire Management

Fire is an essential renewing force in interior forest (taiga) ecosystems, of which there are few in the Bay planning area. The fire releases nitrogen and other essential nutrients from woody vegetation back into the soil, allowing for new plant growth. Depending on the characteristics of the fire, a burn can alter the vegetation composition of any vegetational community from late successional species to early successional or pioneer species such as alder and fireweed (nitrate-fixing plants) (USFS 2002). A well-managed fire implementation plan is beneficial to any ecosystem. Fire is not a common change agent in the coastal temperate forest or alpine tundra ecosystems.

Fire management practices within the Bay planning area are directly tied to the interagency program. The four management options (Critical, Full, Modified, Limited) defined during the 1980s planning effort have been assigned (Table 3.13) in collaboration with adjacent land managers, to all BLM-managed lands (Figures 3.34a, 3.34b and 3.35). The management option classifications establish priorities for allocating fire-fighting resources and are based on values to be protected, resource management objectives, policies, and mandates. Fires are suppressed at minimum cost considering firefighter and public safety, benefits, values to be protected, and consistency with resource objectives. If a wildland fire is not contained by initial response forces, a Wildland Fire Situation Analysis is jointly completed by the suppression initial response forces, a Wildland Fire Situation Analysis is joint document completed by the suppression agency and field office staff to identify suppression alternatives and management constraints.

In addition to landscape scale management options, site-specific designation of Critical, Full, Avoid, and Non-sensitive have been established for structures, cultural, and paleontological sites, small areas of high resource value and Threatened and Endangered Species critical habitat in order for the field office staff to give suppression agencies more specific guidance for small sites. BLM permits and leases that authorize structures on BLM lands should contain wildland fire management information. It is the individual's responsibility to take precautions in order to protect the permitted/leased site and personal property on that site from wildland fire intrusion. Unauthorized structures are not protected. BLM's Policy on Structure Protection can be found in Appendix C.

Table 3.13. Fire Suppression Classes

Option	Intent	Management
Critical	Protect areas where there is a threat to human life, inhabited property, designated physical developments, and structural resources designated at National Historic Landmarks	Highest priority for assignment of available suppression resources to exclude fire from the area/site
Full	Protect cultural and historical sites, uninhabited authorized structures, natural resource high-value areas, and other high-value areas that do not involve the protection of human life and inhabited property	Priority is below Critical for available suppression resources to suppress fires at the smallest reasonably possible acres.
Limited	Allow fires to burn under the influence of natural forces within predetermined areas to accomplish land and resource management objectives. Estimated costs of suppression efforts are also a factor.	Surveillance to observe fire activity and to determine if site-specific values or adjacent higher priority management areas are compromised. Site-specific actions when necessary, to protect human life and site-specific values.
Modified	Balance acres burned with suppression costs and accomplish land and resource objectives. Strategies are based on an annual conversion date.	Assignment priority of available suppression resources is below Full. When risks of large fires are high, the initial response to a fire is analogous to Full without the intent to minimize acres, but to balance acres burned with suppression costs. When the risks are low, the appropriate response is to a wildland fire is analogous to Limited.

Suppression agencies implement the appropriate management response to a wildland fire based on the management option assigned to the BLM-managed land by the AFO staff. Under a Reciprocal Fire Protection Agreement between BLM and the State, fire suppression on BLM lands is the responsibility of the State of Alaska, McGrath Area. Other than suppression, fire and fuels management activities on BLM-administered land including, but not limited to, fire trespass, prevention, education, prescribed fire, and hazardous fuels reduction are the responsibility of the AFO staff.

(3) Fuels Management

Fuels Management assists in achieving the resource and land use objectives. The complete exclusion of wildland fires is not realistically feasible.

To date the BLM AFO has not expended funds within the Bay planning area for fuels treatment to meet resource objectives. Prescribed fire and manual fuels reduction projects would be the most viable although mechanical projects are still a consideration. However, as reflected in the fire history of the planning area, wildland fires are uncommon due to the climate regime and the extent of wet tundra.

(4) Fire History

Fire history can be found in Figures 3.34a, 3.34b, and 3.35.

Insert Figure 3.34a here(11x17 fold-in)

This page intentionally left blank.

Insert Figure 3.34b here (11x17 fold-in)

This page intentionally left blank.

Insert Figure 3.35 here (11x17 fold-in)

This page intentionally left blank.

Alagnak Block

Since 1950 when fire records started being kept no fires have occurred within this block. If a fire should occur it would be a rapid wind driven fire due to the tundra community dominating this block.

Goodnews Block

This block falls within two different vegetative classifications, Bering Tundra North to the west and Ahklun Mountains Tundra to the east. The vegetation ranges in the west from wet grasses along the coast with woody plants found in the transition between the coast and the mountains. In the eastern portion of the block, Alpine tundra dominates in the mountains. Black spruce maybe found on ridges and hills while a mixture of hardwoods and white spruce may be found on higher points along major rivers. The vegetation and maritime influence have kept fires from occurring on unencumbered lands within the block.

Iliamna Blocks

Fire as an environmental factor is insignificant due to the maritime influence and the tundra type vegetation. Fire occurrence on BLM lands within the block is very low, when fires do occur they are generally fast moving and of low intensity. The majority of fires are small, human-caused, and associated with recreational activities (AWFCG 1988). Fires have been ignited by lightening but these are not the norm. Only one recorded fire has occurred on unencumbered BLM lands.

Alagnak fire (A420), started and burned on Full Management Option land and burned 1193 acres on BLM land in 1990.

However, as the temperature rises with regional environmental change, plant communities are changing allowing for the possibility of more frequent fires.

Chulitna River, Chekok Creek, and Gibraltar Lake Blocks

These small isolated blocks of land in the northeast corner of the Bay planning area have not had any fires. The maritime influence dominates here; however, this is a transition zone where vegetation varies between open tundra, mixed deciduous, and spruce forests, transitioning to other types as the elevation rises on the slopes of the Aleutian Range.

Klutuk Creek Block

This planning block falls within the same vegetative classification as the other blocks within the general region. This block has had one fire; however, this fire burned on the border of this block and the Yellow Creek block and is part of the Yellow Creek discussion.

Koggiling Creek Block

This block is comprised of the same type of vegetation: tundra, grasses and dwarf shrubs. This area is also under a maritime weather influence. One fire has occurred in the Block.

Koggiling Creek 2 Fire (7104542), Point of origin was in Modified and burned 140 acres in 1997.

Kivichak Blocks

Fire is also insignificant due to the maritime influence and tundra type vegetation. Fire records show that no fires have burned in this block since 1950.

Yellow Creek Block

In 1957 a small amount of land burned on unencumbered BLM lands.

Cormick Fire (005), there was not a point of ignition identified. The total fire burned 4500 acres.

This area is the same as the previous blocks with regard to vegetation: tundra, grasses and dwarf shrubs. Fires that would burn in these areas would spread rapidly and burn surface vegetation.

Fire management practices within the planning area are directly tied to the AIWFMP. BLM and other lands administered by the BLM have been assigned the appropriate management option. These management options are Critical, Full, Modified and Limited. As the landscape changes so may the options in any given area. The options are based on Intent, Policy, Objective, Operational Considerations and Operational Procedures and are described fully within the AIWFMP. At present, Wildland Fire Use is permitted in the planning area.

8. Cultural Resources

a) Introduction

The cultural resources program is responsible for the identification, monitoring, and protection of all historic and prehistoric resources on BLM administered lands within the boundaries of the Anchorage Field Office (AFO). The cultural resources within this planning area are extremely varied in respect to age, culture, function, and physical remains.

The planning area spans three linguistic groups: central Yup'ik, Alutiiq and Dena'ina (Figure 3.33). The following sections present an overview of the prehistory and history of each area and the current status of cultural resources work on the BLM managed-lands within these areas. A general overview can be seen in Table 3.14 and a timeline for the historic period in the planning area can be seen in Table 3.15.

(1) Central Yup'ik Area Prehistory and History

Overview of Archaeological Data from the Region and the General Area

The oldest sites of human occupation in this area (6000-3000 B.C.) occur in two phases both representing a focus upon caribou or large land mammal hunting. The earlier Paleoarctic is represented by a blade-making tradition; the later Northern Archaic contains diagnostic corner-notched projectile points (Ackerman 1980, 1985; Dumond 1987). A somewhat later tradition, the Arctic Small Tool tradition (2000-1000 B.C.) also appears to focus primarily upon land mammal hunting. This phase is distinguished by fine microblades and microblade cores.

In the larger region even older sites have been found that are believed to extend back to about 9500 B.C.. These areas lie to the northwest in the vicinity of the Kisaralik River and Nukluk Mountain. The younger known sites of the Central Yup'ik considered in this plan are the oldest that occur here (Ackerman 1980).

The Norton tradition (300 B.C. - 1000 A.D.) marked a shift in subsistence focus. Settlements became more permanent and located along the coast and rivers. Ackerman (1981) has found isolated Norton materials inland. Constructed house remains and the development of local pottery support this view. Ground stone net sinkers indicated that the salmon resources were being utilized in greater amounts and probably being preserved and stored as food for most of the rest of the year (Ackerman 1981; Dumond 1987; Kowta 1963; Larsen 1950; Shaw 1986).

Insert Figure 3.33 here (11x17 fold-in).

This page intentionally left blank.

Table 3.14 . Cultural Contexts for the Bay Planning Area

Dates	Location	Theme	Diagnostic Cultural Features, Artifacts
7000 - 9500 B.C.	Kisarilik River, Nukluk Mountain	Earliest Human Occupation of the larger Region	Narrow, wedge-shaped microblade cores, microblades, Donnelly-like burins, blade-like flakes
6000-5500 B.C.	widespread	PaleoArctic/PaleoIndian tradition	Microblade technology
3000-2000 B.C.	Coastal, river drainages	Archaic/Pacific Coastal	side-notched points, unifacial scrapers
2000-1000 B.C.	widespread	Arctic Small Tool tradition	Finely flaked small stone tools, microblades, microblade cores
1000AD - 300BC	Along coast and major rivers, some isolated finds inland	Norton tradition	Constructed houses, fiber tempered pottery, first ground stone, net sinkers
AD 1800 - AD1000	Primarily coastal	Thule tradition	Kayaks, toggling harpoons, floats, dog traction, gravel tempered pottery

Table 3.15. Timeline for Historic Period

Dates	Event
~1767-1867	Russian Era
1767	First exploration of Bristol Bay
1796	Lebedev-Lastochkin company establishes a small trading post at Lake Iliamna
1798	Iliamna trading post destroyed
1799	Czar grants monopoly for fur trade to Russian American Co.
1818-1819	First major trading post in Bristol Bay area built - Alexandrovsky Redoubt (Nushagak)
1835-6	Smallpox epidemic throughout region and beyond
1867 to present	American Era
1868	1 st U.S. government visit to Bristol Bay region in U.S. Revenue steamer <i>Wayanda</i>
1883	1 st cannery in Nushagak Bay
1886	Moravian church mission established in Nushagak
1904	Chinese Exclusion Act- marks beginning of local fishermen's unions efforts to be included in the commercial fishing industry
1912	Mt. Katmai erupts; Savonoski village abandoned

Historic People

Oswalt (1990) presents a breakdown of language subgroups for this area during the historic and late prehistoric periods. The Bristol Bay area was occupied by the Tuyuraniut; the inland Wood-Tikchik Lake and north to the Kuskowim area inhabited by the Kiatagmiut; the Quinaghak area on the eastern side of

Kuskokwim Bay was occupied by the Caninermiut; and the Nushagak River drainage was occupied by the Aglemiut (Aglurmiut). These groups were by no means permanently fixed through time. Just prior to the Russian arrival in the area, the Aglemiut had moved to the Nushagak Bay and River as a result of warfare on the Yukon-Kuskokwim delta.

The Central Yupik during the historic period practiced a central based wandering lifestyle based upon permanent villages. Subsistence focused upon salmon fishing. Along the coast sea mammal hunting also provided for a large part of the diet. In the interior area large land mammal hunting was very important. Other seasonal subsistence pursuits included waterfowl, fresh water fish, berries as well as fur bearers which were, depending on species, also eaten (VanStone 1967, 1968, 1971)

Russian Period

The first Russian exploration into the Bristol Bay area is implied in the 1767 chart of Admiral Nagaev and a chart reflecting Poptap Zaikov's 1772-3 baidarka expedition from False Pass (Bailey and Orth 1990). The 1790's found competing fur trading companies had employees in the area—exploring along the north coast of the Alaska Peninsula and Bristol Bay and ascending the Kvichak River to Iliamna Lake then overland to Kamishak Bay (Solovjova, and Vovnyanko 2002).

In 1799 the Russian Czar gave the Russian American Company a monopoly on the Alaskan fur trade. The first trading post in the plan area was established as a result of the 1818-1819 Korsakovsky exploration of the Nushagak River via Iliamna Lake. While Korsakovsky continued to explore up the coast to the mouth of the Togiak River and to Goodnews Bay, a work crew from his party stayed at the mouth of the Nushagak River and built Novo-Alexandrovsky Redoubt (Black 2004; VanStone 1988).

When the Russian American Company was awarded a monopoly over the fur trade, as a condition it was obliged to support the mission of the Orthodox Church in Alaska. The company paid for clergy, churches and schools. Early relations between the Russian clergy and the Native people were for the most part good; however, they could be extremely tense as evidenced by the killing of Father Juvenal and his Russians and Alutiiq attendants in 1796 (Pierce 1990).

The Aglemiut were displaced from the Yukon-Kuskowkim delta area by warfare shortly before the Russians arrived in the area. Because they were new to the Nushagak River area and the adult male population so low from warfare, they turned to the Russian American Company for protection from the Kiatagmiut and others (Oswalt 1990; VanStone 1971). As a consequence of this relationship, many members of this group worked for the company. Small clusters of Native children throughout the area were educated in small Russian Orthodox schools set up at fur trading outposts. Marriages between Russian traders and Native women were sanctioned by both the church and the company throughout the region. Both Native and mixed Native-Russians became employees of the Russian American Company. Working within the fur trade gave Native people throughout the area their first exposure to a market economy.

The explorations of Bocharoff, Kvichak, Korsakovskiy, Vasiliev, Kolmakov, Lukin (some of these men of mixed Native/Russian creole class) and countless unnamed traders of the Russian American Company contributed a great deal not only to the Russian fur trade but to the general knowledge of the area. By 1867 the Russians had, for the most part, accurately mapped the region.

American Period

The sale of Alaska in 1867 brought the end to the Russian American Company. Its assets were sold to Hutcheson Kohl, a company based in San Francisco. Hutcheson Kohl later became the Alaska Commercial Company which continues to this day as one of the major commercial sources in the region.

The American government did not take an active interest in its new purchase for several decades—at least not in this area of Alaska. In 1868 Captain J. W. White in the United States Revenue steamer *Wayanda*

made a cursory visit to the area stopping long enough at Nushagak to make a description of the old Alexandrovsky Redoubt (VanStone 1967)

With the sale of Alaska to the United States, the Russian Orthodox Church was in a quandry. The Russian American Company had supported church efforts during their tenure but with their departure also went not only most of their support but some personnel. With fewer clergy some areas received fewer or no visits.

Into this perceived void stepped Sheldon Jackson, a Presbyterian who had been working in southeast Alaska since 1877. He undertook a series of public lectures during the early 1880's advocating the need to bring Alaska Natives into Protestant Christianity. His crusade influenced Moravian Church officials to send a mission to the lower Kuskokwim in 1884. Having established a mission on the Kuskokwim another was quickly thereafter established near Nushagak in 1886 (Oswalt 1990; VanStone 1979).

The Russians first looked at developing a commercial fishery from the abundant resources in Alaska but the commercial saltery never became viable. In the meantime canning technology continued to improve and by the 1870s canneries became more commercially feasible. During this period commercial fishing developed on major rivers in California, Oregon, British Columbia and Southeast Alaska. By 1883 the first cannery in Nushagak Bay appeared at Kanulik. After that many more were established throughout the area. By 1908 there were 10 canneries in Nushagak Bay alone and by the 1920s 25 were operating within Bristol Bay with floating canneries starting to make an appearance. Initially salmon were caught from sailboats with gill nets. Power boats were introduced in 1922 but were quickly banned.

The blocking of river mouths with fish dams and over-harvesting resulted in poor returns for the commercial fishing industry as well as poor subsistence fishing. The Bureau of Fisheries tried to stem the tide of illegal and over-fishing, but was ineffective due to lack of enforcement. A 1918 program initiated a practice of installing stream guards on major salmon streams. These men lived in small huts at remote locations for the season. Subsequently the salmon markets dropped.

Native involvement in the commercial fishing industry was severely limited until after WWII. The canneries imported most of their labor for both the cannery operation and the fishing crews. The Chinese Labor Exclusion Act of 1904 and its extension reduced the number of Chinese workers imported, but canneries responded by importing Filipino and Mexican laborers. The organization of fishermen's unions began the fight for local inclusion in the commercial fishing industry. Wages from commercial fishing still makes an important contribution to the economy of Native people from the larger region (Selkregg 1998).

For the next several decades Federal attempts at regulation of this industry were weak. During this time commercial fish traps were used by the big cannery companies which both effectively lowered the number of salmon reaching spawning grounds and shutting out local seine fishermen. Outrage by Alaskans against the big companies which were owned by outside interests fueled a campaign to get the traps outlawed. This was only partially successful. Some traps were closed for conservation reasons. Meanwhile cold storage technology and improved transportation made it possible for the big companies to get relatively fresh fish to markets (Lichatowich 1999).

Unlike much of the rest of Alaska there were no gold stampedes of any significance. However the presence of gold strikes in other areas resulted in a backwash of ever hopeful prospectors entering into this country. Small amounts of gold were found near the confluence of the Kakhtul and Mulchatna rivers in the late 1880s.

The significant mining story of the region began in 1926 by Walter Smith, a Native from Chagvan Bay. While prospecting near Goodnews Bay he encountered a strange dull grey heavy metal ore which turned out to be platinum. On this news a modest 8-10 miners entered the area and began prospecting (Lindstrom and Olson 2004). This was just the beginning of platinum mining in the Goodnews Bay area.

When Andrew Olsen and Walter Culver met on the train between Seward and Anchorage in the spring of 1933 the biggest platinum mine in the United States was born. Olson was on his way to Flat where he

and his brother and partners operated a dragline operation. Culver was planning a prospecting trip to Goodnews Bay. By the spring of 1934 a dragline and elevated sluice box were on their way to Goodnews Bay. The operation was so successful that a dredge was in operation by 1937 (Johnson 1940).

Smith (1938) describes the Goodnews Bay mining company as “the outstanding development in the platinum-mining industry in Alaska, as well as the United States proper.” Later during WWII when most gold mining operations were shut down the platinum mined at the Goodnews Bay Mining Company was listed as critical so the mine was one of few that continued to operate through the war.

Current Status

Most of the blocks of BLM land or Native selected land within the planning area lie within the lands traditionally inhabited and used by the Central Yup'ik. Within the region a number of surveys have been conducted along the coast, major rivers and some of the lakes and upland areas. On BLM managed lands there has been limited permitted use except for mining in the Platinum area and wide ranging guiding operations. Few archaeological surveys have been done on BLM managed lands primarily due to limited accessibility and resource development. BLM archaeologists have performed on the ground inspections of mining and permitted activities over the last several decades. Typically they inspect adjacent areas as time and logistics permit; recording properties as encountered.

The Bureau of Indian Affairs ANCSA program has recorded many properties while doing ongoing 14 (h)(1) inventory on Native-selected lands. During the late 1970s and early 1980s Robert Ackerman and his crews surveyed both BLM and USF&WS lands in the drainages of the Goodnews Bay area. Robert Shaw also surveyed on BLM lands during this time period on Hagemeister Island and the Goodnews Bay area. In 2004 a research permit was issued to the University Museum for archaeological survey at Canyon Lake, an interior area of the Goodnews Bay region (Odess 2005).

(2) Alutiiq Area Prehistory and History

Overview of Archaeological Data from the Region and the General Area

The Paleoarctic tradition within the upper Alaska Peninsula dates to between 8000 B.C -5500 B.C. It is best known from interior sites from the uplands of the Alaska Peninsula. The oldest sites are known from the upper Ugashik drainage located farther down the Alaska Peninsula and outside of the planning area (Dumond 1981). The tools recovered from these paleoarctic sites imply a life style based upon large land mammal hunting, presumably caribou. People during this period are thought to have been extremely mobile; living in skin tents and following game.

There is a 2500-year break between the Paleoarctic period and the Northern Archaic period. This may be the time when interior hunting people settled the coastal areas and learned a maritime subsistence lifestyle as evidenced by the Ocean Bay 1 sites found along the coastal areas of Kodiak Island, the Alaska Peninsula, the east side of the Kenai Peninsula and the Prince William Sound area (Steffian 2001). Ocean Bay tradition peoples developed many specialized tools for a maritime subsistence. Continuing relatively smoothly from the Ocean Bay tradition, is the Katchemak tradition in which dwellings become larger and more permanent, maritime subsistence became more refined, the carving of bone and stone became an art form, and ceremonial life became more elaborate. The region at this time appeared to be a crossroads for cultural contact as seen archaeologically by the appearance of ground slate and oil lamps from this region appearing in a wide arc. At the same time toggling harpoons from the north, labrets from the Northwest coast and pottery types from Siberia made their appearance here (Crowell and Luhrmann 2001).

Historic Native People

From excavations on Kodiak Island archaeologists believe that the Alutiiq descended smoothly from the end of the Katchemak tradition (Jordan and Knecht 1988). The Thule migrations from the north may have displaced Alutiiqs, especially within the plan area on the north side of the Alaska Peninsula. Dumond's

(1987) work shows prehistoric Alutiiq occupation on the upper course of the Naknek River and on the Savonovski River for approximately 4,500 years with the first 500 years primarily hunting (most likely caribou) and last 4,000 with heavy focus on fishing.

The late prehistoric Alutiiq over time most likely moved down the river drainages to the coast. The later migrations of the Central Yupik group, the Aglemiut, most probably displaced Alutiiq people living near the mouth of the Naknek River. By historic times the Alutiiq living within the plan area were living in the Naknek Lake/Savonoski drainage area (Crowell and Lurhmann 2001).

Russian Period

The Russian presence within this area essentially reflects what occurred within the Central Yup'ik area. The Russian fur trade for this part of Alaska was administered from Three Saints Bay on Kodiak Island in 1784. However, the trading post was located at the mouth of the Nushagak River at Alexandrovsky Redoubt had the most contact with people of this area. It was established during the 1818-1819 exploration of Bristol Bay and the coastal areas to the north.

American Period

In 1867 Alaska was sold to the United States. American influence on the Alaska Peninsula came slowly. The first substantive American contact came with missionaries who arrived in the late 1880s. This was followed by the establishment of various commercial fisheries which were developed soon after.

On June 6, 1912 Novarupta erupted sending more than 5 ½ cubic miles of debris into the air. This was a significant historical event for this region and it also leaves a datable stratigraphic mark upon undisturbed historic and prehistoric sites of this region. The ash fall at the village of Savonoski was so massive that the people moved down river to the mouth and established New Savonoski.

Current Status

No BLM unencumbered land lies within the area traditionally inhabited and used by the interior Alutiiq. Fairly extensive survey and excavation has occurred along the length of the Naknek drainage.

(3) Dena'ina Area Prehistory and History

Overview of Archaeological Data from the Region and the General Area

The Iliamna - Lake Clark area is not a well known area archaeologically. What little survey done in this area has concentrated around the lake shores and upon specific areas of projected construction (Kodack n.d.; Yarborough 1986). This work essentially documents the late prehistoric occupation of the area. Smith and Shields (1977) added some sites but not much time depth. They give some suggestions for older site location at slightly higher levels than present day lake shores and caves and also suggest that water fluctuations may have destroyed information for some periods. Inventory in this area otherwise has not been as actively pursued as more accessible, less heavily vegetated areas. In spite of this situation there are indications from the broader region that this area has long been inhabited.

The best evidence so far for time depth comes from Yarborough's 1986 survey of the eastern terraces of the Tazimina River. He found a microblade core fragment and a retouched flake. As can be seen from the more recent historic sites and the continuity of a subsistence lifestyle still practiced today, this is an area with bountiful resources.

Historic Native People

The Dena'ina living in the Iliamna and Lake Clark area as well as those of the upper Mulchatna and Stony rivers are grouped together as the Interior Society. This is one of three societies within the Dena'ina.

The Interior Society has a subsistence focus upon salmon. They also rely upon large land mammals, waterfowl, fresh water fish, and berries in season. The group around Iliamna Lake harvests seals since this is one of the few freshwater lakes in the world with a resident sea population. The Iliamna group also travels to Cook Inlet to hunt beluga (Townsend 1965; 1981).

All societies maintained winter villages from which they set forth seasonally to collect and hunt the foods they depended upon. Until the middle of the 19th century villages tended to be hidden to foil attacks. After this period winter villages were located along the shores of rivers and lakes. By 1906 Dena'ina houses in the Iliamna-Lake Clark area were all above ground structures although the Iliamna Eskimo still had semi-subterranean houses (Townsend 1981; VanStone and Townsend 1970).

Russian Period

By the 1790s it was obvious to the Russians plying the fur trade in the coastal waters of Alaska that the marine mammal fur market was declining. A shift toward land mammal furs took place and exploration of the interior became more attractive. (Solovjova and Vovnyanko 2002; VanStone 1988). Valsily Kvichak explored the Kvichak River and north along the coast as far as the Kuskokwim perhaps even to the Yukon as seen in composite maps drawn by Kobelev in 1779 (Oleksa 1990). One of the competing Russian fur trading companies, the Lebedev-Lastochkin company, began actively operating in the Iliamna area in 1796 (Solovjova and Vovnyanko 2002).

A year later a party from the largest competitor (Shelikov's company) visited the Iliamna artel (a small fortified settlement). Medvednikov and Kashavarov visited the Iliamna artel with a small party and described it as containing a barracks, several Dena'ina-style bark houses and a stockade complete with a guard and sword. A man named Tokmanov was in charge of fifteen Russians and Kamchatkans. All of them were married to Native women and had children (Solovjova and Vovnyanko 2002).

At around this time Vasily Ivanov heading a group of Russians and Dena'ina explored to the north of Iliamna. Because only secondhand accounts of this trip survived the exact route is not known but it is believed that they went across Iliamna, Lake Clark, up the Mulchatna to either the Stoney River or Holitna River and down the Kuskowim as far as Ohagamiut then portaged across to the Yukon (Solovjova and Vovnyanko 2002; VanStone 1988). In 1798 the Iliamna artel was destroyed by Natives and it was not until 1821 that another Russian trading post was established in the area (Vanstone and Townsend 1970).

During Korsakovsky's 1818 trip he left some of his party at the mouth of the Nushagak to build Alexandrovsky Redoubt and ascended the Kvichak to Iliamna where he met Eremy Rodionov who offered to lead a party north to Lake Clark and the upper reaches of the Mulchaltna River. This trip was very similar to that reported for Ivanov. The September return trip brought the travelers back to Iliamna then overland to Cook Inlet and back to Kodiak (VanStone1988). This travel route between Iliamna and Cook Inlet was not surprising considering the Iliamna Dena'ina ties with Cook Inlet Dena'ina. After the Russians established themselves in the Cook Inlet area, trade with the interior Dena'ina was conducted through Cook Inlet Dena'ina middlemen as well as directly with posts around Cook Inlet and the Kenai Peninsula (Townsend 1981; VanStone and Townsend 1970).

American Period

As elsewhere in this region, the American period started slowly. The 1867 purchase of Alaska did not immediately result in much attention or change in the lives of the people living in this area. In the 1880's commercial fish traps set at mouth of Kvichak River resulted in so little escapement that people at Nondalton faced starvation and had to rely on "backup" drainages for fish like the Kuskokwim River (Ellanna and Balluta 1992). Other shortages resulted because of similar blockages on other rivers connecting with Iliamna and Lake Clark (Townsend 1981). A reindeer herd was established at Iliamna in 1905 to help the economy. Some Dena'ina became herders but this endeavor was never very successful and herding had almost disappeared by the 1940's (ibid). Like the Central Yup'ik and Alutiiq, the Dena'ina were eventually able to participate in the commercial salmon fishery during the 20th century after

breaching the barriers to local employment. Their continued participation in that industry is an important part of the local cash economy today.

Current Status

Very little BLM land or Native-selected land lies within the area traditionally inhabited and used by the Dena'ina. There has been limited permitted use except for wide ranging guiding operations for these isolated parcels. Little on the ground inventory has been done for these smaller parcels due to the high costs to access such remote parcels coupled with the lack of ground disturbing projects at these locations. Smith and Shields performed survey on primarily NPS lands in the Lake Clark area in the late 1970s but also found sites on adjacent small BLM managed parcels.

9. Paleontological Resources

a) Introduction

The paleontology program is responsible for the identification, evaluation, monitoring, and protection of fossil resources on BLM-managed lands within the boundaries of the Anchorage Field Office.

An inventory of known paleontological resources on selected BLM lands was contracted in 1986 (Lindsey 1986). This study was done from available literature. Two BLM land blocks lie within the current planning effort. Area 1 encompasses the BLM block lying within the Dillingham, Iliamna, Naknek and Mt. Katmai quadrangles. Lindsey's Area 2 encompasses BLM lands within the Goodnews Bay quadrangle. An examination of the Alaska Paleontological Database (alaskafossil.org) shows no scientifically significant discoveries more recently reported for BLM lands within the planning area.

While none of these finds has been assessed as scientifically important, any earthmoving projects should be assessed with on the ground inspections.

(b) Nushagak/Iliamna/Naknek Region

Lindsey's (1986) Area 1 encompasses the BLM blocks lying within the Dillingham, Iliamna, Naknek and Mt. Katmai quadrangles. While Lindsey reported that no fossils have been reported from this area, the extensive Quaternary deposits present the potential for future finds. Mammoth remains were excavated by archaeologists in secondary context in Naknek although none is known from BLM managed lands (Dumond and VanStone 1995).

(c) Goodnews Bay Region

Lindsey's Area 2 encompasses BLM lands within the Goodnews Bay quadrangle. Small, poorly preserved Permian brachiopods and a Jurassic bivalve are both reported for the Gemuk group. While these fossils may be useful to determine the age and stratigraphy of the Gemuk Group, no special management of these resources is recommended. Findings of Jurassic age radiolaria and fragmentary ammonites have also been reported for the Goodnews Bay and Hagemeister Island quadrangles (Hoare and Conrad 1978).

10. Visual Resources

a) Visual Resources Management Introduction

Scenic quality is an essential component of most recreation activities. In Alaska, the opportunity to experience a natural environment that has been, for the most part, undisturbed by modern human influence, creates a romantic image that appeals to recreationists across the globe. The wide-open spaces, and relatively few public roads throughout the state, make recreating in Alaska an appealing destination (Brown 2002). BLM uses Visual Resource Management (VRM) on BLM-managed lands within the Bristol Bay planning area to manage the quality of the landscape. Management objectives include minimizing potential impacts to visual resources resulting from development activities.

The visual resources of BLM-managed lands within the Bristol Bay planning area were inventoried and classified in accordance with procedures outlined in BLM Handbook 8410-1 (BLM 1984). It involved identifying the visual resources through a photo inventory process and use of data collection sheets, and then assigning the areas to Visual Resource Inventory classes. These classes did not establish management direction, but were used as part of the information to establish VRM Management classes. The four different VRM classes identify the objectives for managing visual resources. The class assignments take into consideration the value of the visual quality and anticipated future land uses, and define the maximum amount of landscape alteration and surface disturbance that could occur.

BLM evaluates visual values based on a rating system that looks at:

- Scenic Quality: the visual appeal of a piece of land,
- Sensitivity Level: the public concern for the scenic qualities of the land, and
- Distance zones: the relative visibility from access routes and observation points.

Based on these factors, lands are placed in one of four visual resource inventory classes. Inventory classes II through IV (the lowest) are assigned based upon the combined scores from the three factors, while class I is reserved for lands previously designated by Congress or administratively to preserve a natural landscape, such as a Wilderness area or a wild portion of a Wild and Scenic River.

During planning, BLM assigns VRM classes. These define visual the objectives that BLM intends to achieve for its lands. The objectives for VRM classes are:

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

Class II Objective. The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III Objective. The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV Objective. The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

b) Description of Bay Visual Resources

Visual resources on BLM lands in the planning area are concentrated in three geographic areas that tend to demonstrate similar scenery: a Goodnews Bay Block in the west, a Nushagak/Kvichak Block in the central portion and an Iliamna Block in the east.

Goodnews Block.

The Goodnews Bay Block consists of large tracts of selected and unselected BLM lands located in the Goodnews River and Arolik River watersheds including coastal plains, slopes and mountains on the Bering Sea to the west and river plains and the Ahklun Mountains to the east. These low mountains and hills can be rather steep and rugged, or support gentle, tundra-clad slopes that increase in elevation towards the northeast, often containing cirques and other glacial features, rock outcrops, talus slopes and cliffs. Shrubs and tundra dominate the block while trees are generally lacking, except in the broad riverine bottoms and along various tributaries where alder and willow predominate. Expansive tundra-covered coastal plains bisected by sinuous west-flowing rivers including Indian and Cripple Creek bound the Pacific Coast western side of the Goodnews Block. Much of this BLM land is adjacent to the 700,000 acre Togiak National Wildlife Refuge, portions of which are managed as designated wilderness by the US Fish and Wildlife Service. Remnants of commercial gold and platinum placer mining activities are occasionally visible near Goodnews Bay to the south.

Nushagak/Kvichak Area

The Nushagak/Kvichak Area, in the central portion of planning area, contains selected and unselected BLM lands in the middle watersheds of the Nushagak, Kvichak, and Alagnak Rivers, reported to be some of the most productive salmon fishery and spawning waters in the world. The land between these rivers and that situated to the west and east, is a vast patchwork of lowland wet tundra, broad low ridges of successive ancient moraine deposits supporting scattered stands of dwarf birch and black and white spruce, sand blows, and thousands of pothole lakes and tributary streams. The land is rich in moose and salmon, rainbow trout and seasonal caribou. The BLM lands in this region bound the Alagnak Wild River and Katmai National Park and Preserve, both administered by the National Park Service, and a small portion of the Becharof National Wildlife Refuge.

Iliamna Area

The Iliamna Area incorporates mostly Native-selected and State-selected lands north, south, and east of Iliamna Lake, and contains the highest mountains and most stunning scenery in the planning area. This includes rocky, snowcapped mountains towering 4,000 feet above short valleys that drain to Iliamna Lake, with heavier white spruce forests and frequent outcrops of glacially smoothed rock below the dry tundra slopes above tree line. BLM lands in this block share boundaries with Lake Clark National Park and Preserve as well as State of Alaska and Bristol Bay Native Corporation lands. Based upon Alaska Native selections and the State of Alaska's priority list for conveyance, the vast majority of BLM lands in this block, including the high mountains and ridges, are likely to be conveyed out of BLM ownership.

c) Condition and Trend

High quality visual resources are in ever greater demand nationally and internationally as commercial, residential, and industrial development associated with growing populations impacts these resources. The quality of visual resources is a critical element in an observer's impression of a landscape and is in great demand by the local residents as well as the many individuals and users who fly over and recreate on public lands in Alaska.

The quality of visual resources directly impacts the quality of a resident's everyday life as well as a given visitor's overall Alaskan experience. Visual resources are therefore very important to the residents, to the visitors who recreate in the planning area, and to the many commercial businesses that serve them.

Both the numbers of visitors, sportspeople, and rafters that are drawn to the area's wildlife, topography, and scenery and the local commercial enterprises that transport, lodge, and guide them are linked to this demand.

Much of the land in planning area consists of wildlife refuges and national and state park lands administered by the US Fish and Wildlife Service, National Park Service, and Alaska State Parks. Although the annual visitation statistics fluctuate, all agencies are experiencing increases in visitation over the long term according to their public statistics, and predict it will continue to increase, as greater numbers of national and international travelers discover and visit these public lands. Travel forecasts by the Alaska travel industry also continue to predict increases in Alaska tourism as more and more visitors are attracted to Alaska's wild lands to hike, fish, hunt, and especially sight-see.

Outside visitation varies widely over the planning area, but tends to concentrate in the central and eastern, salmon and rainbow-rich, watersheds of the Nushagak, Kvichak, Alagnak, and Naknek. The Alagnak River Wild River and adjacent Katmai National Park and Preserve, draw over 50,000 sightseers, fisherman, and float enthusiasts annually. Numerous fishing and hunting lodges operate along these drainages, and many more flying services based in Dillingham, King Salmon, Iliamna, Anchorage, and other locations provide transportation to fishing, hunting, and rafting locations throughout the planning area. The quality of visual resources is extremely important to the financial health of these local businesses, outfitter-guides, and transporters who cater to the needs of area visitors.

Local residents in the planning area express a strong appreciation for the quality of the unaltered visual landscapes that surround them and often speak in terms of the recreational and spiritual benefits they gain from these landscapes. The majority of the residents in the planning area practice subsistence lifestyles and travel the land year-round, harvesting natural products including berries, salmon, moose, and caribou, accessing trapping and fishing sites, and conducting social and business activities. Travel patterns concentrate along the main waterways, both summer and winter, and the heaviest used lands tend to be closely associated with the river corridors. In the snow season, residents also utilize an extensive system of winter trails, well marked with tripods, reflectors and GPS locations, to travel between villages and throughout the area for school and church events, business and family needs.

The quality of visual resources as viewed from the air are especially significant on an area-wide scale as virtually all recreational users and many local citizens access the country by aircraft. This includes both scheduled commercial flights between communities with larger airports including Iliamna, King Salmon, Bethel, and Dillingham, as well as service to smaller villages who all maintain gravel airstrips. Private pilots and transporters annually fly thousands of flights into the bush supporting flightseeing, recreational and subsistence activities. Alaska Fish and Game harvest records for moose, bear and caribou hunts in the BBPA from 1983-2002 indicate that aircraft delivered 46% of these hunters into the field.

Visual resources in the planning area are essentially pristine. With the exception of ATV tracks radiating out from villages, vestigial summer scars of overland snowmachine routes, occasional airstrips, infrequent abandoned mining operations and various lodges, fishing camps, boats and aircraft along the waterways, the visual resources in the planning area are virtually undisturbed from their natural state. Although difficult to quantify, the vast majority of residents and visitors in the planning area share an appreciation for these natural, uniquely Alaskan, visual landscapes.

d) Visual Resource Management Classes

The 1984 Southwest Management Framework Plan (MFP) addresses VRM considerations, but covers only a portion of the actual land within the Bay planning area. Objective VR-1 states "Allow only very limited visual change in areas designated "Wild" portions of Wild and Scenic Rivers." These areas are to be designated VRM Class I which provides for primarily natural ecological changes in visual resources, but does not preclude limited management activities.

The MFP VR-2 objective is to “Maintain the visual quality of the planning area.” The rationale further states “The planning area is virtually undisturbed by human activities. Any major development would be highly visible from aircraft. Development should be designed for minimum impact to visual resources and to reduce unnecessary surface disturbance.”

The MFP multiple-use recommendation calls for evaluating all proposed management activities using the visual resource management contrast rating system and encourage activities that are compatible or designed to be compatible with the character of the natural landscape.

Current management practices require that a specialist analyze the visual resource impacts of proposed actions on a case-by-case basis. The BLM’s policy is to minimize impacts to visual resources and place stipulations on permits to accomplish this goal. To date, most VRM actions in the planning area have been applied to communication tower permits and have addressed mitigation issues related to structure heights and color schemes.

Identifying and monitoring visual resources in the BBPA is extremely difficult and costly due to the vast size and remoteness of the land, and the scattered nature of BLM holdings. BLM staff often learn about developing and existing conditions through conversations with pilots, SRP holders, land managers from other agencies, and local residents and visitors.

Current demands on visual resources beyond the expectations of visitors and adjacent land management agencies have the potential to degrade pristine VRM values. Unlimited and unregulated OHV traffic, increases and expansion in lodge construction and visitation, increases in transporter and charter trips to the area, and utility and infrastructure development associated with human settlements all have potential to affect VRM throughout the planning area.

There currently are no mineral development proposals on the table for BLM lands in the planning area. However, the development and associated infrastructure of new and revitalized mining activities may affect visual resources in the Bay planning area. The unique geological nature of the Goodnews Bay area holds good potential for future development of mineral resources as does the proposed Pebble Mine project, located on state land north of Illiamna Lake. A string of potentially mineral-rich plutons trend southwest of the Pebble project under BLM lands near the lower Kvichak and Nushagak drainages. Future exploration and development of these deposits may also affect the visual landscape in these areas.

The Bay planning area holds limited potential for commercial timber sales although no permit requests have been received in the last ten years. Free use permits for domestic fuel wood and house log use are authorized by 43 CFR 5511-2.1, but also have not been requested in the past ten years. NEPA documentation for either uses would address VRM elements on a site-by-site basis and include VRM stipulations as appropriate.

An analysis of wildfire history in the planning area from 1950-2004 shows limited wild land fire activity compared to other Alaska locations. Smoke management, fireline construction, and other impacts of suppression activities have the potential to affect visual resources and will be taken into consideration in the event of large wild land fire events.

C. Resource Uses

1. Forest Products

The Alaska forest resource program is essentially custodial management. No commercial demand exists for forest products from BLM administered lands in the planning area. Most lands with forest resources are located in remote areas with poor to non-existent access (Figure 3.36). Many of the timber stands on BLM lands are several hundred miles from the nearest road. State and Nationwide program goals seek to protect and enhance forest health and provide forest products commensurate with public and industry demand, which in the planning area has been very low to nonexistent.

Insert Figure 3.36 here.

This page intentionally left blank.

2. Livestock and Reindeer Grazing

a) Livestock Grazing

Livestock Grazing and Range Management includes the management of vegetative forage, animal husbandry and associated facilities on public lands used for domestic livestock including cattle, sheep, horses, mules, goats, pigs, and turkeys. Bison, yak, llama, moose, caribou, elk and other exotic or native species are not considered livestock for the purpose of public land grazing.

Currently there are no active valid BLM livestock grazing leases, permits or special land use or recreation permits for grazing in the Bay planning area. If there is a need in the future for a livestock grazing permit, BLM has the authority to issue such a permit in accordance with the provisions of the statute (Alaska Livestock Grazing Act, 43 U.S.C. 316, 316a-316o). Small scale and casual use commercial and recreational demand for livestock uses and grazing associated with big game hunting or other pursuits does not presently occur in the Bay planning area. There is no current demand for livestock forage and grazing privileges on BLM administered lands in the Bay planning area, nor has there been any during the past 20 years.

There are no grazing management guidelines for the Bay planning area that relate to livestock class, range suitability criteria, range standards, seasons of use, livestock preferences and palatability of plant species, or ability of plant communities to maintain species composition, productivity, ecosystem function, or viable grazing systems. The suitability, capability, compatibility, distribution and quantity of plant resources available for livestock grazing have never been assessed and evaluated.

Also lacking for BLM lands in the Bay planning area is a forage allocation procedure that takes into account the mix of wild and potential domestic species for Bay area ecosystem maintenance. Lands suitable for livestock grazing on a sustained yield basis have not been formally evaluated for compatibility and suitability in the planning area. No ecological site survey has been completed within the planning area. However, preliminary vegetation studies and land-cover mapping for the Bay planning area have been done.

Management recommendations addressing grazing management in the Southwest Management Framework Plan (1982) for the Goodnews Bay block only called for a range inventory to determine carrying capacity and to provide seasonal grazing for domestic livestock including reindeer and musk oxen on a local level where there was public demand and where it was compatible with other uses considered in that plan (USDI BLM 1982). The remainder of the Bay planning area is not covered in any previous BLM land use plan, activity plan or special plans.

The Alaska Department of Fish and Game's 2004 Bristol Bay Regional Management Plan does not address livestock or reindeer grazing. Neither Togiak, Becherof/Alaska Peninsula, nor Maritime National Wildlife Refuge Plans allow livestock or reindeer grazing. The Maritime NWR has had conflicts with feral livestock and reindeer in island settings outside of the Bay planning area. Neither Lake Clark National Park and Preserve, Katmai National Park and Preserve, nor the National Wild and Scenic Rivers System units in the Bay planning area indicate grazing of livestock or reindeer as an allowable use. The military land uses in the Bay planning area currently do not include grazing as a compatible use.

Requests for livestock grazing permits for BLM-administered lands will be evaluated on a case-by-case basis. Grazing by saddle and pack animals may be authorized under regulatory authority on a case by case basis.

b) Reindeer Grazing

Reindeer grazing, which at one time was a widespread activity in Alaska, is no longer practiced in the planning area. Historically, beginning in the 1890s reindeer grazing was introduced and conducted in portions of the planning area but did not persist beyond the 1950s. No interest or inquiry regarding reindeer grazing on or adjacent to BLM lands in the Bay planning area has occurred in the past decade or more. Future requests for reindeer grazing permits will be evaluated on a case-by-case basis.

3. Minerals

a) Leasable Minerals

(1) Regional or National Demands

Oil and Gas

Figures 3.76 and 3.77 provide the geology and mineral terranes for the Bay planning area. The commercial demand for the oil and gas resource from the Federal domain within the planning area is expected to be low during the life of the plan. Oil and gas resource demand for local energy needs may increase as technological advances are made and if the economics of developing local energy resources is more beneficial than shipping diesel fuel into villages. Exploration and development is driven largely by the price of oil and gas.

Insert Figure 3.76 here (11x17 fold-in).

Insert Figure 3.77 here (11x17 fold-in).

The rest of the planning area is more remote, has no production of oil and gas, and little or no infrastructure. A large accumulation of oil and gas is necessary to justify the exploration and development of remote areas within the planning area. Unless a large deposit of oil and gas is identified in these areas, the likelihood of development of oil and gas is low. There is, however, a possibility of interest in developing small oil and gas deposits for local use if a prospect is found close to a Native village. In addition, the State of Alaska is in the process of licensing approximately 329,000 acres adjacent to BLM managed lands which may, in the future, provide additional knowledge to the planning area. Therefore, the justification of exploration and development remains to be seen for the time being.

Coal and Other Leaseable Minerals

There are no known occurrences of any type of coal on Federal lands in the planning area in the Bristol Bay region and there are no existing coal leases. The local demand for these resources is not likely to change during the life of the plan.

There are no occurrences of potential geothermal resources in the planning area.

There are no occurrences of potential phosphates, oil shale, or sodium resources in the planning area.

(2) Local Dependence on Public Lands

Currently, there is no local dependence on Federal Lands within the Bay Planning Area for leaseable minerals resources.

There has been no oil and gas leasing in the planning area up to date. Leasing on BLM-managed lands in the planning area cannot occur until the completion of the land use planning process. Leasing on the U.S. Fish and Wildlife Service (USF&WS) refuge land has been deferred by the USF&WS until they make a determination in their land use planning as to whether leasing is compatible with the purposes for which the unit was established (see ANILCA section 1008.(a)). The National Park Service allows for leasing in their planning units only when drainage is occurring and, then, only with a "No Surface Occupancy" stipulation. There are no Forest Service lands in the Bay planning area.

Geophysical operations may be conducted regardless of whether or not the land is leased. Notices to conduct geophysical operations on BLM surface are received by the field office. Administration and surface protection are accomplished through close cooperation with the operator and BLM. Surface use restrictions, if needed, are applied as conditions of approval to address surface resource concerns.

There are currently no Federal oil and gas leases in the planning area on BLM or US Fish and Wildlife Service lands (Figure 3.78).

Coal

There currently are no coal leases within the planning area. Unless an area is specifically closed to exploration, all unleased BLM administered lands subject to leasing under 43 CFR 3400.2 are open to coal exploration. Leasing would not occur until a site-specific screening process has been carried out along with an appropriate environmental analysis.

Other Leaseable Minerals

There are no leases on the Federal estate for other minerals in the planning area. Unless an area is specifically closed to exploration, all unleased BLM administered lands subject to leasing under 43 CFR 3503 are open to prospecting.

This page intentionally left blank.

Insert Figure 3.78 here (11x17 fold-in).

This page intentionally left blank.

b) Locatable Minerals

(1) Mineral Terranes

The Bay planning area is underlain by eleven Mineral Terrane units whose geologic settings are considered highly favorable for the existence of metallic mineral resources (U.S. Bureau of Mines 1995) (Figure 3.77). Specific commodities and mineral deposit types are more likely to exist within each terrane based on a terrane's particular geologic nature. Just because a specific geologic terrane is more likely to contain certain mineral deposits does not mean that economically valuable deposits exist within that rock unit. Unmapped areas are generally evaluated as having poor to only moderate mineral potential.

An analysis of the eleven mineral terranes identified within the Planning Area, indicate a potential for undiscovered deposits of a number of different mineral commodities.

The areas underlain by intermediate granitic rocks (IGI), granodiorite and quartz diorite are favorable for; copper, gold and molybdenum deposits. Areas underlain by felsic granitic rocks (IGF), granite and quartz monzonite, are favorable for; tin, tungsten, molybdenum, uranium and thorium deposits. Areas underlain by undivided granitic rocks (IGU) are favorable for; uranium, thorium, rare-earths, tin, tungsten, molybdenum, copper and gold deposits.

Areas underlain by mafic intrusive rocks (IMA), gabbro locally includes mafic-rich intermediate rocks, are favorable for; copper and nickel deposits with byproduct platinum and cobalt. Areas underlain by ultramafic rocks (IUM), peridotite and dunite, are favorable for; chromium, nickel, and platinum group metal deposits with byproduct cobalt. Areas underlain by undivided felsic volcanic rocks (VFU), rhyolite and quartz latite are favorable for; copper, lead, and zinc deposits with byproduct silver and gold. Areas underlain by undivided mafic volcanic rocks (VMU), basalt, are favorable for copper and zinc deposits with byproduct silver and gold. Areas underlain by ophiolite terrane (VOP), pillow basalt and associated mafic and ultramafic intrusives with minor chert and other pelagic sediments, are favorable for; copper, nickel, and chromium deposits with byproduct platinum group metals and gold.

The areas underlain by undivided sedimentary and mafic volcanic rocks (VSM), basalt and associated sediments are favorable for; copper and zinc deposits with byproduct silver and gold. Areas underlain by graywacke and shale (SGS), interbedded graywacke and shale with minor volcanic rocks, are favorable for gold or a variety of metal deposits. And coal-bearing sandstone and shale (SCB), coal-bearing continental sandstone, shale, and conglomerate, are favorable for coal deposits and vanadium.

(2) Geologic Units

The geologic units contained within the Bay planning area are arranged in parallel belts oriented in a northeastern direction (Figure 3.76). The area is not as well mapped as other parts of the state, and contains very little detailed geologic information. Many of the geologic maps for this region are old and have not been recently updated. For some areas detailed geological maps, geophysical and geochemical work, have been accomplished by private industry but the information is not publicly available. The following are only descriptions of the surface geology. Subsurface geology for much of this region is largely unknown.

The oldest rocks within the planning area are a narrow belt of highly metamorphosed Precambrian rocks consisting of schist, gneiss, and small amounts of amphibolite and marble, which are at the far western boundary of the planning area near Quinhagak.

Adjoining to the east is a belt of partly metamorphosed Mesozoic volcanic and volcanoclastic rocks that surround the Goodnews Bay and Upper-Wood/Tikchik Lakes regions, known as the Gemuk Group. Within this unit are a few large bodies of Devonian limestone.

Continuing to the east is a thick belt of partly-metamorphosed stratified sedimentary rocks. These are mostly of marine origin. Predominant along these is the Cretaceous Kuskokwim Group rocks, which consists of greywacke and shale. Also dominant a little further to the east are a thick sequence of undifferentiated metasedimentary Cretaceous and Jurassic rocks, consisting of argillite, shale, greywacke, quartzite, conglomerate, lava, tuff, and agglomerate. This unit is separated from the Kuskokwim Group by large northeast trending faults. In places these rocks are highly metamorphosed to the amphibolite facies. North of Togiak extending to the Lower Wood/Tikchik Lake system is a block of Middle Jurassic rocks consisting of argillite, greywacke and conglomerate. North of Lake Iliamna is a block of Lower Jurassic rocks consisting of sandstone and argillite interbedded with volcanic flows and pyroclastic rocks. On the far eastern side of the planning area is a long belt of Upper Jurassic rocks of the Naknek Formation, which consists of sandstone, siltstone, shale and conglomerate.

North and south of Lake Iliamna is a Northeastern trending belt of Tertiary mafic volcanic rocks. There is also a thin belt of these rocks near Togiak. There is a small volcano/vent within this belt that has been active within historic times.

Interspersed through the planning area are a large number and variety of intrusive rocks. These are of particular interest as much of the known and potential mineralization within the area is associated with these rocks. Interspersed through the western portion of the planning area are a large number of relatively small Tertiary felsic intrusive bodies. These are the probable source of the gold found at Wattamuse Creek, and besides gold are sources for possible silver, arsenic, antimony and copper mineralization. Nearby are small bodies of Jurassic mafic intrusives, and other Tertiary felsic intrusives that are mapped as a separate unit. North of Lake Iliamna are Tertiary and Cretaceous granitic rocks which are the probable source of the Pebble Copper deposit. Along the far western planning boundary within the Alaska Range is a long northeast trending belt of Jurassic intermediate intrusives.

Within the Goodnews Bay region are a number of Jurassic ultramafic rocks, consisting of gabbros, hornblends, dunites and other undifferentiated ultramafic rocks. These rocks are the probable source of the platinum found at the Salmon River and associated drainages.

The south-central portion of the planning area is dominated by Quaternary deposits of alluvium, glacial moraines, lake, eolian, and beach deposits. These deposits generally grow thicker as you move away from mapped bedrock geologic units. Additionally, most stream valley floors will be filled with Quaternary and Holocene alluvium.

(3) Minerals Occurrence, Potential, and Administration

Figure 3.79 provides information about mineral occurrences for the Bay planning area and Figures 3.80 and 3.81 show the mineral potential for the planning area.

Insert Figure 3.79 Mineral Occurrence Map here (11X17 fold-in)

This page intentionally left blank.

Insert Figure 3.80, Mineral Potential Map, here (11x17 fold-in).

This page intentionally left blank.

Insert map 3.81, Mineral Potential Map, here (11x17 fold-in).

This page intentionally left blank.

Insert Figure 3.82 Mining Claims Map Here (11x17 fold-in).

This page intentionally left blank.

(4) History and Development

Pebble Copper-Gold-Molybdenum Deposit Area.

Within the northeast portion of the area is the Pebble deposit, a world-class copper/gold/molybdenum porphyry. The deposit is hosted in a north-east trending belt of Cretaceous intrusive rocks ranging from pyroxenite to granodiorite, hosted within Jurassic-Cretaceous andesitic siltstone and argillite. First discovered in 1987, over 88,000 meters of exploratory drilling has occurred. The deposit is currently in the mine planning stage. Hundreds of square miles of State mining claims have been staked on and surrounding this deposit, which is located on State patented lands. The Pebble deposit contains inferred resources of 2.74 billion tons of ore, with 26.5 million ounces of gold, 16.6 billion pounds of copper, and 900 million pounds of molybdenum. These numbers are expected to grow as further drilling and exploration occurs.

The BLM will not have a major involvement into the planning and permitting of the development of this deposit. However, the huge size of this deposit has created intense interest in finding other mineral deposits in this area, which will affect surrounding public lands. A large claim block has been staked on Federal public lands to the southwest of the Pebble deposit on top of a suspected buried granitic intrusive, that may contain similar mineralization.

Lode Deposits

There are numerous known lode deposits within the planning area that have never seen mineral production, including deposits of gold, copper/gold, tin/tungsten, and iron/titanium. None of these deposits are located on BLM managed lands. Kasma Creek is a stratiform copper/lead/zinc skarn deposit located in the northeastern part of the planning area. There are reported reserves of 10 million tons of ore that grade more than 1% copper. To the east is Sleitat Mountain, a large high-grade tin/tungsten deposit, hosted in 59 million year old granite and hornfels. Inferred resources are for 64,000 to 106,000 tons of tin located within 29 million tons of ore. Within the north-central part of the planning area is Kemuk Mountain, a magmatic iron/titanium deposit hosted in Cretaceous pyroxenite. There are inferred reserves of 2.4 billion tons of ore that average 15-17% iron, and 2-3% titanium.

Just north of the northwest portion of the planning area is Shotgun, a gold/copper quartz stockwork and breccia deposit hosted in Late Cretaceous rhyolite. There are inferred resources of 980,000 ounces of gold contained within 36 million tons of ore. The ore is reported to be amenable to recovery by cyanide leaching. Just to the north-east of the planning area is Johnson River, a massive sulfide gold deposit hosted in volcanoclastic, pyroclastic and volcanic rocks of the Talkeetna Formation. The deposit has drilled out reserves of over a million tons of ore grading at 0.32% gold, 0.24% silver, 0.76% copper, 1.17% lead, and 8.37 % zinc.

Redtop Mercury Mine

The Redtop mercury mine is an abandoned mine located on top of Marsh Mountain near the village of Aleknagik, on BLM lands. The cinnabar is located in pods and veins in greywacke along right lateral faults and shear zones. Approximately 60 flasks of mercury were produced between 1953 through 1959, with some additional work occurring in the 1960's. It is unknown how much cinnabar ore remains.

Approximately 1500 feet of underground workings were dug on two levels. The entrance to one mine adit has collapsed. The other was closed by the BLM in 2002 for the purpose of public safety. An abandoned mill containing a grinding circuit is located on the property along with several other abandoned structures. An associated retort millsite was located at the foot of Marsh Mountain along the Wood River, but has since been removed by the BLM. An old road connects the mine with the village.

Goodnews Mining Camp

The Goodnews Bay platinum mining operation is the only currently active operation on Federal mining claims within the Planning Area. The claimant for the Goodnews claims is currently attempting to resume mining operations. The bucket-line-dredge became reportedly operational during the summer of 2003, but is not actively mining. The deposit is one of the largest known platinum deposits in North America. Platinum is considered a critical and strategic mineral.

Placer platinum mining has historically occurred at the Salmon River near the Goodnews Mining Camp and associated side drainages including McCann Creek, Dowery Creek, Squirrel Creek, Platinum Creek, Clara Creek and Fox Gulch. Between 1928 through 1982 an estimated 646,312 troy ounces of platinum were mined from the Salmon River and its tributaries. Early open cut placer mining was conducted by small draglines/sluice-boxes in the side drainages. In 1937 a large bucket-line-dredge with 8 cubic foot buckets was brought in to mine the Salmon River. The dredge operated continuously through 1976, then more sporadically through 1982. Additionally, the bench gravels on the east side were mined by a large dragline.

Much of the drainage is covered with tailings that extend to within a mile of the beach. Little to no reclamation of these tailings occurred as the mining predated the current reclamation requirements. This resulted in poor re-vegetation, and stream channels that occasionally disappear underground into the tailings. This has affected the salmon spawning that occurs in this drainage. The claimant re-established fish passage in the early 1990's, but reportedly the passage dries up during periods of low water.

There is an inferred 60 million cubic yards of deeply buried platinum remaining that was too deep for the dredge to reach. There is also an unknown amount of platinum left in the existing tailings. Most bucket-line-dredges operate with estimated 50-60% recovery efficiency at best.

On surrounding Native-managed lands is potential platinum lode mineralization which is the suspected source of the Goodnews Bay Platinum Mine placer deposits. Both Red Mountain and Suzie Mountain have seen exploration drilling in the past.

Gold Placer Deposits

Placer gold mineralization has been identified and mined in the past but these operations were small and have been inactive for many years. Placer gold mining has occurred in the headwaters of the Arolik River and the Wattamuse/Slate Creek area, near BLM-managed lands north of Goodnews Bay. The largest gold placer operation within the planning area, Wattamuse Creek and associated drainages produced an estimated 30,041 troy ounces of gold between 1917 through 1947.

Additional placer mining has occurred at Trail Creek, a tributary of the Togiak River; at American Creek, north of Naknek Lake; and at Portage Creek and Bonanza Creek, north of Port Alsworth. None of these deposits are on or near known BLM-managed lands. Numerous other placer gold occurrences that have never been mined have been identified through out the Planning Area.

(5) Resource Allocation

Locatable minerals on Federal lands are allocated through the location of mining claims. Prospecting or exploration can take place without a claim, although an unclaimed discovery would be pre-empted by location of a valid claim. A mining claim carries a property right for the claimant and an inherent right to carry a surface patent. Removing that property right on a properly located and maintained mining claim, would require the government to negotiate buying out that right, condemnation proceedings, or conducting a validity examination to challenge and contest the validity of the claim. If the claim is improperly located or the claimant fails to follow certain legal requirements, the BLM can find that claim abandoned or void, effectively eliminating that claim.

By law, all public lands are open to mineral entry (mining claim location) unless specifically segregated or withdrawn. Figure 3.39 shows those areas that are currently open to mineral entry. Currently, 152,746 acres of land are open to locatable mineral entry. Withdrawals currently constrain mineral development on many lands within the planning area, including many currently unselected lands.

To facilitate the conveyance of State and Native land entitlements under ANCSA and ANILCA, most of the public lands in the planning area were withdrawn from mineral entry. Land withdrawals were issued and remain on all State-selected and Native-selected lands. The purpose of a withdrawal from mineral entry would be to prevent new mining claim locations from clouding title to the lands which are selected. This was accomplished by a series of withdrawal actions through Public Land Orders issued in the early 1970s. Currently, 1,327,553 acres out of 2,503,822 acres of BLM-managed lands within the planning area are State-selected or Native-selected. No mineral entry or mining will occur on these lands until either conveyance occurs, or the selection is relinquished back to the BLM and the withdrawal lifted. Mineral entry or mining on conveyed lands would be under the control of the new land owner, and the BLM would not be involved.

Many of the land withdrawals are on public lands that were never State-selected or Native-selected, or the selection has since been relinquished. The withdrawals have prevented the staking of new mining claims, and effectively eliminated mineral exploration on these lands, as there is no incentive for private industry to explore for minerals they cannot stake and develop. The consequence has been that for many of the public lands within most of the planning area, the mineral industry has not been able to respond to new mineral models, geologic information, or changes in market conditions to help meet the National demand for minerals.

Since the 1970s, the only opportunity to explore and develop mineral resources on public lands within the planning area are on non-withdrawn lands, or pre-existing mining claims where there is an established grandfathered right. The only non-withdrawn lands are a few unselected scattered blocks which have remained open to mineral entry. As a result of mining claimants losing interest in maintaining claims because of holding fees, changing market conditions, missed paperwork deadlines, or receiving mineral patent to their claims, the number of active Federal mining claims has steadily decreased over the years. There also has been an active effort by the State to encourage mining claimants on State-selected lands to convert from Federal to State management.

The BLM has allowed limited and targeted mineral exploration on Native-selected lands in order to allow the Native corporations to have the best information possible in which to prioritize their selections. The Native corporations have developed partnerships and operation agreements with private mining companies to explore Native and high potential Native-selected lands. The mineral exploration has been authorized under BLM lands and realty regulations (43 CFR 2920). However, mineral development of these lands can not occur until after the land has been conveyed to the respective Native corporation. Between 1990 and 2005, the only authorized mineral exploration on Native-selected lands within the planning area occurred during the mid-1990s near the Goodnews Bay Mining Camp in Southwest Alaska. The target mineral was lode platinum.

(5) Mining Claims and BLM Management

The AFO currently has approximately 1,000 active Federal mining claims, of which approximately 241 are located within the Bay planning area within two contiguous claim blocks. All mining claim locations within the planning area have been digitized based on claimant submitted maps, and have been entered into a Geographic Information System (GIS) database. The BLM has made the database available to the public over the internet through an agreement with the State.

Within the planning area, one concentration of claims is located along the Salmon River near Goodnews Bay and the second is in an area southwest of Lake Iliamna. The principal problem in managing regulatory compliance on these claims is the geographic remoteness and travel distances required to inspect these claims. The Lake Iliamna claims are completely inaccessible by road. The Goodnews Bay claims are connected to the village of Platinum by a maintained gravel road that traverses the claim block, allowing for local access to the beach south of Red Mountain. The road is used by local villagers as well as the mining claimants. Since the claims predate a 1955 change to the mining law, the claimant could exclude the public from crossing his claims. A small airstrip is also located on the claims. The Goodnews claims have been mineral surveyed.

The 63 unmined claims near Lake Iliamna, north of Levelok in the area north of the Kvichak River tributary, have been recently staked for suspected copper/gold mineralization. These active claims were staked in 2000 by BHP Minerals International and recently TNR Resource Ltd. acquired 70% interest. These claims have not been mineral surveyed.

Several abandoned mines are located within the planning block, including the Redtop mercury mine on Marsh Mountain north of Dillingham, and several small gold placer mines off the Goodnews River. There are 3,256 State mining claims of which 182 are located on State-selected lands. No active Federal or State mining claims are located on Native-selected lands.

Because mining claimants have the right to prospect under the 1872 Mining Law, for locatable minerals, and locate mining claims on open lands without governmental approval, BLM's management is minimal, unless ground disturbing activities or occupancy are involved.

Field Office personnel use an interdisciplinary approach to approving a Plan of Operation under 43 CFR 3809 regulations. Plan of operations are required for any activity that requires access across a wild and/or scenic river corridor, has planned operations that will disturb greater than five acres or has a cumulative disturbance greater than five acres. A Notice must be provided prior to mining areas less than five acres. There are additional requirements under the 43 CFR 3715 regulations for any mining activity on a mining claim requiring occupancy. An environmental assessment or environmental impact statement must be prepared prior to approval of any plan of operation, or occupancy on any mining claim. There is currently only one plan of operations under these regulations for the planning area. Plans must be approved prior to any mining by the applicant, and a reclamation bond provided.

BLM compliance officers conduct inspections of mining operations or occupancies on Federal claims. Currently, all operations are inspected at least once each year. The primary concern of the compliance inspector is that the miner is operating appropriately and that reclamation work is acceptable. During each compliance visit an inspection record is completed that describes the inspector's observations of the operation. If any problems or violations exist at the mine site, the compliance inspector discusses them with the operator, sets a time frame for correction, and issues a notice of noncompliance, if necessary. The mine site is revisited to ensure that corrective actions have taken place.

Mining claim recordation, adjudication and statewide program policy are handled at the BLM Alaska State Office (ASO). ASO handles Notices of Intent to perform annual assessments and holding fees, and maintains all mining claim files.

c) Salable Minerals (Mineral Materials)

Salable minerals disposition is addressed under the Materials Act of July 31, 1947, as amended by the Acts of July 23, 1955, and September 28, 1962. These acts authorized that certain mineral materials be disposed either through a contract of sale or a free-use permit. The Materials Act of 1947, as amended, removes petrified wood, common varieties of sand, stone, gravel, pumice, pumicite, cinders, and some clay from location and leasing. These materials may be acquired by purchase only and are referred to as salable minerals.

Significant quantities of salable minerals known to be present in the Bay planning area, include but are not limited to, sand and gravel aggregate, silica sand (abrasives), dimension and decorative stone, and common or bentonite clay. Production value of mineral materials sales were about \$500,000 for FY 2001 statewide and the trend indicate increased sales yearly.

There are currently no mineral material contracts or free-use permits issued by the BLM within the planning area. Many of the sites in the planning area are roadside materials sites owned by municipalities or the State.

4. Recreation Management

a) General Recreation

Recreation opportunities are quite diverse within the planning area. Recreational activities/resources managed by the BLM include rivers, sport fishing, motorized and non-motorized boating, camping, hiking, skiing, commercial recreation activities (guides and outfitters), sightseeing, wildlife viewing, and traditional recreation activities. The recreation program is also responsible for visual resources, and Off-Highway Vehicle (OHV) management. Currently, there are no special area designations within the planning area.

Tourism is a leading industry in Southwest Alaska, and it provides an economic base for the region both directly in the form of guided hunting and fishing and indirectly through the many services provided (i.e. lodging, food, transportation), particularly in the “hub” communities. Demands on recreational resources will primarily be focused on guided and self guided hunting and fishing opportunities. In response, local dependence on public lands is also increasing in order to accommodate additional commercial and non-commercial recreation demands of visitors. It should be noted that, due to the extreme remoteness of the planning area, the opportunities for recreation are limited and expensive due to access difficulties and lack of amenities such as hotels and restaurants.

However, with changes in technology and a growing trend in visitation to areas that were previously remote and inaccessible the potential to cause adverse impacts to recreation and other resources exists unless proactive management decisions and practices are implemented. Without active management, the tendency on BLM-managed lands in general is for those areas inventoried as Primitive opportunity to trend towards Semi-Primitive Motorized opportunity.

Guided tourism for fishing and hunting during the peak season (June - September) in this region of Alaska is primarily limited by the amount accommodations and available guides. Many of which are booked years in advance. This industry has demonstrated that it is quite resilient to national and international crisis and thus is expected to increase.

Law enforcement and compliance with permitted activities is difficult or non-existent on BLM-managed lands due to the large land base, remote location and expensive access. Many trespass issues or resource abuses including un-permitted commercial use are unreported or unknown, discovered by chance, or reported by the public long after they have occurred. Limitations on back country use are anticipated to be particularly difficult to enforce in remote areas.

b) Special Recreation Permits

Requests for commercial Special Recreation Permits (SRPs) have increased and then decreased again in the past ten years. In 1992, approximately 4 SRPs were issued within this planning area. These SRPs were primarily issued to big game hunting and fishing guide services. Today there are once again 4 special recreation permits for commercial use, down from 15. Currently the State of Alaska Division of Occupational Licensing lists more than 200 licensed guides within the same area. Environmental Assessments (EAs) are conducted to assess the condition of natural resources and establish specific management parameters for these commercial guiding operations. Post use reports for SRPs are supplied with each authorization and are requested for submission to AFO within 30 days of completion of permitted activity. These numbers are recorded within the Recreation Management Information System (RMiS), a national database designed to track recreation use statistics.

For commercial operations, attempts are made to perform compliance checks annually or when designated camps are in use. Use seasons vary according to when hunting seasons are prescribed. Compliance exams are usually conducted in the company of a BLM law enforcement ranger. Permittees are checked to make sure permits are in hand and that they are operating according to the stipulations and conditions set forth in the permit. Larger big game guiding operations may include lease permits as well. Coordination with the lands and realty department is important when processing and monitoring these operations.

There is limited information available regarding commercial and non-commercial recreation activities. Information on commercial use is derived from tourism surveys, special recreation permits and business license types, all of which are components used in making comprehensive recreation management decisions.

Law enforcement and compliance with permitted activities is difficult or non-existent on BLM-managed lands due to the large land base, remote location and expensive access. Many trespass issues or resource abuses including un-permitted commercial use are unreported or unknown, discovered by chance, or reported by the public long after they have occurred. Limitations on back country use are anticipated to be particularly difficult to enforce in remote areas.

c) Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum (ROS) is a framework for classifying and defining different classes or types of outdoor recreation environments, activities, and experience opportunities. The BLM approach to ROS applies criteria to a land area's physical, social and managerial parameters to describe the existing conditions that define a land area's capability and suitability for providing a particular range of recreational experience opportunities. For example, some recreationalists seek an undeveloped setting emphasizing solitude and self-reliance while others seek an experience with more comfort, security, and social opportunities. The ROS framework helps provide managers guidance to ensure that recreational opportunities are provided for a wide range of users.

Recreation opportunity classes describe conditions that range from high density urban environments to primitive settings. Along this continuum physical, social, and managerial conditions will vary. Physical conditions for the urban classification include areas with relatively easy access and a high degree of human alteration, such as buildings, roads, and power lines. In contrast, the physical environment classification is remote and relatively free of human alteration. The social environment varies from settings with abundant opportunities for solitude to areas where other people are nearly always within sight and sound. The managerial environment is the degree and type of management actions taken to control visitation. Urban/developed sites may have more on-site aids such as interpretive and directional signing whereas at primitive sites, less interpretation is desired or necessary.

(1) Definition and Examples of Recreation Opportunity Spectrum Classes

For the Bristol Bay Management Plan (RMP) select classes were chosen to best represent this area. They are:

ROS Class Setting

Primitive Area is typically characterized by a remote unmodified natural environment of fairly large size. Concentration of users is rare and evidence of other users is minimal. Sights and sounds of the road systems are nonexistent. Human-built structures are few and far between or are inconspicuous. In general, visual resources are natural and unaltered. Vegetation and soils remain in a natural state. This class may include areas accessed by aircraft and helicopter and is therefore motorized unless otherwise noted.

Semi-primitive non-motorized Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. Area is more accessible than primitive class, but is free of recognized or maintained motorized trails and roads. Vegetation, soils and visual resources are predominantly natural but some impacts may exist such as a foot or game trail.

Semi-primitive motorized Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low to moderate, and evidence of use is present but rare. Area is accessible to OHVs less than 1500 GVWR and generally, is not accessible to most street four-wheel drive vehicles. Sights and sounds of the road system may or may not be dominant. Vegetation and soils are predominantly natural but localized areas of disturbance may exist such as an impacted trail.

Example: Upper Arolik River watershed

(2) Recreation Opportunity Spectrum (ROS) Prescription Tables

Table 3.16 provides the physical criteria - resources and facilities - for the Recreation Opportunity Spectrum. Table 3.17 provides the social criteria regarding visitor use and users, and Table 3.18 outlines administrative management controls and service settings.

**Table 3.16. Recreation Opportunity Spectrum
Physical Criteria - Resources and Facilities**

	Primitive	Semi-Primitive non-motorized	Semi-Primitive motorized
Remoteness	High opportunity for solitude and self reliance More than 5 miles from any road No improvements with in sight	Moderate opportunity for solitude and self reliance Within 5 miles of a road Human improvements may be within distant sight or sound	Moderate opportunity for solitude and self reliance Adjacent to or easily accessible to access points or trail systems Human improvements may be within distant sight or sound.
Naturalness	Undisturbed natural landscape	Naturally appearing landscape, modifications not readily noticeable Trails may or may not be present	Naturally appearing landscape, modifications not readily noticeable Trails are evident but not dominant to landscape
Facilities	Generally none, but may contain remote cabins and single track game trails. Cross-country travel is unrestricted	Non-motorized foot trails that are not maintained	Recognized Motorized trails (may have seasonal or other restriction) that may be maintained

**Table 3.17. Recreation Opportunity Spectrum
Social Criteria - Visitor Use and Users**

	Primitive	Semi-Primitive non-motorized	Semi-Primitive motorized
Social Encounters	Little probability of visual or direct social encounter Small group size (<3)	Moderate possibility of visual or direct social encounter Group size (<5)	Moderate possibility of visual or direct social encounter. Likely to be of similar recreational interest Group size (<5)
Evidence of use	Footprints or evidence of old camp site	Footprints and some vegetative trampling Increased frequency of camp sites or human use	Footprints, motorized vehicle tracks, airstrips, engine noise Increased frequency of camp sites and tracks deeper into the back country

**Table 3.18 . Recreation Opportunity Spectrum
Administrative - Management Controls and Service Settings**

	Primitive	Semi-Primitive non-motorized	Semi-Primitive motorized
Visitor Services	Basic maps Primarily self researched and guided Guided opportunities depending upon services requested	Maps with locations of known trails identified Guided opportunities depending upon services requested	Maps with locations of known trails identified and regulations associated with those trails Guided opportunities depending upon services requested
Management Controls	No visitor controls No use limits Enforcement presence very rare	No visitor controls or use limits Enforcement presence rare but available	Visitor controls in areas that have specific restrictions Potential use limits Enforcement presence rare but available
User Fees	None (Fees associated with Commercial Use Permit Required)	None (Fees associated with Commercial Use Permit Required)	None (Fees associated with Commercial Use Permit Required)

(3) Summary

BLM managed lands are quite fragmented making it difficult to provide and apply long-term recreation management prescriptions unique to a specific area. To this end, the ROS applications are fairly general.

Because a large portion of the BLM managed lands within The Bay planning area are selected for conveyance, many recreation management prescriptions are also made cooperatively with neighboring land management agencies, private land owners and the public.

d) Recreation Opportunity Regions

Four areas have been identified as either requiring different management prescriptions or are simply physically different due to the large area covered by this planning effort. Regionalizing provides for a better opportunity to apply accurate management recommendations to areas specific needs.

These areas are as follows:

(1) Alagnak River Region

This region includes BLM lands South of the Kvichak River. The Alagnak Wild River, a portion of the Alagnak River, designated as a wild river by Title VI, Section 601(25) and 601(44) of ANILCA, preserves the free-flowing condition of the river, and protects the river and its immediate environments for the benefit and enjoyment of present and future generations. The river corridor and lands within the designated wild river boundary (1/2 mile either side of the river) are managed by the National Park Service (NPS). BLM manages significant portions of land outside this corridor boundary. Close coordination with the NPS is important to provide for public opportunity and protection of the recognized resources.

The Alagnak River is the most popular fly-in fishery in southwest Alaska, and has experienced a significant increase in use over the last several years. The increasing sport fishery on the river is a topic of concern to many local residents.

The meaning of Alagnak in Yup'ik is "making mistakes" because "the channel is always changing, causing mistakes and getting lost." Prehistoric people who lived along the Alagnak River left the remains of their camps and villages, ranging in age from as early as 8,000 years ago to the 18th century. The occupations include small scatters of stone tools, small settlements (up to four houses), and large late prehistoric villages with up to 69 houses. Historically there were many villages and cabins at various locations on the Alagnak River, including villages such as Alagnag'llug, Lockanok, and "Sleepy Town." The last historic settlement on the river was abandoned by the 1960s. Apparently, the Alagnak River was not only used by Yup'ik people from the Kvichak River but also from the Nushagak and even Yukon and Kuskokwim drainages, a testament of its rich subsistence resources during the historic period. The descendants have since moved to Kokhanok, Igiugig and Newhalen. Many people still return to the area for subsistence purposes (NPS strategy plan 2005). Discussion of specific resources within this region (OHV, rivers, visual, ROS) will be discussed in their own sections.

(2) Goodnews Bay Region.

The BLM managed lands in the Goodnews Bay area are surrounded by the Togiak National Wildlife refuge and are far removed from other parcels of BLM lands. Thus, it is important that this area be examined to meet the demands and unique recreation opportunities.

Again, this region is known for its world class fishing opportunities. Getting to this region can be difficult and expensive. Small charter flights can be obtained from Dillingham and Bethel. There are no commercial aircraft providers in Goodnews Bay.

Unique physical characteristics of this area are the dramatic visual relief of the numerous mountains in the area, the many clear-water streams and the coastal influence. Discussion of specific resources within this region (OHV, rivers, visual, ROS) will be discussed in their own sections.

(3) Iliamna Lake Region.

The BLM-managed portion of the upper Iliamna Lake region has world class recreational values, primarily sport fishing and hunting. This area in particular is experiencing increasing competition between commercial and public recreation and traditional subsistence users (DNR, 2004).

The BLM-managed lands in this region include small fragmented parcels, providing little opportunity for effective recreation management practices. The Upper Iliamna River area, while containing many selections for conveyance, is a significant recreation management concern due to increase use and potential development scenarios. Commercial providers under BLM permit (hunting and fishing) as well as private and subsistence users frequent the area.

This area is physically unique to the rest of the planning area as it runs from the dramatic Chigmit mountain range to the shores of Iliamna lake. Discussion of specific resources within this region (OHV, rivers, visual, ROS) will be discussed in their own sections.

(4) Kvichak/Nushagak Region

This area has been separated from the Alagnak River region due to its special status. This region includes all the BLM managed lands North of the Kvichak River and all drainages of the Nushagak River. The Kvichak and the Nushagak rivers are the dominant feature of this region. However, BLM managed lands in this region are very diverse and provide ample recreation opportunities which is primarily fishing and hunting to both riverine and upland users. A recreation management plan was completed for Nushagak region in 1990 by the Alaska Department of Natural Resources, Alaska Department of Fish and Game and the Bristol Bay Coastal Resources Service Area. This plan identified recreation management

prescriptions for specific units within the Nushagak drainage. This plan will attempt to mirror those management guidelines and recommendations. The Kvichak River basin contains one of the largest and most important salmon fisheries in the world. This river is the pipeline for all salmon fisheries of the Iliamna and Lake Clark watersheds. Discussion of specific resources within this region (OHV, rivers, visual, ROS) will be discussed in their own sections.

5. Travel Management

a) Travel Management Overview

Very few roads exist within the Bay Planning Area. Most of the villages in the planning area are isolated where roads between neighboring villages do not exist. There are more trails than roads within the planning area.

b) Roads & Trails

Existing, proposed, and recognized routes are covered in this section.

(1) State-recognized RS 2477 Routes

Under Revised Statute 2477, Congress granted a right-of-way for the construction of roads, trails, or highways over unreserved public land. Although the R.S. 2477 provision was repealed in 1976 by FLPMA, a savings clause preserved any existing R.S. 2477 rights-of-way. The State of Alaska recognizes these routes. These routes must be adjudicated or asserted through a process that will occur outside of this planning process. Only a court of jurisdiction can determine the validity of an R.S. 2477 claim (Mushovic 2006, Pers. Comm.). Within the planning area, these routes are based on historical or traditional trails. Because of lack of regular maintenance or use, many of the mapped State-recognized R.S. 2477 routes may no longer exist on the ground.

Definition of a CSU

A Conservation System Unit, or CSU, as defined by ANILCA Section 102(4), is any unit in Alaska of the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers Systems, National Trails System, National Wilderness Preservation System, or a National Forest Monument including existing units, units established, designated, or expanded by or under the provision of this Act, additions to such units, and any such unit established, designated or expanded hereafter.

(2) 17(b) Easements

Section 17(b) of ANCSA provided for the reservation of easements across Native Corporation and Regional Corporation lands to provide public access to publicly owned lands or major waterways for the purposes of recreation, hunting, transportation, access to utilities and docks, and other public uses. The BLM is responsible for identifying and reserving 17(b) easements during the conveyance process. The management of these easements lies with BLM or, under a Memorandum of Understanding, the appropriate Federal land manager (e.g., USFWS, NPS). BLM retains management responsibilities of easements reserved to access State lands. However, BLM is able to transfer jurisdiction of a 17(b) easement to the State of Alaska or to a political subdivision if they agree to it (Mushovic 2006, Pers. Comm.).

Road Right-of-Way. One road right-of-way exists in the planning area. It is for the road that connects the villages of King Salmon and Naknek.

Waterways. The waterways of the major rivers in the planning area serve as important transportation routes in both winter and summer. During the ice-free months, private and commercial boats from villages and lodges utilize navigable waterways to access rich hunting and fishing areas throughout the watersheds for subsistence and recreation. Frozen waterways and adjacent wetlands also serve as winter transportation routes for snow machine traffic to upriver villages and hunting sites.

Air Routes and Air Strips. Established commercial air service in the Bay planning area is available to Dillingham, King Salmon, Good News Bay, and Iliamna. These sites and other villages in the planning area are also generally accessed by charter services and private aircraft. Transporters licensed by the State of Alaska deliver fishermen, hunters, river users and others to remote sites throughout the planning area, landing on gravel bars, sand blows, waterways, private runways, and regulated and unregulated airstrips. A small number of these transporters hold BLM SRPs, although most do not. No BLM authorized airstrips exist in the planning area.

c) Off-Highway Vehicle Management

Advances in technology, coupled with a rise in popularity and demand, have required the BLM to address possible impacts caused by OHVs on BLM-administered lands. To comply with BLM regulation 43 CFR 8342.1, all BLM lands must be designated in one of the following three categories:

- “Open” - OHVs may travel anywhere; cross-country travel is permitted.
- “Limited” - OHVs are restricted to certain areas or specific trails, with restrictions that can include vehicle weight, type of vehicle, seasonal limitations, or travel restricted to designated trails.
- “Closed” - no OHV activity is allowed.

Currently all regions within the planning region are open to OHV use (Figures 3.37 a, b, c, and d).

Insert Figure 3.37a here (11x17 fold-in).

Insert Figure 3.37b here (11x17 fold-in).

Insert Figure 3.37c here (11x17 fold-in).

Insert Figure 3.37d here (11x17 fold-in).

As stated under “Designation criteria,” “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 the public lands, and the minimization of conflicts among various uses of the public lands . . .” (43 CFR 8342.1).

The current State policy on casual (non-permitted) OHV use on State lands is addressed by direction in the Alaska Administrative Code (AAC) at 11 AAC 96.020, “Generally Allowed Uses on State Land,” and 11 AAC 96.025 “Conditions for Generally Allowed Uses.” Use of highway vehicles with a curb weight up to 10,000 lbs. or recreational-type vehicles (OHVs) with a curb weight of less than 1,500 lbs. is allowed on or off an established road easement if use off the road easement does not cause or contribute to water quality degradation, alteration of drainage systems, significant rutting, ground disturbance, or thermal erosion. To prevent damage to wetlands, stream banks, and other areas with poorly drained soils, prevent erosion and wildlife disturbance or displacement, and provide access to public lands, the Alaska Department of Natural Resources (DNR) may designate certain State lands as “Special Use Lands.” This State designation implements regulations on OHV and other uses in order to protect specific resource values (ADNR 2004).

OHV use on unencumbered BLM-administered lands within The Bay planning area is minimal to nonexistent, and does not appear to have increased in recent years. Primary factors are the remoteness of these blocks of land and the preference for other modes of transportation to access these lands (ADF&G 2004).

OHV use on established trails as well as overland travel is very important to local users, commercial development and operators as well as recreationists. Established trail systems are not well known and efforts are on-going to identify and understand the location and use characteristics of these trails. Overland trails are much more difficult to identify. Most important is to understand destinations and general routes.

Certain regulatory exceptions were created by ANILCA legislation to allow for the use of OHVs (i.e., snowmobiles, motorboats and other forms of surface transportation) on public lands for traditional/subsistence activities and for travel to and from villages and homesites, unless closed through regulation. Currently there are no closures on BLM administered lands within this study area.

BLM-managed 17(b) easements play a role in providing public access across Native corporation and Regional corporation lands. 17(b) easements allow public use and access to Federal and State lands for the purposes of recreation, hunting, transportation, utilities, docks, and other such public uses. OHV use on 17(b) easements as well as any established trail, may be subject to a variety of limitations, including type, seasonal and weight restrictions, depending on the frequency and type of trail use and the potential for resource damage. A large number of 17(b) easements exist within the planning region, although a formal inventory has not been conducted.

There are no existing BLM planning documents for the majority of the Bay planning area. A Management Framework Plan for the Southwest Planning Area was signed in November 1981, but only a small portion of that plan, the Goodnews Block, overlaps the planning area. The Bay area is surrounded by many National Refuges and Preserves (Togiak, Yukon Delta, Lake Clark, Katmai, Becharof) as well as State Parks (Wood Tikchik). BLM will follow the existing OHV prescriptions (if any) of these special areas as closely as possible.

In accordance with the provisions of FLPMA, 43 CFR 8340 and the National Management Strategy for OHV Use on Public Lands, AFO management practices are to inventory and document OHV trail development and provide interim management until official decisions regarding OHV use designations are implemented. This inventory data provides a “snapshot” of the current status of resources. Regular monitoring is the critical factor in helping to understand current use profiles, and ultimately determine cumulative impacts and effective of mitigation measures to protect resources.

The NEPA process is used to evaluate all proposed management decisions. Proposed actions involving OHV use are carefully analyzed on a case-by-case basis to ensure minimal impact to visual, cultural, and other biological resources.

Due to the size, remoteness and large geographical distances between the Bay planning area and Anchorage Field Office, many of these BLM-managed lands are rarely visited. This results in a limited understanding of current OHV use levels, use areas and important access routes. For the purposes of this planning effort, BLM has solicited the help of local users to better understand OHV use in the planning area. Compliance checks for permitted actions often do not occur, particularly in remote portions of the planning area, and may sometimes result in unauthorized use of public lands and resources.

6. Renewable Energy

Consideration of renewable energy sources available on the public lands has come to the forefront of land management planning as demand for clean and viable energy to power the nation has increased. Currently there is no demand for development of renewable energy projects on BLM-managed lands within the planning area, although some alternative energy sources have been investigated in the planning area. In the 1990s Sandia Laboratories investigated the presence of thermal energy sources in the Aleutian Range in Katmai National Park; however, the project was not carried through to completion due to the lack of viability based on the remoteness of the resource. At least one family in the Bay planning area has utilized wind energy to generate electricity for personal use during the past 15 years.

In cooperation with the national Renewable Energy Laboratory (NREL), BLM assessed renewable energy resources on public lands in the western United States (BLM and DOE 2003). The assessment, which did not include Alaska, reviewed the potential for concentrated solar power, photovoltaics, wind, biomass, and geothermal resources on BLM, BIA, and USDA Forest Service lands in the west.

a) Photovoltaics (PV)

Photovoltaic (PV) technology makes use of semiconductors in PV panels (modules) to convert sunlight directly into electricity. Criteria used for determining potential include amount and intensity of sunlight received per day, proximity to power transmission lines, and environmental compatibility. To date, the Anchorage Field Office has not authorized any PV facilities for commercial power production, nor has any interest been expressed by industry in developing such facilities on BLM-managed lands within the planning area, which tend to be somewhat remotely located from the villages that would use the power.

b) Wind Resources

Interest in developing wind energy in Alaska is increasing. The Alaska Energy Authority and rural utilities are considering developing wind power projects at many villages. There is an ongoing program to assess wind energy resources in western and southwestern Alaska and to develop a high-resolution wind map for this area. Development of this map will increase understanding of Alaska's wind resource and will allow communities to more easily apply for U.S. Department of Energy (DOE) wind energy funding programs. In February 2005 the Governor of Alaska established a Rural Energy Action Council to report on short-term proposals to reduce the cost of energy in rural Alaska. One issue the Council will address is acceleration of wind turbine generator installations.

The potential to use wind as a supplemental energy source for local communities within the planning area is high. Most of the communities in the planning area rely on diesel-powered generating stations. The cost of generating electricity in this manner is very high. Using wind turbines along with diesel generation can save significant amounts of fuel.

The potential of a large wind farm on BLM-administered lands or elsewhere within the Bay planning area is low. The population in the planning area is relatively low and infrastructure to transport electricity outside of the region does not exist. The best sites are near the coast and in order to be effective, need to be close to communities. Most of the land around villages is owned by Native corporations, and BLM manages very little land along the coast. That which it does manage, the proposed Carter Spit ACEC,

might not be a viable site for windmills because of the large migratory bird populations in the area during spring, summer, and fall.

c) Biomass

The biomass program utilizes organic matter waste products for production of paper and pulp, value-added commodities, and bio-energy or bio-based products such as plastics, ethanol, or diesel. There is some interest in biomass in Alaska. The State has sought DOE funding to investigate fish oil and diesel blends, conversion of wood residues to fuel grade ethanol, conversion of fish and wood waste to Btu gas, and replacement of oil-fire boilers with wood-fired boilers to reduce energy costs in rural communities.

Although there are no known biomass projects in the Bay planning area, the Anchorage Field Office is currently experimenting with a biomass demonstration project which is used to provide energy for the Campbell Creek Science Center in Anchorage. In this case, the fuel used is spruce bark beetle-killed trees. The energy generated will be used to heat the Science Center building and two storage sheds of over 10,000 ft² by means of an in-floor radiant heat system that uses glycol. The project was initiated in 2005 and will provide heat for the first time in fall 2006.

The National Energy Policy recommends development of a strategy to encourage the use of biomass from public lands as a source of renewable energy. The potential for the use of biomass from public lands within much of the planning area is very limited. An average of 17% of the planning area is forested. However, this number rises to up to 33% in the Lake Iliamna - Alagnak River region, where there are currently large areas of beetle-killed spruce trees. While the probability of the development of a biomass project on BLM-administered lands in the planning area seems remote, a viable project might be started in the Lake Iliamna - Alagnak River region. There is no known market in the planning area at this time.

7. Lands and Realty

There are two primary objectives of the lands and realty program in the Anchorage Field Office (AFO). One objective is to implement the actions contained in the Federal Land Policy and Management Act (FLPMA). The second objective is to facilitate the transfer of lands to the State of Alaska, the ANCSA corporations and individuals through the application of the entitlement Acts.

The lands and realty program operates in accordance with multiple laws, regulations and guidance, such as FLPMA, the Recreation and Public Purposes Act (R&PP), and the Mineral Leasing Act (MLA).

Land ownership in the Bay planning area is influenced by three main entitlement Acts, the Native Allotment Act of 1906, the Alaska Statehood Act, and the Alaska Native Claims Settlement Act (ANCSA). Although millions of acres of land have been conveyed to individual Alaska Natives, Native corporations, and the State of Alaska, there is still much land that will be conveyed out of Federal ownership in the near future.

Lands that are selected by Native corporations or the State that are within the boundaries of a Conservation System Unit (CSU) are interimly managed by whatever Federal agency administers that CSU. BLM has an adjudicative role in conveying land within CSUs, but not surface management responsibilities. Therefore, alternatives for management of CSU land will not be discussed in this management plan.

a) Land Use Authorizations

Land use authorization means any authorization to use the public lands under 43 CFR §2920. Land use authorizations are used to permit activities when other land actions cannot be used, such as a right-of-way or R&PP lease.

The only type of land use currently authorized in the Bay planning area is a Permit, which authorizes an applicant to use public lands for specified purposes, normally involving little or no land improvement, construction or significant monetary investment. Permits do not convey a possessory interest in land and are normally issued for three years or less and may be renewed with the discretion of the Authorized Officer.

Leases authorize uses of public lands involving substantial construction, development, or land improvement and the investment of large amounts of capital which are to be amortized over time. A lease conveys a possessory interest and is revocable only in accordance with its terms and the provisions of 43 CFR §2920.9-3. Leases are issued for a term, determined by the Authorized Officer, which is consistent with the time required to amortize the capital investment.

Easements may be used to assure that uses of public lands are compatible with non-Federal uses occurring on adjacent or nearby land. The Authorized Officer determines the term of the easement. An easement granted under this part may be issued only for purposes not authorized under Title V of the Federal Land Policy and Management Act or section 28 of the Mineral Leasing Act.

(1) Rights-of-Way

A Right-of-Way grants an applicant the authority to use specific public land to build such things as roads, communication facilities and power lines. Generally, Rights-of-Way are issued for long-term projects that require significant investment. Rights-of-Way are a possessory interest in land, in that BLM will consult with the entity holding a Right-of-Way if they plan an action that could affect their authorized use. Usually, Rights-of-Way are issued for a maximum of 20 year terms with the option to renew.

(2) Withdrawals

Withdrawals are formal actions that set aside, withhold, or reserve Federal lands by administrative order or statute for Federal purposes. The effect of a withdrawal is to segregate and close Federal land to the operation of all or some of the public land laws and one or more mineral laws; transfer total or potential jurisdiction of Federal land between Federal agencies; or dedicate Federal land for a specific Federal purpose.

Withdrawals (other than ANCSA D-1). These withdrawals are for administrative sites, power sites, and military purposes. Two water power withdrawals, seven military withdrawals, and nine administrative site withdrawals, approximating over 38,500 acres, lie within the Bay planning area. Creating, modifying, renewing or revoking withdrawals for other Federal agencies is forecast to continue to be an important function of the BLM. As populations grow throughout the region, pressures placed on resources will continue to escalate, which may impact the number of requests from Federal agencies for withdrawals and demands for withdrawal review may increase from the state and local governments. Figures 3.38 and 3.38a-d show withdrawals within the Bay planning area.

ANCSA 17(d)(1) withdrawals. ANCSA §17(d)(1) withdrawals are a series of public land orders (PLOs) issued from 1972 to 1975 that placed a protective withdrawal on Federal lands for the purpose of study and review to determine the proper classification and “to ascertain the public values in the land...” The intent of the withdrawals was to limit appropriation of the lands in order to complete inventories of resources and assessment of values which would then future public needs (Figure 3.39) for lands within the Bay planning area affected by (d)(1) withdrawals). In the 1980s studies and assessments were completed, and opening orders were issued on some lands covered by the ANCSA §17(d)(1) clause. Table 3.19 describes the effect of the ANCSA 17(d)(1) withdrawals within the Bay planning area.

**Table 3.19. Effect of ANCSA §17(d)(1) Withdrawals
on Federal Public Lands**

PLO	Description
5174	Withdrew lands for village or regional deficiency selections under the authority of Section 11(2)(3) of ANCSA. Each of these PLO's contained a paragraph in which a withdrawal under Section 17(d)(1) was also placed on the same lands.
5179	Withdrew approximately 80 million acres of land in aid of legislation for creating or adding to conservation system units under the authority of Section 17(d)(2) of ANCSA, which had a termination provision. A second paragraph added a D-1 withdrawal to the same lands and did not have a termination provision. Opened lands to State Selection except in Umiat and portions of Kateel River Meridians.
5180	Placed a D-1 withdrawal on approximately 47,000,000 acres including the lands in the transportation and utility corridor withdrawn by PLO 5150. PLO 5180 was amended by PLO 5418 which placed a D-1 withdrawal on all unreserved land and any lands which may become unreserved in the future. Did not bar State Selection
5181	Withdrew lands for classification and study as possible additions to the National Wildlife Refuge System. Closed to all forms of appropriation under public land laws including selections by the State of Alaska under the Alaska Statehood Act, 72 Stat. 339 and from location and entry under the mining laws (except locations for metalliferous minerals and from leasing under the Mineral Leasing Act.
5184	Placed a D-1 withdrawal on lands originally withdrawn under ANCSA for selection by the village corporations. Placed on 25 township withdrawal. Closed to State Selection and from location and entry under the mining laws. Set aside for study and review by the Secretary of the Interior for the purpose of classification or reclassification of any lands not conveyed pursuant to section 14 of said Act: All of those lands withdrawn by section 11 of the Act lying between 58° N. and 64° N., Latitude, and west of 161° W., Longitude and not withdrawn fro any part of the National Wildlife Refuge System.
5186	Withdrawal for classification and protection of the Public interest lands not selected by the State. Open for Metalliferous Minerals. Did not close the lands to State Selections.

(3) Recreation and Public Purposes Act

Under the Recreation and Public Purposes Act (R&PP), state and local government agencies, municipal utilities, and non-profit entities can acquire public land (at less than fair market value) through a patent or lease. There have been three patents issued under the R&PP Act within the Bay planning area, but no lands are currently being leased. The patents were issued for two church sites and a church camp (Figure 3.40). These patents contain a reverter clause requiring BLM concurrence of any change in use and ownership; otherwise the land would revert back to the United States. Considering evolving land ownership patterns in the Bay planning area, we do not foresee a great demand for land being needed under the R&PP authority.

(4) Land Tenure Adjustment

When all of the conveyances resulting from entitlement acts are complete, a broken/scattered land pattern will be a result in some areas. These broken/scattered land patterns would be difficult to manage by land owners (individual Alaska Natives, Native Corporations, and the State of Alaska). It is likely that the landowners may want to consolidate their lands through land exchanges, disposal, or acquisitions. We do not anticipate acquiring lands within the Bay planning area during the life of this plan (except through exchange).

The preferred method of land tenure adjustment would be through land exchange with other willing land owners. AFO would consider a FLPMA sale on a case-by-case basis. No current proposals for sales are identified in the Bay planning area. (Figure 3.41)

(5) Trespass Abatement

Unauthorized uses are the activities that do not appreciably alter the physical character of public lands and resources. Unauthorized occupancies are activities resulting in full or part time human occupancy or use. Unauthorized development issues are activities, which disturb the earth's surface or which physically, alter the character of public lands or vegetation. Collectively, the above activities can be termed a trespass situation.

When presented with a trespass situation, BLM has three options to resolve the situation; removal of the trespasser (which could include taking possession of structures or improvements and utilizing them for Federal purposes), authorization of the trespass activity, or sell of the land to the trespasser. Each situation is handled on a case-by-case basis, according to BLM regulations and policies.

(6) Subsurface Estate

When the Federal government patents land to individuals it does so under a variety of land laws. In some instances, the subsurface or mineral estate is reserved to the Federal government due to requirements of law. For example, BLM may reserve oil and gas rights, or perhaps all mineral rights. Some instances where BLM would reserve mineral rights are under lands patented according to homestead laws¹ or the R&PP Act. Many laws require BLM to reserve these rights.

To complete this management plan, Master Title Plats were reviewed and all patents with reservations of subsurface rights were inventoried. Subsurface data were searched on October 18, 2004. Within the Bay planning area, interests such as oil and gas, all minerals and coal were distinguished according to the reserves identified in each patent (Figure 3.42).

¹ Homestead Laws were repealed with the passage of FLPMA in 1976, except the repeal did not go into effect in Alaska until 1986.

Insert Figure 3.38 here (11x17 fold-in).

Insert Figure 3.38a here (11x17 fold-in).

Insert Figure 3.38b here (11x17 fold-in).

Insert Figure 3.38c here (11x17 fold-in).

Insert Figure 3.38d here (11x17 fold-in).

b) ANCSA 17(b) Easement Identification and Management

The BLM identifies ANCSA 17(b) easements for travel across Native lands to access publicly owned lands², major waterways, and for travel between communities on lands that will be conveyed to Native corporations. If the easement is reserved to access lands managed by the U.S. Fish & Wildlife Service or the National Park Service, management responsibilities of the easement will be formally transferred to those agencies after the lands are conveyed. BLM manages those easements providing access to BLM-managed lands and State of Alaska lands (Appendix E).

c) Detailed Descriptions of Planning Blocks

This section is separated into 10 different sections with distinct levels of detail and focus for each section. Sections 1-2 are designed to provide a general analysis of areas near Dillingham/Aleknagik, and King Salmon/ Naknek/South Naknek. In these areas BLM manages land in the interim, but is expected to not manage lands after the conveyance process is completed. Sections 3-10 are in depth discussions of individual planning blocks where BLM will retain large tracts of land beyond the finality of the conveyance process. These planning blocks are: Alagnak, Goodnews Bay, Iliamna East, Iliamna West, Koggiling Creek, Klutuk Creek, Kvichak, and Yellow Creek. (Figure 3.2-3.4)

(1) Dillingham/Aleknagik Vicinity

In the area generally located near Dillingham and Aleknagik, BLM is the interim manager of 74,514 acres of land (Figure 3.43). Within this area, all lands are selected for conveyance by Native Corporations and the State of Alaska, or they have been applied for as Native Allotments. Native Corporations have selected 64,678 acres, Native Allotment applications encumber 800 acres, and 9,036 acres of land are selected by the State of Alaska. Almost all lands that have not been prioritized by Native Corporations have been prioritized by the State of Alaska. The exception is two sections 7 and 18 (1228 acres) in T. 10 S., R. 53 W., located about 13 miles east of Aleknagik, which will likely be unencumbered BLM lands at the conclusion of the conveyance process. This land will be surrounded entirely by lands owned by a Native Corporation and the State of Alaska and should be considered for land tenure adjustment such as a land exchange with either entity.

² Publicly owned lands means all Federal, State, or municipal corporation (including borough) lands or interests therein in Alaska, and submerged lands as defined by the Submerged Lands Act. 43 CFR §2650.4-7(b)

This page intentionally left blank.

Insert Figure 3.39 Here (11x17 fold-in).

This page intentionally left blank.

Within this area, BLM has patented two separate tracts of land under the R&PP Act.

- The Seventh Day Adventists received a patent in 1972 (Patent # 50-73-0080) to 10 acres of land for a church camp located on Lake Aleknagik. The land is described as U.S. Survey 4931; located within T. 9 S., R. 57 W., sec. 26. The case is serialized as A-048645.
- The Catholic Archbishop of Anchorage received a patent in 1984 (Patent # 50-84-0403) to 1.8 acres of land for a church site located in Clarks Point. The land is described as U.S. Survey 4992, Tract B; located within T. 15 S., R. 56 W., sec. 36. The case is serialized as A-052661. (Figure 3.40) The BLM is responsible for on-going compliance of these parcels to insure they are continually used for the purposes for which they were patented.

There are three withdrawals within the vicinity of Dillingham. One for the U.S. Department of Health and Human Services, Alaska Area Native Health Services, Public Health Services, serialized as AA-58074, encompassing 87.47 acres. The second is for the Federal Aviation Administration, serialized as A-58836 and encompassing 95.94 acres. The third withdrawal is for the U.S. Army, serialized as A-52010, encompassing 2.67 acres.

Within this area, there are no rights-of-way or land use authorizations.

(2) Naknek/King Salmon Vicinity

In the area generally located near Naknek, South Naknek and King Salmon, BLM is the interim manager of 29,524 acres of land (Figure 3.44). Within this area, all lands are selected for conveyance by Native Corporations and the State of Alaska, or they have been applied for as Native Allotments. Native Corporations have selected 17,635 acres, Native Allotment applications encumber 374 acres, and 11,515 acres of land are selected by the State of Alaska. All lands not prioritized by Native Corporations have been prioritized by the State of Alaska. BLM anticipates owning no lands in this area at the conclusion of the conveyance process.

This page intentionally left blank.

Insert Figure 3.40 Here (11x17 fold-in).

This page intentionally left blank.

Within this area, BLM has patented one tract of land under the R&PP Act. The Federation of Norwegian Lutheran Youth Peoples Society Inc. received a patent in 1962 (Patent # 1224794) to 1.73 acres of land for a church site located in Naknek. The land is described as U.S. Survey 3539, lot 3; located within T. 17 S., R. 47 W., sec. 3. The case is serialized as A-031707. The BLM is responsible for on-going compliance of this parcel to insure it is continually used for the purposes for which it was patented. (Figure 3.40)

Two rights-of-way have been issued in this area under FLPMA authority.

- BLM issued a right-of-way for a power line to the Naknek Electric Association in 1960. Serialized as A-051081, the right-of-way is 40 feet wide and 15.1 miles in length, encumbering 73.2 acres of land. The power line is located in T. 17 S., R. 45 W., T. 16 S., R. 46 W., T. 17 S., R. 46 W., and T. 17 S., R. 47 W. As lands were patented along the route of this line, they would have been subject to this right-of-way. This right-of-way expires on July 10, 2008. If the lands remain under BLM's jurisdiction there will be an option to renew.
- BLM issued a right-of-way for a road to the Bristol Bay Borough in 1996. Serialized as AA-077688, the right-of-way is 50 feet wide and 1,110 feet in length, encumbering 1.26 acres of land. The road is located in T. 17 S., R. 45 W. This right-of-way expires on May 1, 2026, with an option to renew.

There are ten withdrawals within the vicinity of Dillingham. Four withdrawals are for the Federal Aviation Administration, serialized as: A-46709, encompassing 91.81 acres; serialized as A-50813, encompassing 5 acres; A-53428, encompassing 133.75 acres; AA-65121, encompassing 1.58 acres. The National Park Service has one withdrawal serialized as A-42044, encompassing 11.43 acres. The National Marine Fisheries has one withdrawal serialized as A-72642, encompassing 6.29 acres. The U.S. Air Force has four withdrawals serialized as A-23000, encompassing 16.97 acres; A-31940, encompassing 15 acres; AA-82862, encompassing 1.2 acres; AA-2838, encompassing 640 acres.

Within this area, there are no land use authorizations or areas identified for land tenure adjustment.

(3) Alagnak Planning Block

The Alagnak Planning Block is bordered by the Alagnak Wild and Scenic River on the Northeast, the Bristol Bay Fisheries Reserve (Kvichak River) on the west the Katmai National Park and Preserve on the East and Native or State land to the North and South (Figure 3.45). The area contains about 319,448 Acres. Once all selected lands have been conveyed in this planning block, we anticipate BLM will manage approximately 125,381 acres of public land. Currently BLM is the interim manager of about 64,643 acres of land. Native Corporations have prioritized 7,516 acres, and the State of Alaska has prioritized 57, 127 acres. Within the life of this plan, those lands should be conveyed out of Federal ownership.

This page intentionally left blank.

Insert Figure 3.41 Here (11x17 fold-in).

This page intentionally left blank.

Land Use Authorizations/Rights-of-Way

Figure 3.46 Bristol Bay Cellular Partnership Communications Site

There is one right-of-way authorized in the Alagnak Planning Block in Section 33, T. 14 S., R. 41 W., Seward Meridian. Bristol Bay Cellular Partnership has maintained a communications site in that section since May 2000 under land use authorization AA - 081909 (Figure 3.42).

As these lands are on the State's selection priority list, these lands will likely be conveyed out of Federal ownership and jurisdiction over this right-of-way will be transferred. There are no Land Use Authorizations within this planning block.

Alagnak Planning Block 17 (b) Easements

Within the Alagnak Planning Block there are 4 easements. One is for a site easement, one is for a proposed 25 ft. wide trail, one is for a 25 ft. existing trail, and one is for a 25 ft. existing winter trail. Table 3.20 provides information regarding each easement within this planning block. Figure 3.43 is an overview map of the ANCSA 17(b) easement reservations in this planning block.

Table 3.20. 17(b) Easements within the Alagnak Planning Block

Easement I.D.	Administrative Agency	Land Owner IC/Pat#	Land Access	Easement Type	Location Information
bbleve013 EIN 8b C6 D9 Dillingham A-2	BLM	IC 193 Levelock Natives Limited	Public Land	1 acre site easement	Sec. 20 T.13 S., R.44 W.
N/A EIN 8c C4 Dillingham A-2	BLM	IC 193 Levelock Natives Limited	Public Land	Proposed 25ft trail	Beginning in Sec. 20 T.13 S., R.44 W., southerly to public lands
bb / NA EIN 29d C5 Naknek D-3	BLM	50-91-0600 Paug-vik Inc. Ltd	Public Land	Existing_25 ft. trail	Beginning in Sec. 33 T.14 S., R.46 W. Easterly to public lands
bb / NA EIN 14 C3,D1,D9 Naknek D-3	BLM	50-91-0600 Paug-vik Inc. Ltd	.Public Lands	Existing_25 ft. trail. Winter use	Sec. 3 T.17 S., R.47 W., Northerly to Village of Levelock (transportation between communities)

Insert Figure 3.42 Here (11x17 fold-in).

Insert Figure 3.43, 3.44, 3.45, 3.47 Here (11x17 fold-in).

Withdrawals. There are no withdrawals within the planning block.

Recreation and Public Purposes Act Sites. There are no Recreation and Public Purposes Act Sites within the planning block.

Land Tenure Adjustment. There are no areas for Land Tenure Adjustment within the planning block.

Subsurface Estate. There are approximately 692 acres of land where the surface estate has been conveyed and the United States has reserved an interest in "Oil & Gas" within the planning block. There are 1.19 acres of land where the surface estate has been conveyed and the United States has reserved an interest in "All Minerals" within the planning block (Figure 3.42).

(4) Goodnews Bay Planning Block

The Goodnews Bay Planning Block is bound by the Togiak National Wildlife Refuge on the North, South and East and by the Kuskokwim Bay and the Bering Sea on the West. The area contains about 525,727 Acres (Figure 3.48). Once all selected lands have been conveyed in this planning block, we anticipate BLM will manage approximately 110,843 acres of public land. Currently BLM is the interim manager of about 210,248 acres of land. Native Corporations have prioritized 85,979 acres, and the State of Alaska has prioritized 124,269 acres. Within the life of this plan, those lands should be conveyed out of Federal ownership.

Land Use Authorizations/Rights-of-Way

No land use authorizations or Rights-of-Way are authorized in this Planning Block.

ANCSA 17(b) Easements

There are several easements reserved within the Goodnews Planning Block (Table 3.21).

Table 3.21. 17(b) Easements within the Goodnews Planning Block

Easement I.D.	Administrative Agency	Land Owner IC/Pat.#	Land Access	Easement Type	Location Information
bb / NA EIN 1 C3,C5,D1,D9 M Kuskokwim Bay D-1	BLM	50-95-0437 Arviq Inc.	Public lands	Existing 25 foot trail Seasonal use (winter) Northwesterly to public land	Sec.19 T.12 S., R. 74 W., sm
bb / NA EIN 3 C3, C4, D1, D9 Goodnews A-8	BLM	IC 1660 Calista Corp.	State of Alaska	Existing 25 foot trail Southwesterly to Sec.10 T.8 S., R. 72 W. sm	Sec.31 T. 7 S., R.71 W., sm
bb / NA EIN 3a C3, C4,D1,D9 Goodnews B-7	BLM	IC 1660 Calista Corp.	State of Alaska	Existing 25 ft (winter) trail from Sec.27 T.8 S., R.72 W.southwesterly to Sec. 27 T.8 S., R. 72 W. sm	Sec. 27 T.8 S., R. 72 W., sm
bb / NA EIN 3b C3, C4, D1, D9 Goodnews B-7	BLM	IC 1660 Calista Corp.	State of Alaska	Existing 25 ft (summer) trail from Sec. 10 T.8 S., R. 72 W. southwesterly to Sec. 27 T.8 S., R. 72 W. sm	Sec10 T. 8 S., R.72W., sm
bb / NA EIN 4 C3,C4, D1,D9 Goodnews B-6	BLM	IC 1660 Calista Corp.	Public Land	Existing 25 ft trail. Winter Northeasterly to intersect w/EIN 6a, C4,D9 Proposed a 50ft. trail in Sec.15 T.10 S.,R.71W. sm to 1 acre site EIN 6 C4, D9	Sec.21 T.10 S., R.71 W., sm
bb / NA EIN 15 C4, D1 Goodnews B-6	BLM	Easement not with the Conveyance Document		1-acre Site Easement EIN C4, D1 identified to be reserved when land is conveyed. <u>Existing</u> trail EIN 15a C4, D1	

Figure 3.45 depicts three trails located in T. 8 S., R. 72 W., Seward Meridian. They are reserved in IC 1660. They are all twenty-five foot wide trails. EIN 3a C3, C4, D1, D9 is limited to use in the winter only. EIN 3b C3, C4, D1, D9 is limited to summer use only. All allow for transportation from public lands (BLM managed lands on the South) to public lands (The Togiak National Wildlife Refuge on the North). The State has a priority selection on the lands to the south and Calista Corporation has a priority selection on some of the lands to the north. Ultimately, the trail system will provide access from State Lands to the Togiak National Wildlife Refuge.

Figure 3.48 depicts three trail easements and two site easements. Trail EIN 4 C3, C4, D1, D9 was reserved in IC 1660 and provides access from the village of Goodnews Bay to State Public lands in Section 25, T. 9 S., R. 71 W., Seward Meridian. The trail crosses both Native-Selected and Native-conveyed lands. The selected lands are priority selections for Calista Corporation. The trail is twenty-five (25) feet wide from south to north until it intersects with EIN 6a, C4, D9 in Section 15, T. 10 S., R. 71 W., Seward Meridian where it changes to a width of fifty (50) wide until it reaches the State lands in Section 25, T. 9 S., R. 71 W., Seward Meridian.

Easement EIN 6a, C4, D9 is a proposed easement reserved in IC 1660 which is fifty (50) feet wide and proceeds from trail easement EIN 4 C3, C4, D1, D9 in Section 15, T. 10 S., R. 71 W., Seward Meridian southeasterly to site easement EIN 6 C4, D9. Approximately one half mile of this easement has yet to be reserved.

Trail easement EIN 15a C4, D1 has yet to be reserved as well. It proceeds from site easement EIN 15 C4, D1 in Section 23, T. 10 S., R. 71 W., Seward Meridian southwesterly to BLM Managed lands. The easement crosses Section 26, of T. 10 S., R. 71 W., Seward Meridian which was originally selected by Goodnews Bay or Mumtrak Village. That selection however is no long a priority selection nor is the section on the State's priority conveyance list. Therefore, the section will likely remain in the Federal Public Domain and the trail will be at least a mile to a mile and a quarter shorter than originally proposed. Section 23, T. 10 S., R. 71 W., Seward Meridian, the beginning of the trail and the location of its attendant site easement, is a priority selection by Calista Corporation and will likely leave the Federal Public Domain.

Insert Figures 3.48, 3.50, 3.51, 3.52 Here (11x17 fold-in)

Figure 3.50 depicts one of the two trails mentioned at the beginning of this discussion. It is part of a trail that goes from Goodnews Bay to Bethel. It is a winter trail, but more importantly it is part of an inter-community trail system that ought to be preserved. Here, EIN 1 C3, C5, D1, D9, M was reserved in Patent 50-95-0632, dated September 27, 1995. The subsurface estate is owned by Kuitsarak, Inc. The trail is twenty-five (25) feet wide and its use is limited to winter transportation.

Figure 3.51 depicts systems out of the Village of Goodnews Bay through Native-conveyed lands to two areas of State Conveyed lands. The northeastern portion of the system was discussed under Figure 3.50 above. The main trail discussed under Figure 3.52 and described as EIN 4 C3, C4, D1, D9 was again reserved under Patent 50-95-0632, dated September 27, 1995. The trail is twenty-five (25) feet wide and its use is limited to winter. Those portions of land it crosses which remain in the Federal Public Domain are priority selections Goodnews Bay and Mumtrak Village.

EIN 11 C5 is a site easement on the left bank of the Goodnews River in Section 2, T. 11 S., R. 72 W., Seward Meridian. Its purpose is to accommodate a change in mode of transportation from water to ground. Its purpose is related to EIN 11a C5, a proposed trail easement that provides for access to a block of land locked State Land, Sections 1, 12, 13 and 24 in T. 11 S., R. 72 W., Seward Meridian. Both easements were reserved in Patent 50-95-0632, dated September 27, 1995. Both easements are lands owned by Kuitsarak, Inc.

EIN 12 C5 intersects EIN 4 C3, C4, D1, D9 in Section 3 of T. 12 S., R. 73 W., Seward Meridian. It provides access to a large block of State owned land to the west. It was reserved in Patent 50-95-0632, dated September 27, 1995.

There is one new trail to this discussion in Figure 3.51: EIN 3 C3, C4, D1, D9. EIN 3 C3, C4, D1, D9 is reserved in Patent 50-95-0632, dated September 27, 1995. It is an existing trail and it is twenty-five (25) feet wide. While it appears to begin on BLM managed lands in Section 20, T. 12 S., R. 74 W., Seward Meridian, the lands are priority selections by Calista Corporation. The trail proceeds north from Section 20, T. 12 S., R. 74 W., Seward Meridian to public lands in Section 2, T. 11 S., R. 74 W., Seward Meridian. The trail is designed to proceed further if the lands to the north of Section 2, T. 11 S., R. 74 W., Seward Meridian are conveyed to the Native community. Calista Corporation has a priority selection on Sections 13, 22, 23, and 24 of T. 10 S., R. 74 W., Seward Meridian. The State claims a priority selection on Sections 26 and 35 of T. 10 S., R. 74 W., Seward Meridian and Section 3 of T. 11 S., R. 74 W., Seward Meridian. The northern portion of the trail system will therefore fall on both State and Native owned lands. The left or western portion of the branch in the trail system is demarcated as EIN 16 C4, D1 and has yet to be reserved in any conveyance.

Figure 3.52 depicts the last of the ANCSA 17(b) easements in the Goodnews Planning Block. EIN 3 D1, D9 and EIN 6 C3, D1 were both reserved in Patent 50-95-0437, dated August 15, 1995. EIN 6 C3, D1 is a sixty (60) foot wide road easement. It goes from the South Spit at Platinum and the Platinum Airstrip south to the Goodnews Mining Camp. EIN 3 D1, D9 is an existing trail easement from Platinum to Goodnews Bay.

Withdrawals. There are no withdrawals within the planning block.

Recreation and Public Purposes Act Sites. There are no Recreation and Public Purposes Act Sites within the planning block.

Land Tenure Adjustment. Section 18, T. 9 S., R. 72 W., appears to be unencumbered BLM lands that does not have a state selection or a Native selection within the section. The area encompasses 605 acres and because it would be isolated public land at the completion of the conveyance process, it would be suitable for land tenure adjustment, such as a land exchange or sale.

Subsurface Estate. The Federal government has no subsurface estate interests within the Goodnews planning block (Figure 3.42).

This page intentionally left blank.

Insert Figure 3.53, 3.54, 3.55, 3.56 Here (11x17 fold-in).

(5) Iliamna East Planning Block

The Iliamna East Planning Block occupies an area east of the Kvichak Block, adjoining the Iliamna West Planning Block in which both the East and West Planning Block takes in the Iliamna Lake. The area contains about 1,265,641 Acres (Figure 3.57). Once all selected lands have been conveyed in this planning block, we anticipate BLM will manage approximately 22,716 acres of public land. Currently BLM is the interim manager of about 265,907 acres of land. Native Corporations have prioritized 159,496 acres, and the State of Alaska has prioritized 107,411 acres. Within the life of this plan, those lands should be conveyed out of Federal ownership.

Land Use Authorizations/Rights-of-Way. No land use authorizations or Rights-of-Way are authorized in this Planning Block.

ANCSA 17(b) Easements. There are 39 ANCSA 17(b) site and trail easements in the Iliamna East Planning Block area. There are twenty-seven one (1) acre site easements and three ½ acre site easements. There are six proposed 25 ft. wide trail easements, and one 25 ft. existing trail easement. One is for a 50 ft. existing trail, and there is an easement for a airstrip measuring 250' x 1500'. These easements are shown in Figure 3.59, and details are provided in Table 3.22.

Table 3.22. 17(b) Easements within the Iliamna East Planning Block

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bbilia001 EIN 24 C5, D1 N Lake Clark A-6	BLM	Kijik Corporation IC 300 Easement not identified in a conveyance document	State Conveyed	A one acre site easement starting at Long Lake accessing proposed 25 feet trail to the Chulitna River.	Sec.31 T.1N., R.33W., sm
bbilia001 EIN 4a D1 Lake Clark A-6	BLM	Kijik Corporation Patent No. 50-94-0485 Easement not identified in a conveyance document	State Conveyed	Existing 25ft. trail for public purpose and access. Northwesternly to public lands	Sec.30 T.2S., R. 32W., sm
bbilia003 EIN 12b D9 Lake Clark A-6	BLM	Kijik Corporation IC 300	Public Land	1acre site	Sec.11 T.1S. R.34W., sm
bbilia005 EIN 12e C5 Lake Clark A-5	BLM	Kijik Corporation IC 300	Public Land	Proposed 25ft trail for public purpose and access. Southerly to public lands	Sec.16 T.1N., R.32W sm

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bbilia005 EIN 13a D9 Lake Clark A-5	BLM	Kijik Corporation IC 300	Public Land	1 acre site	Sec.16 T.1N., R.32W., sm
bbilia007 EIN 20 C5, D1, N Lake Clark A-5	NPS	Kijik Corporation PA No. 50-94-0485 Easement not identified in a conveyance document	Public Land	Trailhead for 25 feet proposed trail accessing public land and periodic site on the Chulitna River.	Sec.5 T.1N., R.31W., sm
bbilia009 EIN 22 C5, D1, N Lake Clark A-5	NPS	Kijik Corporation PA No. 50-94-0485 Easement not identified in a conveyance document	Public Land	Trailhead for 25 feet proposed trail accessing isolated public land.	Sec.16 T.1N., R.31W., sm
bbilia011 EIN 10kE Lake Clark A-5	NPS	Kijik Corporation IC 300	Public Land	Proposed 25ft. trail for public purpose and access. Northwesternly to public lands.	Sec.5 T.1S., R.31W., sm
bbilia015 EIN 16 L Lake Clark A-5	NPS	Kijik Corporation IC 300	Public Lands	Existing bush airstrip, 250' width and 1500' length used to access public lands.	Sec.18 T.1N., R.30W., sm & Sec. 13 T.1 N., R. 31 W., sm
bbilia016 EIN 16b L Lake Clark A-5	NPS	Kijik Corporation IC 300	Chulitna River	1 acre site	Sec.18 T. 1 N., R.30W., sm
bbilia018 bb / NA EIN 102 C5	NPS	Kijik Corporation IC 1337	Lake Clark NP	½ acre site	Sec.11 T.2S., R.30W., sm

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
Lake Clark A-4					
bbilia020 EIN 27 C-5 Lake Clark A-4	NPS	Kijik Corporation IC 1337	Lake Clark NP	½ acre site	Sec.11 T.2S., R.30W., sm
bbilia022 EIN 100 C4 Iliamna D-5	NPS	Kijik Corporation IC 1337	Lake Clark NP	1 acre site	Sec.26 T.2S., R.31W., sm
bbilia024 EIN 26b C5, D1, N Iliamna D-5	NPS	Kijik Corporation IC 300 Easement not identified in a conveyance document	Lake Clark NP	1 acre site	Sec.28 T.2S., R.32W., sm
bbilia026 EIN 27a D1 Iliamna D-5	NPS	Iliamna Natives Ltd IC 1341.	Lake Clark NP	1 acre site	Sec.9 T.3S., R.31W., sm
bbilia028 EIN 27 D1 Iliamna D-5	NPS	Iliamna Natives Ltd. IC 1339	Lake Clark NP	1 acre site	Sec.8 T.3S. R.31W. SM
bbilia031 EIN 17a D1 Iliamna D-5 17 D1	Selected PD Proposed	Applicant AA6685-0	Lake Clark NP	Proposed ?trail accessing isolated public land. Site easement	Sec.8 T.3S., R.32W. SM

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bbilia032 EIN 11a C5 Iliamna D-5	NPS	Iliamna Natives Ltd. 50-94-0481	Lake Clark NP	1 acre site	Sec.27 T.3S., R.32W., sm
bbilia034 EIN 12a C5 Iliamna D-5	NPS	Iliamna Natives Ltd. 50-94-0481	Lake Clark NP	½ acre site	Sec.22 T.3S. R.32W., sm
bbilia035 EIN 15c D9 Iliamna D-5	BLM	Iliamna Natives Ltd. 50-94-0481	Public Land	1 acre site	Sec.1 T.5S. R.32W., sm
bbilia037 EIN 11d D1, D9 Iliamna D-5	BLM	Iliamna Natives Ltd. IC 402	Public Lands	1 acre site.	Sec.31 T.3S. R.32W., sm
bbilia039 EIN 22 E Iliamna D-6	BLM	Iliamna Natives Ltd. IC 402	State Conveyed	1 acre site	Sec.28 T.4S. R.33W., sm
bbilia041 EIN 4a C4 Iliamna C-6	BLM	Alaska Peninsula Corporation IC 283	Public Land	1 acre site Sec. 17 and/or Sec.20 T.5 S.,R.33W. sm at end of EIN 4b D9	Sec.17 T.5S. R.33W., sm
bbilia045 EIN 3e D9 Iliamna C-6	BLM	Alaska Peninsula Corporation IC 283	Public Land	1 acre site	Sec.13 T.6S., R.35W., sm
bbilia046 EIN 5B D1, D9, L	BLM	Alaska Peninsula Corporation IC 283	Public Land	1 acre site	Sec.28 T.5S., R.33W., sm

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
Iliamna C-6					
bbilia047 EIN 6a D9 Iliamna C-5	BLM	Iliamna Natives Ltd. IC 402	Public Land	1 acre site	Sec.15 T.5S., R.33W., sm
bbilia051 EIN 24a D3 Iliamna D-5	BLM	Iliamna Natives Ltd. IC 649	Public Land	1 acre site.	Sec.12 T.5 S., R.33W., sm
bbilia052 EIN 24b D3 Iliamna D-5	BLM	Iliamna Natives Ltd. IC 649	Major Waterway - Slopbucket Lake	1 acre site	Sec.12 T.5S., R.33W., sm
bbkokh001 EIN 12b D9 Iliamna C-5	BLM	AK Pen Corp IC 357	Navigable Water	1 acre site	Sec.35 T.7S., R.31W., sm
bbkokh002 EIN 12k D9 Iliamna C-4	BLM	AK Pen Corp IC 357	Public Land	1 acre site	Sec.34 T.7S., R.30W., sm
bbkokh004 EIN 23 E Iliamna B-4	BLM	AK Pen Corp IC 357	Public Land	1 acre site	Sec.24 T.8S. R30W., sm
bbkokh006 EIN 8a D9 Iliamna B-5	BLM	AK Pen Corp IC 357	Public Land	1 acre site	Sec.5 T.9S., R.31W., sm
bbkokh008 EIN 22 E	BLM	AK Pen Corp IC 357	State Conveyed	1 acre site.	Sec.7 T.9S., R.31W., sm

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
Iliamna B-5					
bbkokh010 EIN 24 C5 Iliamna B-5	BLM	AK Pen Corp IC 1042	State Conveyed	1 acre site	Sec.2 T.10S., R.32W., sm
bbkokh012 EIN 25 C5 Iliamna B-5	BLM	AK Pen Corp IC 1042	State Conveyed	1 acre site.	Sec.31 T.9S. R.32W., sm
bbkokh014 EIN 4a D9 Iliamna B-5	BLM	AK Pen Corp 50-92-0730	Public Land	1 acre site	Sec.35 T.8S., R.33W., sm

Withdrawals. There are two withdrawals within the planning area. One is for the Federal Aviation Administration, serialized as AA-721 and encompasses 709 acres. The second withdrawal is for the Department of Interior, serialized as AA-6497, encompassing 13,951 acres. (Figure 3.58).

Recreation and Public Purposes Act Sites. There are no Recreation and Public Purposes Act Sites within the planning block.

Land Tenure Adjustment. These areas are potential disposal, acquisition or land exchange sites:

Chulitna River, located in secs. 21 to 23 and sec. 28, T. 1 N., R. 32 W., approximately 2,560 acres are lands recommended for exchange. A village selection application, AA-6686-K, still remains on secs. 29 to 32, but secs. 31 and 32 are not prioritized for conveyance, and are anticipated to remain in BLM management and would be appropriate for exchange. Total acreage for these lands are 3,836 acres. (Figure 3.60)

Some BLM land will remain under BLM's management after the conveyance process is completed in the area near Chekok Creek, located in Tps. 2 and 3 S., R. 30 W. The south half of this township is on the State's priority. Lands located outside the boundary of Lake Clark National Park and Preserve and not conveyed to the State should be considered for exchange or sale. Total acreage would be 8,935 acres (Figure 3.61).

Subsurface Estate. The Federal government has retained oil and gas rights on several Native allotments and all minerals on at least one Native allotment.

This page intentionally left blank

Insert Figures 3.57, 3.58, 3.59, 3.60 Here (11x17 fold-in)

This page intentionally left blank

(6) Iliamna West Planning Block

The Iliamna West Block occupies an area east of the Kvichak Block, and west of the Iliamna Lake, adjacent to the Village of Igiugig. The Iliamna West Block is located approximately twelve miles northwest of King Salmon, Alaska. The area contains about 548,952 Acres (Figure 3.63). Once all selected lands have been conveyed in this planning block, we anticipate BLM will manage approximately 237,548 acres of public land. Currently BLM is the interim manager of about 167,093 acres of land, all of which all of these lands have been prioritized by the State of Alaska. Within the life of this plan, those lands should be conveyed out of Federal ownership.

Land Use Authorizations/Rights-of-Way. No land use authorizations or Rights-of-Way are authorized in this Planning Block.

ANCSA 17(b) Easements. There are six ANCSA 17(b) site and trail easements in the Iliamna West Planning Block area. There are two (1)acre site easements. There are three proposed 50 ft. wide trail easements, and one 50 ft. existing trail easement. These easements are shown in Figure 3.65, and details are provided in Table 3.23.

Table 3.23. 17(b) easements within the Iliamna West Planning Block

Easement I.D.	Administrative Agency	Land Owner IC / Pat#	Land Access	Easement Type	Location Information
bb / NA EIN 19b C4 Iliamna B-8	BLM	Igiugig Native Corp 50-89-0710	Public Lands	1 acre site	Sec. 15 T.10 S., R.38 W., sm
bb / NA EIN 6C D9 Iliamna B-8	BLM	Igiugig Native Corp 50-89-0710	Public Lands	1 acre site	Sec. 14 T. 10 S., R.40 W., sm
bb / NA EIN 19a C4 Iliamna B-8	BLM	Igiugig Native Corp 50-89-0710	Goes to Public Land	Proposed 50 ft trail. southerly to public lands	Sec.15 T.15 S.,R.38 W., sm
bb / NA EIN 11 D9 Iliamna B-8	BLM	Igiugig Native Corp	Goes to Public Land	50 foot proposed trail.	Sec. 18 T.10 S., R. 39 W., sm
bb / NA EIN 11a C4 Iliamna B-8	BLM	Igiugig Native Corp	Goes to Public Land	50 foot trail	Sec. 7 T.10 S., R. 39 W., sm
bb / NA EIN 18a C4	BLM	Igiugig Native Corp 50-89-0710	Public	Proposed 50 ft trail. Easterly to Sec.33 T.11 S., R.37W. sm	Sec.36 T.11S.,R.38 W., sm

Withdrawals

There is a withdrawal for the U.S. Air Force, serialized as A-32838, encompassing 335.37 acres. The Air Force is currently remediating the site for return to the public domain, and the State of Alaska has prioritized the lands for conveyance, so these lands will likely be conveyed out of Federal ownership during the life of the plan.

Recreation and Public Purposes Act Sites

There are no Recreation and Public Purposes Act Sites within the planning block.

Land Tenure Adjustment

These areas are potential disposal, acquisition or land exchange sites:

This area is located about 14 miles southeast of Iguigig; it is in T. 11 S., R. 37 W., secs.2, 3, 4, 9, 10, and portions of sec. 16 and 21. This area is state selected, but not prioritized for conveyance and is anticipated to remain in BLM management. It would be appropriate for sale or exchange, total acreage for these lands is 3,532 acres.

Subsurface Estate

There are approximately 2701.98 acres of land where the surface estate has been conveyed and the United States has reserved an interest in "Oil & Gas" within the planning block (Figure 3.78).

Insert Figure 3.61, 3.62, 3.63, 3.64 here (11x17 fold-in).

This page intentionally left blank

(7) Koggiling Creek Planning Block

The Koggiling Creek Planning Block occupies an area west of Levelock, and east of Dillingham. The southern boundary of the planning block is formed by Kvichak Bay and Kvichak River (Figure 3.67). The Lower Nushagak River and the Keefer Cutoff form a broad nearly level river valley that cuts through the western side of the planning block. The area contains about 543,438 Acres. Once all selected lands have been conveyed in this planning block, we anticipate BLM will manage approximately 173,752 acres of public land. Currently BLM is the interim manager of about 92,403 acres of land. Native Corporations have prioritized 40,318 acres, and the State of Alaska has prioritized 52,085 acres. Within the life of this plan, those lands should be conveyed out of Federal ownership.

Land Use Authorizations/ Rights-of-Way

One land use authorization is currently authorized in the Koggiling Creek Planning Block. BLM issued a communications site right-of-way on April 12, 1991 to Bristol Bay Cellular Partnership serialized as AA-74046. The right-of-way expires on April 11, 2016, and may be renewed. The granted use is for an H-1 repeater site, occupying .08 acres, located within the W $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$, sec. 9, T. 16 S., R. 50 W., S.M. The improvements located on the site are a 40 foot tower with 2-12 foot diameter microwave antennas located at the top of the tower. A small electronics shelter is located near the base of the tower. This land is selected by the Bristol Bay Regional Corporation (Figure 3.67). There are no Land Use Authorizations within this planning block.



Figure 3.66. Iliamna West Block Communication Site

ANCSA 17(b) Easements

Within the Koggiling Planning Block there are 9 site and trail easements. There are four one (1) acre site easements, four proposed 25 ft. wide trail easements, and one 25 ft. existing trail easement. These easements are shown in Figure 3.64, and details are provided in Table 3.24.

Table 3.24. 17(b) easements within the Koggiling Creek Planning Block

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bbdill079 EIN 1 D1, N Dillingham A-5	BLM	BBNC IC 1658	Public lands	1 acre site	Sec. 20 T.12 S., R.50 W., sm
bbdill080 EIN 1a D1, N Dillingham A-5	BLM	BBNC IC 1658	SOA	Proposed 25 ft trail from EIN 1 D1, Northwesterly to public lands in Sec 18 T.12 S., R.50W. sm	Sec. 20 T.12 S., R.50W., sm
bbdill081 EIN 2 D1, N Dillingham A-5	BLM	BBNC IC 1658		1 acre site	Sec. 34 T.12S., R.50W., sm
bbdill082 EIN 2a D1, N Dillingham A-5	BLM	BBNC IC 1658	SOA	Proposed 25 ft trail from EIN 2 D1, N easterly to public lands in Sec. 35 T.12 S., R.50 W. sm	Sec. 34 T.12 S., R.50 W., sm
bbnakn001 EIN 29 C5	BLM	Paug-vik inc. 50-91-0600	SOA	Existing 25 ft. trail westerly to public lands	Sec. 25 T.14S., R.47W. sm
bbnakn083 EIN 8b C5 Naknek D-6	BLM	Choggiung Limited 50-93-0519	SOA	Proposed 25 ft trail from EIN 8a C5 westerly to public lands	Sec. 14 T.14 S., R 51 W., sm
bbnakn084 EIN 8a C5 Naknek D-6	BLM	Choggiung Limited 50-93-0519	N/A	1 acre site	Sec. 14 T14 S., R51W., sm
bb / NA EIN 2 D1, C5 Naknek D-5	BLM	BBNC 50-88-0370	Public land	1 acre site	Sec. 25 T.16 S., R.50 W., sm
bb / NA EIN 2a C5 Naknek D-5	BLM	BBNC 50-88-0370	BLM	Proposed 25 ft trail from EIN 2 D1, C5 thru sec.25 & 26 T.16 S., R.50 W. to public land @ southern boundary sec.23	Sec. 25 T.16S., R.50W., sm

Withdrawals. There are no withdrawals within the planning block.

Recreation and Public Purposes Act Sites. There are no Recreation and Public Purposes Act Sites within the planning block.

Land Tenure Adjustment. There are no areas for Land Tenure Adjustment within the planning block.

Subsurface Estate. The Federal government has retained mineral rights on several Native allotments (Figure 3.82)

(8) Klutuk Creek Planning Block

The Klutuk Creek Planning Block is located south of the Village of Koliganek and north of the Village of New Stuyahok. The Block is east of the Wood Tikchik State Park. The confluence of the Mulchatna and Nushagak Rivers occurs within this area. The area contains about 1,168,569 Acres. Once all selected lands have been conveyed in this planning block, we anticipate BLM will manage approximately 141,959 acres of public land (Figure 3.69). Currently BLM is the interim manager of about 187,436 acres of land. Native corporations have prioritized 36,019 acres, and the State of Alaska has prioritized 134,859 acres. Within the life of this plan, those lands should be conveyed out of Federal ownership.

Land Use Authorizations/Rights-of-Way

One land use authorization is currently authorized in the Klutuk Creek Planning Block. BLM issued a 2920 FLPMA permit on September 2, 2005, to Geocom Resources Inc., serialized as AA-085926. The granted use is to conduct geophysical exploration for evaluate of gold and copper mineralization on their claims. This action occurred 25 miles west of Lake Iliamna. The land is State selected under the jurisdiction of the Bureau of Land Management within Secs. 25, 26, 35, and 36, Township 5 S., R. 45 W., and Secs. 1 to 3, and 9 to 17, T. 6 S., 45 W. (see Figure 3.69). This permit will expire on March 1, 2006, and may be renewed if further evaluation is needed by Geocom. There are no authorized rights-of-way.

This page intentionally left blank.

Insert Figure 3.65, 3.67, 3.68, 3.69 Here (11x17 fold-in).

This page intentionally left blank.

ANCSA 17(b) Easements

There are a total of eighteen 17(b) site and trail easements within the Klutuk Planning Block. There are nine one-acre site easements and nine proposed 25 ft. wide trail easements. These easements are shown in Figure 3.71, and details are provided in Table 3.25.

Table 3.25. 17(b) Easements within the Klutuk Planning Block

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bbekwo002 EIN 30 C4, Dillingham D-4	BLM	Koliganek Natives Ltd. IC 228	Public Lands	1 acre site	Sec.36 T. 3 S., R.48W., sm
bb/NA EIN 30a,C4 Dillingham D-4	BLM	Koliganek Natives Ltd. IC 228	Public Lands	Proposed 25ft. trail from EIN 30 C4, westerly to public lands.	Sec. 36 T.3 S., R. 48 W., sm
bbekwo003 EIN29 C4, Dillingham D-4	BLM	.Koliganek Natives Ltd. IC 228	Public Lands	1 acre site	Sec.18 T.4 S., R.47W., sm
bb/NA EIN29a,C4 Dillingham D-4	BLM	Koliganek Natives Ltd. IC228	Public Lands	Proposed 25 ft. trail from EIN 29 C4, easterly to public lands.	Sec. 18 T.4 S.,R.47 W., sm
bbekwo005 EIN28 C4, Dillingham D-4	BLM	.Koliganek Natives Ltd. IC 228	Public Lands	1 acre site	Sec. 23 T.4 S., R. 47 W., sm
bb/NA EIN28a,C4 Dillingham D-4	BLM	Koliganek Natives Ltd. IC228	Public Lands	Proposed 25ft. trail from EIN 28 C4, southerly to public lands.	Sec. 23 T.4 S., R.47 W., sm
bbekwo008 EIN25 C4, Dillingham C-3	BLM	Koliganek Natives Ltd.. IC 228	Public Lands	1 acre site	Sec.21 T.5 S., R. 45 W., sm

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bb/NA EIN 25a,C4 Dillingham C-3	BLM	Koliganek Natives Ltd. IC 228	Public Lands	Proposed 25 ft. trail from EIN 25 C4 westerly to public lands	Sec. 21 T.5 S., R.45 W., sm
bbekwo012 EIN33 C4, Dillingham C-5	BLM	Stuyahok Ltd. IC 290	Public Lands	1 acre site	Sec(s). 6 fractionally, Sec. 7 fractionally T. 6 S., R. 46 W., sm
bb/NA EIN33a,C4 Dillingham C-5	BLM	Stuyahok Ltd. IC 290	Public Lands	Proposed 25ft. trail from EIN 33 C-4 easterly to public lands.	Sec(s). 6 fractionally, Sec. 7 fractionally, T.6 S., R. 46 W., sm
bbekwo010 EIN 32 C4 Dillingham C-4	BLM	Stuyahok Ltd. IC 290	Public Lands	1 acre site	Sec.6 T.6 S., R. 46 W., sm
bb/NA EIN32A,C4 Dillingham C-4	BLM	Stuyahok Ltd. IC 290	Public Land	Proposed 25 ft. trail from EIN32 C4 westerly to public lands.	Sec.6 T. 6 S., R. 46 W., sm
bbekwo014 EIN 119 D1,M Dillingham C-5	BLM x	BBNC 50-92-0709	Public Lands	1 acre site	Sec. 14 T.7 S., R. 46 W., sm
bb/NA EIN 119a D1, M Dillingham C-5	BLM x	BBNC 50-92-0709	Public Lands	Proposed 25 ft. trail from EIN 119 D1,M	Sec. 14 T.7 S., R.46 W., sm
bbekwo023 EIN 16 C4, Dillingham B-5	BLM	Ekwo Natives Ltd. 50-92-0738	Public Lands	1 acre site	Sec. 33 T.9 S., R.50 W., sm

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bb/NA EIN 16a C4 Dillingham B-5	BLM	Ekwok Natives Ltd. 50-92-0738	Public Lands	Proposed 25 ft. trail from EIN 16 C4 northerly to public lands	Sec.33 T.9 S., R.50 W., sm
bbekwo025 EIN 14 C4 Dillingham B-5	BLM	Ekwok Natives Ltd. 50-92-0738	Public Lands	1 acre site	Sec. 31 T.9S., R.50 W., sm
bb / NA EIN 14a C4 Dillingham B-5	BLM	Ekwok Natives Ltd. 50-92-0738	Public Lands	Proposed 25 ft. trail from EIN 14 C4 southwesterly to public lands.	Sec. 31 T.9S., R.50 W., sm

Withdrawals. There are no withdrawals within the planning block.

Recreation and Public Purposes Act Sites. There are no Recreation and Public Purposes Act Sites within the planning block.

Land Tenure Adjustment. There are no areas for Land Tenure Adjustment within the planning block.

Subsurface Estate. There are approximately 2,491 acres of land where the subsurface estate has been reserved as an interest in "Oil & Gas" within the planning block (Figure 3.78).

(9) Kvichak Planning Block

The Kvichak Planning Block generally is located on each side of the lower portion Kvichak River. BLM managed lands within the block are generally located off of the major rivers, with legal access provided by proposed trails reserved as 17(b) easements. The area contains about 362,599 Acres. Once all selected lands have been conveyed in this planning block, we anticipate BLM will manage approximately 92,217 acres of public land (Figure 3.72). Currently BLM is the interim manager of about 133,359 acres of land. Native Corporations have prioritized 5,112 acres, and the State of Alaska has prioritized 120,652 acres. Within the life of this plan, those lands should be conveyed out of Federal ownership.

Land Use Authorizations/Rights-of-Way. No land use authorizations or Rights-of-Way are authorized in this Planning Block.

ANCSA 17(b) Easements. There are a total of twelve 17(b) Easements within the planning block. Five are 1-acre site easements; four located along the Kvichak River and one located along the Alagnak River. Five easements are 25-foot wide easements for proposed trails to provide access to public lands. Two of the easements are for 25-foot existing winter trails that provide for travel between communities. These easements are shown in Figure 3.73, and details are provided in Table 3.26.

Table 3.26. 17(b) easements within the Kvichak Planning Block

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bbleve002 EIN 1b D9, C6 Dillingham A-2	BLM	Levelock Nat. Ltd. IC 193	Public lands	1 acre site	Sec. 19 T.11S., R.43 W., sm
bb / NA EIN 1f D9, C6 Dillingham A-2	BLM	Levelock Natives Ltd. IC 193	Public lands	Proposed 25ft. trail. Northerly to public lands	Sec. 19 T.11S., R.43 W., sm
bbleve004 EIN 1c D9, C6 Dillingham A-2	BLM	Levelock Natives Ltd. IC 193	Public Lands	1 acre site	Sec.36 T.11S., R.44W., sm
bbleve006 1d D1,D9,L Dillingham A-2	BLM	Levelock Nat. Ltd IC 193.	Public lands	1 acre site	Sec. 4 T.12S., R.44W., sm
bb / NA EIN 1g C6,D1,D9,L Dillingham A-2	BLM	Levelock Nat. Ltd. 193	Public lands	Proposed 25ft. trail from EIN 1c C6,D1,D9, L / Sec. 36 T.11 S.,R.44 W. sm	Sec. 36 T.11S., R.44W., sm
bb / NA EIN 1h D1,D9,L Dillingham A-2	BLM	Levelock Nat. Ltd. 193	Public lands	Proposed 25ft. trail from EIN 1d D1,D9, L / Sec.13 T.12 S.,R.45W.	Sec.4 T.12S., R.44W., sm
bbleve008 EIN 2e C4 Dillingham A-3	BLM	Levelock Nat. Ltd. 193	Public lands	Proposed 25 ft. trail. Northerly to Public lands	Sec.33 T.13S., R.45 W., sm
bb EIN 12b E Dillingham A-2	BLM	Levelock Nat. Ltd. 193	Public lands	Proposed 25ft. trail. Northerly to public lands	Sec.31 T.11S., R.44W., sm
bbleve001	BLM	Levelock	Public lands	Existing 25ft.	Sec. 13

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
EIN 13 E Dillingham A-2		Nat. Ltd. 193		winter trail. Parallels Kvichak River thru selection Winter use	T.11S., R.43W.. sm
bbleve010 EIN 14 E Dillingham A-3	BLM	Levelock Nat. Ltd 193	Public lands	Existing 25ft. winter trail on L.H. side of river across from Village of Levelock, southerly to public land in Sec. 6 T.14 S., R.45W., sm Winter use	Sec. 27 T.12 S., R. 45 W., sm
bbleve008 EIN 15a C5 Dillingham A-2	BLM	Levelock Nat. Ltd 193	Public lands	1 acre site	Sec. 31 T.11S., R 44W., sm
bbleve011 EIN 16 C5 Dillingham A-3	BLM	Levelock Nat. Ltd? x	Public lands	site	Sec.33 T.13 S., R.45W., sm

Withdrawals. There are no withdrawals within the planning block.

Recreation and Public Purposes Act Sites. There are no Recreation and Public Purposes Act Sites within the planning block.

Land Tenure Adjustment. There are no areas for Land Tenure Adjustment within the planning block.

Subsurface Estate. The Federal government has retained mineral rights on several Native allotments (Figure 3.82).

Insert Figures 3.70, 3.71, 3.72, and 3.73 here (11x17 fold-in)

This page intentionally left blank.

(10) Yellow Creek Planning Block

The Yellow Creek block is located east of New Stuyahok and west of Ekwok. The Nushagak River runs northwest and Kvichak River runs southeast of the planning area. New Stuyahok is located within the Bristol Bay Recording District and on the Nushagak River, just 12 miles upstream from Ekwok. Once all selected lands have been conveyed in this planning block, we anticipate BLM will manage approximately 266,667 acres of public land (Figure 3.74). Currently BLM is the interim manager of about 151,794 acres of land. Native Corporations have prioritized 9,565 acres, and the State of Alaska has prioritized 119,773 acres. Within the life of this plan, those lands should be conveyed out of Federal ownership.

Land Use Authorizations/Rights-of-Way

No land use authorizations or Rights-of-Way are authorized in this Planning Block.

ANCSA 17(b) Easements

There are a total of five 17(b) easements within the Yellow Creek Planning Block. There are four one-acre site easements. One 25 ft. existing trail easement. These easements are shown in Figure 3.75, and details are provided in Table 3.27.

This page intentionally left blank

Insert Figure 3.74, 3.75 here (11x17 fold-in)

This page intentionally left blank

Table 3.27. Yellow Creek 17(b) Easements

Easement I.D.	Administrative Agency	Land Owner IC / Pat #	Land Access	Easement Type	Location Information
bb / NA EIN C4 Dillingham B4	BLM	Easement not noted in conveyance document x	public lands	1 acre site	Sec. 21 T.9S., R.48 W., sm
bb / NA EIN 37 E Dillingham B4	BLM	Ekwok Natives Ltd. 50-92-0738	public lands	1 acre site adjacent to EIN 38E left bank of Nushagak R.	Sec. 11 T.10 S., R.49W., sm
bb / NA EIN 10 B C4 Dillingham B5	BLM	State of Alaska x	public lands	1 acre site	Sec. 25 T.10 S., R.50 W. sm
bb / NA EIN 13 E Dillingham A3	BLM	Levelock Natives Ltd. 50-89-0751	public lands	Existing 25ft. trail. From east end sec.13 southwesterly to public lands in Sec.34 T.13 S.,R.46 W. sm	Sec. 13 T.11S. R.43W., sm
bb / NA EIN 119 D1, M Dillingham C3	BLM x	Easement not noted in conveyance document	public lands	1 acre site	Sec. 14 T.7 S. R.46W., sm

Withdrawals. There are no withdrawals within the planning block.

Recreation and Public Purposes Act Sites. There are no Recreation and Public Purposes Act Sites within the planning block.

Land Tenure Adjustment. There are no areas for Land Tenure Adjustment within the planning block.

Subsurface Estate. There is no identified subsurface estate retained by the Federal government. (Figure 3.42).

D. Special Designations

1. Areas of Critical Environmental Concern

a) Background

Areas of Critical Environmental Concern (ACECs) are an administrative designation unique to BLM. BLM regulations (43 CFR Part 1610) define an ACEC as an area "... within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards." While an ACEC may emphasize one or more unique resources, other existing multiple-use management can continue within an ACEC so long as the uses do not impair the values for which the ACEC was designated. Section 202 (c)(3) of FLPMA mandates that BLM give priority to the designation and protection of ACECs in the development and revision of land use plans. BLM Manual 1613 describes the process followed to nominate ACECs and to evaluate areas for their suitability for ACEC designation. Currently there are no designated ACECs within the planning area.

b) Nominated Areas

During the scoping process for the Bay RMP, the Anchorage Field Office actively solicited nominations and comments from the public regarding areas that should receive consideration as ACECs. Two nominations were received from the public and BLM specialists (Figures 2.7 and 2.8):

- Carter Spit ACEC - Nominated by BLM specialists.
- Bristol Bay ACEC - Nominated by the Alaska Coalition, the public, and BLM specialists.

Based on interdisciplinary review, the following areas met both the relevance and importance criteria and will move forward for additional consideration as Alternatives within this Environmental Impact Statement. For more specific information on specific measures proposed for these areas, see the detailed Alternative comparison tables in Chapter 2.

(1) Carter Spit ACEC

The Carter Spit area has known cultural resources and it also has high potential for previously undiscovered resources given its geographic setting on the coast and within prime hunting areas for marine and terrestrial game and fish. Archaeological surveys have not been conducted in the area.

The rivers and tributaries within the proposed Carter Spit ACEC contribute to the watershed and feed the coastal marshes. They provide habitat for economically important subsistence, commercial and recreational fisheries. This area is part of the Kuskokwim Bay ADF&G Fisheries Management Area. The rainbow trout stocks which inhabit the area are considered "world class" with high catch rates and large rainbow trout.

Several wildlife-related resources justify protection of the habitats in the Carter Spit ACEC for maintaining species diversity. Carter Bay and coastal areas provide molting and staging habitat for Steller's eiders, a threatened species under the Endangered Species Act (Shaw et al. 2004). Many BLM sensitive species use the area for staging and migration in fall including black brant, black scoters, blackpoll warblers, bristle-thighed curlews, grey cheeked thrush, harlequin ducks, king eiders, long-tailed ducks, red-knot, hudsonian godwit, red-throated loon, surf scoter, white-fronted geese and harbor seals (Seppi 1997). The area is also remarkable for the wide variety of plants, and several rare plant species have been documented in the Carter Spit/Goodnews Bay area (Lipkin 1996, Parker 2005). The coastal estuaries

and watersheds have concentrations of breeding shorebirds and waterfowl, including several trans-oceanic shorebird species.

Subsistence activities serve local communities, through egg and spring waterfowl hunting, fishing, seal and Beluga whale hunting. Brown bears, a subsistence and sport hunted species, concentrate in coastal areas in spring to forage for vegetation and feed on marine mammal carcasses. They later concentrate on coastal salmon streams to catch salmon.

The importance of these subsistence activities is underscored by the presence of several named historic sites in the Carter Spit ACEC. *Neqlercuryaraq* is at a lake in the ACEC southeast of Carter Spit, and is named for white-fronted geese. *Taqiikatarmiut* is in the northwestern part of the ACEC, located prominently at the mouth of Cripple Creek where it empties into Jacksmith Bay. *Nerviaq* is not located within the ACEC, but is situated at the mouth of Jacksmith Creek, the upper half which drains the northern part of the ACEC. *Maqallarliq* is located at the base of an unnamed spit in Jacksmith Bay. An unnamed creek that drains an unnamed lake south of Carter Creek and empties into Carter Bay was particularly noted during scoping as being an important water body deserving of protection as the only source of fresh water in that area.

The Jacksmith Creek watershed is a fresh water source for the Togiak National Wildlife Refuge Coastal Wetlands, and the Jacksmith Bay/Carter Spit estuary and mudflats. The islands in Carter Bay and the coastal estuaries, while not in BLM jurisdiction, are dependent upon the terrestrial watersheds within the ACEC for fresh water and nutrient input which maintains the estuary tidal flat ecosystems adjacent to BLM lands.

(2) Bristol Bay ACEC

The Bristol Bay ACEC, taken as a whole, provides habitat for the Mulchatna caribou herd, spawning and rearing habitat for five species of salmon and numbers of freshwater fish, year-round habitat for moose, and a summer fisheries forage base for brown bears. The northeast portion of the ACEC has concentrations of nesting trumpeter swans (Gibson and Maley 2003) and the remainder of the ACEC has nesting tundra swans (Wilk 1988). The widespread wetland habitats in the Bristol Bay ACEC, considered separately, have moderate productivity; however, taken all together the area ranks high in statewide waterfowl productivity. Waterfowl hatched and reared here are harvested throughout the Pacific flyway. Sensitive species in the region include trumpeter swans, white-winged and black scoters, black-poll warblers, rusty blackbirds (not on the Special Status Species list), and bald eagles. These BLM lands, though discontinuous, provide movement corridor continuity for caribou movement and important seasonal habitats for caribou, including calving and important winter range. Five plant species noted by the Alaska Natural Heritage Program as rare are located in the Bristol Bay ACEC (Batten and Parker 2003). Tidal mudflats that are not BLM lands but are adjacent to the Bristol Bay ACEC in Kvichak Bay and Nushagak Bay are recognized as a shorebird migration stopover site of regional importance, under the Western Hemisphere Shorebird Reserve Network (WHSRN 2005). These migratory shorebirds may also use the shores of the many lakes in the region during their stopover.

BLM lands in the Bristol Bay ACEC are almost exclusively situated away from the major rivers draining the Bristol Bay region; however, the headwaters of many of the streams emptying into these rivers are located in the Bristol Bay ACEC, and are important to the terrestrial watersheds within the ACEC and elsewhere for fresh water, nutrient input, and habitat for a world-class red salmon fishery, and for spawning and rearing the wide variety of other fish species found here.

Residents of the region are dependent upon this area for commercial, subsistence, and sport fishing, and for subsistence and sport hunting. The Bristol Bay ACEC offers an area for guided sport hunting and fishing in a remote, pristine setting.

2. Wild and Scenic Rivers

An assessment of comparative resource values for river segments within the Bay Planning Area is ranked according to river eligibility. These rankings can be found in Appendix A. In order for a river to be eligible for designation as a component of the National Wild and Scenic River System, a river must be both free-flowing and possess one or more “outstandingly remarkable” characteristics described below. Rivers that receive a value of 1 or 2 have an outstandingly remarkable value. Outstandingly Remarkable Value is defined as a unique, rare or exemplary feature that is significant at a comparative regional or national scale. The criteria used for ranking these rivers, creeks, and tributaries are based on a numerical value of 1 to 5. The following rating key used for the Wild and Scenic River Matrix is listed below:

- 1 Exemplary, one of the better examples of that type of resource at a national level.
- 2 Unique, a resource or combination of resources that is one of a kind at a regional level.
- 3 High quality at a regional and/ or local level.
- 4 High quality at a regional and/ or local level.
- 5 Unknown. A resource specialists’ team at the (AFO) inventoried and assessed these water bodies, leading to a determination of the river’s eligibility for the Bay RMP/EIS.

Provided below are the factors considered for each resource team specialist.

Fisheries. The Kvichak River, the largest sockeye salmon run in the world (Minard 1998), was only river to receive a value of 1; however, the river is not in BLM jurisdiction. The 2 value was assigned to rivers with existing high recreation and subsistence fishing for anadromous and resident fish species. The 3 value was assigned to rivers with moderate recreation and subsistence fishing for anadromous and resident fish species. Rivers and creeks with no subsistence or recreational fishing were assigned a value of 4. The majority of the subsistence and recreational fishing activity occurs within the rivers that received a value of 2 or 3.

Recreation. The ratings provided were based on recreational and scenic qualities within the following rivers, creeks, and tributaries. Rivers that are free-flowing with unique recreational features and accessible to large numbers ranked with a 2 value. For example, the Kvichak River is a unique watershed with trophy rainbow trout fisheries. Scenic values are unique because of the river basin being widely used since all five salmon species appear here. Those rivers that rated with a 3 value were based on high populations of fish and usage.

Wildlife/Subsistence. Both Subsistence and Wildlife were grouped together for the purpose of this evaluation since chapter 3 discussion was referenced in the same manner. Rivers and creeks that ranked with a 1 value represent anadromous fish runs, known bear or moose or caribou harvest, and includes the main stem portion of the watershed, for example, the Alagnak River. The 2 value given was based on salmon runs, bear numbers, but numbers of animals not as high as 1 rank and/or extent of habitat not as large as 1. The 3 value shows high quality habitat; but not unique in the region which only accounts for a small portion of the watershed within high elevations. All other rivers and creeks rated at a 4 since they are common on a local or regional basis. Also no salmon runs occur and there is no association with a higher order watershed.

Cultural/Historic. The ranking system used for these rivers, creeks, and tributaries was based on a numerical value ranging from 1 to 5. The criteria for evaluation of cultural resources on proposed wild & scenic rivers within the Bay RMP are listed below.

The 1 value represents that there is an observable settlement pattern of cultural sites (either eligible for listing on National Register of Historic Places individually or as a group), and/or sites exhibiting evidence of two or more cultures using the area, and/or an area of religious or cultural significance for local population (TCP eligible). A rating of 2, illustrates there is at least one site eligible for listing and high potential for more.

Rivers and Creeks that rank out at 3 reveal no cultural resources are known for this segment, but there is high potential for cultural resources. High potential for cultural resources in this area includes: well drained areas adjacent to salmon streams/rivers, inlets/outlets to lakes that do not freeze to bottom in the winter;

overlooks where game herds would funnel through a natural constriction such as a valley. A value of 4 reveals no cultural resources are known within such segments, but there is medium potential for cultural resources. A value of 5 indicates that no cultural resources are known within such segments, and there is low potential for cultural resources. Low potential for cultural resources in this area includes: poorly drained areas, areas not adjacent to trout or salmon streams, streams draining from lakes that freeze to the bottom in winter, steep slopes of over 30 degrees.

E. Social and Economic

1. *Public Safety*

a) Abandoned Mine Lands

The BLM Abandoned Mine Lands (AML) Program is administered under Federal policy to meet Federal and State cleanup requirements. The AML Program addresses the mines as environmental and safety hazards on public land resulting from a culmination of former mining activity on Federal claims (BLM 2004b). The AML program focuses on the longer term clean up of mine related waste materials that may be considered hazardous to human health and the environment. If hazardous materials are present at abandoned mine sites they are most often considered non-time critical removal actions under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) rather than emergency removal actions that are typical of many hazardous materials problems. Typical hazardous materials found at the sites include petroleum hydrocarbons from diesel powered equipment and building heating fuel, lead acid batteries associated with heavy equipment and vehicles, asbestos insulation and lead paints used in mine building construction, and mine tailing wastes. The AML program also focuses on physical safety dangers from open shafts, adits, and pits.

b) Hazardous Materials Management

Hazardous materials are a broad category of substances or chemicals that humans bring onto or produce on Federal lands. Hazardous materials are defined by multiple Federal regulations, but may be summarized as follows: hazardous materials are substances or materials capable of posing an unreasonable risk to health, safety, and property. Some regulations list specific chemicals as hazardous, and evaluate other materials based on their characteristics: toxic, ignitable, corrosive, or reactive.

Hazardous materials which may be present on public lands are there because they were used or produced by recreational or industrial processes, included with illegally dumped household or industrial solid waste, used and generated by clandestine drug lab operations, or result from off-site releases that migrate onto public land. Authorized industrial processes on public land may include mineral exploration and production of oil, gas, metallic ores, and gravel or rock material for construction processes.

BLM's objective is to be in full compliance with all Federal and State laws, regulations, and policies related to hazardous materials (Appendix A). The Hazardous Materials Management Program goals include:

- Protection of public health and safety from hazardous materials on public lands, including public land users, visitors, neighbors, employees and other publics.
- Compliance with applicable hazardous materials management and other laws and regulations at the Federal and State levels.
- Minimization of future hazardous materials related liabilities and costs.
- Protection of natural resource(s) and the environment on public lands from hazardous materials.

- Coordination and mutual support with other Bureau programs that have hazardous materials roles, activities, or implications on public lands.

BLM manages hazardous materials in the Bay planning area in a manner that is consistent with Federal, State, and local governmental requirements and constraints. The BLM Alaska Environmental Protection Program is responsible for identifying and protecting public lands and the users of those lands from the effects of hazardous materials and waste. The Environmental Protection Program is responsible for the:

- Inventory of public land for hazardous materials.
- Investigation and reporting of hazardous waste/materials sites.
- Assurance that conveyed lands to and by the Federal government do not contain known hazardous materials/wastes.
- Completion of cleanup of contaminated Federal sites.
- Support of legal actions to recover cleanup costs on hazardous waste sites.
- Point of contact for the emergency response plan (BLM 2005c).

(1) Affected Environment

Current management concerns related to hazardous materials on BLM-administered lands in the Bay planning area consist of one active hazardous materials site.

Red Top Mine and Mill Site (two geographically separate sites)

The Red Top Mine and Mill Site are located approximately 2 miles east-southeast of Aleknagik. The site consisted of a mercury lode mine on Marsh Mountain, and a mill site on the east bank of the Wood River. Cinnabar was first discovered on Marsh Mountain in 1941. Exploration and minor development continued until 1952. According to available information, from 1952 until about 1955 sixty flasks (1 flask equals 1 quart or 72 pounds) of mercury was produced from ore extracted from Marsh Mountain. Cinnabar ore was transported from the mine to the mill facility built on the banks of the Wood River where the mercury was retorted (heated to a high temperature, separating and collecting the liquid). Mining ended by 1959, leaving an ore stockpile at the mill estimated to contain another 60 flasks of mercury. In the 1960s the stockpiled ore was high-graded and shipped to a retort facility in Anchorage. In 1985 BLM issued abandoned and void decisions for the Red Top Mine and Mill Site claims AA-12608. All of the Site lands, with the exception of the Mill Site, were Interim Conveyed to Aleknagik Natives, Ltd. in 1980. The legal description for the parcel that remains under BLM management is: Lots 1 and 2, USS 12403, Section 32, Township 10 South, Range 55 West, Seward Meridian. Lot 1 is 2.57 acres and Lot 2 is 2.39 acres.

BLM became aware of hazardous materials issues at the Site in 1992 and initiated cleanup. In coordination with the Alaska Department of Environmental Conservation site characterization, interim removal activities, and site remediation began in 1994. Work progressed in stages with some periods of inactivity. EPA placed the site on the Federal Agency Hazardous Waste Compliance Docket on June 27, 1997. In 1998 work was completed on a CERCLA based Emergency Removal Action at the retort site. The remaining stockpiled cinnabar and mercury contaminated soils were removed from the site along with a number of drums of Bunker C oil and oil impacted soils. BLM completed the CERCLA required Preliminary Assessment for the site on December 31, 1998. The materials were loaded on a barge, taken to Dillingham and shipped to approved disposal facilities. EPA notified BLM on September 10, 1999 that after evaluating the PA and the Remedial Action reports, the Hazard Ranking System score applied was not high enough for the site to be listed on the National Priorities List. The Docket now reflects a No Further Remedial Action Planned status for the site. The Site remains listed as an active cleanup site in the ADEC contaminated sites database. BLM is in the process of seeking closure from ADEC.

BLM land management activities regarding hazardous sites in the Bay RMP planning area are implemented by the Anchorage Field Office (AFO) (BLM 2005c). The AFO is also responsible for

administering the Hazmat Program for the Bay RMP planning area. Typical hazardous materials and waste issues on BLM properties are found around abandoned mines, logging operations, abandoned military sites, illegal dumps, or due to accidental spills of hazardous materials. Hazardous materials may threaten the health and safety of public lands and its users directly or indirectly through the contamination of soil, surface water, or ground water. A summary of potential hazardous materials sources within the Bay RMP planning area described in Table 3.28. Abandoned mine operations and former military sites are the most common sites on BLM managed lands where hazardous materials impacts have been identified. Former mine claimants and military operations have left hazardous materials in the form of drums of chemicals, fuels, oils, solvents; as well as batteries, asbestos, heavy metal contaminated mine tailings, and fuel contaminated soils. Typically, the USACE or other Department of Defense agencies perform funding, management, and cleanup operations of FUDS and other DOD sites involving hazardous materials and are not specifically listed in this document. However, BLM typically manages cleanups of abandoned mines and illegal dumping activities on non-DOD property where there have been hazardous material impacts.

Table 3.28. Activities and Associated Hazardous Materials

Potential Hazards	Examples
Hazardous materials associated with historic and active mine operations	Heavy metals leaching from tailings impoundments, chemicals associated with processing ore or used in laboratories (i.e. cyanide and/or xanthates); explosives such as dynamite, ammonium nitrate, caps, and boosters; heavy metals from mine tailings; asbestos; batteries, and petroleum hydrocarbons from mine operations (e.g., fuel, oil, and solvents); and PCBs from power generation/distribution systems.
Hazardous materials associated with historic and active logging operations	Asbestos; batteries; and petroleum hydrocarbons from logging operations (e.g., fuel, oil, and solvents)
Military operations	Unexploded ordinances; petroleum hydrocarbons from military operations (e.g., jet fuel, diesel fuel, gasoline, solvents); PCBs; asbestos; lead based paint; heavy metals; and batteries
Illegal dumping	Unauthorized drum dumping of waste fuels, oils, and PCBs; solid waste dumping; dumping of lead acid batteries; dumping of miscellaneous other chemicals; and lead-based paint or asbestos containing building materials.
Illegal activities	Drug labs, debris burn sites; illegal firearm activity (lead and heavy metal impacts)
Spillage of hazardous materials	Materials spilled from overturned trucks, cars, or train cars; spillage from pipelines
Oil and Gas activities	Hydrogen sulfide gas, oil spills; petroleum hydrocarbons from drilling wastes and operations; heavy metals and fuel contamination from drilling wastes (e.g., chromium, barium, diesel based drill muds); and seismic survey related blasting agents
Facilities on public land either Federal or private (under a right-of-way)	Leaky underground storage tanks, asbestos; PCBs; batteries; petroleum hydrocarbons

Source: (BLM 2004b; BLM 2004c)

Illegal Dumping. Illegal dumping of hazardous materials is a management concern on BLM property. The BLM’s policy is to identify potentially responsible parties (PRPs) who are liable for hazardous materials releases affecting BLM lands or resources. After a PRP is identified, the BLM will ensure that the PRP cleans up the hazardous material, or reimburses BLM for costs incurred to clean up the hazardous substance release.

Oil Spills. Spills of oil are a management concern on BLM property. The BLM’s policy is to require all users of BLM managed lands to fully comply with State and Federal regulations concerning prevention of, and response to, releases of oil. BLM includes the requirement to comply with Spill Prevention, Control,

and Countermeasures prescribed by Federal and State regulations in all Land Use Permits. When a release of oil, usually a diesel or gasoline range fuel, is identified, BLM policy is to identify potentially responsible parties (PRPs) who are liable for the release. After a PRP is identified, the BLM will ensure that the PRP cleans up the oil release, or reimburses BLM for costs incurred to clean up the release.

ADEC and EPA Listed Sites. There are no USEPA-permitted hazardous waste treatment/Storage/Disposal facilities on or adjacent to public lands within the Bay RMP planning area. Non-hazardous solid waste disposal facilities (NHSW Landfills) are regulated by EPA and administered by ADEC under 18 AAC 60. BLM generally does not permit landfills on public land; however properly permitted NHSW landfills are occasionally established/operated at Federal mine claims or other industrial sites. Closed landfills of various sizes exist on or near public lands within the Bay RMP planning area. Some of these landfills are included in the ADEC's records, some are yet undiscovered/unrecorded. Hazardous materials are likely to have been placed in some landfills that operated prior to modern standards being established. If present these hazardous materials can possibly leach into groundwater. Other potentially regulated sources of hazardous materials within the Bay RMP planning area include the use of aboveground storage tanks (ASTs) and underground storage tanks (USTs). With the exception of specifically excluded UST uses (e.g., home heating oil), UST operations are regulated by the USEPA and administered by the ADEC under 18 AAC 78. A listing of permitted USTs in Alaska can be obtained at the following web site: http://www.state.ak.us/dec/spar/csp/db_search.htm Based on that database, no BLM-owned regulated USTs are located in the Bay RMP planning area; however, there may be USTs on BLM lands that are owned by other entities (e.g., DOD, other Federal agencies).

EPA and ADEC have identified contaminated sites within the Bay RMP planning area. ADEC contaminated sites program is administered under the regulatory authority of 18 AAC 75. This program identified sites that are known to have contamination currently or that have been cleaned up during administration of the program. Due to the large area included in the Bay RMP planning area, sites may be included in both the ADEC and EPA databases. Additionally, other regulatory programs may have sites that are not included in the ADEC and EPA databases such as those reported to the US Coast Guard or other Federal agencies.

2. Social and Economic Conditions

This section summarizes demographic and economic trend information, and describes key industries in the planning area that could be affected by BLM management actions. Local industries most likely affected by BLM land management policies and programs are: travel, tourism and recreation, and mineral exploration and mining.

a) Regional Overview

The Bay planning area includes the Lake and Peninsula Borough, the Bristol Bay Borough, Dillingham census Area, and the villages Goodnews Bay, Platinum, and Quinhagak within eastern Bethel Census Area. There are 24 villages or towns in the planning area. Dillingham and King Salmon are "gateway communities," trade and transportation centers for the region. Naknek and Iliamna are also gateway communities, based upon their importance to commercial and recreation activities in the region. The total population considered within the planning area is 7,917 (2000 Census).

Dillingham, Iliamna, and King Salmon have commercial airline service connecting cities outside the region. Air service also provides the only year round access to most villages in the planning area. Although there are roads connecting communities on the north side of the Naknek River, in the Iliamna area, and in the Dillingham area, no road leaves the planning area. Waterways are important travel routes and links between communities in this region during months of ice free water. Snowmachine travel is relied upon for nearly six months of the year.

The planning area can be characterized as a mixed subsistence-market economy. Villages such as Twin Hills and Kokhanok fit this description closely, while Dillingham and King Salmon are closer to the classic industrial-capitalist character. Subsistence is of universal significance in the planning area. Bristol Bay communities continue to be natural resource dependent.

Many of the villages and towns are incorporated and collect sales tax ranging from 2% in Togiak to 6% in Dillingham. Several towns and villages collect other taxes, including raw fish taxes, liquor taxes, bed taxes, and gaming taxes. Property tax is assessed in Dillingham. Bristol Bay Native Corporation, and Calista Corporation are regional corporations formed under ANCSA as were native village corporations within the planning area. There are 25 villages with Tribal status. The village of Ekuk is not included in economic analysis because census data is unavailable.

The Bristol Bay region has long been reliant on commercial salmon fishing as its main industry. The Alaska Department of Labor and Workforce Development reported 1,881 workers in the seafood processing industry of which 1,569 were nonresidents for Bristol Bay in 2003 (Nonresidents Working in Alaska, 2003). Both the value and volume of fish harvest in the planning area as well as Alaska have declined in the last 20 years. The majority of Alaska's fish harvest now occurs beyond state waters in the Federally-controlled Extended Economic Zone (Trends, December, 2004).

Recent change agents in the planning area include the passage of ANCSA, and the passage of ANILCA, including creation of four conservation units in the area. These include: Lake Clark National Park and Preserve, Alaska Peninsula National Wildlife Refuge, and Togiak National Wildlife Refuge. These events directly resulted in employment, and income in the planning area. With growth of major population centers (Southcentral Alaska and Fairbanks), visitation, and use of area resources has dramatically increased in the last 20-30 years. Population in the area has grown over the last three decades, although migration from the area has also increased. Also, renewed interest in exploration for oil and gas, and minerals is occurring. The Pebble Prospect is within the planning area, although not located on BLM managed land.

Increasing incomes and desire for basic amenities often not available in Bush villages inspire out-migration. Consider for example, in the Dillingham Census Area almost 20% percent of housing lacked complete plumbing and 14% lacked complete kitchen facilities.

Energy is very expensive in the region. Market basket surveys conducted by the University of Alaska Fairbanks Cooperative Extension Service in December, 2004 reported Dillingham area electricity 76% more expensive than Anchorage, and 156% higher than the U.S. average; heating oil 17% less expensive than Anchorage; unleaded gasoline 82% higher than Anchorage; and propane 91% higher than Anchorage. Census 2000 reported that almost 22% of workers in the Dillingham Census Area walked to work, and 17% used "other means," referring to personal modes of transportation other than motor vehicles and public transportation. Diesel generated electricity provides the main source of power throughout the region. Food costs are much higher in the planning area than urban centers in Alaska. The market basket for a family of four in Dillingham cost 1.76 times that of Anchorage and 1.9 times that same basket in Fairbanks in March, 2005.

Data used in this analysis are largely from the Alaska Department of Labor and Workforce Development, the Alaska Department of Commerce, Community, and Economic Development, the U.S. Census Bureau, and from the Sonoran Institute's Economic Profile System.

b) Community Profiles

Community profiles for all villages, towns, and cities in the state, in both summary and detailed report forms, are available at the Alaska Department of Commerce and Community Development, Community Database Online at http://www.commerce.state.ak.us/dca/commdb/CF_BLOCK.htm. Detailed information on planning area communities can be found at this site.

c) Demographics

Dillingham (2,466), has the highest population in the planning area followed by, Togiak (809), Naknek (678), Quinhagak (555), and New Stuyahok (471). The remaining nineteen villages within the planning area range in population from 36 (Portage Creek) to 399 (Manokotak). The planning area encompasses two boroughs, Dillingham Census Area, and three towns in the Bethel Census Area. The population is approximately 70% Alaska Native, primarily indigenous Alutiiq, Athabascan, and Central Yupik people. In comparison, Alaska Natives comprised 16% of the state’s population, which is a larger percentage of Native Americans than in any other state. The balance of the race distribution in the area and the state is primarily white, comprising as much as 70% of the state population. Although the Alaska Native population has doubled in the last 30 years, the population growth in these regional communities slowed in the 1990s. Tables 3.30 and 3.31 show historic and modern population for communities and boroughs in the planning area.

Alaska Natives are migrating to urban population centers including the Matanuska-Susitna Borough, and Anchorage. The growth rate of the Native population for these two areas is 68.3% and 30% respectively. The growth rate of Native population in Fairbanks North star Borough is relatively low at 7.2% for the decade, which is half the growth rate for the state. See Table 3.29 Growth of Alaska Native Population.

Overall, the population growth in the three boroughs/census areas touching the planning area is very similar to the population growth rate for the State of Alaska, while it is far below the population growth rate of southcentral Alaska. The median age ranges from 29 In Dillingham Census Area and Lake and Peninsula Borough to 36 years in the Bristol Bay Borough. The State median age was just over 32 years (2000).

Out migration is evident with 3.4 persons per year per 1000 population leaving the Dillingham census Area, and 14.8 persons per year per 1000 population left both Bristol Bay and Lake and Peninsula Boroughs during 1990-2003. This is similar to Fairbanks North Star Borough (-11.5/1000/year), and similar to most rural Alaska. Net positive migration was reported in Juneau, Anchorage, the Kenai Peninsula, and the Matanuska-Susitna Borough (highest at 25.5/1000/year) during the same reporting period. (Alaska Department of Commerce, 2005)

d) Employment and Income

Table 3.35 provides information about local resident employment. Commercial salmon and herring fishing has long been the predominant economic activity in Bristol Bay and in Southwest Alaska. As elsewhere in rural Alaska, public employment is very important to the economy of the planning area. The largest employers in the region are the Bristol Bay Area Health Corporation, Bristol Bay Native Association, Wards Cove Packing Association, and Borough government and school districts.

Table 3.29. Growth of Alaska Native Population

Area/Year	1990	2000	Percent Growth
Alaska	85,698	98,043	14.4%
Anchorage	14,569	18,941	30%
Fairbanks	5,330	5,714	7.2%
Mat-Su	1,939	3,264	68.3%
Dillingham Census Area	2,925	3,452	18%
Bristol Bay Borough	455	550	20.9%
Lake and Peninsula Borough	1,261	1,340	6.2%

Source: U.S. Census Bureau, Census 1990, 2000

Table 3.30. Population per Community, Historic U.S. Census Data

Community	Year				
	1960	1970	1980	1990	2000
Aleknagik	231	128	154	185	221
Clark's Point	138	95	79	60	75
Dillingham	424	914	1,563	2,017	2,466
Ekwok	106	103	77	77	130
Goodnews Bay	154	0	168	241	230
Igiugig	36	36	33	33	53
Iliamna	47	58	94	94	102
King Salmon	227	202	545	696	442
Kokhanok	57	88	83	152	174
Koliganek	100	142	117	181	182
Levelock	88	74	79	105	122
Manokotak	149	214	294	385	399
Naknek	249	178	318	575	678
New Stuyahok	145	216	331	391	471
Newhalen	63	88	87	160	160
Nondalton	205	184	173	178	221
Pedro Bay	53	65	33	42	50
Platinum	43	55	55	64	41
Port Alsworth	0	0	22	55	104
Portage Creek	0	60	48	5	36
Quinhagak	228	340	412	501	555
South Naknek	142	154	145	136	137
Togiak	220	383	470	613	809
Twin Hills	0	67	70	66	59

Source: U.S. Census Bureau, Census 2000

Table 3.31. Population of Selected Boroughs, Census Areas

Regional Entity	Year				
	1960	1970	1980	1990	2000
Fairbanks North Star Borough	43,412	45,864	53,983	77,720	82,840
Anchorage Municipality/Borough	82,833	126,385	174,431	226,338	260,283
Dillingham Census Area	1,213	2,322	3,203	4,012	4,922
Bristol Bay Borough	618	1,147	1,094	1,410	1,258
Lake and Peninsula Borough			1,384	1,668	1,823

Source: NRWIA 2005

Both seafood harvesting and processing are highly seasonal industries in Bristol Bay. Salmon and herring fishing comprise most of the harvest activity which occurs between May and September. In 2003, 21% of private sector workers in Alaska were nonresidents of the state. (NRWIA 2005) Seafood processing employs the highest number of nonresident workers (63.4%) in this state. In 2002, there were 2,820 fish harvesting jobs in Southwest Alaska. This was 21% of all private sector employment. Adding seafood processing workers (3,900) makes the fishing industry in Southwest Alaska the largest sector of employment (49% of private jobs.) The State reports fish harvesting jobs using a regional approach, estimating employment since the number of workers does not correspond to wage and salary employees who are qualified for workers compensation. Although Southwest Alaska includes areas outside the Planning area, it is a reasonable measure of the Bristol Bay region.

Table 3.32. Workers and Wages in the Seafood Processing Industry

Locale	Total Workers	Total Wages (millions)	Nonresident Workers	Nonresident Percent	Nonresident Wage (millions)	Nonresident Percent
Bristol Bay Borough	1,316	\$9.2	1,071	81.4%	\$7.1	76.8
Dillingham	228	\$2.0	180	78.9%	\$1.6	81.0
Lake and Peninsula Borough	337	\$2.9	318	94.4%	\$2.7	91.8
Plan area Total	1881	\$14.1	1,569	83.4	\$11.4	80.9
Alaska	19,480	\$247.4	13,858	71.1%	\$156.8	63.4

Source: NRWIA 2005

Table 3.33. Commercial Fishing Permits Held by Residents

Community	Permits
Aleknagik	33
Clark's Point	16
Dillingham	277
Ekwok	6
Goodnews Bay	41
Igiugig	5
Iliamna	17
King Salmon	36
Kokhanok	8
Koliganek	18
Levelock	15
Manokotak	96
Naknek	115
New Stuyahok	43
Newhalen	7
Nondalton	14
Pedro Bay	3
Platinum	9
Port Alsworth	4
Portage Creek	Not reported
Quinhagak	83
South Naknek	43
Togiak	244
Twin Hills	15
Total	1148

Source: Alaska Department of Commerce, Community & Economic Development, Alaska Economic Information System 2004

Government employment includes State of Alaska, borough, city, and Federal agency jobs in the planning area. The Alaska Department of labor reported that government employment ranged from 33% of the workforce in Bristol Bay Borough (398 of 1203), 39% in the Dillingham Census Area (904 of 2,332), to 50% in the Lake and Peninsula Borough (320 of 636) during 2003.

Table 3.34. Employment by Sector (Percentage of Total Employment)

Employment by Sector	Dillingham Census Area	Bristol Bay Borough Area	Lake and Peninsula Borough	Alaska
Agriculture, forestry, fishing, hunting, mining	3.9	0.9	1.4	4.9
Construction	4.2	11.4	4.8	7.3
Manufacturing	1.9	1.5	1.2	3.3
Wholesale trade	0.6	0.3	0.5	2.6
Retail trade	10.0	7.7	5.7	11.6
Transportation, warehousing and utilities	9.9	17.4	10.2	8.9
Information	1.1	6.4	0.9	2.7
Finance, insurance, real estate, rental and leasing	2.7	2.4	1.0	4.6
Professional scientific, management, administrative and waste management	1.8	4.1	2.4	7.6
Education, health and social services	37.9	23.6	33.9	21.7
Arts, entertainment, recreation, accommodation and food services	2.9	7.2	6.2	8.6
Other services	9.4	2.2	7.2	5.6
Public administration	13.7	14.7	24.6	10.7

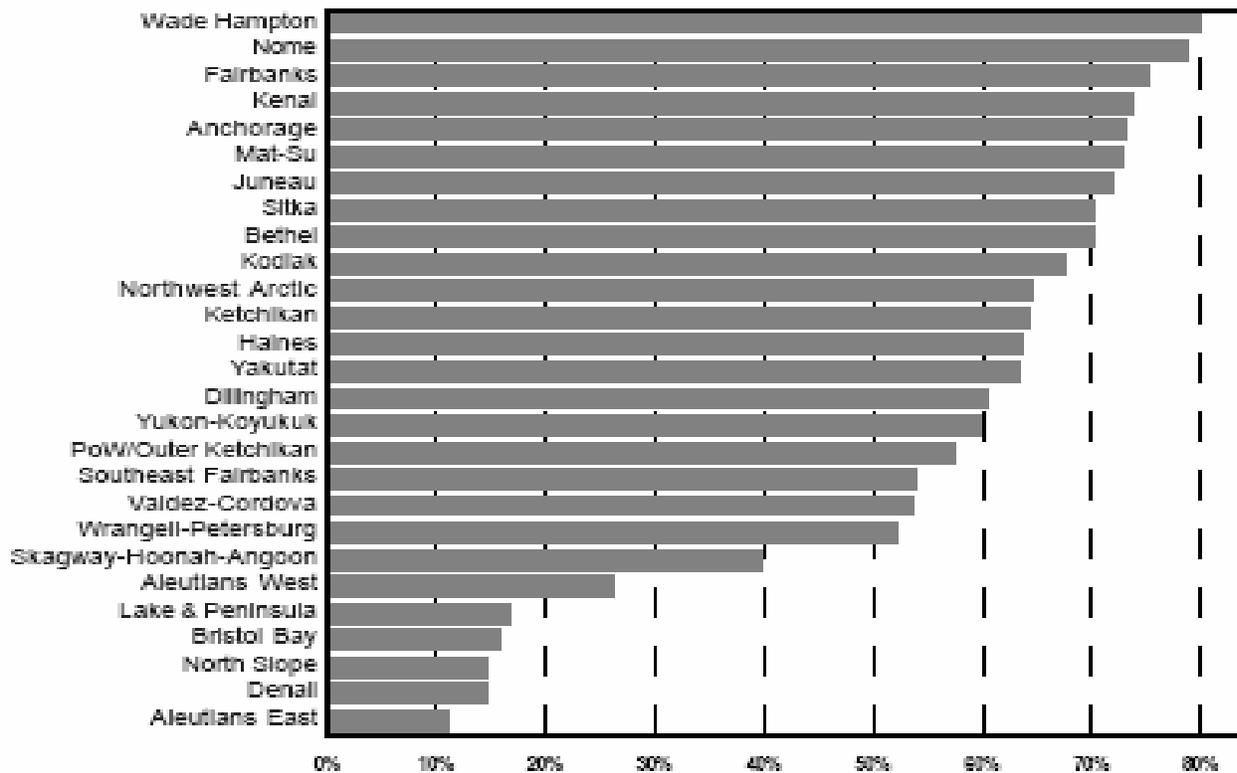
Source: U.S. Census Bureau, Census 2000.

State of Alaska statewide data indicate that mining, oil and gas, and oil and gas services industries employed 24% to 26% non-resident workers in 2003. North Slope Alaska industry employs less than 15% within region labor. These industries, which may be expanding presence in southwest Alaska, are likely to provide jobs to Alaskans; however, they will be primary out of region residents. Tech Cominco Alaska has worked with NANA Regional Corporation to employ NANA shareholders at Red Dog Mine in northwest Alaska. However, most of the NANA shareholders employed at the mine are out of region residents.

Teck Cominco Alaska provided 412 direct jobs to employees and contractors in 2003. This is slightly over 14% of wage and salary employment, and 22% of non-government employment in the Borough. Over 50% of mine workers are NANA shareholders. Those directly employed by Teck Cominco Alaska receive free transportation to the job site from their residence within the state. As a result only about 140 employed NANA shareholders live in the planning area. The mine operation also resulted in the Borough's largest source of revenue through payments in Lieu of taxes of \$5.9 million in 2003 (Trends 2005; ADOL 2005; Alaska Economic Trends 2005).

Even visitor related industries provide a significant number of jobs to non-resident Alaskans. ANCSA Corporations and subsidiaries provide jobs in some locations within the planning area. The regional corporation is headquartered in Anchorage.

Table 3.35. Percent of Private Sector Workers Who Are Local Residents



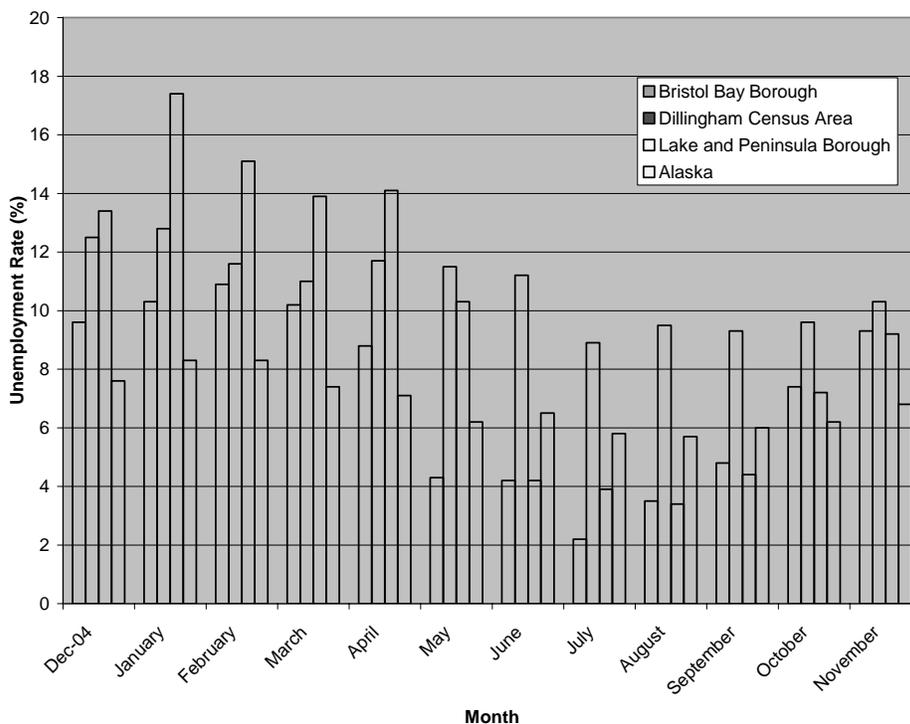
Source: Alaska Department of Labor and Workforce Development, Research and Analysis Section

Source: Jeff Hadland, et.al., Nonresidents Working in Alaska-2003, Alaska Department of Labor and Workforce Development, January 2004.

Unemployment in the planning area is fluctuates widely compared with urban centers in Alaska and the state average. According to State of Alaska data average unemployment during 2004 ranged from 10.2% in the Lake and Peninsula Borough, 6.6% in Bristol Bay to 11.2% in Dillingham Census Area. At the same time the state average was 7.5% (ADOLWD 2005).

Table 3.36. Comparative Unemployment Rates December 2004–November 2005

Comparative Unemployment Rates December 2004–November 2005

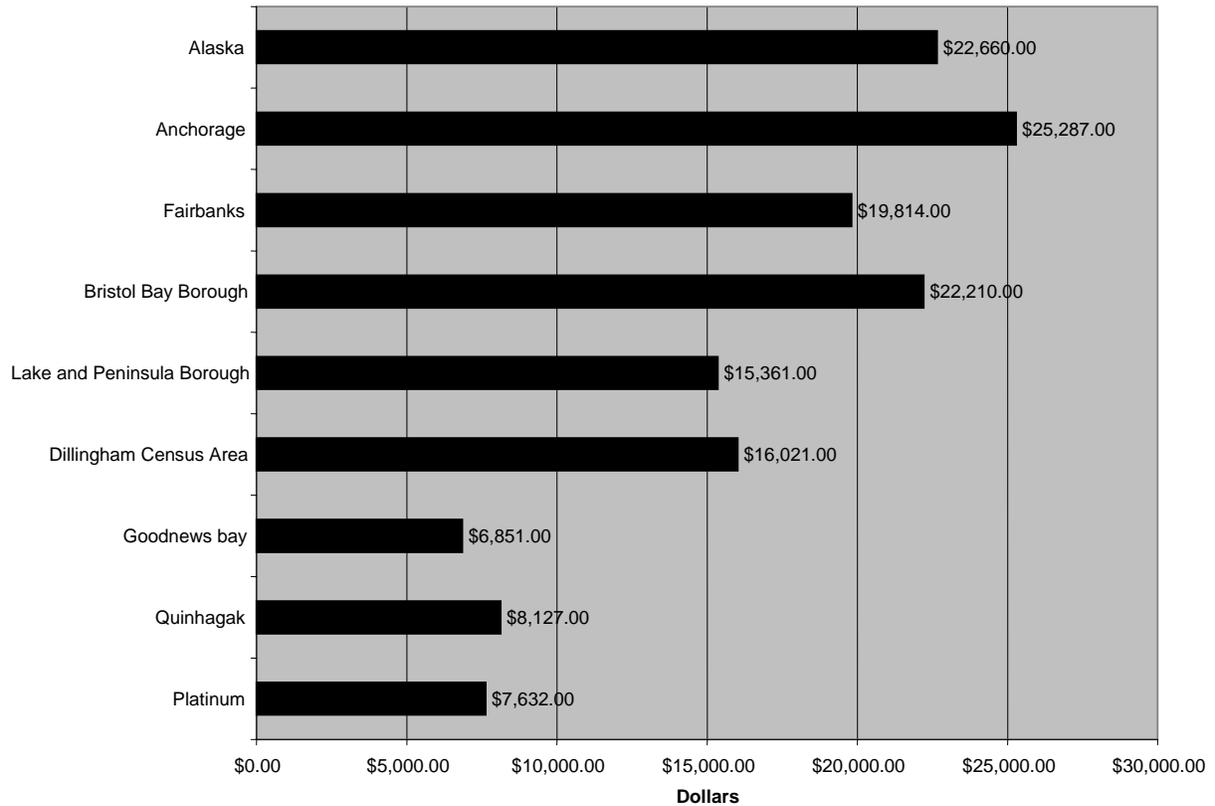


Labor force participation rates are low as is typical in bush Alaska (Table 3.36). This measure reports the number of individuals in a census area that are not seeking employment. Census data shows that Kokhanok has the lowest participation rate in the planning area, where about 64% of the population was not in the labor force in 2000. Eleven villages in the planning area have labor force participation rates in excess of 50%. This underscores the relative scarcity of jobs, and emphasizes the role and importance of subsistence activities.

The educational attainment curve lags in bush villages. Over 60 percent of residents in the State of Alaska have some college; 88% have completed high school, and almost 25% have college degrees. In the planning area, 59% of residents completed high school, and 11% hold bachelor’s degrees or higher. The difference may be exaggerated by out-migration of more highly educated and therefore employable individuals.

Per capita income in the planning area ranges from almost equal to the Alaska average in Bristol Bay Borough, to under \$8000 per year in smaller villages (Table 3.37 and Table 3.38). Only in the regional centers does per capita income begin to respond to the high cost of living.

Table 3.37. Comparison of Per Capita Income (2000)



The extent of individuals considered at or below poverty level in the planning area is much higher than the average for the state of Alaska. In the Bristol Bay Borough 9.5% Individuals were below poverty level in 2000. In the Dillingham Census Area 21.4% Individuals were below poverty level in 2000. In the Lake and Peninsula Borough, 18.9% of the population was below poverty level in 2000. In comparison, 9.4% of individuals in Alaska were below the poverty level in 2000.

Table 3.38 Environmental Justice Data from the 2000 Census

State or City	Per Capita Income	Percent of Population as a Minority ¹	Percent of Individuals Below Poverty Level Income ²	Percent of Households Below Poverty Level Income ²	Percent of Unemployed Population Over 16 Years of Age	Percent Population Over 16 Years of Age Not In The Labor Force
Alaska	\$22,660	19.0	9.4	6.7	6.1	28.7
Aleknagik	\$10,973	81.9	40.8	21.7	13.3	39
Clark's Point	\$10,988	90.7	45.7	20	5.1	53
Dillingham	\$21,537	52.6	11.7	9.2	7.1	27
Ekwok	\$11,079	91.5		29.2	11.1	44
Goodnews Bay	\$6,851	92.6	39.0	37.8	9.9	55
Igiugig	\$13,172	71.7	6.9	0	0	55
Iliamna	\$19,741	50.0	3.1	0	0	28
King Salmon	\$26,755	29.0	12.4	8.8	6.9	22
Kokhanok	\$7,732	86.8	42.6	40.0	4.1	64
Koliganek	\$13,242	87.4	19.3	14.9	9.2	30
Levelock	\$12,199	89.3	24.5	16.7	0	53
Manokotak	\$9,294	94.7	35.3	32.5	5.5	54
Naknek	\$21,182	45.3	3.7	3.1	6.7	29
New Stuyahok	\$7,931	92.8	31.7	32.6	9.2	46
Newhalen	\$9,448	85.0	16.3	26.7	17.9	43
Nondalton	\$8,411	89.1	45.4	37.3	18.7	50
Pedro Bay	\$18,420	40.0	6.0	0	0	21
Platinum	\$7,632	90.2	22.0	33.3	20.0	26.7
Port Alsworth	\$21,716	4.3	6.0	0	0	29
Portage Creek	\$8,010	86.1	0	0	0	50
Quinhagak	\$8,127	96.0	26.1	27.2	6.3	59
South Naknek	\$13,019	83.9	27.1	16.1	12.5	48
Togiak	\$9,676	86.3	29.9	32.5	11.9	55
Twin Hills	\$16,856	84.1	27.9	22.2	0	50

Source: Census 2000

There is some income outflow evident in the planning area. In Bristol Bay Borough, the outflow decreased from 45.6% in the 1980's to 28% in 2000. (EPS 2005) Dillingham Census Area and Lake and Peninsula Borough experience income outflow to a far lesser degree.

e) Revenue

Local government revenue in the planning area is influenced by exemption of ANCSA village corporations and regional corporations from certain forms of property taxation.

Villages and boroughs are empowered to levy and collect tax revenues if they are incorporated political subdivisions. Several villages or towns in the planning area levy sales taxes and specific use or product taxes. The City of Dillingham and the Bristol Bay Borough collect property tax.

Table 3.39, 2004 Per Capita Tax Revenues in Dollars, lists collections by those villages and boroughs that levy taxes. The columns labeled “Other Tax” aggregate collections for items such as liquor, tobacco, bed use, and fish processing. The North Slope Borough collections and revenue are greatly enhanced by North Slope oil field property taxes. This greatly skews the per capita revenues compared with the rest of the state. Anchorage, Fairbanks North Star Borough, Matanuska-Susitna Borough, and the city of Fairbanks are included in the table for comparison purposes.

Table 3.39. 2004 Per Capita Tax Revenues in Dollars

Municipality ¹	Property Tax (Inc. Oil & Gas)	Sales Tax	Other Taxes	Total Taxes Reported	Population (2004)	Per Capita Revenue
Lake and Peninsula Borough	0	0	\$731,799	\$731,799	1627	\$450
Bristol bay Borough	\$1,747,532	0	\$363,737	\$2,111,269	1,103	\$1,914
Anchorage	\$322,352,907	0	\$19,681,861	\$342,034,768	273,565	\$1,250
Fairbanks North Star Borough	\$71,382,439	0	\$1,375,192	\$72,757,631	82,131	\$886
Matanuska-Susitna Borough	\$55,571,134	0	\$716,992	\$56,288,126	67,526	\$834
Fairbanks, City ²	\$8,685,154	0	\$3,748,522	\$12,433,676	29,002	\$429
Aleknagik	0	\$93,429	\$618	\$2,484,947	235	\$400
Dillingham	\$1,339,892	\$2,014,814	\$328,551	\$3,683,257	2,390	\$1,754
Quinhagak	0	\$77,506	0	\$77,506	578	\$134
Togiak	0	\$76,097	\$32,680	\$108,777	820	\$133
Manokotak	0	\$1,185	0	\$1,185	405	\$3
All other towns	0	0	0	0	0	0
Average statewide per capita revenue (excluding the North Slope Borough)						1,224
Average statewide per capita revenue (including North Slope Borough)						1,518

Source: ADCCED 2005. Alaska Department of Commerce, Community, and Economic Development. 2005. 2004 per capita tax revenues. Office of the State Assessor.
http://www.commerce.state.ak.us/dca/osa/pub/04AKTax_Tab3a.xls.

¹ Only those municipalities that levy sales, severance, property, or other type of local tax are included in this table.

² Both the city of Fairbanks and the borough in which it is located levy taxes.

³ Per capita revenue encompasses both city and borough taxes.

F. Subsistence

1. Definition of Subsistence

The Federal Subsistence Board assures the subsistence priority among consumptive uses on Federal public lands under ANILCA Title VIII (USDI and USFWS 1992). ANILCA assures a rural priority for Subsistence. This means that rural residents have priority for the use of fish and wildlife resources on Federal lands for wildlife and Federal reserved waters for fisheries. There are no Federal reserved waters on BLM-administered lands in the planning area that fall under the BLM subsistence management responsibility. State- and Native-selected lands are not within the jurisdiction of the Federal subsistence management program, except within Federal CSUs, such as national parks, preserves, and wildlife refuges. Title VIII of ANILCA defines subsistence uses as:

The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of inedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing for personal or family consumption; and for customary trade (16 U.S.C. § 3113).

Under state law, subsistence use means

The noncommercial, customary and traditional uses of wild, renewable resources by a resident domiciled in a rural area of the state for direct personal or family consumption, such as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible by-products of the fish and wildlife resources taken for personal or family consumption; and for customary trade, barter, or sharing for personal or family consumption (AS 16,05.940[32]).

The state does recognize preferential allocation of resource harvest opportunities for rural or non-rural user groups where uses are allowed.

2. The Federal Subsistence Program

The Federal Subsistence Program, unique to Alaska, and without precedent in Federal law, implements ANILCA Title VIII through the Federal Subsistence Board (FSB), Secretary of Interior-appointed Subsistence Regional Advisory Councils (SRACs), and interagency staff specialists. The FSB consists of the Regional or State Directors of the U.S. Fish and Wildlife Service, BLM, US Forest Service, National Park Service and Bureau of Indian Affairs. The FSB is chaired by a subsistence user representative appointed by the Secretary of the Interior. The FSB is tasked with management of subsistence resources relative to customary and traditional use determinations, animal population health and maintenance, bag limit determinations, seasons of harvest, methods and means of taking determinations, and regulatory and public processes.

The Bay planning area lies within Regions 4 and 5 of the ten Federal Subsistence Program's regions in Alaska. Each region is represented by a Federal Subsistence Regional Advisory Council. These councils provide an opportunity for rural Alaskans to contribute in a meaningful way to management and use of subsistence wildlife, fish and shellfish resources.

The Planning area encompasses, wholly or in part, Game Management Units 9(B), 9(C), 17(A), 17(B), 17(C) and 18 of the State's 25 Game Management Units, Management Areas 6 and 7 of the State's 14 Fishery Management Areas and the Bering Sea Management Area of the eight Alaska Shellfish Management Areas.

The program provides for customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools or transportation; for making and selling of handicraft articles out of non-edible by products of fish and wildlife resources taken. A person must be a qualified rural Alaska resident to harvest fish and wildlife under Federal Subsistence Regulations on Federal public land in and Federal reserved waters in Alaska as defined in ANILCA. All communities within the Bay planning area are rural, as it is defined in the current rural determination. While the majority of Bay planning area inhabitants are Alaska Native and have established the patterns for subsistence use in Alaska, the Federal subsistence regulations apply to all rural residents who have a customary and traditional use of fish and wildlife in the area, irrespective of their race or ethnicity.

Subsistence resources are highly valued and are central to the economies, customs and traditions of many families and communities in Alaska. Customs and traditions include sharing and distribution networks, cooperative hunting, fishing, gathering, and ceremonial activities. Subsistence fishing, hunting, and gathering are important sources of nutrition and livelihood in all of the rural communities in the Bay planning area. ADF&G (2000) estimated that approximately 43.7 million pounds of useable weight of wild foods are harvested annually by residents of rural areas of the state. That would be about 375 pounds per person per year for rural residents. ADF&G (2000) suggests that in Southwest Alaska 65% of rural households harvest game, 86% harvest fish, and 90 - 94% use fish and game. Because this region's residents participate in a mixed subsistence - cash economy, there may be little cash available for store-bought groceries. A 2005 survey comparing living expenses across Alaska indicates that groceries for a family of four for one week in Dillingham cost \$227, compared with \$122 for the same groceries in Anchorage (University of Alaska Fairbanks 2005).

A person must have his or her primary, permanent residence in a rural area to qualify to hunt and fish under Federal subsistence regulations. Seasonal residence in a rural area does not qualify a person as a rural resident. The FSB determines which communities have customarily and traditionally taken specific fish and wildlife populations in which areas. These customary and traditional use determinations are listed along with seasons and harvest limits for each management unit in the Federal regulations. The Federal program publishes separate hunting/trapping and fishing regulation booklets annually. If there is a positive customary and traditional use determination for specific communities or areas, only those communities and areas have a Federal subsistence priority for that specific species in that management unit. If no customary or traditional use determination for a wildlife/fish population in a management unit has been determined by the FSB, then all rural residents of Alaska may harvest fish or wildlife from that population. The FSB may determine that there is no customary and traditional use of a specific fish or wildlife population.

The planning area has within its borders over 6,400 people in 25 Federally-qualified subsistence communities ranging in population from less than 50 to over 2400 people and the additional rural residents not associated with a community. The following rural communities lie within the Bay planning area.

Table 3.40. Bay Planning Area Communities and their Locations With Relation to the Subsistence Game Management Units

Game Management Unit(s)	9(B)	9(C)	17(A)	17(B)	17(C)	18	Other
Aleknagik					√		
Clarks Point					√		
Dillingham					√		
Ekuk					√		
Ekwok					√		
Goodnews Bay						√	
Igiugig	√						
Iliamna	√						
King Salmon		√					
Kokhanok	√						
Koliganek				√			
Levelock	√						
Manokotak					√		
Naknek		√					
Newhalen	√						
New Stuyahok					√		
Nondalton							
Pedro Bay							
Platinum						√	
Portage Creek					√		
Port Alsworth							√
Quinhagak						√	
South Naknek		√					
Togiak			√				
Twin Hills			√				

Depending upon subsistence determinations, other rural residents of Alaska residing outside the planning area are also qualified subsistence users on Federal Public land in the planning area

3. Historic Subsistence Use Patterns, Social Organization and Sharing Patterns

The following brief overviews of social organization and sharing patterns describe those encountered at the time of European contact. While these traditions may continue into the present day, a number of influences brought changes to traditional ways of life. Several epidemics (smallpox, influenza, tuberculosis and measles) decimated local populations and interrupted the transmission of culture. The introduction of European and Euroamerican economic, religious and political practices also brought changes.

Historically, these groups practiced a central based settlement pattern. This typically included an established winter village from which families or small groups would venture to seasonally based camps for fishing, hunting, trapping, and gathering activities such as gathering eggs, berries, basketry materials or pottery supplies.

a) Central Yup'ik

Historically a winter village would contain at least one men's house (*quasig*) and individual houses inhabited primarily by women and younger children. This was an egalitarian society where leaders are chosen by ability, knowledge and articulate speaking. A winter ceremonial season enhanced visiting and hospitality between villages (Fienup-Riordan 1994; Oswalt 1990).

Sharing was highly valued in the society in the past, and continues to be important today. Men might distribute meat after the kill to hunting partners but when the meat was brought home, the women became responsible for sharing it with family and friends. The first kills by young hunters were often completely given away especially to Elders (Fienup-Riordan 1990).

b) Alutiiq

Historically the Alutiit were a ranked society. Wealth and leadership were concentrated among high-ranking lineages and each village was run by a chief who inherited power from his family. The chiefs directed hunting and trading expeditions. Ordinary families made up a class of free, common people and a lower class of slaves was composed of orphans, people captured in raids or taken in trade from other groups. Within the group were also specialists such as whalers, shamans, weather forecasters, healers and midwives (Crowell and Leer 2001).

The cultural emphasis upon sharing was reflected in large ceremonials noted for their lavish hospitality and gift-giving. Like other groups of the region, a boy's first kill was given away.

c) Dena'ina Athabascan

Historically the Dena'ina were a ranked society with a redistributive economic system. High ranking individuals or "rich men" took the role as leaders and functioned as a center for redistribution of goods. They were responsible for caring for their kin group and were responsible for widows, orphans, and the infirm. Their trading partnerships linked their group with other groups in the region (Ellanna and Balluta 1992).

In the Dena'ina area leaders selected for their generosity, willingness to help others, hunting ability, bravery and ability in warfare. An aspiring leader rose through the system by trading to acquire prestige symbols and gathering supporters (Ellanna and Balluta 1992; Townsend 1981).

Sharing of meat was typical between hunting partners. Potlatches were given for several reasons. Large potlatches were given to honor the deceased and smaller ones were given to honor marriages, to help the poor. A small potlatch would be given by a father when his son killed his first big game (Osgood 1976; Townsend 1981).

4. Sociocultural, Socioeconomic and Cosmological Aspects of Subsistence Lifeways

For Alaska Natives today, subsistence is more than the harvesting, processing, sharing, and trading of land and sea mammals, fish, and plants. Subsistence subsumes holistically the cultural, social, and spiritual values that are the essence of Alaska Native cultures. The Alaska Federation of Natives (2002) described subsistence as

The hunting, fishing, and gathering activities which traditionally constituted the economic base of life for Alaska's Native peoples and which continue to flourish in many areas of the state today...Subsistence is a way of life in rural Alaska that is vital to the preservation of communities,

tribal cultures, and economies. Subsistence resources have great nutritional, economical, cultural, and spiritual importance in the lives of rural Alaskans...Subsistence, being integral to our worldview and among the strongest remaining ties to our ancient cultures, is as much spiritual and cultural as it is physical.

There are several significant differences between traditional approaches to subsistence and the western notion of hunting. Traditional groups often adhere to recognition of an individual's or a family's customary ownership through long-term use of a hunting locality that may be passed on generation after generation. For example, Dena'ina hunting grounds are passed on from father to son. If anyone else kills game there the owner usually is paid a quarter of the meat from the hunt (Ellanna and Balluta 2001).

A common belief is that animal souls return after death to be born into new animals. The hunter's respectful treatment of animals is reflected in his future success and often the success of the entire group. If respect is not shown, an animal will not continue to give itself to people. Animals may abandon an area if not respectfully treated or they may hide themselves from hunters. Since hunting was a survival situation for groups, behavior was regulated and social sanctions were often enforced (Crowell and Leer 2001; Fienup-Riordan 1994).

Some behavior seen as ethical in western hunting and fishing practices, such as catch-and-release fishing, is seen as disrespectful in traditional Native society (Fienup-Riordan 1990). In the traditional view this type of behavior may threaten future fish runs.

5. Historic and Contemporary Subsistence Use Patterns

Archaeological evidence indicates that the Bristol Bay region has been continuously inhabited by humans for at least the past 8,000 years or more (Dumond 1981). Among the three linguistic groups present at European contact, all of them had subsistence economies, and all participated in widespread formal trade which was well-established in the region and beyond prior to the arrival of the Europeans (Fitzhugh and Crowell 1988). However, the Russian trappers and traders who explored the region in the 18th and early 19th Centuries were the first to develop an export market economy of large scale (Wright et al. 1985; Fitzhugh and Crowell 1988). The Russians established trading posts and churches in parts of the region in the early 1800s. In 1867 the Russians sold Alaska to the United States, and subsequently the fur trade declined (Wright et al. 1985). Commercial salmon fishing began in the late 1800s, and became the dominant industry (Wright et al. 1985).

Many of the communities in the Bay planning area remain predominantly Alaska Native (Table 3.41), and in many of these communities traditional patterns of subsistence hunting, fishing and gathering activities have been retained flexibly, accommodating a part-time cash economy that includes the commercial fishery, trapping for a commercial market as well as for personal use, hunting and fishing guiding activities, and other cash-generating activities (Wright et al. 1985; McClenahan 2004). Having a cash income has proven beneficial in that it provides for the purchase of modern equipment and gasoline that make subsistence activities more efficient and productive. However, it has also required some changes in the duration and timing of some subsistence activities to accommodate wage employment.

A detailed discussion of the subsistence use of salmon and freshwater fish, caribou, and moose was presented in the wildlife portion of Chapter 3. In addition to these three leading subsistence resources, upland game, grizzly and black bears, furbearers and waterfowl are all important local subsistence resources but are of lesser importance in terms of biomass harvested for food and fiber than fish, caribou and moose (ADF&G 2005).

Table 3.41. Bay Planning Area Communities and their Alaska Native Population Composition (U.S. Census Bureau 2004)

Community	Population	Percent Alaska Native
Aleknagik	221	85
Clarks Point	75	92
Dillingham	2466	56
Ekuk	2	0
Ekwok	130	94
Goodnews Bay	230	94
Igiugig	53	83
Iliamna	102	58
King Salmon	442	30
Kokhanok	174	91
Koliganek	187	87
Levelock	57	95
Manokotak	437	95
Naknek	601	47
Newhalen	183	91
New Stuyahok	477	96
Nondalton	205	90
Pedro Bay	47	64
Platinum	39	93
Portage Creek	49	86
Port Alsworth	113	22
Quinhagak	612	97
South Naknek	88	84
Togiak	805	93
Twin Hills	67	94

6. Resources Harvested

Residents of regional centers like Dillingham participate in a mixed subsistence and cash economy. Residents earn cash through commercial fishing and employment in government, service, and trades, but they also harvest substantial quantities of wild foods, and share those foods with other households and other communities. Dillingham residents share in non-commercial distribution of fish and game with other communities. This balance of commercial and subsistence activities makes Dillingham, Naknek, and King Salmon distinctive among communities in Southwest Alaska. At the same time, Dillingham residents participate in the overall pattern of resource harvesting activities that are part of the economic system of the Bristol Bay region (Fall et al. 1986).

The cash economy of Dillingham, like the rest of the Bristol Bay region, is inextricably linked to the commercial salmon fishing industry, which is a highly seasonal industry. About 44% of the sampled households in 1984 were involved in commercial fishing, with a smaller percent employed in fish processing or in businesses that provide services to commercial fishermen (Fall et al. 1986).

Tables 3.76a-e provide the names of the wild species used by subsistence users in the Bay planning area.

a) Harvest Estimates

Table 3.42 provides the rates of participation and harvest levels for those Bay area communities for which data are available, for one study year. These data are not current. The discussion by BLM block in the wildlife section of this chapter provides more recent harvest information including locations by Game Management Unit of harvest for caribou, moose, and brown bear in the Bay planning area.

**Table 3.42 Bay Planning Area Communities' Subsistence Take for One Study Year
(Alaska Department of Fish and Game Community Profile Database 2005)**

Community	Study Year	Study Year Population	All Resources	Salmon	Non-Salmon Fish	Large Land Mammals	Small Land Mammals	Marine Mammals	Birds and Eggs	Marine Invertebrates	Vegetation
Aleknagik	1989	143	54,079.00	13,556.00	8,749.00	21,619.00	1,669.00	2,171.00	2,007.00	450.00	3,859.00
Dillingham	1984	2041	494,486.00	288,651.00	35,649.00	117,878.00	16,612.00	6,067.00	10,807.00	2,488.00	16,328.00
Ekwok	1987	107	85,260.00	48,827.00	7,340.00	20,524.00	6,155.00	0.00	390.00	0.00	2,025.00
Goodnews Bay	*										
Igiugig	1983	47	43,028.00	30,961.00	5,439.00	3,447.00	884.00	183.00	485.00	0.00	1,628.00
Iliamna	1991	98	82,915.00	42,204.00	7,492.00	24,702.00	980.00	4,063.00	1,516.00	321.00	1,637.00
King Salmon	1983	369	81,261.00	37,854.00	5,873.00	36,429.00	1,104.00	0.00	0.00	0.00	
Kokhanok	1992	173	175,639.00	97,626.00	18,325.00	45,658.00	4,931.00	728.00	3,942.00	573.00	3,855.00
Koliganek	1987	186	154,705.00	67,520.00	17,743.00	54,699.00	8,550.00	0.00	2,148.00	240.00	3,878.00
Levelock	1992	111	97,677.00	51,710.00	7,279.00	27,742.00	2,466.00	5,548.00	1,311.00	71.00	1,551.00
Manokotak	1985	308	118,337.00	41,847.00	26,229.00	18,610.00	10,661.00	10,052.00	5,197.00	1,391.00	4,349.00
Naknek	1983	383	72,110.00	39,259.00	7,134.00	24,766.00	554.00	397.00	0.00	0.00	
New Stuyahok	1987	353	247,494.00	144,394.00	12,718.00	67,096.00	16,717.00	207.00	1,382.00	139.00	4,840.00
Newhalen	1991	158	117,716.00	66,192.00	5,925.00	32,229.00	3,863.00	1,310.00	3,276.00	513.00	4,409.00
Nondalton	1983	280	329,274.00	215,447.00	48,946.00	50,323.00	5,498.00	0.00	2,442.00	0.00	6,619.00
Pedro Bay	1996	63	24,931.00	18,269.00	1,626.00	4,560.00	0.00	0.00	135.00	132.00	210.00
Platinum	*										
Port Alsworth	1983	76	27,416.00	18,209.00	881.00	7,205.00	142.00	0.00	332.00	84.00	564.00
Quinhagak	1982	474	363,740.00	162,125.00	70,815.00	49,000.00	6,850.00	58,964.00	13,863.00		2,124.00
South Naknek	1992	134	39,893.00	19,451.00	2,703.00	14,832.00	48.00	269.00	277.00	272.00	2,042.00
Togiak	*										
Twin Hills	*										

*Data currently are not available.

b) Annual Round of Seasonal Subsistence Activities

Because salmon and freshwater fish are the primary resource for subsistence users in the Bay planning area, and because a substantial number of Bay planning area residents also commercial fish, the spring - summer - fall portion of the annual round of seasonal subsistence activities is focused largely on their timing and availability, particularly those of salmon. To a much lesser extent this is also true for migratory waterfowl. Most other resources sought by subsistence harvesters are available year round. In addition to seasonal availability of the resource and periodic fluctuations in resource abundance, the seasonal round is affected by the subsistence user's available time, availability of competing subsistence resources, ability to afford fuel for transportation, and regulatory restrictions.

Tables 3.76a-e provide the wild species used by Bay planning area residents for subsistence purposes, and gives the annual round of seasonal activities by subregion (Wolfe et al. 1984; Wright et al. 1985; Morris 1983, 1985, 1986, 1991; Endter-Wada and Levine n.d.; Fall et al. 1986; Chythlook and Fall 1988; Schichnes and Chythlook 1985).

Insert Table 3.76a here.

This page intentionally left blank.

Insert Table 3.76b here

This page intentionally left blank.

Insert Table 3.76c here

This page intentionally left blank.

Insert Table 3.76d here

This page intentionally left blank.

Insert Table 3.76e here

This page intentionally left blank.

c) Federal Subsistence Use Areas

Residents of the Bay planning area use all of the blocks of BLM unencumbered land as well as most of the planning area for subsistence purposes. The discussion by block in the wildlife section provides details about this use.

Appendix B provides subsistence use area maps for each of the Bay planning area communities. Figures 1 - 19 in Appendix B are historic subsistence use area maps, recorded by ADF&G in the 1980s and early 1990s (Wolfe et al. 1984; Wright et al. 1985; Morris 1983, 1985, 1986, 1991; Endter-Wada and Levine n.d.; Fall et al. 1986; Chythlook and Fall 1988; Schichnes and Chythlook 1985).

Regulations implementing amendments to the Migratory Bird Act written in 2000 relate to subsistence taking of migratory birds, primarily ducks and geese, but also all water birds and other migratory fowl. These regulations are currently being finalized and implemented.

d) Condition of the Resource

The topic of subsistence has not been addressed previously in any BLM land use planning effort for the Bay planning area. All lands in the Bay planning area that meet the ANILCA section 102(3) definition of Federal public land in Alaska have been managed since 1991 under the Federal Subsistence Program.

Fish and wildlife populations and the habitats upon which they rely in the Bay planning area are in good condition overall, with the exception of the Northern Alaska Peninsula Caribou Herd. Some areas of caribou habitat in the Iliamna blocks of BLM unencumbered land may be degraded due to overgrazing by caribou (ADF&G 2002; Valkenburg and Keech 2002). However, no habitat condition surveys have been carried out.

Regional environmental change may alter the quantity and distribution of subsistence resources in the planning area. The potential for extensive and/or intensive mineral resource exploration, extraction, and development as well as development of infrastructure in the region could significantly alter availability, access to, abundance of, distribution of and movement patterns of subsistence resources. Using data from a sample of 98 communities in Alaska, Wolfe and Walker (1987) identified that certain types of economic development can create conditions which diminish subsistence productivity. Construction of roads and settlement entry into roaded areas produce changes associated with lower subsistence harvests, including increased competition for wild resources, increased habitat alteration, and changing community economic orientations away from mixed, subsistence-market adaptations. The current high cost of gasoline makes motorized access to subsistence resources more expensive.

As demonstrated by their meaningful participation in the initial scoping process for the Bay RMP/EIS and as reflected in the many substantive subsistence-related comments received, local communities will be in the forefront in addressing potential conflicts, land use actions and issues that may affect quality, quantity, distribution, access to, and uses of renewable natural resources as well as cultural resources.

Chapter IV: Environmental Consequences

- A. Introduction.....4-2
- B. Assumptions and Methods.....4-2
 - 1. Analytical Assumptions.....4-3
 - 2. Resource Assumptions.....4-3
 - 3. Resource Uses Assumptions.....4-6
 - 4. Special Designation Assumptions.....4-13
 - 5. Social and Economic Assumptions.....4-14
 - 3. Subsistence Assumptions.....4-14
- C. Direct and Indirect Effects to Resources.....4-14
 - 1. Introduction.....4-14
 - 2. Resources with Effects Common to All Alternatives.....4-16
 - 3. Direct and Indirect Effects to Air Quality, Soils, Vegetation, and Water Resources.....4-18
 - 3. Direct and Indirect Effects to Fisheries and Aquatic Habitats.....4-31
 - 5. Direct and Indirect Effects to Wildlife and Wildlife Habitat.....4-42
 - 6. Direct and Indirect Effects for Special Status Species: Fish, Wildlife, and Vegetation Species..4-57
 - 7. Direct and Indirect Effects for Cultural Resources.....4-73
 - 8. Direct and Indirect Effects for Paleontological Resources.....4-75
 - 9. Direct and Indirect Effects for Visual Resource Management.....4-76
 - 10. Direct and Indirect Effects for Recreation Management.....4-81
 - 11. Direct and Indirect Effects for Travel Management.....4-82
- D. Resource Uses.....4-83
 - 1. Forest Products.....4-83
 - 2. Livestock and Reindeer Grazing.....4-83
 - 3. Direct and Indirect Effects to Minerals.....4-86
 - 4. Special Designations.....4-91
 - 5. Social and Economic Conditions.....4-94
 - 6. Environmental Justice.....4-99
 - 7. Subsistence.....4-99
- E. Cumulative Effects.....4-100
 - 1. Methods.....4-100
 - 2. Activities Considered in the Cumulative Case.....4-101
 - 3. Resources.....4-106
 - 4. Resource Uses.....4-111
- F. Irreversible and Irretrievable Commitment of Resources.....4-115
 - 1. Resources.....4-115
 - 2. Resource Uses.....4-117
 - 3. Social and Economic Conditions.....4-118
 - 4. Subsistence.....4-118
- G. Unavoidable Adverse Impacts.....4-118
 - 1. Resources.....4-118
 - 2. Resource Uses.....4-122
 - 3. Social and Economic Conditions.....4-122
 - 4. Environmental Justice.....4-122
 - 5. Subsistence.....4-123

Chapter IV: Environmental Consequences

A. Introduction

This chapter describes the predicted consequences, or potential effects, on the physical, biological, and human environment from implementing the Alternatives described in Chapter 2. The analysis of impacts associated with the Alternatives is required by BLM planning regulations and by the Council on Environmental Quality (CEQ) regulations at 40 CFR 1500-1508 implementing the National Environmental Policy Act (NEPA). The analysis presents best estimates of impacts. As required by NEPA, direct, indirect, and cumulative effects are addressed. The chapter first provides a summary of the methods and approach used in the effects assessment, describes the type of effects analyzed, and summarizes the assumptions used during the analysis.

Effects are defined as modifications to the environment as it presently exists that are brought about by external actions or events. These effects may be beneficial or adverse, and may result from the action directly or indirectly. Effect levels are determined by their magnitude (measure of change), extent (size of change), duration (length of time; e.g. temporary, short-term or long-term), and likelihood of change. The characteristics of an effect level vary according to resource category; however, in general an effect that persists more than a few years would be considered long-term. Effects that would allow the resource to revert back to its predisturbance condition within a few years of the activity would be considered short-term. The magnitude or extent of an effect is dependent upon the current condition of the resource.

Chapter IV is organized into the following main sections:

- Introduction
- Assumptions and Methods
- Direct and Indirect Effects
- Cumulative Effects
- Irreversible and Irrecoverable Commitment of Resources
- Unavoidable Adverse Impacts

B. Assumptions and Methods

The type and level of effects that could result from implementing the Alternatives have been identified using the information presented in Chapter III, which provides the current condition of the environment. Activities that may occur in the reasonably foreseeable future within the Bay planning area were also considered as part of the analysis. This effects analysis presents the best estimates of direct, indirect, and cumulative effects, and analysis and conclusions are based on interdisciplinary team knowledge of the resources in the planning area, on information provided by BLM and other agency experts, on relevant literature, and on professional judgment. At this time, no specific development projects have been proposed. It is the task of this EIS to describe the potential effects from a proposed Alternative, which exact kinds and locations of future projects are unknown. While the analysis of this chapter provides quantitative data wherever possible, qualitative analysis is also provided.

1. Analytical Assumptions

Assumptions and estimates were made to facilitate the analysis of the project effects. These assumptions set guidelines and provide reasonably foreseeable projected levels of development that would occur within the planning area over the next 20 years. These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each Alternative and described in Chapter II. If no assumptions were made for a resource, the heading is not included in the following sections.

- Sufficient funding and personnel would be available for implementation of the final decision.
- Implementation of actions from any of the Resource Management Plan/Environmental Impact Statement Alternatives would be in compliance with all valid existing rights, Federal regulations, bureau policies, and other requirements.
- The discussion of effects is based on the best available data. Knowledge of the planning area and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used to infer environmental effects where data are limited.
- Acreage figures and other numbers used in the analysis are approximate projections for comparison and analytic purposes only. Readers should not infer that they reflect exact measurements or precise calculations.
- State and Native entitlements are being fulfilled rapidly, and will be met sometime within the next five to ten years. This will reduce the acreage of current BLM-managed lands within the Bay planning area.
- State-selected and Native-selected lands are segregated from mineral entry. These lands will become available for mineral entry or leasing only when they either are conveyed out of Federal ownership or are maintained in long-term BLM management upon rejection of land selection.
- Although it is currently not possible to identify BLM-selected lands that may remain in BLM jurisdiction over time, any isolated parcels that do may be considered, along with parcels identified in the Alternatives, for future exchange in order to consolidate existing discontinuous blocks of BLM unencumbered lands.

2. Resource Assumptions

a) Air Quality, Soil, and Water Resources

(1) Air Quality

- The air in the Bay planning area currently is judged to be pristine. Increasing uses of the area for recreation or development may cause deterioration in the current air quality, especially during seasons of high visitation.
- The most likely causes of deterioration in air quality in the Bay planning area are smoke and gases from wildland fire, dust from travel on unpaved roads, and dust and exhaust from new construction or development, including mining activities.

(2) Soils

- The majority of the soils present on BLM unencumbered lands in the Bay planning area are inceptisols; histosols make up another small percentage. There is very little soil formation with either type, and they may present challenges with respect to their susceptibility to erosion and the difficulty with which they can be reclaimed.

- Permafrost is found intermittently throughout the Bay planning area. The current regional environmental warming trend is bringing major changes in soil moisture, organic matter, changes in vegetation patterns, and weathering patterns. Changes will affect carbon and nitrogen cycles and gaseous emissions. Additionally, frost heave and slumping may affect soils.

(3) Water Resources

- Demand for clean water will increase should recreation use, population, commercial development, or infrastructure development increase. Water quality requirements would be achieved through the use of the Required Operating Procedures (ROPs).

b) Vegetation

- Demand for healthy fish and wildlife habitat, particularly riparian and wet and dry tundra habitats, will continue and may increase. Demand for subsistence uses associated with the various vegetation types present in the Bay planning area will also continue or may increase. In addition to rich habitat for fish and wildlife, current human uses of vegetation include gathering personal firewood and logs for home use and light construction, and subsistence gathering of berries and a variety of plants for food and crafts.
- Natural and human-caused fire events are expected to increase should the current drying trend and bark beetle infestation continue. In the past this region had few fires due to the well-watered nature of the area and the marine influence. Fire suppression efforts will continue in areas near villages and where wildland fire would produce undesirable resource effects.
- There is one plant on the Special Status Species list present in the Bay planning area. Increased visitor use or development activities may add to the necessity for additional protective measures where the plant occurs.

c) Wetland-Riparian

- The desired condition of wetland and riparian communities is proper functioning condition. Pressure on some riparian and wetland areas will increase should recreation, population, development projects, or infrastructure development increase. This will result in localized effects to riparian vegetation, but not at levels that threaten proper functioning condition except in localized areas that will need to be addressed on a case-by-case basis as they develop and are identified. Placer mining may threaten the properly functional condition of localized riparian and wetland communities.

d) Invasive Plant Management

- The Bay planning area vegetation is predominantly pristine and free from invasive non-native plants. Inventory efforts will continue to identify specific occurrences of legally-designated noxious weeds and invasive plants. Increases in invasive species will reduce habitat quality and quantity.

e) Wildlife, Fisheries and Aquatic Habitats

(1) Wildlife

- While a relationship exists between the quantity and quality of habitat and the potential size and distribution of wildlife populations, not all available habitats are occupied by wildlife. Populations of migratory species are affected by the availability and quality of wintering habitats outside the state or the planning area. BLM lands in the planning area provide seasonal and year round habitats that are required to maintain abundance, productivity and distribution.

- Management actions intending to benefit a specific habitat for a priority species of fish or wildlife may have beneficial or adverse effects to some other species of fish and wildlife occurring in that same habitat.
- Demand for a sufficient amount of quality wildlife habitat to sustain viable populations of wildlife and its human uses, particularly game species, will likely increase over the life of the plan. Additionally, animal populations can be expected to fluctuate in natural cycles over the course of the planning period. Quality wildlife habitat to maintain viable populations and human uses up to the carrying capacity of populations will be needed.

(2) Fisheries and Aquatic Habitats

- The demand for fisheries resources from increased subsistence, commercial, and recreational fishing will increase during the life of the plan, resulting in increased pressure on fish populations in the planning area.
- The international and national trends toward the protection and management of wild stocks would increase demands for production capability information in selected streams.
- Potential impacts to aquatic habitat quality will increase during the life of the plan should increased recreation, project development, and infrastructure development take place.
- The BLM will continue to manage fish habitat to protect important spawning, rearing, overwintering, and migratory habitat for resident and anadromous fish species.
- The BLM will cooperate with the Alaska Department of Fish and Game to manage, to protect, and to maintain the genetic integrity of Alaska's wildstock populations of resident and anadromous fish.

f) Special Status Plant and Animal Species

- Continuing current monitoring programs and adding new wildlife inventories and monitoring may identify additional Special Status Species on lands administered by BLM, or may document the expansion of known ranges of species currently on the BLM Alaska Special Status Species list.
- Nationally, the legal requirement for protection of species listed under the Endangered Species Act (ESA), as well as for species not yet listed, but of concern, will likely increase.
- There are two endangered species, one threatened species, one candidate species, and numerous sensitive wildlife species present in the Bay planning area. Demand for protection of these species may increase as inventory indicates critical habitat and recovery plans are developed and implemented. Increased visitor use or development activities may add to the demand for greater protective measures in areas where special status species occur.
- One plant on the BLM Special Status Species list has been documented on BLM-administered lands in the planning area. Increased visitor use or development activities in the plant's habitat could occur within the life of the plan.

g) Wildland Fires and Fuels Management

- Fire is an essential renewing force in interior forest (taiga) ecosystems, as the fire releases nitrogen and other essential nutrients from woody vegetation back into the soil, allowing for new plant growth.
- Depending on the characteristics of the fire, a burn can alter the vegetation composition of forest communities from late successional species such as spruce, to early successional or pioneer species, such as alder and fireweed (nitrate-fixing plants) (USFS 2002). A well-managed fire implementation plan is beneficial to the interior forest (taiga).
- Fire is not a usual or consistent change agent in the coastal temperate forest. However, with increasing temperature and drying, the fire regime in the Bay planning area may change. Wildland fire frequency may increase over the planning period due to this trend, and with the possibility of increased recreation, population, project development and infrastructure development.

h) Cultural Resources

- Undertakings on BLM managed lands have the potential to damage cultural resources. Cultural resources will be considered before any undertakings on these lands are authorized (Section 106 of the National Historic Preservation Act) and damage will be avoided or mitigated before the undertaking is begun.
- All cultural resources will be treated as potentially eligible to the National Register of Historic Places until determined otherwise.
- Inventory efforts to identify cultural resources on BLM managed lands will continue and they will be evaluated for eligibility to the National Register of Historic Places.
- Resource use of cultural resources includes scientific research, interpretation, preservation for future research, and traditional cultural uses. This demand will increase in the future.

i) Paleontological Resources

- Undertakings on BLM managed lands have the potential to damage paleontological resources. Significant paleontological resources will be avoided or otherwise mitigated whenever possible.
- Authorized resource use of fossils includes scientific research, interpretation and educational outreach and limited collection of non-vertebrate fossils by the general public.

j) Visual Resources

- Scenic resources will remain in demand from local residents who want to maintain scenic quality, local businesses that depend on tourism, and an increasing level of recreational users within the Bay planning area over the life of the plan. Increasing tourism will increase the value of scenic views, undeveloped landscapes and open spaces.
- Wilderness characteristics of naturalness, solitude, and primitive and unconfined recreation are expected to remain in demand from local residents and those visitors who want to experience the primitive and unspoiled nature of the local landscape. Businesses that depend on natural landscapes for their excursions, such as ecotourism, guided hunting, and guided sport fishing, will favor an area that possesses wilderness characteristics. Recreationists who depend on a backcountry experience for their activities will also seek lands that have wilderness characteristics (BLM 2005).

3. Resource Uses Assumptions

a) Forest Products

There are few opportunities to utilize forest products for anything other than personal use, due to the fact that there are few forests on BLM lands in the Bay planning area, and the trees are not considered to be of commercial value. While forests are reportedly expanding due to the warming, drying climate trend, the bark beetle infestation and other insect invasions are also spreading. The current situation for forestry is not expected to change during the life of the plan.

b) Livestock Grazing

- No livestock grazing currently occurs under permit, nor has any interest been expressed in requesting livestock grazing authorization. The only anticipated grazing uses might be incidental use associated with recreational and commercial use of pack animals for hunting, fishing, and other back country recreation. Authorizations for grazing by pack animals will be examined on a case-by-case basis.

- No requests for reindeer grazing permits are anticipated. There are no current reindeer grazing authorizations within the Bay planning area.

c) Minerals

(1) *Leasable Minerals*

- No leasable mineral development with the exception of natural gas would occur within the life of the plan on BLM administered lands.
- Oil and gas exploration would occur as described in the Reasonably Foreseeable Development (RFD) Scenario. The RFD predicts activity based on geologic potential as well as past exploration, accessibility, and lack of existing infrastructure. The following is reasonably foreseeable to occur within the planning area:
 - One seismic survey would occur every five years covering 63 linear miles with a total of 250 miles collected over the next 20 years. Short term disturbance would average one acre per mile; however, long term disturbance will be minimal. The seismic surveys would begin by collecting 2-D seismic lines through the use of shot-hole or Vibroseis. The crew size for this operation would be 20-50 (35-65 for 3-D seismic), and the job would be completed in 2-4 weeks. Support equipment would be barged either to Dillingham, Naknek, or Pederson Point. A central "base" would not be established, as individual staging areas (164' x 164' or 650' x 650') would be used. The entire operation would be accomplished during the winter months if conditions were favorable. The acquisition of 3-D seismic data is a key step in the exploration process. It is used to identify and map the prospects of interest. Successful and accurate interpretation results in more efficient drilling with fewer dry holes, better drill pad positioning and higher petroleum recoveries. For the purposes of analysis, it is assumed that the drilling of holes (shot holes) by off-road, track-mounted drills and the detonation of explosives (shots) placed in the shot holes would account for approximately 46% of the source points total. Heli-portable drill rigs would access approximately 44 % of the source points on steeper terrain (slopes in excess of 20%). The vibroseis-mounted vehicles would access about 10% of the source points on off-road, less steep trails (less than or equal to 15% slopes). It is assumed that significant portions of the contract area are inaccessible for locating source and receiver points due to the steep topography.
 - Two exploratory gas wells would be drilled during the first five years of the plan. If possible, the operator will use nearby existing facilities for housing and feeding its crew. If the facilities are not available, a temporary camp of trailers may be placed on the pad. One of the two wells would have an appreciable gas show resulting in drilling one field delineation well. The delineation/confirmation well is likely to be required before a commitment is made to develop the project and a contract is signed with the local utility company. It is assumed that the discovery field will comprise 1,280 acres and will produce from two wells located on two drill sites, one mile apart. Typically, after analyses of the data and subsequent geotechnical description of the reservoir, exploration wells are not used for production purposes. Under this scenario, however, both the exploration well and delineation well are used for production of natural gas since pipeline construction costs and additional well drilling costs render the project sub economic.
 - Given a 15-year plan life, it is assumed that a total of 6 exploration wells would be drilled. Low ground pressure vehicles in conjunction with helicopters would transport equipment and crews to the drill sites.
 - One gravel staging area (6 acres) would be developed to receive and store equipment for the winter exploration program.
 - One gas field likely would be developed in the Koggiling Creek block (this block was picked due to its proximity to the Dillingham market). It is assumed the field would contain 18 bcf of gas reserves. Production from this field would come from the discovery well and delineation well, spaced one mile apart. The drilling of each well would disturb 6 acres. There would be up to 6 gas exploration wells plus one additional gas delineation well.

- The gravel pads would be joined by a 35-foot wide, 5-foot thick gravel road (40,000 cubic yards per mile). The road would link the drilling pads only and one section would also serve as an airstrip. Gravel required for construction would likely be mined during winter months to reduce impacts. The source would likely come to the closest feasible gravel source to the gas field, using one or two separate gravel deposits (10-20 acres in size).
- A typical life of a producing gas well is 10 to 12 years. Therefore, one or both gas production wells may be plugged after the planning period. Field abandonment may take from 2 - 5 years after production ends.
- Natural reservoir pressure would be adequate to push the gas through the 3-inch transmission pipeline 40 miles to the Dillingham market. No compression facility would be needed. The pipeline would be constructed during the winter months to reduce impacts, dependent upon the presence of sufficient snow cover and sufficiently cold temperatures to freeze the ground.
- One of the production wells would serve as an in-field underground injection well (annular injection) to dispose of drilling waste, wastewater, spent fluids, chemicals and the produced water. The ability to dispose of fluid downhole is dependent on the existence of suitable subsurface formations, the formation fluid content, proximity to any hydrocarbon bearing zones and the availability of an annulus between the casing strings set in the well.
- When there is insufficient snow cover for oil and gas related operations, low ground pressure vehicles will be used in conjunction with air support.
- This level of development is assumed for the purposes of impact analysis in the EIS. Actual exploration, development, and production may vary considerably based on exploration results, price of oil and gas, and marketability. Additionally, to market the gas in Dillingham, the current diesel plant would need to be converted to gas. For this to be economical, funding would need to come from energy subsidies derived from the State of Alaska or the Federal Government.
- An ongoing joint State/Federal program to determine the feasibility of developing coal bed natural gas (CBNG) for the benefit of rural communities does not plan to explore the Bristol Bay area at this time. If CBNG were available close to a rural community the development would occur on non-BLM administered lands. BLM lands in the planning area are not in proximity to the two largest communities, Dillingham, Naknek and King Salmon. Transportation costs associated with building a gas pipeline would render CBNG development uneconomic.

2) Locatable Minerals

- Chapter III summarizes the activity levels in the planning area based on surface disturbance tabulated from mining plans and notices of mining operations submitted through the Annual Placer Mining Application and Permit process for both placer and hard rock operations. The RFD for locatable minerals (BLM 2006) summarizes the historic data characterizing mineral occurrences by commodity and genetic ore deposit modeling, as well as differentiating between placer and lode mining methods. Based on this information, a placer mine scenario was developed around a medium-scale (250 cubic yards per day) placer mine as the most likely mining activity to occur in the planning area in the reasonable future. The typical placer mine would result in a maximum of 1-5 acres of surface disturbance at any given point in time. Two similar lode mining scenarios have been dropped from further consideration as it was determined that due to the length of time needed to bring a lode deposit to production and the undeveloped nature of the potential lode deposits, there would be no lode mining development, particularly on BLM unencumbered lands, during the life of the plan.
 - Placer Mining - Placer mining for gold and platinum is the most common type of mining that occurs in the planning area. Placer platinum is the most likely development target while placer gold is the most likely target for exploration and development. Mineral resource development in the planning area is occurring primarily on State, Native, and private lands. This can be attributed to the patenting of large numbers of Federal mining claims staked during the gold rush era and to the State and Native corporations targeting mineral resources for selection under the Alaska Native Claims Settlement Act (ANCSA).

- o Additional exploration should prove that development of placer properties in the Bonanza Creek, Goodnews Bay/Snow Gulch, Iliamna/Fog, Kijik Lake, Platinum, and Shotgun Hills areas in the planning area is feasible. These deposits would probably be developed either as small surface open-cut sluice box operation or as a bucket-line dredge operation (Goodnews Bay Platinum Mine).
- o Anticipated placer mining activity in the Bay planning area is expected to occur in the Snow Gulch part of the Goodnews Bay/Snow Gulch area on BLM unencumbered lands. There is expected to be 1 to 3 small scale placer operations employing 3 to 5 people at each location. Most likely activity would occur on Barnum Creek, Domingo Creek, Faro Creek, or on Jacksmith Creek. Table 4.1 provides information on anticipated new placer mines under each Alternative.

Table 4.1. Anticipated New Placer Mines

	Alternative A	Alternative B	Alternative C	Alternative D
Anticipated placer mines on BLM-Managed Lands	0	1-3	0	1-3

- o Hard Rock Exploration and Development - Historic producers of hard rock for mercury operated on a small scale in the early part of the twentieth century. Today, development projects involve gold and copper from developing new and old prospects. Most of these are located on State and Native lands in the Iliamna/Kvichak area. Hard rock exploration is up in the region, generated by the increasing price of gold and increased interest in mineral occurrences on State and Native lands.
- o Elsewhere around the State, exploration has focused on deposits of rare metals (nickel and platinum group metals [PGM]) has occurred in the Broxson Gulch area north of the Denali Highway, East Central Alaska Range. Exploration results in this area indicate that there is the potential for a significant discovery of these metals. This interest, coupled with the rising price of platinum, has sparked recent exploration efforts in the Goodnews Bay along the Salmon River where platinum has historically been mined by placer methods.
- o Additional exploration should prove that development of lode properties in the Bonanza Creek, Goodnews Bay/Snow Gulch, Iliamna/Fog, Iliamna/Kvichak, Kasma Creek, Kemuk Mountain, Kijik Lake, Pebble Copper, Platinum, Shotgun Hills, and Sleitat Mountain areas in the planning area is feasible. These deposits would probably be developed either as open pit or as cut and fill underground mines. Surface disturbance will vary depending on the mine design, construction of roads, power line corridors, selection of tailing disposal method, and other factors. An order of magnitude estimate would be in the range of 1,300-3,400 acres. Road building, airstrips, and associated material sites account for the largest surface disturbance followed by mine, mill, tailings disposal site, and camp facilities. While most of these disturbances would occur on State or Native lands, some road construction or power lines could cross BLM-managed land.
- o Currently in the pre-production phase of exploration and development is the Pebble Copper property on State lands near Lake Iliamna. This plan is a hard rock, combination open pit and underground mine with a mill that combines free milling processes with floatation and vat chemical leach circuits to recover gold and copper. This mill could include ore from locations situated close by, the Pebble South and the Big Chunk (BC) properties, to name a few. More than 100 employees would contribute to the Iliamna area economy and the mine mill complex could draw power from the Homer utilities grid.

- Table 4.2 provides information about anticipated new locatable lode exploration projects under each Alternative. Anticipated locatable lode exploration activity in the Bay planning area is expected to occur in the Snow Gulch part of the Goodnews Bay/Snow Gulch and Iliamna/Kvichak areas on BLM-managed lands. There is expected to be 1 to 2 small scale open pit operations employing up to 275 people at each location. Most likely open pit operations would occur activity would occur in the Faro Creek area on Figure Four and Island mountains. There is expected to be 1 to 2 small scale underground operations employing up to 300 people at each location. Most likely underground operations would occur activity would occur in the Iliamna/Kvichak area in the vicinity of the Nushagak River and Klutuk Creek.

Table 4.2 Anticipated New Locatable Lode Exploration Projects

	Alternative A	Alternative B	Alternative C	Alternative D
Anticipated locatable lode mines on BLM-managed lands	1	2-4	0	2-4

(3) Salable Minerals (Mineral Materials)

- Salable materials and industrial minerals including sand & gravel, building stone, pumice, clay, and limestone are common throughout the Bay planning area.
- Active rock quarries are located on Native land near Dillingham, Platinum, and Goodnews Bay. Numerous sand and gravel pits exist near Dillingham and King Salmon, mostly located on certified Native Allotments. Most communities in the planning area have a small gravel pit for local use.
- No active mineral material contracts, community pits, or free-use permits issued by BLM exist within the Bay planning area. Most of the sites in the planning area are roadside material sites owned by villages or the State, or certified Native Allotments.
- Mineral material sales would occur under Alternatives B and D in association with oil and gas development. These impacts are discussed under leasable minerals.
- Future sand and gravel needs for the Bay planning area will be well supplied by the existing sources on private land.
- Expected future needs will be project driven, related to the development of mines, oil and gas exploration and production, roads, airstrips/airports, village improvements, and other infrastructure needs.

d) Recreation

- Because much of the BLM-managed land within the Bay planning area generally consists of isolated parcels that are not accessible by road, increases, if any, will be focused on sport hunting and fishing, recreation OHV use (including snow machines), hiking, canoeing, and rafting.
- Currently, BLM manages six BLM Special Recreation Permits (SRPs) within the planning area, with the majority operating on State and Native selected lands. Commercial recreation applications are predicted to increase from the current six, to as many as ten applications in the next five years. These are strictly for large game guide hunting operations in the Iliamna Lake area in the eastern Bay planning area region.

- There is economic benefit to communities and businesses for providing opportunities to accommodate the public seeking professional guide services.
- An activity plan is proposed to further assess potential impacts, conflicts, and use levels for SRPs and air transporters, to be completed within five (5) years from plan approval.
- Public health and safety issues for visitors will receive priority consideration in the management of public lands. Demand for safe visits will increase with increasing numbers of public land users.

e) Travel Management

- The use of Off-Highway Vehicles (OHVs) for hunting and subsistence will remain stable or increase slightly. Primary factors for increases in use are the greater public interest in unconfined, outdoor recreational opportunities, and rising disposable income for use on recreational pursuits.
- Changes in OHV design and technology will continue, enabling OHV users to range into areas that were once thought of as inaccessible due to terrain and water or soil features.
- Future demand for roads to support mineral exploration and development or other resource developments on or across from BLM-managed lands may increase in proximity to villages and communities. Current demand for road development is limited due to the nature and location of the lands within Bay planning area.
- It is generally accepted practice that OHV designation starts at the “limited” classification. Use of designated or existing trails would be allowed for subsistence harvests by qualified subsistence users.
- No transportation or utility corridors have been identified as a result of this planning effort. The BLM recognizes that they may be proposed during the life of the plan and will consider them at that time.
- From public scoping input, there is community support to manage off-highway vehicle recreation while providing existing and reasonable access to still occur.
- At this time, there is little known concerning the specific OHV patterns or locations by either local users accessing traditional use areas or by commercial providers. A comprehensive trails and travel management plan is proposed for completion within five years of approval of the Bay plan.
- The use of OHVs for recreational purposes and subsistence hunting within the Bay planning area is centered around existing villages and communities such as Dillingham, Goodnews Bay, and King Salmon.
- The need for access to public lands may increase slightly as Native corporation entitlements are met and if restrictions on use of those private lands are implemented by the Native corporations. The public easements reserved through Section 17(b) of ANCSA will become more important during the life of the plan. The need to identify and maintain these easements on the ground will increase.
- For the purposes of this document, OHVs include snowmachines. However, most impacts described in this analysis result from OHVs used during snow-free months. Where impacts are specific to snowmachines, they are described as such.

f) Renewable Energy

- As the cost of fossil fuels rises, Federal, State, and local governments, private concerns and individuals in the Bay planning area will be seeking alternative sources of renewable energy. However, BLM unencumbered lands are not located in proximity to the villages, and the probability of receiving applications to permit or lease commercial construction of facilities on BLM lands is low.

g) Lands and Realty Actions

- Disposal or Land Exchange - Land conveyance to the State and Native corporations will be completed within the life of the plan. BLM would consider land exchanges to resolve issues of split estate of ownership of surface and subsurface resources. Land exchanges would not be pursued until State and Native entitlements are resolved on parcels being considered. Isolated parcels of land in the Iliamna East and Iliamna West Blocks and two sections east of Aleknagik would be identified in this RMP/EIS for potential exchange. Additional isolated parcels that revert back to BLM after all land conveyance is completed might also be considered for future exchange. Land exchange identified under Section 206 of the Federal Land Policy and Management Act (FLPMA)(1976) would be the preferred method of land ownership adjustment, and would be used to consolidate the larger, discontinuous tracts of BLM unencumbered lands. Any proposed disposals of land through sales would be considered on a case-by-case basis.
- Land Ownership Adjustment - State and Native corporation land entitlements will be met within the life of the plan. BLM may retain management of approximately 20% of lands currently selected by the State and Native corporations. Once land status is resolved, there would be a demand, both internally and externally, for land ownership adjustments to improve the manageability of Federal and non-Federal lands.
- Withdrawals (ANCSA 17(d)(1)) - ANCSA 17(d)(1) withdrawals are Public Land Orders implementing this provision of ANCSA. The review of these withdrawals within the planning area is addressed in this RMP/EIS. The revocation of ANCSA 17(d)(1) withdrawals would remove the restriction created in ANCSA, which closed the lands to all forms of appropriation under the public land laws, including mining (except in some locations for metalliferous minerals) and the mineral leasing laws. Recommendations for removing the ANCSA 17(d)(1) withdrawals would be implemented as described in each Alternative. Should new withdrawals of another type be proposed to take their place, existing withdrawals in these areas will be retained until the new withdrawal is in place.
- Withdrawals Other Than ANCSA 17(d)(1)(FLPMA Section 204) - Other withdrawals identified in the Bay Planning area are for administrative sites, power sites, and military purposes. Two water power withdrawals, seven military withdrawals, and nine administrative site withdrawals, comprise approximately 38,500 acres within the planning area. Creating, modifying, renewing or revoking withdrawals for other Federal agencies is forecast to continue to be an important function of the BLM. As populations grow throughout the region, pressures placed on resources will continue to escalate, which may impact the number of requests from Federal agencies for withdrawals and demands for withdrawal review may increase from the state and local governments. As part of the land planning process the BLM will review existing withdrawals.
- Land Use Authorizations and Rights-of-Way - As the State and Native Corporation land entitlements are met there will be a limited demand for land use authorizations under 43 CFR §2920 and 43 CFR §2800 within the Bay planning area. Only those remaining BLM unencumbered lands will require a land use authorization for permit activities involving rights-of-way, R&PP lease, and other actions within this category. These actions will fluctuate with the degree of economic growth and infrastructure occurring within and adjacent to the planning area.

In accordance with 43 CFR§2880, BLM shall place stipulations on these Rights of Way requiring:

- Restoration, revegetation, and curtailment of erosion.
 - Compliance with air and water quality standards.
 - Control or prevention of damage to the environment, to public or private property, and hazards to public health and safety.
 - Protection of the subsistence interests of those living along the right of way.
- Wind Energy Development - Future actions may demand processing energy-related rights-of-way applications to ensure that public lands are used to promote energy production. The request for future rights-of-way related to energy development may consist of such rights-of-way for petroleum pipelines, electric power lines, energy development and distribution facilities, roads, water facilities, and communication sites needed for energy development.
 - ANCSA 17(b) Easements - BLM would continue to manage ANCSA Section 17(b) easements that have been reserved in patents or interim conveyances to ANCSA corporations.
 - 17(b) easement management will be transferred to the National Park Service or the U.S. Fish and Wildlife Service for those easements that access lands administered by these agencies or are wholly within the boundaries of the park, preserve, Wild and Scenic River corridor, or refuge.
 - BLM will continue to mark and verify 17(b) easement locations as staffing and budgets allow.
 - BLM reserves easements to ensure access to Federal, State, and municipal corporation lands as ANCSA conveyances occur. BLM would continue to identify, sign, map, monitor use, and realign 17(b) easements, with priority based on:
 - Easements accessing lands that are permanently managed by BLM or are important to BLM programs.
 - Easements receiving high public use.
 - Easements required to implement an activity or implementation plan.
 - Easements where land owners support the activity allowed by the easement. (Often support of the landowner is key to resolving signing issues, realignment, mitigating damage, and addressing other issues).
 - Easements where signing or education would mitigate environmental damage to the land where the easement is located or to BLM-managed lands.
 - Access - BLM will continue to manage 17(b) easements that access public lands across Native lands. An effort will be made to transfer 17(b) easements that other Federal agencies and consider agreements to transfer management to State and local entities on a case-by-case basis.
 - There is no expected decrease in access needs currently provided by 17(b) easements. Road and utility easements associated with specific proposed activities will be considered on a case-by-case basis. BLM is able to transfer jurisdiction of a 17(b) easement to the State of Alaska or to a political subdivision if they agree to it.

4. Special Designation Assumptions

a) Areas of Critical Environmental Concern

Areas designated as Areas of Critical Environmental Concern (ACECs) will be managed to maintain the values for which they were designated.

b) Wild and Scenic Rivers

Recreational use of the river corridors being considered for proposed Wild and Scenic River (WSR) designation would increase. If the proposed corridors were designated, prescribed management would protect the Outstandingly Remarkable Value (ORV) for which the rivers were designated, requiring a mix of education and regulatory measures.

5. *Social and Economic Assumptions*

a) Public Safety

Public health and safety issues will receive priority consideration in the management of public lands. Demand for safe visits will increase with increasing numbers of public land users.

b) Social and Economic Conditions

While the population in some villages may decrease, overall the population in the Bay planning area is expected to increase during the life of this plan.

c) Tribal Treaty Rights

As a government agency, the BLM will maintain a special government-to-government relationship with Federally-recognized Indian Tribes. Residents of these areas utilize Native and village corporation lands as well as BLM-managed public lands for traditional subsistence activities, and will continue to do so. Through this planning process, the BLM has initiated consultation with different village entities. This consultation will continue throughout the planning period.

3. *Subsistence Assumptions*

BLM will continue to play a role in the management of subsistence resources on Federal public lands. Based on current trends, the demand for subsistence resources will stay the same or will increase during the life of the plan.

C. Direct and Indirect Effects to Resources

1. *Introduction*

Direct, indirect, and cumulative impacts are considered in effects analysis, consistent with direction provided in 40 CFR 1502.16.

- ***Direct effects*** are caused by an action or by implementation of an Alternative and occur at the same time and place as that action or implementation.
- ***Indirect effects*** also result from an action or implementation of an Alternative, but usually occur later in time or are removed in distance from the action or implementation, but are still reasonably foreseeable.
- ***Cumulative effects*** result from individually minor but collectively significant actions over time. A cumulative impact is an impact on the environment that results from the incremental impact of the

action when added to other past, present, and reasonably foreseeable future actions regardless of what agency, entity (Federal or non-Federal), or individual undertakes such other actions (40 Code of Federal Regulations 1508.7 and 1508.8).

Actions anticipated during the life of the plan on all lands in the planning area, including private, State, Native corporation, and Federal (FWS and NPS) lands, have been considered in the analysis to the extent reasonable and possible. Decisions about other actions occurring within the planning area could be made by many public and private entities, though the location, timing, and magnitude of these actions are not well known. Assumptions about actions outside of the BLM's jurisdiction that are considered in the cumulative effects analysis include:

- ANCSA and State land entitlements will be fulfilled within the life of this plan.
- The BLM will retain approximately 14% of the lands currently selected by the State or Native corporations, while approximately 86% will be conveyed.
- Land sales (settlement and remote settlement areas) will continue on State lands consistent with the Alaska Department of Natural Resources area plans.
- Mineral exploration and development will increase on State and Native lands.
- Mineral exploration and development will remain minimal in National Parks and Preserves within the planning area, and in the Wildlife Refuges.
- National Parks, Preserves, and Wild and Scenic Rivers within and adjacent to the planning area will continue to manage for remote, primitive recreation experiences. Access into parks will continue to be primarily by air and boat.
- National Wildlife Refuges within or adjacent to the planning area will continue to be managed for wildlife and compatible remote, primitive recreation experiences. Access into refuges will continue to be primarily by air and by boat.
- Road construction will increase on State and Native corporation lands in support of local communities, and mineral exploration and development.
- Use of communication sites will increase.

Irreversible or irretrievable commitment of resources and unavoidable adverse impacts are discussed after the Cumulative Impacts section.

- *Irreversible commitment of resources* result from actions in which resources are considered permanently changed.
- *Irretrievable commitment of resources* result from actions in which resources are considered permanently lost.
- *Unavoidable adverse impacts* are those that remain following the implementation of mitigation measures, and include impacts for which there is no mitigation.

Treatment of BLM Critical Elements

BLM's National Environmental Policy Act (NEPA) Handbook, as supplemented with BLM Instruction Memorandum No. 99-178, identifies 14 "Critical Elements of the Human Environment" that must be addressed during environmental analysis (BLM 1988; BLM 1999):

- Air Quality
- Areas of Critical Environmental Concern (ACECs)
- Cultural Resources
- Environmental Justice
- Floodplains
- Hazardous or Solid Wastes
- Invasive, Non-native Species
- Native American Religious Concerns
- Prime or Unique Farmlands
- Threatened or Endangered Species
- Water Quality

- Wetlands/Riparian Zones
- Wild and Scenic Rivers (WSRs)
- Wilderness

No Prime or Unique Farmlands, designated Wild and Scenic Rivers, designated ACECs, or designated Wilderness currently exist on BLM-managed lands within the Bay planning area (NRCS 2006). Impacts related to proposed designations or findings are described. The remaining elements are identified and addressed in the relevant sections of this chapter.

Availability of Data and Complete Information

The best available information relevant to the decisions to be made was used in development of the RMP. Considerable effort over a two-year period has been taken to acquire and convert resource data into digital format for use in the plan. Data have been acquired from BLM sources and from outside sources such as the State of Alaska, U.S. Fish and Wildlife Service, and National Park Service.

Some information was unavailable for use in developing this plan, usually because inventories have not been conducted or are not complete. Specific data that were unavailable include:

- Inventory and assessment of trails
- Detailed soils surveys
- Recreation use information for waterways
- Definitive Special Status Species and habitat occurrence (plant and animal); delineation of identification and conservation measures
- Riparian assessments
- Certain key wildlife seasonal and life function habitat occurrences; use/concentration areas identification and delineation
- Watershed assessments
- Cultural Resource inventories of uplands and smaller drainages

As a result of these deficiencies, impacts cannot be quantified given the proposed management of certain resources in these instances, impacts are projected in qualitative terms or in some cases are described as unknown. Inventory efforts identified in Chapter 2 will continue to update and refine the information used to implement this plan.

2. Resources with Effects Common to All Alternatives

a) Air Resources

Much of the Bay planning area is designated as unclassifiable, with regard to air resources (USEPA 2004a). Regardless of the selected Alternative, Air resources in the Bay planning area will be affected. Although there will be varying degrees of effects throughout the planning area, it is expected that Alternative B may result in a greater magnitude of impacts due to potential mineral development or OHV activity. Due to the scattered nature of BLM lands and the low potential for reasonably foreseeable mineral development, the impacts on air resources would be minimal under all Alternatives. Impacts from OHV activity will be localized and would be expected to dissipate quickly.

b) Climate, Physiography, and Geology

The proposed Alternatives would have little direct or indirect effect on climate in the Bay planning area. There is a moderate likelihood of development associated with locatable and salable minerals, and a low to moderate likelihood of development associated with leasable minerals on BLM-administered lands in the Bay planning area during the life of this plan. There is a small amount of OHV use on BLM lands in

the eastern part of the Bay planning area, but effects on the physiographic and geologic resources are expected to be negligible.

c) Floodplains

The land management actions proposed under any Alternative would have minimal effects to floodplains. Alternative B has the potential to impact more areas due to mineral development and OHV activity. Impacts on floodplains under Alternative B would be greater in magnitude than under any of the other Alternatives. However, the scattered nature of BLM lands and low potential for reasonably foreseeable mineral development indicate that effects on floodplains would be minimal under all Alternatives.

The potential impacts from exploration and mining for locatable (metalliferous minerals) in floodplains under any of the Alternatives could include the destruction of the structure and stability of the floodplain. Impacts under all Alternatives would be reduced with the implementation of Required Operating Procedures and mitigation measures developed during the NEPA analysis for specific action proposals.

d) Wildlife and Special Status Species

Some of the sensitive migratory bird species are subject to subsistence hunting by Alaska Natives. The recent changes in the Migratory Bird Treaty Act relative to subsistence taking of migratory birds refers to all migratory birds including waterfowl, shorebirds, and other species groups. These populations are monitored by the USFWS and spring and summer migratory bird harvests are managed under legislation implementing the Migratory Bird Treaty Act Amendments. BLM provides input as necessary to the USFWS regarding decisions on harvest regulations and therefore has no direct role in mortality rates of these species. BLM is involved indirectly in allowing access across its lands, but these transportation requests and historic trails serve a multitude of purposes in addition to access for hunting. Activities on BLM administered lands that require permits are reviewed for consistency with applicable wildlife conservation laws such as the Bald Eagle Protection Act, Migratory Bird Treaty Act, Marine Mammal Protection Act, and others during the permitting process.

Species of wildlife listed on the Alaska BLM sensitive species list are considered in proposals for uses of BLM lands to mitigate impacts to these species in order to avoid their potential listing under the Endangered Species Act.

Some Special Status Species are subject to subsistence hunts by Alaska Natives (e.g., Steller's eider, Steller sea lions), but the numbers killed each year are managed under the terms of the Marine Mammal Protection Act, and the Endangered Species Act (ESA), which provide exemptions for certain qualifying Alaska Native subsistence harvests. Because many marine species are susceptible to oil pollution in the water, any activities on BLM lands that had the potential for accidental release of oil or other harmful materials into the marine and coastal environments should receive careful scrutiny for prevention and mitigation measures during the permitting process under all Alternatives. These measures would protect T&E species from potential mortality as well as decreased reproductive rates. Other protective measures for T&E species and their habitats would also be considered under all Alternatives during the permitting process for other types of proposed activities on BLM lands such as mining and road building.

BLM is required by law and by its own policies to cooperate and coordinate with the USFWS and NMFS to develop and implement appropriate conservation measures for T&E species on BLM lands. This applies to all the Alternatives and all regions of the Bay planning area. The policy common to all Alternatives is to be consistent with the ESA during the planning and permitting processes.

Critical habitats for Steller sea lions and Steller's eiders have been established, and critical habitat for other listed species has been designated by the USFWS and NMFS. (No critical habitat has been established on BLM-administered lands in the Bay planning area.) Recovery plans have been established for Steller sea lions in conjunction with NMFS and Steller's eiders in conjunction with USFWS. BLM has not undertaken any specific monitoring or surveys for Special Status Species on its lands.

3. Direct and Indirect Effects to Air Quality, Soils, Vegetation, and Water Resources

a) Effects Common to all Alternatives

Proposed management of the following resources/resources uses/programs would have no anticipated impacts to vegetation management: Cultural Resources, Paleontological Resources, Visual Resources, Renewable Energy, Lands and Realty Actions, Social and Economic Conditions, and Subsistence.

(1) Effects to Soils from Environmental Change (Common to All)

One aspect of environmental studies is to anticipate how soils will change with regional environmental warming. Changes will affect carbon and nitrogen cycles and gaseous emissions, including the release of greenhouse gases (Birkeland 1999; Lal and others 1995) and the increased uptake of carbon dioxide and the production of oxygen. Major changes include (1) changes in soil moisture, with wetter ones experiencing greater leaching, and drier ones accumulating salts, (2) changes in organic matter, which will equilibrate at new levels as a function of changing climate-vegetation patterns, (3) greater weathering will release more nutrients, which could influence biomass production, the impact which will vary from place to place.

(2) Effects to Soils, Water, Vegetation and Air from Vegetation Management (Common to All)

Vegetation throughout the planning area would benefit from proper management of soils, water, and Special Status Species plant resources. Implementation of mitigation measures to protect terrestrial and wetlands vegetation on a project-specific basis would benefit not only vegetation but also soils, water, and air quality. It would limit disturbance and thermokarst subsidence to permafrost soils (some of which are present in the Bay planning area), would reduce soil erosion, limit blowing dust and airborne particulates, and control sediment runoff that impairs water quality, and would assist the recovery of terrestrial and aquatic habitat from permitted uses. Direct and indirect effects for Special Status Species plants will be discussed separately.

(3) Effects to Soils, Water, Vegetation and Air Quality from Fire and Fire Management (Common to All)

Fire is recognized as an essential ecological process and natural agent of change in ecosystems. At the same time, it has impacts to air quality, soil, and water resources as described in detail in the Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska (BLM 2004). Soils can be affected by fire in several ways. Fire can be beneficial in stimulating new vegetative growth, in helping maintain a mixture of vegetation types and age classes that provide soil stability, and in providing essential nutrients to the soil matrix. Implementation of various fire management options (Critical, Full, Modified, or Limited) in wildland fires and the level at which fire would be used to manipulate the vegetation would directly affect the diversity of the habitats present in the planning area and the successional stages of the plant communities throughout. Fire can also strip soils completely of vegetation and make them vulnerable to erosion if heavy rains occur before vegetative regrowth takes place. Species such as willow and alder sprout quickly after a fire and bring soil stabilization. If the fire is sufficiently hot, it can sterilize the earth, precluding regeneration of the plant species that were present before the fire, and allowing introduction of new species. Wildland fires have not occurred with great regularity in the planning area due to the marine influence on the region's climate and the well-watered nature of the wet tundra environment. Should the current warming and drying trend continue, the fire regime might change.

(4) Effects to Soils, Water, Air and Vegetation from Livestock Grazing (Common to All)

Grazing by domestic livestock (cattle, horses, sheep and goats), ranched wildlife, or reindeer can impact soil, water, air and vegetation resources. Grazing can degrade wetlands, stream, riparian, and tundra

vegetation by creating localized areas of trampled and over utilized natural vegetation including lichens, mosses, grasses, forbs, willow, and dwarf birch. It can denude areas of vegetation and cause conversion of naturally occurring plant communities to less productive or less desirable ones. It can create a proliferation of trails, impacting habitat by compacting soils under them, by reducing the viability of vegetative ground cover, and by making soils susceptible to wind and water erosion due to keeping the animals in one general area. Trampling at watering locations can cause destruction of the vegetation mat and silting of the water body. Although there is a history of reindeer herding in the Bay planning area, due to the fact that there currently are no herds of cattle, caribou, or other livestock in the Bay planning area, and no interest has been expressed in this activity, this type of impact is not likely to be a problem for the foreseeable future. Should grazing be permitted, assessment and application of proper use criteria, range suitability criteria and carrying capacity, annual monitoring of grazing allotments, consultation with herders, and use of allotment management plans encourage proper range management and help to prevent or mitigate adverse effects to soil, water, air and vegetation resources.

(5) Effects to Soils, Water, Vegetation and Air from Hazardous Materials Management (Common to All)

The BLM management actions under all Alternatives for hazardous or solid wastes may beneficially affect soil, water and air quality by ensuring adequate protections against soil, water and air becoming polluted by hazardous or solid wastes at current and future permitted sites, and conducting clean-up of soils and water that have become polluted, as those sites are discovered.

(6) Effects to Soils, Water, Vegetation, and Air from Forestry Management (Common to All)

There is no commercial use of timber and no associated road construction activity on BLM lands within the Bay planning area. No commercial use of timber is anticipated due to the lack of commercial-grade timber resources. A small amount of household use of timber takes place in the form of gathering firewood and house logs. Effects to soil, water, vegetation and air are expected to be minimal to nonexistent should the existing kinds and amounts of forest products be available and the current pattern of use continue into the future.

(7) Effects to Soils, Water, Vegetation and Air from Locatable Minerals (Common to All)

Some mining exploration and development could occur on some BLM unencumbered lands in the Bay planning area, and on existing Federal claims under any Alternative. Potential effects include disturbance and redistribution of gravel, overburden, and soil materials. Existing and future locatable mineral activities unfavorably impact wetlands, stream, riparian and tundra vegetation and habitats by stripping away the vegetative mat as part of mine site overburden, trampling or eliminating vegetation in the development of mine site infrastructure, and increase the potential for introduction and spread of exotic and invasive plant species. The structure of the soil profile and the stability of floodplains is destroyed on a temporary basis and can result in long-term, permanent changes. Removal of soil could also cause an increase in stream sedimentation and turbidity and a decrease in stream channel stability. Required Operating Procedures (ROPS) to protect soil include separating organic overburden from mined gravels for future reclamation, backfilling all mining pits with tailings as the mining progresses and spreading the remaining vegetation and overburden piles on the ground surface up to the stream channel. Current soil storage handling stipulations do not prevent damage to soil health and viability and this reduces the soil's capability to support revegetation.

(8) Effects to Soils, Water, Vegetation and Air from Mineral Materials (Common to All)

Few mineral materials requests for BLM unencumbered lands in the Bay planning area are anticipated due to the generally isolated and remote location of these lands and the activities that are anticipated during the life of the plan. Mineral materials would be needed to support oil and gas development if it occurred. Such exploration and development activities on BLM lands might only be economically feasible in the Koggiling Creek block. Mineral material acquisition and disposal can unfavorably impact vegetation by destroying vegetation growing on the site and by compacting and removing soils, hindering plant

regrowth. Mineral material excavation and disposal may degrade soil resources. Because soil development is slow in this region, some sites may recover to the original vegetative cover very slowly or not at all. Impacts would be reduced under all Alternatives with implementation of Required Operating Procedures. Additional mitigation measures, if necessary, could be developed during NEPA analysis of specific material site disposal actions.

(9) Effects to Soils, Water, Vegetation and Air from Recreation and Travel Management (Common to All)

Recreation use takes place throughout the Bay planning area. Most of it is focused on guided and unguided sport hunting and fishing, which tends to make use of different areas in different months and years, influenced by the movements and abundance of wildlife. Effects would include impacts to vegetation and soils from temporary campsites, development of social trails, and aircraft landings, that may result in erosion should the vegetative cover be destroyed, and/or compaction of soils. Repeated scrambling up and down river and stream banks can destroy riparian vegetation and create bank erosion.

Off-Highway Vehicles (OHVs) are mostly used in areas with proximity to villages. Under all Alternatives there would be some impacts to soils by OHV use, since no areas would be completely closed to OHV use. Impacts to wetlands would include the potential for loss of vegetative cover, soil erosion, soil compaction, thermokarst subsidence, water diversions, and ponding. Commercial and non-commercial recreation activities could cause effects to wetlands, stream, riparian and tundra vegetation. Temporary and repeated use of campsites and aircraft landings at remote sites are two common activities on BLM lands in the Bay planning area that may have direct effects to riparian and tundra vegetation. Impacts could include trampled and broken vegetation, compacted and disturbed soil, and an increased potential for wildland fires. There would be a slight possibility of localized soil and water contamination from hydrocarbons or from lead-acid batteries. Where trails cross streams, riparian soil and vegetation may be altered or destroyed, increasing soil loss and sedimentation into aquatic habitats and resulting in diminished water quality. Given the relatively low level of recreational use on the remote BLM-managed lands, these impacts would be minimal overall and degradation of air quality, soil and water resources should not increase in the foreseeable future.

(10) Effects to Soils, Water, Vegetation and Air from Lands and Realty Management (Common to All)

There are minor impacts to air quality, soil, and water resources from lands and realty actions under all Alternatives. An exception would be a right-of-way that authorized road construction.

Access (Rights-of-Way and Easements) - Construction of access roads, railroads, bridges, culverts, and gravel pads in easements may adversely affect soil in the region. Construction of roads has a major local impact, removing soils. Construction of bridges and culverts may create diversion of water and subsequent soil erosion at the site. Development of borrow pits for road construction can impact soils by removing them. Currently there are no proposals for developments. Should BLM receive proposals for road or gravel pad construction, impacts would be reduced under all Alternatives by implementing Required Operating Procedures. Additional mitigation measures could be developed during the NEPA analysis of specific realty actions.

Disposals and Acquisitions - Disposal of BLM lands results in removal of the land from the public domain to state entitlements, Native Settlements, private or state exchanges, mining patents, Recreation and Public Purposes (R&PP) sales, and Federal Land Policy and Management Act (FLPMA) sales. The relinquishment of BLM-managed lands removes them from the requirements of BLM policies that currently provide some degree of protective measures to soil resources. Should lands be acquired by BLM, they would then be subject to BLM protective policies. Should BLM lands be transferred to other Federal or State agencies, they would be managed under protective measures similar to those of BLM.

Withdrawals - Effects to soils on lands withdrawn under authority other than (d)(1) would be the same for all Alternatives. In the Bay planning area they include FERC sites and military sites, to name two.

Contamination by hazardous materials, compaction, erosion, and solifluction from changes in the condition of the permafrost could all occur.

b) Effects to Soils, Water, Vegetation and Air Quality for Alternative A

(1) Effects to Soils, Water, Vegetation, and Air from Vegetation Management (Alternative A)

Impacts to soil, water, vegetation and air resources from vegetation management would be the same as that discussed under Impacts Common to All Alternatives.

(2) Effects to Soils, Water, Air and Vegetation from Livestock Grazing (Alternative A)

Impacts to soil, water, and air resources from livestock grazing would be similar to those discussed under Impacts Common to All Alternatives. Under this Alternative, applications for grazing permits would be considered throughout the planning area but would likely not be approved for areas within occupied caribou habitat, due to the difficulty of managing reindeer within occupied caribou habitat.

(3) Effects to Soils, Water, and Air from Lands and Realty: ANCSA 17(d)(1) Withdrawals (Alternative A)

In Alternative A, existing ANCSA 17(d)(1) withdrawals would be retained. For those lands currently closed to mineral exploration and development, they would remain closed, and impacts to soils, air, and water from minerals exploration and development would be the same as they are today.

(4) Effects to Soils, Water, and Air from Leasable, Locatable, and Salable Minerals (Alternative A)

Leasable Minerals. Under Alternative A, BLM-managed lands would be closed to fluid mineral leasing; however, BLM has the authority to lease lands where oil and gas are being drained, and those areas subject to leasing under 43 CFR 3400.2 would be open to coal exploration and study.

Locatable Minerals and Salable Mineral Materials. Under Alternative A, 152,746 acres of BLM-administered lands within the planning area, acreage currently not withdrawn under ANCSA 17(d)(1), would be open to hard rock mineral exploration. Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than 17(d)(1). Development of salable minerals on BLM-managed lands is not expected to occur during the life of this plan. Hard rock mineral exploration and development activities could adversely affect soils, water and air quality including

- Loss of vegetative cover and subsequent erosion of soil, rutting, ponding
- Disturbances to and removal of soil from development of gravel roads, borrow pits, bridges, exploratory drilling work, erection of temporary campsites, seismic tests, construction of gravel pads, and use of heavy equipment for extraction.
- Compaction of soils from vehicles, heavy equipment, social trails
- Sedimentation of water bodies
- Wind-blown particulates
- Smoke and exhaust

(5) Effects to Soil, Water, Vegetation, and Air from Travel Management (Alternative A)

Under Alternative A, impacts from OHV use and travel management would be the same as today. They would be greater than in Alternatives C and D. The planning area would remain undesignated and cross-

country use of OHVs weighing 2,000 pounds or less Gross Vehicle Weight Rating (GVWR) would be allowed throughout. Sensitive habitat areas would not receive additional protection from OHV impacts.

c) Effects to Soils, Water, Vegetation and Air Quality for Alternative B

(1) Effects to Soil, Water, and Air from Vegetation Management (Alternative B)

Since Alternative B promotes exploration and development activities, impacts to soil resources from vegetation management would likely increase somewhat, due to a projected increase in surface-disturbing activities. In addition to the information that was provided in Impacts Common to All Alternatives, management of vegetative resources under Alternative B would implement Required Operating Procedures to preserve the protective vegetation cover on soil and permafrost, and to reduce erosion and sediment runoff that degrades water quality.

(2) Effects to Soil, Water, Air and Vegetation from Livestock Grazing (Alternative B)

Impacts to soil from livestock grazing under Alternative B would be the same as that for impacts Common to All Alternatives.

(3) Effects to Soil, Water, Air, and Vegetation from Leasable Minerals (Alternative B)

Under Alternative B, all unencumbered lands (1,176,269 acres) except for 3,999 acres withdrawn under Public Land Orders other than ANCSA 17(d)(1) and any selected lands whose selections are relinquished or revoked would be open for fluid mineral leasing. Based on the reasonably foreseeable development scenario, while there is a medium potential for the generation of oil and gas in the Alaska Peninsula and the Bristol Bay Nushagak Basin, and a low potential for the Goodnews Bay region, there is a low development potential for all areas. The Reasonably Foreseeable Development Scenario assumes exploration for gas in the Koggiling Block of BLM unencumbered lands in the Bristol Bay area. However, in the Bristol Bay Nushagak Basin no oil or gas exploration has taken place to date. The region is remote, and it lacks existing infrastructure to deliver the product to market.

Using the Reasonably Foreseeable Development Scenario for the Bay planning area, the Resource Assumptions for Leasable Minerals on pages 7 and 8 were formulated. Based on that Scenario, the following effects could occur.

Assuming use of modern Alaska oil construction and operations practices, there would be relatively few long-term impacts to soil resources. Modern operations have substantially decreased the footprint of drill pads, which now affect approximately two to four acres, from which the topsoil is removed and stockpiled. However, current soil storage handling stipulations do not prevent damage to soil health and viability and this reduces the soil's capability to support revegetation. 20 Alaska Administrative Code [AAC] 25.520 requires a maximum of four oil wells, or one gas well, for each 640 acres. An oil spill or natural gas blowout may adversely affect soil in the immediate areas by contamination; should compacted soil also be present, the amount of compacted soil could increase the affected area. Post-production oil and gas remediation measures include the removal of structures, including drill pads, redistribution of stockpiled topsoil over the disturbed area, and subsequent reseeding, recontouring, and drainage control. The full magnitude of production effects is dependent upon the location, depth, size, and soil composition of the project area.

Coal Bed Natural Gas - CBNG is methane gas that is extracted from coal beds. Exploration for CBNG usually requires four to five wells, each requiring a gravel pad of approximately one square acre. Drilling mud and cuttings are typically disposed of on-site. Upon completion of exploration, the drill rig, all debris and other waste material are removed from the site. Should this type of development occur, it is expected that an average of five to seven acres of soil resources would be affected per well. This includes construction and operation of the well site, support sites, access roads, temporary roads, pump stations, injection facilities, utility lines and pipelines. Requiring utilization of existing road systems (few of which

exist in the Bay planning area) and vehicles that do not cause significant damage to the vegetation cover or to soils would reduce some effects.

Seismic Exploration - Seismic surveys involve seasonal occupation and transport of seismic equipment and camps using sledge-drawn trailers at locations chosen for best transport, preferably at times when the snow cover accumulation is sufficient to insulate the tundra and after the ground, lakes, and rivers are frozen. In the Bay planning area during the past 20 years, snow accumulations in some years have been insufficient to drive snow machines across, and the timing of freeze-up has been uncertain with the regional warming trend.

Historically, the principal effect of seismic activities on soil and water resources has been diversions of shallow water tracks and ponding in places where track depression compresses the organic mat sufficiently to alter the thermal regime, melt surface ground ice, and alter the native vegetation (Emers and Jorgenson 1997). More recently, modern seismic lines, with newer low-ground pressure equipment have less impact on the tundra than older, outdated types, but impacts to the tundra are more likely to occur during the camp move (WesternGeco 2003). A 2D operation covers fewer line miles, but the camp moves virtually every day. While a 3D seismic operation covers more line miles, the camp moves less often (WesternGeco 2003). While extensive thermokarst erosion along recent winter seismic trails is seldom observed, impacts to vegetation and surficial compaction are still in evidence (Jorgenson et al. 2003). Adequate protection of the tundra requires a uniformly distributed snow pack with a hard surface crust. Often, less than ideal snow conditions exist in the Bay planning area. Varying levels of disturbance elsewhere have been documented even where the snow depth exceeded two feet (Felix et al. 1989).

Observations by the BLM and others (National Research Council) indicate that short-term transitory impacts, such as surficial compaction, diversions of shallow water tracks and limited ponding are estimated at about one percent of the proposed seismic lines per season, though newer, low ground pressure equipment could reduce this significantly. Since tundra vegetative mat has been shown to recover in 7 to 10 years where damage is not severe (Abele et al. 1984, Jorgenson et al. 2003), the long term impacts due to thermokarst erosion, such as permanent diversions of shallow water tracks and limited ponding, are estimated at only about one percent of the short-term impacts. These impacts are strongly influenced by snow depth and distribution and may only happen when seismic activities occur under less than ideal snow conditions (National Research Council 2003). Where disturbance does occur, it could take from several years to several decades for the effects to be ameliorated (Walker et al. 1987).

These types of impacts would be reduced by implementation of ROPs, including limiting most seismic exploration to those times during the winter when the ground is frozen and snow cover is adequate, or, those conditions lacking, utilization of Alternative means of travel and transport, such as helicopter.

Exploratory Drilling and Field Development- Exploratory drilling in Alaska typically occurs in the winter when snow pack and frozen ground help minimize impacts from surface disturbing activities. Surface disturbance directly impacts plant communities through vegetation removal and mechanical damage to plants. Indirect impacts of surface disturbance on vegetation include soil compaction, erosion, changes in hydrology, and encroachment by invasive plant species. These indirect impacts can limit recovery or rehabilitation of vegetative communities following disturbance. Construction of gravel pads and in-field roads, and overland travel by low-ground-pressure vehicles would temporarily impact various vegetation regimes by soil compaction, damage or destruction of tussocks, disturbance to tundra wetlands, and acceleration of stream bank or lake shore erosion.

Most allowable uses have the potential to affect soil resources to some degree. Surface-disturbing actions would result in removal of vegetative cover, loosening the surface soil, formation of compacted layers, reduced infiltration, changes in physical and biological properties, reduction in organic matter content, and increasing the potential for accelerated erosion by exposing soil particles to wind and water. There also would be a loss of soil productivity through disruption of natural soil horizons and removal of vegetated acreage for use by roads, well pads, and other facilities. Operating vehicles on moist soils, especially heavy equipment, is likely to cause compaction of the surface layer, decrease infiltration and aeration, and reduction of soil productivity by making it more difficult for plant roots to grow and obtain soil moisture and nutrients. Indirect impacts caused by disrupting soil stability, increased compaction, and

moisture and nutrients. Indirect impacts caused by disrupting soil stability, increasing compaction, and reducing productivity include (1) sedimentation of drainages and perennial water bodies primarily by wind or water erosion, (2) particulate matter affecting air quality through wind erosion, (3) reduced infiltration, (4) an increase in surface water runoff that could cause higher peak streamflows and possibly downstream flooding, and (5) changes in surface water quality caused by exposing soils or bedrock with undesirable chemical characteristics.

The extent of the impacts to water resources would depend on the location and the nature of the exploration area. Possible impacts include drainage disruption, sedimentation, water removal, gravel removal, and thermokarsting in areas where permafrost is present. An impact to riparian and wetland areas impacts the physical, chemical, and biological components of an ecosystem. Activities that contribute to the decline in abundance, distribution, or functionality of riparian and wetland communities are considered adverse impacts. Direct impacts to riparian and wetland communities result from disturbing vegetation or ground surfaces. Indirect impacts to riparian and wetland communities result from actions within a watershed that cause a change in riparian and wetland functionality (e.g., increased rates of sediment loading into streams or increased surface runoff to streams), a change in water chemistry, or spread of invasive nonnative species. Changes in water chemistry, for example, can affect riparian and wetland areas primarily through changes in plant species composition, which could impact use of the area by wildlife.

Inadequate design or placement of structures, culverts, or bridges can alter natural sediment transport and deposition, creating scour holes or channel bars. Improper placement or sizing of gravel fill can result in erosion from pads or roadbeds adjacent to streams or lakes. Natural drainage patterns can be disrupted when activities or structures divert, impede, or block flow in stream channels, lake currents, or shallow-water tracks. Blockages or diversions to areas with insufficient flow capacity can result in seasonal or permanent impoundments. Diverting stream flow or lake currents also can result in increased bank or shoreline erosion and sedimentation that degrades water quality. Proper location and adequate design capacity of culverts, bridges, pipelines, and other control structures would minimize drainage problems. Winter or low-water construction and transport activities and adequate armoring of fill would minimize erosion and sedimentation problems.

Short-term air quality impacts from leasable minerals development and production would occur from two primary sources: (1) combustive emissions (vehicle tailpipe and exhaust stack emissions) due to the operation of mobile and stationary source construction equipment, and (2) fugitive dust emissions (particulate matter less than 10 microns in diameter [PM10]) due to earth moving activities and the operation of vehicles on unpaved surfaces. Minerals production would generate long-term combustive and fugitive dust emissions from two sources: (1) stationary sources, such as natural gas flaring, natural gas-fired compressors, and storage and handling of equipment; and (2) mobile sources that access and service oil and gas facilities. The planning area is a large region with a maximum east-west extent of 280 miles and a north-south extent of about 150 miles. Given the good air quality that currently exists in the region and the expected separation of sources within the planning area, it is unlikely emissions from Alternative B activities would exceed national or State ambient air quality standards. There could be localized air quality impacts depending on the locations and emissions levels of proposed sources in the area, the surrounding topographical characteristics, and the site-specific meteorology.

Sources of hazardous air pollutants within the planning area would include fossil fuel combustion, fugitive volatile organic compounds, and emissions due to oil and gas production. The accidental release of sour natural gas (rich in hydrogen sulfide (H₂S)) poses the main risk under Alternative B. Another source of release of H₂S is at oil and gas fields where secondary recovery operations are occurring. To mitigate H₂S impacts, applications for permit to drill (APDs) in sour gas areas would include a contingency plan that may include requirements to monitor wind speed, wind direction, and atmospheric stability and to conduct dispersion modeling analyses. These requirements would apply to areas where public health and safety or important resource values are a concern, such as proposed well sites in proximity to residences. If the BLM determines after review of a contingency plan that additional data or safety precautions are needed, the BLM would require these items as conditions of approval (COAs). The potential release of H₂S during production operations in sour gas areas may be mitigated by health and safety plans.

The preferred and normal means of disposing of drilling wastes, including muds and cuttings, is reinjection into wells. Cuttings may be stored temporarily to facilitate reinjection and/or backhaul operations. Use of mud pits may be allowed by the Authorizing Officer. If mud and cuttings are stored on the surface, sediments and other contaminants could be flushed into the watershed. However, requirements that wastes be stored in lined and bermed areas and disposed of before spring break-up would reduce the potential of sediments and other contaminants being flushed into the watershed. Adherence to the Required Operating Procedures and Stipulations, and to project-specific requirements by all permitted operations would help prevent pollution to any stream or lake.

Consumptive water use in the summer seldom is a problem on the coastal Bristol Bay Plain, as water generally is abundant. Exceptions would be in small lakes and ponds, smaller coastal streams or most foothill streams during early summer when flow is low, and recently in summer if conditions are hot and dry. In these instances shallow pools might be pumped dry. Depending on the areas leased and number of development wells drilled, annual water usage for development activities under Alternative B would vary considerably. Annual water use during development could be similar to that for exploration (i.e., use for dust abatement). If more than 15 per cent is removed, then fewer lakes would be required, but if it is being used in winter, less of the critical overwintering habitat would remain in the pumped lakes or rivers. Adherence to the Required Operating Procedures and Stipulations for all permitted operations would prevent the unlimited drawdown or pollution of any stream or lake.

While some of the gravel used for the construction of permanent facilities may be obtained from non-BLM managed lands, some of the material sites would probably be located on BLM-managed lands within the planning area. Improper location of gravel-removal operations can result in alteration or destruction of soils, stream channel or lake configuration, stream-flow hydraulics or lake dynamics, erosion and sedimentation, and ice damming and aufeis formation. Locating gravel pits far enough away from streams and lakes to avoid break-up or storm flooding would greatly minimize these effects to water resources.

Under the potential development activities, spills and spill cleanup would involve both crude oil and refined petroleum products, probably from fuel-storage areas or handling operations. Storage of fuel in lined and bermed areas and the onsite availability of absorbents and removal equipment would help ensure that the size of any area affected by a spill and cleanup efforts is kept to a minimum. Crude oil spill cleanup associated with production operations and pipelines is possible and could adversely affect streams and lakes. While the petroleum residue from a spill could be flushed from streams within a few years, the impacts to lakes and ponds could persist for decades. Spill cleanup in a watershed would involve containing the spill, diverting or isolating it within the waterbody, skimming off the oil, and treating the remaining oil-contaminated water and sediments. Prevention and rapid response with adequate removal equipment would minimize effects. The Required Operating Procedures associated with Alternatives B, C, and D are designed to prevent or otherwise mitigate oil spills in the planning area.

Spills of chemicals and saline waters would be rapidly diluted in a large lake or river. In small lakes, tundra ponds, and shallow water tracks, the impacts would be greater, with waters remaining toxic to sensitive species for several years. These spills could be pumped out of the water body, if confined, or neutralized and then diluted with uncontaminated fresh water. Seppi's (2006) work on lake water chemistry and productivity indicate that many Bristol Bay lakes are chemically sensitive; spills, dilution or neutralization may be detrimental or may create unwanted changes.

Air quality impacts may result from the emissions of hydrocarbons and gaseous byproducts of combustion (Hydrogen sulfide) or wind-borne particulates. Ambient air quality on the North Slope of Alaska, however, is relatively pristine even though oil and gas exploration, development, and production have been under way for more than 30 years. In the Bay planning area, prevailing winds may blow these emissions and particulates to other areas of Alaska, where they might affect air quality elsewhere. Arctic haze is a phenomenon resulting from elevated concentrations of fine particulate matter found over the Arctic, primarily in winter and spring. Scientists believe that most of the pollutants contributing to Arctic haze are from combustion sources in Europe and Asia. It is not known to what extent local sources in Alaska contribute to Arctic haze. However, the Arctic haze phenomenon was first observed in the 1950s, long

before oil development started on the North Slope. Emissions from development resulting from Alternative B would be small compared to the emissions from North Slope oil production.

Effects of Oil, Gasoline, and Diesel Spills - Spills could occur from pipelines, production and exploration pads and ancillary facilities, airstrips, roads, fuel storage containers, and mechanical equipment. Spills that leave the pads and roadbeds could reach one or more of several environments and habitat types, including wet and dry tundra, riparian areas, tundra ponds, lakes, flowing creeks and rivers, the water table, and potentially Bristol Bay. Spills could occur at any time during the year.

Specific primary spill response options include mechanical or physical, chemical, biological, in-situ burning and natural recovery. Mechanical or physical methods are used to control spills through containment and recovery. Physical response methods include but are not limited to:

- Booming
- Skimming
- Barrier/Berm
- Physical Herding
- Debris Removal
- Vegetation Removal
- Manual Removal/Cleaning
- Mechanical Removal
- Sorbents
- Vacuum
- Flushing
- In-situ Burning

In the case of debris removal, vegetation removal, manual removal or cleaning, vacuum, flushing, and in-situ burning, direct effects to the ground surface, to soil, vegetation, and small living things could be expected (USFWS 2005).

Chemical treatment employs the use of dispersing agents that contain surfactants, or compounds that break up substances such as oil into small droplets. Chemical dispersants would only be used when the associated impacts of the dispersed oil would be less harmful than non-dispersed oil (USFWS 2005). Both direct effects and potential indirect effects to wildlife, especially waterfowl, could be anticipated.

Biological treatment uses biological agents such as nutrients, enzyme microorganisms that increase the rate at which natural biodegradation takes place. This is a natural process that slowly removes oil from the environment (USFWS 2005). This method does not work as efficiently in colder climates as it does in temperate climates.

In-situ burning of oil involves the ignition and controlled combustion of a spill. It can be used when oil is spilled on a water body or on land (USFWS 2005). One problem with burning on land is that the vegetation cover would be completely destroyed, and the heat of the fire might sterilize the soil so that native vegetation might not recover, and the area would be susceptible to invasive vegetative species.

Natural recovery, leaving the spill alone, allows natural processes to remove oil from the environment. Natural processes include evaporation, oxidation and biodegradation (USFWS 2005). Natural recovery is not recommended in cases where the spill might migrate into water bodies or into the water table.

Air Quality - Volatiles from the oil spill can present an immediate health hazard to humans and wildlife during the first few hours to days of a spill. The rate at which the volatile (gaseous) component of an oil spill disperses into the atmosphere is dependent upon many factors, including the volume of the spill, the thickness of the oil on the surface, the air and/or water temperature, weather, and the amount of wind (Trust 2006, Pers.Comm.; McClenahan 2006, Pers. Comm). The Northeast Integrated Activity Plan (IAP) and EIS (BLM and MMS 1998) provides a discussion regarding the rate of evaporation, ambient concentrations, and the types of compounds the EPA classifies as hazardous air pollutants. The heavier the compound the longer it takes to evaporate. The EIS discusses the rate of evaporation, ambient

concentrations, and the types of compounds the EPA classifies as hazardous air pollutants. In the event of an oil spill on land, the air quality effects would be less severe than offshore because some of the oil would be absorbed by vegetation or into the ground during months of the year other than winter when everything is frozen.

Diesel fuel oil could be spilled either while being transported or from accidents involving vehicles or equipment. A diesel spill would evaporate faster than the volatiles from a crude oil spill. Ambient hydrocarbon concentrations would be higher than those from a crude oil spill, but would also persist for a shorter time. Since a diesel spill probably would be smaller than a potential crude oil spill, any air quality effects from a diesel spill likely would be lower than those from other types of spills. Fire would be another source of airborne contaminants. Oil or gas blowouts may catch fire. Additionally, in-situ burning during the first few hours after an oil spill is a preferred technique for cleanup and disposal of oil spilled into water. This type of burning would be less likely to be used in the case of oil spilled on land, but the effects to air quality if some of the oil were burned would be similar. Burning could affect air quality in two important ways. For a gas blowout, burning would reduce emissions of gaseous hydrocarbons but would slightly increase emissions of other pollutants temporarily. If an oil spill were ignited immediately after spillage, the burn could combust most of the volatiles that otherwise would evaporate. Incomplete combustion of oil would release an oily soot of unburned hydrocarbons and minor quantities of other pollutants into the air.

Soil and Vegetation Resources - Oil spills could affect vegetation and impact soils, primarily when the surface vegetation is altered. The oil would kill vegetation and/or decrease vegetation growth, but would leave the organic mat largely intact although probably saturated with oil. The depth to which the soil would be saturated would depend on a number of factors, including the amount of oil spilled, the viscosity of the oil, the type of soil present, the permeability of the soil and the covering vegetation mat, ambient temperature, and the presence or absence of frozen ground and/or permafrost. Surface and underground dispersal of the spill would also depend on many of the same factors, as well as the amount and force of water running through the ground at the site of the spill and the degree of slope of the terrain. Snow, ice, and a frozen ground surface would limit oil absorption into the soil and surface organic mat (though not eliminate it), and would simplify cleanup. Spill cleanup, however, is more likely to damage soils when the ground surface is not frozen. Cleanups are not always well controlled; heavy traffic and digging are common, resulting in damaged soils. Oil spill cleanup mitigates impacts on soils only if cleanup methods and operations are very carefully controlled to minimize surface disturbance. The impacts to vegetation and soil resources from surface disturbing activities during oil spill cleanup when the tundra is unfrozen may be greater than the impact of the spilled oil, as the area affected may not be limited to that area immediately adjacent to and covered by the spill.

Water Resources - Small crude or diesel spills (<1 bbl and smaller) are projected to occur onshore. It is likely that all small fuel spills would occur on or near pads or roadbeds, though some fuel may possibly reach adjacent waters. In the case of a complete freeze up of the ground during the winter at the location of a spill, spill response likely would remove almost all of the spill from the frozen tundra prior to snowmelt. During that part of the year when the soil and vegetation are unfrozen, late May through around October 15, spills could reach and adversely impact tundra waters before oil spill response is initiated or completed. Storage of fuel in lined and bermed areas and the onsite availability of absorbents and removal equipment would help ensure that the size of any area affected by a spill and cleanup effort is kept to a minimum. Since most oil exploration and development activities, as well as pipeline and facilities construction, would occur during winter when the ground is frozen, it is likely that most anticipated small fuel spills would be largely contained and removed prior to reaching tundra waters.

In the case of a larger spill, the Northeast NPR-A IAP/EIS (BLM and MMS 1998), analyzed the effects of a 325 bbl spill reaching the Colville River and Teshekpuk Lake in summer, and the effects are incorporated here by reference. In the Colville River, in the view of the analysis, the high rate of water flow would rapidly disperse the spill and preclude any effects on dissolved oxygen concentrations. Direct toxicity in the water column would be minimal and limited to the first few reservoir pools down current of where the spill entered the river. Analysts believe that some toxicity might persist in initial reservoir pools for a few days to weeks until toxic compounds were washed out of the oil trapped in the sediment or the oiled sediment was buried under cleaner sediment. However, based on studies carried out by NOAA at post-

spill areas of the 1989 EXXON Valdez oil spill (EVOS) between 1989 and 2005, researchers found that oil persists in pockets and reservoir pools and in many cases was not washed away. Some of the residual oil weathered and some did not; however, the oil remained toxic with polynuclear aromatic hydrocarbons (PAH) and a suite of persistent organic pollutants (POP) ten to fifteen years after the incident (Short et al. 2001; Rice et al. 2005; Springman et al. 2005; Short et al. 2005; Babcock et al. 1998). Scientific studies of the lingering potency of EVOS oil were carried out on a variety of animal species, including otters, harlequin ducks, rainbow trout, and salmon, and were found to be the source of a variety of adverse physiological responses in these animals (Babcock et al. 1998; Rice et al. 2005; Springman et al. 2005; Short et al. 2005).

According to the Northeast NPR-A analysis (BLM and MMS 1998), the primary effect of an oil spill in tundra ponds would be long-term direct toxicity. Similar effects would be expected for any of the lakes in the planning area should an oil spill occur.

Spill cleanup in a watershed would involve containing the spill, diverting or isolating it within the waterbody, skimming off the oil, and treating the remaining, oil-contaminated water and sediments. Storage of fuel in lined and bermed areas and the onsite availability of absorbents and removal equipment would help ensure that the size of any area affected by a spill and cleanup efforts is kept to a minimum. Prevention and rapid response with adequate removal equipment would reduce effects but probably would not completely eliminate them (Short et al. 2001).

(4) Effects to Soil, Water, Air, and Vegetation Resources from Locatable Minerals and Mineral Materials (Alternative B)

Locatable Minerals. Mining exploration could occur on existing Federal or State claims under any Alternative. However, Under Alternative B, ANCSA 17(d)(1) withdrawals would be revoked, and BLM unencumbered lands would be open to Locatable Mineral exploration and development. The type of mining most likely to occur is placer mining. The range of potential impacts to soil resources includes disturbance and redistribution of gravel, overburden, and soils. The structure of the soil profile could be destroyed and may require decades to recover. Soil development in the Arctic is a slow process. Removal of vegetative cover and soil could cause an increase in erosion, stream sedimentation, and turbidity as well as a decrease in stream channel stability. Water could be contaminated by toxic materials introduced by the mining process. Denuded soil and contaminated soil particulates could become airborne. Some effects may be mitigated by utilizing Required Operating Procedures that protect soil, including separating vegetative cover and soil from mine tailings for future recovery, backfilling and replacing topsoil as appropriate, as mining progresses, and returning the stored soil to the ground surface upon completion of the mining project.

Mineral Materials. Mineral material excavation and disposal may degrade soil resources, and may cause erosion and an increase in stream sedimentation and turbidity. Sites may never recover native vegetative cover due to loss of soil from the site. Construction of access roads to the site may add to the impacts in terms of soil loss, soil compaction, and erosion. The degree of impact would depend on the type of soil present, the type of road, the terrain, and the presence or absence of permafrost.

(5) Effects to Soil, Water, Air, and Vegetation Resources from Recreation Management (Alternative B)

Impacts to air quality, soil, vegetation and water resources from recreation management would be similar to those discussed under Impacts Common to All Alternatives.

(6) Effects to Soil, Water, Air, and Vegetation Resources from Travel Management (Alternative B)

Impacts to air quality, soil, vegetation, and water resources from OHV use and travel management would be similar to those discussed under Alternative A.

(7) Effects to Soil, Water, Air, and Vegetation Resources from Lands and Realty Actions (Alternative B)

Impacts to air, soil, vegetation, and water resources would be similar to those discussed under Impacts Common to All Alternatives. Implementation of Required Operating Procedures would further reduce the potential for impacts compared to Alternative A.

d) Effects to Soils, Water, Vegetation and Air Quality for Alternative C

(1) Effects to Soils, Water, and Air from Vegetation Management (Alternative C)

Impacts to soil, water, and air resources from vegetation management would be similar to those discussed under Impacts Common to All Alternatives.

(2) Effects to Soils, Water, Air and Vegetation Resources from Livestock Grazing (Alternative C)

Impacts to soil, water, vegetation and air resources from livestock grazing would be similar to those discussed under Impacts Common to All Alternatives.

(3) Effects to Soils, Water, Vegetation and Air Resources from Lands and Realty (Alternative C)

In Alternative C, existing ANCSA 17(d)(1) withdrawals would be removed. For those lands currently closed to mineral exploration and development, they would be open with the exception that ANCSA 17(d)(1) withdrawals would be retained at locations where Wild and Scenic Rivers are proposed until Congress has had an opportunity to act. Impacts to soils, air, vegetation and water from minerals exploration and development would be greater than in Alternative A but slightly less than in Alternatives B and D.

Delineating Right-of-Way avoidance areas would have a positive impact on soils.

(4) Effects to Soils, Water, Vegetation and Air from Leasable, Locatable, and Salable Minerals (Alternative C)

Leasable Minerals. Under Alternative C, BLM-managed lands would be open to fluid mineral leasing and those areas subject to leasing under 43 CFR 3400.2 would be open to coal exploration and study. Impacts to soils, vegetation, water and air would be greater than in Alternative A and slightly less than Alternative B. Soils, vegetation, water and air resources would benefit from Required Operating Procedures, Stipulations, and project-specific requirements. Effects from leasable mineral activities would not be expected outside of the Koggiling Block during the life of this plan.

Locatable Minerals and Salable Mineral Materials. Under Alternative C, all unencumbered BLM-administered lands within the planning area would be open to hard rock mineral exploration. Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1), and ANCSA 17(d)(1) withdrawals at locations of proposed Wild and Scenic Rivers would be retained in place until Congress had had an opportunity to act. Impacts to soils, water, air, and vegetation resources from locatable and salable mineral exploration and development would be expected to be similar to those for Alternative B. However, Required Operating Procedures and project-specific requirements would play a greater role in the two proposed Areas of Critical Environmental Concern. Development of salable minerals on BLM-managed lands is not expected to occur during the life of this plan.

(5) Effects to Soil, Water, Vegetation, and Air Resources from Recreation Management (Alternative C)

Impacts to air quality, soil, vegetation, and water resources would be similar to Alternative B.

(6) Effects to Soil, Water, Vegetation, and Air Resources from Travel Management (Alternative C)

Under Alternative C, impacts from OHV use and travel management would be less than in Alternatives A and B. The planning area would be designated as limited to existing trails by OHVs weighing 2,000 pounds or less Gross Vehicle Weight Rating (GVWR). Sensitive habitat areas would receive additional protection from OHV impacts. The fewest impacts to air, soil, vegetation, and water resources would occur under Alternatives C and D.

d) Effects to Soils, Water, Vegetation and Air Quality for Alternative D

(1) Effects to Soils, Water, Vegetation and Air from Vegetation Management (Alternative D)

Impacts to soil, water, vegetation and air resources from vegetation management would be similar to those discussed under Impacts Common to All Alternatives.

(2) Effects to Soils, Water, Air and Vegetation Resources from Livestock Grazing (Alternative D)

Impacts to soil, water, vegetation and air resources from livestock grazing would be similar to those discussed under Impacts Common to All Alternatives.

(3) Effects to Soils, Vegetation, Water, and Air from Leasable, Locatable, and Salable Minerals (Alternative D)

Leasable Minerals. Under Alternative D, BLM-managed lands would be open to fluid mineral leasing. Impacts to soils, vegetation, water and air would be greater than in Alternative A or C and similar to those in Alternative B. Soils, vegetation, water and air resources would benefit from Required Operating Procedures, Stipulations, and project-specific requirements. Effects from leasable mineral activities would not be expected outside of the Koggiling Block during the life of this plan.

Locatable Minerals and Salable Mineral Materials. Under Alternative D, all unencumbered BLM-administered lands within the planning area would be open to hard rock mineral exploration, and those areas subject to leasing under 43 CFR 3400.2 would be open to coal exploration and study. Within the Bay planning area, approximately 3,999 acres would remain withdrawn from mineral entry due to withdrawals other than ANCSA 17(d)(1). Impacts to soils, water, air, and vegetation resources from locatable and salable mineral exploration and development would be expected to be similar to those for Alternative B. However, Required Operating Procedures and project-specific requirements would play a greater role in the proposed Carter Spit Area of Critical Environmental Concern. Development of salable minerals on BLM-managed lands is not expected to occur during the life of this plan.

(4) Effects to Soil, Water, Vegetation, and Air Resources from Recreation Management (Alternative D)

Impacts to air quality, soil, vegetation, and water resources would be similar to Alternative B.

(5) Effects to Soil, Water, Vegetation, and Air Resources from Travel Management (Alternative D)

Under Alternative D, impacts from OHV use and travel management would be less than in Alternatives A and B. The planning area would be designated as limited to existing trails by OHVs weighing 2,000

pounds or less Gross Vehicle Weight Rating (GVWR). Sensitive habitat areas would receive additional protection from OHV impacts. The fewest impacts to air, soil, vegetation, and water resources from OHV use would occur under Alternatives C and D.

(6) Effects to Soils, Water, Vegetation and Air Resources from Lands and Realty (Alternative D)

In Alternative D, existing ANCSA 17(d)(1) withdrawals would be removed. For those lands currently closed to mineral exploration and development, they would be open. Impacts to soils, air, vegetation and water from minerals exploration and development would be slightly less than Alternative B but greater than in Alternatives A and C.

Delineating Right-of-Way avoidance areas would have a positive impact on soils, vegetation and water resources.

3. Direct and Indirect Effects to Fisheries and Aquatic Habitats

a) Effects Common to All Alternatives

(1) Effects to Fisheries and Aquatic Habitat from Hazardous or Solid Waste Management (Common to All)

The BLM management actions under all Alternatives for hazardous or solid wastes may have localized, beneficial effects on fish habitat quality through prevention measures and mitigation practices as sites become known.

(2) Effects to Fisheries and Aquatic Habitat from Soil, Water, Vegetation and Air Quality Management (Common to All)

All Alternatives propose some activities, such as mining, oil and gas exploration and development, road construction, and the use of OHV trails and stream crossings, which could contribute to erosion and/or sedimentation into streams and rivers. Currently there are no proposals for mining, oil and gas exploration or development, road construction or other development activities for BLM lands in the Bay planning area. Project-specific descriptions would provide information that would help determine what impacts would be expected, and to what degree sedimentation may occur.

Removing the vegetative cover, altering the natural topsoil, or changing the shape of the slope can increase the potential for erosion, increased runoff, and can create additional sediment in waterbodies.

The main factors influencing erosion rate include the volume and velocity of runoff from precipitation, the rate of precipitation infiltration through the soil, the amount of plant cover, the slope length or the distance from the point of origin of overland flow to the point of deposition, and operational erosion control structures (EPA 1997). Accelerated erosion occurs whenever the soil surface is disturbed. Sediments created by accelerated erosion clog streams and fill lakes and impair the water-holding capacity. Erosion decreases the productive value of the soil; additionally, it reduces the quality of the waters that receive the sediment.

Significant increases in sediment yield can lead to alteration of stream channel morphology, substrate composition, and surface-ground water interaction; decreased survival of fish in the egg and young-of-the-year stages; changes in macro invertebrate community structure; and decreased primary production (Madison 1981, Van Nieuwenhuyse 1983, Weber and Post 1985, Bjerklie and LaPerriere 1985, Lloyd et al. 1987, Reynolds et al. 1989, Buhl and Hamilton 1990).

Stream channel instability occurs when excessive sediment deposition leads to destructive lateral erosion of streambank and progressively wider and shallower stream channels (Elmore and Leonard 1998).

Accelerated runoff can trigger downcutting, which lowers the streambed, alters the water table, dries out the riparian area, destabilizes streambanks, increases erosion, and further accelerates runoff. Unless stopped by some form of intervention or a hard geologic formation, downcutting will migrate upstream and eventually disrupt the hydrologic functioning of the entire watershed (Chaney and others 1993).

These changes can lead to decreased survival of fish in the egg and alevin stages; decreased density, biomass, and diversity of aquatic insects the fish depend on for food; and decreased primary fish production (Cordone and Kelley 1961; Cooper 1965; Van Nieuwenhuysse 1983; Webber and Post 1985; Lloyd and others 1987; Buhl and Hamilton 1990).

Increased turbidity and sedimentation from erosion can inhibit feeding and spawning success. All members of the biotic community have the potential to be affected. Potential effects of sedimentation on benthic macroinvertebrates - which are prey species for fish - include interference with respiration, and interruption of filter-feeding insects' capability to secure food. A more important impact to benthic invertebrates would be smothering of physical habitat by increased sediment loads. A loss of interstitial space in the substrate would be highly detrimental to burrowing species. A decrease in abundance could be expected in these situations. In Arctic environments, where fish depend on summer food sources to grow and reproduce, a reduced prey base may preclude fish from directing energy towards spawning.

Direct threats to fish from sediment include changes to physical habitat, subsequent decreased reproductive success, and loss of rearing habitat. Physical habitat changes from sediments are most often attributed to finer size particles. Developing eggs can be smothered and newly hatched fry can be killed by deposited sediment that prevents emergence from spawning gravels and interferes with respiration. Developing fish eggs and larvae need a constant supply of cold, oxygen rich water which flows through the interstitial spaces in stream gravels. Embedded sediments fill these interstitial spaces and also limit essential winter habitat used by juvenile fish for cover from predators, ice scour, and high-velocity stream flows. The filling of pools with sediment further limits overwintering sites for juvenile and adult fish.

Beneficial effects to fish from proper management of soils, water, and vegetation resources would occur. Implementation of mitigation measures to protect soil, water, and vegetation on a project specific basis, particularly in riparian zones of watersheds, would reduce disturbance to fish habitats and would aid in the recovery of aquatic habitat from permitted uses. Improper management of soil, water, and vegetation resources can reduce the quality of the waters and the productive value of the soil. Climate change and the resultant melting permafrost along stream banks may increase localized input of sediments and decrease bank stability.

Riparian vegetation condition directly influences the condition, quality, and maintenance of aquatic habitat. Riparian plants filter sediments and nutrients, provide shade, stabilize streambanks, provide cover in the form of large and small woody debris, produce leaf litter energy inputs, and promote infiltration and recharge of the alluvial aquifer (Orth and White 1993; Wesche 1993). As a result of these functions, spawning beds for fish and microhabitats for macroinvertebrates remain relatively free of damaging fine sediment deposits. Riparian vegetation reduces sedimentation of pools, thereby maintaining water depths and structural diversity of the channel. Base flow levels are augmented throughout the year by the slow release of water stored in aquifers. Complex off-channel habitats, such as backwaters, eddies, and side channels, are often formed by the interaction of streamflow and riparian features such as living vegetation and large woody debris. These areas of slower water provide critical refuge during floods for a variety of aquatic species and serve as rearing areas for juvenile fish.

The bank stabilizing function of streamside vegetation not only helps reduce erosion and influence channel morphology but also acts to supplement in-stream cover by the developing of undercut streambanks and by providing overhanging vegetation. Well-vegetated stream channels and stable streambanks help reduce turbidity and channel scouring resulting from high runoff rates and, in turn, can enhance primary production. In cold regions well-vegetated stream channels help reduce the formation of aufeis (ice formed by the overflow of water onto existing ice). Aufeis can decrease primary productivity, delay riparian plant growth, increase erosion, tie up water in the form of ice during critical low-flow periods,

and cause the formation of new stream channels due to channel blockage (Churchill 1990; Michel 1971; Slaughter 1990).

(3) Effects to Fisheries and Aquatic Habitat from Fire and Fire Management (Common to All)

Fire effects which directly impact fish populations are increased siltation, altered water quality (dissolved oxygen, pH, suspended and dissolved solids, total hardness, turbidity), and water temperature changes. Indirectly, any alteration of the nutrient flow that adversely affects aquatic organisms or results in a reduction in emergent insect production would also affect fish populations, at least temporarily.

Fish species and aquatic fauna have been exposed to indirect effects of wildland fire for thousands of years. Fire can indirectly influence fish populations or their prey through the factors mentioned previously as well as changes in nutrient input to water system and changes in permafrost status that can lead to altered hydrology. The extent of surface erosion after a fire largely depends on the topography and soil types of the immediate area, and the amount of ice-rich frozen ground within the active layer. Stream siltation is usually negligible from surface erosion on burned sites in interior Alaska due to its gentle topographical features. Siltation may be a factor where severe burns occur on steep slopes or even shallow slopes with ice-rich active layers, where fire has severely damaged riparian protection of bank soils' integrity, or where heavy equipment is used in suppression activities. Lakes are also potentially vulnerable to fire effects of concentration of nutrients, sedimentation, and erosion of riparian protected shorelines from wave and wind action. Response of deciduous riparian foliage after a fire is related to already existing riparian vegetation; the impact of a fire is a change in age structure and short-term productivity.

Data on how fires affect stream temperatures and productivity are currently inadequate to accurately assess the effects of fire on anadromous or resident fish habitats. Much of the published work has focused on changes in lake systems (McEachern et al. 2000, St-Onge and Magnan 2000). Analyses of long-term fire effects on stream ecology are currently under way as part of Frostfire, a landscape-scale prescribed research burn in the boreal forest of Interior Alaska conducted in July 1999.

Fish populations have generally shown a positive response during the initial five-year period after wildland fire where populations exhibit good connectivity with key refugia throughout the watershed (Gresswell 1999; Minshall et al. 1989). Fish will generally reinvade fire-affected areas rapidly where movement is not limited by barriers. These new colonists generally come from areas upstream of the affected area, from surrounding watersheds and from mainstem rivers where migration is not limited. Fish population recovery generally tracks the increase in primary and secondary production that occurs in the early post-fire period. Where sediment is continually delivered into the stream, there could be short-term negative effects on fish and macro-invertebrate communities.

Fuels projects are designed and implemented in a "non-emergency" manner that minimizes impacts to aquatic resources. Although wildland fires may still occur in areas where hazardous fuel loads have been reduced, fires which may occur are expected to be predominately ground fires rather than crown fires. Ground fires are easier to control with lower-impact suppression methods (such as hand-built fire line) that are less likely to adversely affect aquatic resources. In contrast, the crown fires associated with heavier fuel loads often require suppression techniques likely to have greater adverse impacts to aquatic habitats and species.

Competent planning and implementation will minimize the effects of fuels treatments. Some projects involve multiple treatments of the same area. Prescribed fires conducted in the spring (when drainage-bottoms are still snow covered) help to protect riparian vegetation and soils. The primary goal of these projects is to reduce the occurrence, risk, and impacts of wildland fires, not restore the natural capacity of aquatic species to withstand the effects of natural fires.

Removal of vegetation to reduce future fuel loading may be accomplished with minimal impacts in some areas, but in others, sensitivity to ground disturbance from loss of vegetation can cause increased erosion, compacted soils, and a loss of nutrients (FS 2000, Beschta et al. 1995). To protect water quality and the diversity of habitats for fish, amphibians and other aquatic organisms, standard operating

procedures are in place to protect the proper functioning condition of riparian area and stream characteristics.

Impacts to fisheries from fire and fuels management would be the same under all Alternatives. Most of the area within the planning region is in a Limited fire management option designation, which means that the standard response is to monitor fires and only to initiate suppression actions if necessary to protect identified values. In a worst case scenario, there may be some episodic events related to fire suppression that may affect fish and fish habitat. These effects would be from increased erosion and ground-based control, and alterations of water chemistry from aerial applications of fire retardant. Erosion impacts would likely be small in scale and localized, and could be minimized by rapid rehabilitation after the fire is under control, although improperly located bulldozer line firebreaks could greatly increase local stream sediment loads. The use of fire retardant in/near fish bearing streams is a serious threat to these aquatic ecosystems. The by-products of certain retardants are toxic to fish and will result in fish kills. To decrease the potential of affecting fish habitats and stream conditions, it is a standard operating procedure of the suppression agencies to avoid dropping retardant near or in water bodies.

(4) Effects to Fisheries and Aquatic Habitat from Minerals (Common to All)

While the Salmon River mine is operating, currently there are no new proposed projects for mining on BLM lands in the Bay planning area. However, under all Alternatives, some BLM unencumbered lands are available for metalliferous metals exploration and mining. In general, surface mining activities increase erosion and accelerated sediment production and input into nearby streams and lakes. Mine development may also alter the natural input rate of organic matter and nutrients to aquatic systems. Mine sites can include open pits, heap and dump leaches, waste rock and overburden piles, tailings piles and dams, haul roads and access roads, ore stockpiles, vehicle and equipment maintenance areas, and exploration and reclamation areas. These areas are all major sources of erosion and sediment.

Surface mining operations may also disrupt surface and ground water flow patterns. Mining operations also have the potential to release pollutants to surface waters and ground water, the deposition of contaminants into soils, and the eventual incorporation of pollutants into plant tissue. Both water and soil contamination may be harmful to riparian-wetland vegetation.

Naturally occurring substances in the ore may create a major source of pollutants. Mined ore not only contains the mineral being extracted but varying concentrations of a wide range of other minerals. Frequently other minerals may be present at much higher concentrations and can be much more mobile than the target mineral. Depending on the local geology, the ore (and the surrounding waste rock and overburden) can include trace levels of aluminum, arsenic, asbestos, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, selenium, and zinc, as well as naturally occurring radioactive materials.

As with many surface disturbing activities, one of the most detrimental impacts associated with mining is increased sediment yield. Because of the large area of land disturbed by mining operations and the large quantities of earthen materials exposed at sites, erosion can be a major concern at hardrock mining sites. Erosion may cause significant loadings of sediments to nearby waterbodies and associated riparian-wetland areas, especially during severe storm events and high snow melt periods. Placer mining inherently degrades or completely destroys channel features and riparian habitat, resulting in increased erosion and sedimentation.

During placer mining, streams are often diverted into bypass channels while the original channel is mined and then returned to a newly built channel once mining is complete. It has been common practice to construct stream bypasses and new channels with different geometry and physical characteristics (e.g. flood prone and bankfull widths, bankfull depth, sinuosity, slope, entrenchment, and substrate size) than that of the natural channel. This difference is often necessary because of the removal of streamside vegetation and other hard structural elements that help define the natural channel morphology. As a result, new channels are often straighter, have a higher gradient, and consequently have more energy than the natural channel. In addition, new channels often lack the diversity of habitats (pools, glides,

riffles) and cover components (undercut bank, overhanging vegetation, and large woody debris) that enhance the quality of habitat in natural channels.

Mining activities, placer operations in particular, may lead to a loss of riparian-wetland vegetation. All vegetation within the active mining area is removed before and during mine development and operation. Vegetation immediately adjacent may be affected by the roads, water diversions or other development. Riparian-wetland vegetation has a significant influence on the stability of uplands and certain stream types. Changes in the composition, vigor, and density of riparian vegetation can result in changes in sediment input from uplands, stream shade, and protection from instream erosional processes, terrestrial insect habitat, and the contribution of detritus and structural components to the stream channel. Water quality and esthetic values are also affected by disturbance to riparian-wetlands (Rosgen 1996).

The altering of surface hydrology often results in stream conditions that are no longer suitable to species or life stages of fish and other aquatic organisms that occurred before disturbance. For example, increased stream flow may result in water velocities that (1) cause involuntary downstream displacement and mortality of juveniles, (2) result in scour-related mortality of eggs and alevins, (3) accelerate streambank erosion, and (4) over the long term, deplete large woody debris and organic material. The enlargement of stream channels may result in a shallow, slow water environment during periods of low flow. This new environment could result in crowding, loss of spawning habitat, reduced primary and secondary productivity, increased vulnerability to predation, and increased sedimentation (Swanston 1991; Hicks and others 1991; National Research Council 1992; Strouder and others 1997).

The removal of streamside riparian-wetland vegetation during mining would result in loss or degradation of aquatic habitat until proper functioning condition could be reestablished. In general, the time required for riparian-wetland areas to attain proper functioning condition would be dictated by natural processes and may require decades to centuries before it approximates the structure and function of the original aquatic habitat (NCSU 1998; BLM and Montana Dept. of Environ. Quality 1996; BLM 1988).

The current state of knowledge of suction dredging and its impacts on aquatic resources suggests that the practice could be either detrimental or beneficial, depending on site-specific use by aquatic organisms and physical habitat limitations. In either case, evaluation of the location and timing of suction dredging activities would benefit aquatic resources.

Suction dredging has been shown to locally reduce benthic (bottom dwelling) invertebrates (Thomas 1985; Harvey 1986) and cause mortality to early life stages of fish due to entrainment by the dredging equipment (Griffith and Andrews 1981). Suction dredging may also destabilize spawning and incubation habitat, remove large roughness elements such as boulders and woody debris that are important for forming pool habitat and that can govern the location and deposition of spawning gravels (Harvey and Lisle 1998). Suction dredging may also increase suspended sediment, decreasing the feeding efficiency of sight-feeding fish (Barrett and others 1992); reducing living space by depositing fine sediment (Harvey 1986); and cause fish to avoid certain habitats because of their response to divers (Roelofs 1983).

On the other hand, suction dredging may temporarily improve fish habitat by creating deep pools or by creating more living space by stacking large unembedded substrate (Harvey and Lisle 1998). In general, invertebrates and periphyton all rapidly recolonize small patches of new or disturbed substrate in streams as long as the area of disturbance is not so widespread as to limit the number of organisms to recolonize (Griffith and Andrews 1981; Thomas 1985; Harvey 1986). In addition, dredge tailings may increase spawning sites in streams lacking spawning gravel or streams that are armored by substrate too large to be moved by fish (Kondolf and others 1991). In some cases the reduction in the feeding efficiency of fish may be offset by reduced visibility and the corresponding reduced risk of predation at moderate levels of suspended sediment (Gregory 1993).

Bridges, culverts, and low-flow crossings are integral features to road development associated with surface mining. These features can also interfere with stream bedload (substrate) movement, migrations to spawning, feeding, rearing, and overwintering sites if improperly designed. Current concerns related to surface mining and road placement include diverting or eliminating flow from small tributaries that connect lakes or connect lakes and rivers. Fish species found in the planning area that move between these

habitat types are vulnerable to impact. Potential loss of migratory capacity could stress or kill these fish if they are unable to migrate to food-rich habitat in the summer, reach spawning areas, or move into overwintering habitat. Proper placement of these structures is critical in minimizing impacts to fish.

(5) Effects to Fisheries and Aquatic Habitats from Forestry (Common to All)

Some minimal forestry activity generally occurs within the Bay planning area each year, consisting of small-scale localized timber removal for personal use, including gathering firewood and house logs. While it is unlikely that any type of road construction will occur in conjunction with this activity, it is conceivable that short spur or temporary roads may be constructed to access parcels of timber in the future, which could affect fisheries riparian habitat and water quality.

(6) Effects to Fisheries and Aquatic Habitats from Renewable Energy (Common to All)

Proposed renewable energy program sites would be evaluated on a case-by-case basis. Renewable energy programs (i.e., hydroelectric, solar, and wind power generation) in the Bay planning area would generally be expected to be small. Effects from renewable energy programs on fish habitat may include runoff due to the presence of access roads and other structures, which may carry sediment and petroleum hydrocarbons. These programs would not likely affect the mortality of fish to the same degree as mineral resource development.

b) Effects to Fisheries and Aquatic Habitat for Alternative A

(1) Effects to Fisheries and Aquatic Habitat from Recreation Management (Alternative A)

The main impacts on fish would come from a potential for an increased number of OHV trails or roads under this Alternative, which may gather runoff and begin to rut, thereby leading to increased erosion and subsequent sedimentation of fish-bearing streams. It has been documented in Alaska that multiple stream crossings by OHVs can cause alterations of the stream bank's structure and function and may cause the introduction of sediment into the waterway (Weidmer 2002). Extensive adverse effects may occur to fish habitat located in areas of high OHV use.

(2) Effects to Fisheries and Aquatic Habitat from Minerals (Alternative A)

Leasable Minerals. Under Alternative A no lands would be identified as open for fluid mineral leasing. Impacts to fisheries and aquatic habitat would be minimal (where leasing is required to protect hydrocarbon resources from drainage) to non-existent from this activity under this Alternative.

Locatable Minerals. Impacts to fish would be similar in type to those discussed under Impacts Common to All Alternatives. Under Alternative A, few BLM lands not withdrawn under ANCSA 17(d)(1) withdrawals would be available for locatable mineral exploration and development in the planning area.

Salable Materials. There are approximately 1,176,269 acres available for the sale of mineral materials (i.e. sand and gravel). Measures to minimize impacts to fish habitat are considered on a case-by-case basis. Alternative A would have the greatest potential of all the Alternatives for impacts to fisheries habitat from salable minerals. Gravel mining activities conducted in fish-bearing streams or in tributaries to fish-bearing streams can block and reroute stream channels and increase silt concentrations resulting in reduced primary production, loss of invertebrate prey species, and disruption of feeding patterns for sight dependent feeders (Branson and Batch 1971, Cooper 1965). For general mining impacts to fisheries, see *Impacts Common to All Alternatives*.

(3) Effects to Fisheries and Aquatic Habitat from Lands and Realty (Alternative A)

ANCSA 17(d)(1) Withdrawals - Under Alternative A, no withdrawal review would take place and all ANCSA 17 (d)(1) withdrawals would remain in place. These withdrawals would protect fish habitat by excluding mineral leasing and, in some cases, locatable mineral entry.

Rights-of-Way - Rights-of-Way grants and easements may promote the construction of paved or unpaved access roads, gravel pads, railways, all of which may adversely affect fish habitat through runoff that may introduce sediment and contaminants into the water. Under Alternative A, avoidance or exclusion areas would be identified on a case-by-case basis for potential impacts.

(4) Effects to Fisheries and Aquatic Habitat from Recreation (Alternative A)

Under Alternative A, recreation management is custodial and impacts would be similar to those discussed under Impacts Common to All Alternatives. There are no SRMAs that would set recreation objectives or develop visitor use limits. Unmanaged trail proliferation would continue, with no guidance for proper construction and placement of new trails. Of all the Alternatives, Alternative A would have the most negative impacts to fish and fish habitat from recreation activities.

Recreation - Under Alternative A, recreation management is custodial and impacts would be similar to those discussed under Impacts Common to All Alternatives. There are no SRMAs that would set recreation objectives or develop visitor use limits. Unmanaged trail proliferation would continue, with no guidance for proper construction and placement of new trails.

Off-Highway Vehicles (OHV) - Under Alternative A, BLM-managed lands would remain undesignated and impacts would be similar to those discussed under Impacts Common to All Alternatives. There would be no SRMAs that would set recreation objectives or develop visitor use limits. Areas of high OHV use, and any correlations to areas that may include important fish habitat have not been identified. The unauthorized and unmanaged proliferation of trails would potentially increase under this Alternative, with a resulting potential for increase in erosion and sediment impacts.

(5) Effects to Fisheries and Aquatic Habitats from Wild and Scenic River Nominations (Alternative A)

Under Alternative A, there would be no Wild and Scenic Rivers recommended for designation under the National System. Additional protections and regulations to fish habitat would be outlined in the Stipulations, Required Operating Procedures, and project-specific approved Plans of Operations.

c) Effects to Fisheries and Aquatic Habitat for Alternative B

(1) Effects to Fisheries and Aquatic Habitat from Lands and Realty Actions (Alternative B)

Revoking existing ANCSA 17(d)(1) withdrawals that currently withdraw BLM lands from mineral entry could have a negative impact on fisheries and fish habitat with the potential for upcoming land-use development activities. Alternative B would revoke all ANCSA 17(d)(1) withdrawals to allow for increased mineral exploration and development. Potential effects of mineral development on fish habitat under this Alternative are described under Impacts Common to All Alternatives.

Disposal or exchange of BLM lands results in transfer of the land to the State of Alaska, Native corporations, individuals, and local governments. Alternative B identifies two parcels in the Iliamna East planning block and one parcel in on the Iliamna West planning block for disposal or land exchange. Under Alternative B, the lands that are considered for disposal do not provide key fisheries habitat, and have small influence on the fisheries resources. Should other BLM-administered lands currently selected by the State or Native corporations be rejected or revert back to BLM, those lands might also be considered for future exchange. Land disposal could result in loss of valuable fisheries habitat. Should BLM-managed lands be transferred to or exchanged with other Federal agencies (e.g., NPS or USFWS), fish resources would be managed under existing conservation and protective guidelines.

Rights-of-Way grants and easements may promote the construction of paved or unpaved access roads, gravel pads, railways, all of which may adversely affect fish habitat through runoff that may introduce sediment and contaminants into the water. Under Alternative B, avoidance or exclusion areas would be identified on a case-by-case basis for potential impacts.

(2) Effects to Fisheries and Aquatic Habitat from Minerals (Alternative B)

Fluid Leasable Minerals

Alternative B would revoke all ANCSA 17(d)(1) withdrawals to allow for increased fluid mineral leasing. Alternative B anticipates a baseline exploration and development scenario, at least approximately 1,142,775 acres of BLM-administered lands would be available for mineral leasing in the Bay planning area during the life of the plan. These lands in the Bay planning area are currently designated as having low development potential. Oil and gas operations could affect fisheries resources in several ways, as described below.

Effects from Seismic Surveys - Potential threats to overwintering fish from seismic surveys in the planning area would primarily stem from 1) stress associated with acoustic energy pulses transmitted into the ground directly over overwintering pools, and 2) physical damage to overwintering habitat caused by seismic vehicles. Large overwintering pools might allow fish to flee immediate areas of intense stress, whereas fish occupying small pools might not have that option. Depending on proximity, adult fish could suffer no more than temporary discomfort, whereas intense acoustical pulses could be lethal to juveniles. Given that overwintering habitat represents only a small percent of the planning area, it is unlikely that seismic transmissions would occur directly over overwintering sites with any degree of regularity. Furthermore, seismic crews could avoid known overwintering areas. Overall, any effects to overwintering fish caused by winter seismic surveys would be localized and would not be likely to have any effect on fish populations within the planning area.

Effects from Water Demand - Overwintering areas are limited to deep-water pools and channels in rivers and streams and to lakes deep enough to provide sufficient under-ice free water during winter. In standing waters, 7 feet is considered the minimum depth for supporting overwintering fish (Phillips Alaska, Inc. 2002). Moving waters may deter the thickening of ice, thereby providing overwintering habitat at shallower depths.

Under Alternatives B, C, and D, greater levels of water withdrawal would be expected in conjunction with the increased land available for exploration and development activities as compared to Alternative A.

Effects from Exploratory Drilling - Drilling operations require large amounts of water for blending into drilling muds. Operations also produce large amounts of rock cuttings. If an exploratory well were to be plugged and abandoned, drilling muds and cuttings would be re-injected into the bore hole. If the well were to go into production, muds and cuttings would be removed to an approved disposal site. Any chemical leaching into surrounding waters by cuttings temporarily being stored at the drill site could affect nearby fish habitat. Even though the disturbance under Alternatives B, C and D would be greater than the amount of disturbance under Alternative A, the prevention of drilling in rivers and streams would provide fish with adequate protection. In general, it is not expected that exploratory drilling would have a measurable effect on fish populations in and adjacent to the planning area under this Alternative.

Effects from Pad, Road, and Pipeline Construction - Impacts from pad, road, and pipeline constructions are mainly increased erosion and sedimentation, subsurface and surface flow disruption, and increased pollution in runoff.

Effects of Spills - Oil spills can have a range of effects on fish (Malins 1977; Hamilton et al. 1979; Starr et al. 1981). The specific effects depend on the concentration of petroleum present, the length of exposure, and the stage of fish development involved (eggs, larva, and juveniles are most sensitive). If lethal concentrations are encountered (or sub-lethal concentrations over a long enough period), fish mortality is likely to occur. Most acute-toxicity values (96-hour lethal concentration for 50 percent of test organisms)

for fish generally are on the order of 1 to 10 parts per million (ppm). Concentrations measured under the slicks of former oil spills at sea have been less than the acute values for fish and plankton. For example, concentrations of oil 1.6 to 3.3 feet beneath a slick from the Tsesis spill ranged from 50 to 60 parts per billion (Kineman et al. 1980). Extensive sampling following the Exxon Valdez oil spill also found hydrocarbon levels in the water column well below those known to be toxic or to cause sub-lethal effects in plankton (Neff 1991). The low concentration of hydrocarbons in the water column following even a large oil spill at sea appears to be the primary reason for the lack of lethal effects on fish and plankton.

Locatable Minerals. This Alternative would anticipate the greatest exploration and development for locatable minerals given the revocation of all ANCSA 17(d)(1) withdrawals. Dependent on gold prices, a moderate increase in small placer operations on BLM-managed lands could occur during the life of this plan. Large operations could be possible, but would most likely occur on State lands. Roads or infrastructure necessary for those operations, however, could cross BLM-managed lands. For general mining impacts to fisheries, see *Impacts Common to All Alternatives*.

The Required Operating Procedures (ROPs) common to Alternatives B, C, and D are designed to minimize or prevent impacts from erosion, altered stream flow, stream crossings, and riparian impacts. Strict adherence to the ROPs would minimize effects to fish and fish habitat within the planning area. The protection provided to fish and fish habitat under Alternatives B, C, and D would be superior to that provided under Alternative A.

Salable Minerals. There would be approximately 1,142,775 acres available for the sale of mineral materials under Alternative B. Under this Alternative and Alternatives C and D, Required Operating Procedures would minimize the effects of gravel extraction on fish by avoiding gravel mine sites within active channels. The protection provided to fish and fish habitat under Alternatives B, C, and D would be superior to that provided under Alternative A.

Gravel mining activities conducted in fish-bearing streams or in tributaries to fish-bearing streams can block and reroute stream channels and increase silt concentrations resulting in reduced primary production, loss of invertebrate prey species, and disruption of feeding patterns for sight dependent feeders (Branson and Batch 1971, Cooper 1965). For general mining impacts to fisheries, see *Impacts Common to All Alternatives*.

(3) Effects to Fisheries and Aquatic Habitat from Recreation (Alternative B)

Recreation management under Alternative B would be expected to be the same as that for Alternative A. Impacts to fish from recreational use would be the same as discussed under impacts for Alternative A.

(4) Effects to Fisheries and Aquatic Habitat from Off-Highway Vehicles (Alternative B)

Under Alternative B, BLM-managed lands would be designated as “open” to OHV use and, resulting in some continued localized impacts from erosion due mainly to unauthorized stream crossings. Locations that may include important fish habitat have not been identified. Inventoried OHV trails have authorized anadromous stream crossings with a permit from the State Department of Natural Resources. The unauthorized and unmanaged proliferation of trails could increase under this Alternative, with a resulting increase in erosion and sediment impacts. Potential adverse effects to fish habitat from OHV use are discussed under *Impacts Common to All Alternatives*. There are no SRMAs that would set recreation objectives or develop visitor use limits. Alternative B includes vehicle weight limits for limited areas to 2,000 pounds gross vehicle weight rating (GVWR includes load capacity), which would positively influence environmental conditions.

(5) Effects to Fisheries and Aquatic Habitat from Wild and Scenic River Nominations (Alternative B)

Under Alternative B, there would be no Wild and Scenic Rivers recommended for designation under the National System. Additional protections and regulations to fish habitat would continue to be limited to those outlined in the Stipulations, ROPs, and project-specific approved Plans of Operations.

d) Effects to Fisheries and Aquatic Habitat for Alternative C

(1) Effects to Fisheries and Aquatic Habitats from Minerals (Alternative C)

Fluid Leasable Minerals. The anticipated level of fluid mineral leasing under Alternative C would be the same as that identified under Alternative B, but would include retaining 17(d)(1) withdrawals for proposed Wild River segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres) as an interim measure to provide an opportunity for Congressional action. Retention of these 17 (d)(1) withdrawals would further minimize impacts to fish and fisheries habitat from oil and gas leasing activity. The potential level of oil and gas leasing activity would be slightly greater under Alternatives B and D than under Alternative C.

Locatable Minerals. The anticipated level of exploration and development for locatable minerals under Alternative C would be similar to that identified under Alternative B, but would include retaining 17(d)(1) withdraws for proposed Wild River segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres) as an interim measure to provide an opportunity for Congressional action. Retention of these 17 (d)(1) withdrawals would further minimize impacts to fish from what limited oil and gas leasing activity might occur. The potential level of locatable minerals activity could be slightly greater under Alternatives A and B than under Alternative C. The protection provided to fish and fish habitat under Alternatives B and C would be superior to that provided under Alternative A.

Salable Minerals. The anticipated level of exploration and development for salable minerals under Alternative C would be similar to that identified under Alternative B, but the following lands would be closed to sale: (1) Proposed Carter Spit ACEC (52,862 acres); (2) Proposed Bristol Bay ACEC (989,202); and (3) Retain 17(d)(1) withdrawals for proposed Wild River segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres) as an interim measure to provide an opportunity for Congressional action. There are approximately 1,176,269 acres available for the sale of mineral materials. Under Alternatives B, C, and D, Required Operating Procedures would minimize the effects of gravel extraction on fish by avoiding gravel mine sites within active channels. The potential level of salable minerals activity would be greater under Alternatives A and B, than under Alternative C. The protection provided to fish and fish habitat under Alternatives C and D would be superior to that provided under Alternative A.

(2) Effects to Fisheries and Aquatic Habitats from Lands and Realty (Alternative C)

Disposal or Land Exchange - Impacts are the same as those discussed under Alternative B.

Withdrawals - The anticipated level of withdrawals under Alternative C would be similar to those identified under Alternative B, but would include retaining 17(d)(1) withdrawals for the proposed wild river segments of Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres). The potential level of withdrawals would be greater under Alternatives A and C, than under Alternatives B and D. The protection provided to fish and fish habitat under Alternatives A and C would be superior to that provided under Alternative B and D.

Rights-of-Way - The anticipated avoidance area level for Rights-of-Way grants and easements under Alternative C would be similar to those identified under Alternative B, but the proposed Bristol Bay ACEC (989,202 acres) and the proposed Carter Spit ACEC (62,862 acres) would be identified as avoidance areas for Rights-of-Way. The potential level of avoidance for Rights-of-Way would be greater under

Alternatives C and D, than under Alternatives A and B. The protection provided to fish and fish habitat under Alternative C would be superior to that provided under Alternative A, B, or D.

(3) Effects to Fisheries and Aquatic Habitat from Recreation (Alternative C)

Off-Highway Vehicles - Under Alternative C, OHV use would be limited to existing roads and rails, providing less opportunity for potential impact to fisheries and aquatic habitat from OHV use than in Alternative A or B. Under this Alternative, OHV trails would be managed with the objective of minimizing the unmanaged proliferation of trails. Locations that may include important fish habitat have not been identified. Inventoried OHV trails have authorized anadromous stream crossings with a permit from the State Department of Natural Resources. Potential adverse effects to fish habitat from OHV use are discussed under Impacts Common to All Alternatives. There are no SRMAs that would set recreation objectives or develop visitor use limits. Alternative C includes vehicle weights limits for limited areas to 2,000 pounds gross vehicle weight rating (GVWR includes load capacity).

(4) Effects to Fisheries and Aquatic Habitat from Wild and Scenic Rivers (Alternative C)

Under Alternative C, BLM would propose Wild and Scenic River designation of identified river segments under the National System. The following river segments would be recommended for Wild and Scenic River designation: Alagnak River (626 acres), Goodnews River mainstem (7,138 acres), and Goodnews River Middle Fork (7,361 acres).

This designation would provide legal protections from adverse development and would provide a mechanism for management of the river's resources. Wild rivers would allow unobtrusive development and activities, but typically do not allow motorized use. Scenic rivers can allow motorized use, though mining and leasing operations must be conducted in accordance with the Stipulations, Required Operating Procedures and/or project-specific Approved Plans of Operations, if motorized use is tied to a project such as oil and gas exploration or development, locatable mineral exploration or development, or some other form of permitted activity. Recreational rivers contain the least stringent regulations, but activities must still not produce any adverse effects on the river and its immediate environment. Some recreational rivers would perhaps see increases in use levels, but in general these designations would provide increased protections for fish and fish habitat.

e) Effects to Fisheries and Aquatic Habitat for Alternative D

(1) Effects to Fisheries and Aquatic Habitat from Leasable, Locatable, and Salable Minerals (Alternative D)

Fluid Leasable Minerals. The anticipated level of mineral leasing under Alternative D would be the same as identified under Alternative C, but the Proposed Carter Spit ACEC (62,862 acres) and specific blocks of unencumbered land in the Bristol Bay area (Koggiling, Yellow Creek, Kvichak, Iliamna West, Alagnak, and Klutuk blocks (989,202 acres) would be subject to Stipulations, Required Operating Procedures, and other special requirements on a project-specific basis, such as seasonal restrictions. Such restrictions would further minimize potential impacts to fish and fisheries habitat from oil and gas leasing. The potential level of oil and gas leasing would be greater under Alternative B than under Alternatives A, C or D.

Locatable Minerals. The anticipated level of locatable mineral exploration and extraction under Alternative D would be the same as identified under Alternative C. All BLM lands would be subject to Required Operating Procedures. The potential level of locatable mineral exploration and extraction would be greater under Alternatives B, C, and D than under Alternative A.

Salable Minerals. The anticipated level of exploration and development for salable minerals under Alternative D would be similar as identified under Alternative B, but the proposed Carter Spit ACEC (62,862 acres) would be closed to sale. There would be approximately 1,176,269 acres of salable

materials available. Under Alternatives B, C, and D, the Required Operating Procedures would minimize the effects of gravel extraction on fish by avoiding gravel mine sites within active channels. The potential level of salable minerals activity would be greater under Alternatives A and B than under Alternative D. The protection provided to fish and fish habitat under Alternatives B, C, and D would be superior to that provided under Alternative A.

(2) Effects on Fisheries and Aquatic Habitat from Lands and Realty (Alternative D)

Rights-of-Way - The anticipated level of Rights-of-Way grants and easements under Alternative C would be similar to those identified under Alternative B, but the Carter Spit ACEC would be identified as an avoidance area for Rights-of-Way (62,862 acres). The potential level of impacts from Rights-of-Way would be greater under Alternatives A and B, than under Alternative C or D. The protection provided to fish and fish habitat under Alternatives C and D would be superior to that provided under Alternative A and B.

Off-Highway Vehicles - The anticipated impact of OHV use would be the similar to that identified under Alternative B, but would include limitations defined within the proposed Cater Spit ACEC.

Alternatives B, C, and D include vehicle weights limits for limited areas to 2,000 pounds gross vehicle weight rating (GVWR includes load capacity). OHV use under Alternative D would be restricted to existing roads and trails, resulting in fewer potential impacts to fish and fish habitat from unauthorized stream crossings or sedimentation into streams or rivers.

5. Direct and Indirect Effects to Wildlife and Wildlife Habitat

a) Direct and Indirect Effects to Wildlife Common for All Alternatives

Proposed management of the following resources/resource uses/programs would have no anticipated impacts to wildlife management: Air Quality, Fisheries Management, Special Status Species, Cultural Resources, Paleontological Resources, Visual Resources, Wilderness Characteristics, Public Safety, Forest Products, Social and Economic Conditions, and Subsistence.

(1) Effects to Wildlife from Soil, Water, and Vegetation (Common to all)

There would be beneficial effects to wildlife from proper management of soils, vegetation, and water resources. Implementation of mitigation measures to protect soil, water, vegetation, and air on a project specific basis would reduce disturbance to wildlife habitats and aid in the recovery of habitat from permitted uses.

(2) Effects to Wildlife from Fire and Fuels Management (Common to all)

A large percentage of the planning areas is comprised of herbaceous or shrub habitats. Fire is less prevalent in these vegetation types compared to boreal forests; therefore, effects of fire on wildlife and habitats are lower in the planning area than may be anticipated for Interior Alaska.

Fire has both direct and indirect effects on wildlife and their habitats. These effects are described in detail in the Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska (BLM 2004). Generally, the effects on habitat are much greater than the effects on resident animals. Short-term negative impacts from fire on resident wildlife include displacement, disruption of reproductive activities, and occasional mortalities. However, populations of certain species can recover quickly if suitable habitat is available. Adverse effects to current individuals are generally offset by the benefits of beneficial habitat changes for future generations.

Fire helps maintain a mixture of vegetation types and age classes that provide habitat and forage for a variety of wildlife. Fire alters habitats and may improve habitat components for some species while degrading habitat for other species. Over time, as vegetation recovers from fire disturbance, various species of wildlife will benefit from various successional stages of vegetation. Herbivores are directly affected by the changes in vegetative cover and forage associated with fire, whereas predators respond to both changes in cover and abundance of prey.

Wildlife has evolved in the presence of fire and has adapted to it. Overall, a natural fire regime has a beneficial effect on maintaining a diversity of wildlife and wildlife habitats. Grasses, sedges and herbaceous plants that quickly re-sprout after fire provide forage and cover for small mammals, wet and alpine tundra birds, and grazing species. Browsers such as moose, hares, and ptarmigan benefit from fire when trees and shrubs reestablish themselves. If fires are not too severe, sprouting of some shrub species will occur soon after burning.

Moose generally benefit from fire due to increased production of high quality browse for 23-30 years after fire (McCracken and Viereck 1990). Prescribed fires are a management tool used to increase moose habitat. Moose populations generally react in a strongly positive manner to areas with increased browse. The level of effect is variable, depending upon the health of the moose population prior to the fire and the amount of browse available. If browse is not a limiting factor on moose populations, then fire will have little impact on populations over the short-term (BLM 2004b).

The short-term effects of fire on caribou winter range are negative, and vary depending upon the severity of the burn. Lichens, which are primary winter forage for caribou, are highly susceptible to wildland fire. Impacts to habitat include reduced availability of forage lichens for up to 80 years after a fire (Klein 1982, Joly et al. 2003). On caribou summer ranges, forage quality of vascular plants is improved by fire. Fire also affects caribou movement patterns. Research has shown that caribou actively avoid burned areas for 35-50 years after a fire (Joly et al. 2003). Over the long-term, fire is likely beneficial to caribou as it helps maintain the ecological diversity of the habitat and may prevent mosses from out-competing forage lichens. Light fires may rejuvenate stands of lichen and replace old forest stands where lichen has been replaced by moss. Periodic fires create a mosaic of fuel types and fire conditions that naturally preclude large, extensive fires (BLM 2004b).

Fire is very rare in subalpine habitats used by Dall sheep. Fire may enhance sheep habitat by reducing encroachment of shrubs and spruce into subalpine habitats. Fire can also increase the amount or quality of herbaceous and graminoid forage available and reduce cover used by bears and wolves when hunting sheep.

Fire has both beneficial and negative effects on bears. Beneficial effects include increasing the availability of forage plants such as berries, grasses and forbs. On the negative side, some forage species may be reduced or temporarily eliminated by fire. Moose calves are an important prey item for both black and grizzly bears. Early stages of plant succession due to fire tend to increase moose production, resulting in more calves available for prey (BLM 2004b). Fire has little direct effect on grizzly bears as it is infrequent in tundra habitats and tundra fires tend to be small.

The effects of fire on furbearers are variable depending on the species. Carnivorous furbearers (e.g., coyote, fox, wolf, wolverine, lynx) respond to fire in a manner similar to their prey species, though there tends to be a lag period. If prey species benefit from fire, predators do as well. Snowshoe hares, voles, and other small mammals tend to respond positively to vigorous re-growth triggered by wild fires. Species such as marten and lynx tend to increase as well, tracking these prey species (Johnson et al. 1990). Fire is not common in the coastal habitats favored by Arctic foxes and so they are minimally affected. Herbivorous furbearers (such as muskrats) may benefit from fire due to rejuvenation of forage plants and maintenance of open water. Beavers may be negatively affected by severe fires until forage species recolonize the area.

Fire near wetlands can consume dead grass and sedges, opening up dense marsh vegetation to maintain habitat for waterfowl. Burning also stimulates new shoots that have greater forage value. Under the right conditions, fire may create new ponds or prevent old ponds from filling in with vegetation. Fire can have

short-term negative effects on waterfowl when it occurs during nesting or molting periods, or when it eliminates woody vegetative cover (BLM 2004b).

(3) Effects to Wildlife from Livestock Grazing (Common to all)

Livestock grazing permits could be considered on a case-by-case basis under any Alternative. Grazing by reindeer can indirectly impact wildlife by degrading habitat or reducing the availability of preferred forage species. The greatest potential for impact would be on caribou as they have the same forage requirements as reindeer. Reindeer remain in the same allotment yearlong, and may overuse lichen in localized areas. Reindeer herders utilize the same area year after year. This may result in reduction of lichen biomass in some areas and may decrease the opportunity and potential for the area to support caribou in key seasonal or life function habitats.

Herding activities may result in disturbance impacts to wildlife. These impacts would be negative, especially during stressful times such as winter or reproductive periods. Reindeer herders may attempt to separate their reindeer from caribou, resulting in disturbance impacts to caribou. Disturbance to wintering moose by reindeer herding activities may result in increased stress on these animals.

Effects of grazing on riparian, wetlands and stream habitats can decrease quality and quantity of fish habitat and productivity. Such impacts have indirect impact on terrestrial predators and scavengers such as bears, osprey, and eagles that are dependent upon abundant fish resources for food.

Authorization of grazing may negatively impact brown bear and wolf populations due to the increased number of predators harvested by reindeer herders in defense of life and property and predator control programs. Harvest of predators by reindeer herders in some parts of the Seward Peninsula, outside of the Bay planning area, has been substantial in the past (ADF&G 2002). From 1996 to 1998, nine bears were reported harvested in defense of life and property (DLP) in GMU 22. This reported total does not accurately represent the actual number of non-hunting kills due to low compliance with reporting requirements. Nelson (1993) estimated that an additional 10 to 30 bears were killed annually and not reported in GMU 22.

Approval of grazing permits may result in conflicts between wildlife management and reindeer grazing. ADF&G and the Federal subsistence program intensively manage caribou hunts and public outreach relative to caribou movement in areas that overlap with reindeer ranges in an attempt to reduce accidental harvest of reindeer by hunters in regions outside of the Bay planning area where reindeer grazing is currently engaged in.

Disease and parasite transmission between reindeer and caribou may negatively affect the caribou. Reindeer and caribou are the same species. If disease transmission did occur, it could have serious, negative impacts on the Mulchatna Caribou Herd and other herds in the planning area. Grazing associated with Special Recreation Permits (SRPs) could be authorized under all Alternatives on a case-by-case basis. Potential impacts include transmission of disease and parasites to wildlife from a variety of domestic animals; reduction of forage availability; and introduction of noxious or invasive plants from manure and feed carried in for pack animals.

(4) Effects to Wildlife from Hazardous Materials (Common to all)

Hazardous materials in the planning area have the potential to enter the food chain and contaminate wildlife species that are consumed by humans, causing negative health effects. This could occur in sport hunted species, and particularly in subsistence species where human consumption levels are higher. Hazardous materials may also directly and indirectly affect wildlife by causing direct mortality, reduced survival, and reduced productivity thereby reducing species abundance.

The hazardous materials program could have a beneficial effect on wildlife by identifying and rehabilitating hazardous sites.

(5) Effects to Wildlife from Fluid Mineral Leasing (Common to all)

Although Leasable Mineral development is not anticipated under every Alternative, some mineral-related activities may occur under any Alternative. Mining and oil and gas leasing could have adverse effects to wildlife species and important habitat. Ancillary infrastructure including separation ponds, pipelines, and roads would cause surface disturbance and loss of wildlife habitat. There is also potential for oil spills that would further degrade habitat. Where Rights of Way are associated with development on non-BLM-managed lands, or associated with mining or oil and gas leasing, there could be localized impacts to habitat, migratory patterns, and wildlife abundance and distribution. Direct habitat loss may also lead to wildlife displacement and habitat fragmentation. Surface disturbing activities may displace animals into lower quality habitat and increase competition for available resources with other species uses. Direct mortality of wildlife from vehicle collisions, oil associated with treatment and production facilities, hydrogen sulfide poisoning, oil field worker access, and enhanced access for non-oil industry related individuals would increase authorized and non-authorized harvests. Effects are likely to occur during construction and mineral extraction activities, and could cause long and short term effects resulting in permanent loss or alteration of wildlife habitat and disruption of migratory patterns. Direct and indirect impacts to fish and fish habitat may result in impacts to terrestrial predators and scavengers by reducing or contaminating forage sources.

(6) Effects to Wildlife from Minerals (Common to all)

Locatable Minerals. Locatable Mineral exploration and development to some degree may occur under every Alternative. Potential impacts to wildlife would include temporary displacement in localized areas, temporary and long term loss of habitat, long-term degradation of habitat, and possible direct mortality of small mammals or nestlings and brooding birds. Both direct and indirect impacts may be reduced under all Alternatives due to implementation of the Required Operating Procedures.

Salable Minerals. Mineral material mining and disposal has both direct and indirect impacts on wildlife and their habitat. Habitat is degraded or destroyed, depending upon the location of the material site. Some sites may recover to the original vegetation cover within a relatively short time frame. Other sites may never recover to the original vegetative cover due to loss of soil from the site. In some cases, disturbance to the site by mining of mineral materials may result in improved habitat for species which depend upon habitats in a low seral stage. Temporary displacement and disturbance impacts would occur to larger and more mobile animals. Direct mortality may result to smaller and less mobile animals such as lemmings, voles, or nestling birds. Both direct and indirect impacts may be reduced under all Alternatives due to implementation of mitigation measures developed during NEPA analysis of specific mineral materials actions.

Impacts to wildlife from mineral material mining and disposal would be minimal under most Alternatives. Sufficient material sources exist on private lands to meet the needs of most communities within the planning area. Under all Alternatives mineral material mining and disposal would occur in association with transportation infrastructure development and minerals development and would impact wildlife.

(7) Effects to Wildlife from Recreation Management (Common to all)

There may be impacts to wildlife from both commercial and non-commercial recreation activities. The primary impacts may be temporary stress, displacement, enhanced or excessive harvest, or habitat abandonment of wildlife due to recreational activities, or to recreation associated access (aircraft overflight and landing in remote areas). In areas that are repeatedly used for camping sites, there may be minor, site-specific degradation of habitat. Special recreation permits for guiding and outfitting game species may result in population effects to caribou, moose, and bears.

(8) Effects to Wildlife from Travel Management (Common to all)

The noise and activity associated with OHV use (including snowmachines) can adversely affect wildlife both directly and indirectly. Direct effects include stress and displacement of animals, possibly to less suitable habitats, especially in important seasonal habitats. Stress and displacement may result in reduced productivity (ADF&G 1990). Changes to traditional movement patterns, distribution and behavior

of wildlife, and increased harvest vulnerability, can result from exposure to OHVs. Wildlife are particularly vulnerable to disturbance at periods of time and in areas of concentration such as caribou calving grounds, or during stressful periods during life history (i.e. caribou and moose calving, post calving aggregations, winter habitats, bear natal dens and foraging concentrations, bird nesting and staging areas). OHV use may result in habitat abandonment or changes in density or species population, age, and sex composition in the vicinity of the trail.

Indirect effects include habitat degradation and alteration, and increased access into habitats. Remote areas will become more accessible over time as OHVs become more powerful and as the human population in the planning area increases. Improved technology and increased demand for resources may lead to increased harvest of wildlife. Snowmachine use compacts snow and may inhibit movement under the snow by small rodents. Fragile habitats such as wetlands and riparian areas may be degraded seasonally by OHV use.

(9) Effects to Wildlife from Renewable Energy (Common to all)

Renewable energy sources such as wind could be developed on BLM-managed lands within the planning area under all Alternatives. Should such development take place, there would be both direct and indirect impacts on wildlife. Direct impacts would include disturbance during construction and maintenance activities, mortality due to bird strikes on wind towers, and mortality of small, less mobile animals such as small mammals or nestling birds during construction and maintenance. Indirect impacts would include minor loss of habitat due to facility construction. Higher mortality may be expected if wind towers are sighted in bird movement corridors. To be most useful, these types of development need to be located near population centers. However, most land near villages is private. Due to the remoteness of BLM unencumbered lands, little renewable energy development is anticipated on BLM-managed lands, actual impacts would be minimal, and would not have population level effects. The increasing cost of fuel may make wind energy more cost effective in the future, including power for mineral development. At this time, solar energy technology options do not appear to have the potential for impact on wildlife on BLM lands. Limited opportunity for using available geothermal energy, and local, small scale opportunity for use of solar energy would result in insignificant impacts.

(10) Effects to Wildlife from Climate (Common to all)

The climate within the Bay planning area is described as maritime near the coasts, and more transitional farther inland. Current scientific evidence suggests the climate warming in Alaska can be linked to changes occurring in the structure and function of terrestrial ecosystems throughout the state. These changes include the thawing of permafrost, the conversion of tundra to more shrub habitats, and the drying and decrease in areas of closed basin lakes, causing alteration and conversion of wildlife habitats. Climate change has also been linked to changes in disturbance regimes such as fire potential and insect outbreaks, further affecting ecosystem processes and causing habitat changes in some areas. Warming climates may be instrumental in the introduction of disease and parasites previously unknown in the planning area, Current research suggests that these trends will continue, and will likely occur to a greater extent and magnitude at higher latitudes first. These climatic changes and subsequent habitat changes will impact wildlife by expanding habitats for some species, and limiting habitat for other species, thereby altering the distribution and abundance of some species, particularly those dependent on wetlands, tundra, shrub or closed forest habitats. BLM lands in the Bay planning area will be subjected to these climate and habitat changes.

(11) Effects to Wildlife from Lands and Realty Actions (Common to All)

There would be both direct and indirect impacts to wildlife from lands and realty actions under all Alternatives. Wildlife may be temporarily displaced or disturbed or movement patterns disrupted during activities authorized under this program. There may be direct mortality and/or habitat abandonment by wildlife species. Actions that increase access may create increased harvest opportunities. Wildlife habitat may be destroyed, fragmented, or degraded. Acquisitions and exchanges may benefit wildlife by

consolidating and protecting important wildlife habitats. Disposal action may fragment blocks of land, remove protections for wildlife habitats, and make them available for other uses detrimental to wildlife.

b) Effects to Wildlife for Alternative A

Under the current management system, Alternative A, compliance, monitoring, and mitigation requirements for wildlife are determined on a case-by-case basis during the permitting process.

(1) Effects to Wildlife from Soil, Water, and Vegetation Management (Alternative A)

Effects to wildlife from the soil, water, and vegetation management programs would be the same as those discussed under Common to All Alternatives.

(2) Effects to Wildlife from Realty and Lands Actions (Alternative A)

The nature of impacts would be the same as discussed under those Common to All Alternatives. Under this Alternative, no lands would be identified for disposal or land exchange, ANCSA 17(d)(1) mineral entry withdrawals would be retained. The degree of impacts that would occur to wildlife and wildlife habitat under this Alternative would be less than under Alternatives B, C, or D. Avoidance or exclusion areas and specific mitigation requirements would be identified on a case-by-case basis for Rights-of-Way, including access and utility corridors and ancillary facilities.

(3) Effects to Wildlife from Minerals (Alternative A)

Fluid Leasable Minerals. Under Alternative A, in some situations, BLM has the authority to lease lands where oil and gas is being drained. No lands would be open for fluid mineral leasing, with the exception of drainage from an adjacent ownership. In those areas, leases are subject to standard lease terms, including seasonal or other constraints. Geophysical exploration would be considered on a case-by-case basis. Impacts to wildlife would be the same as discussed under Common to All Alternatives.

Locatable Minerals. Under Alternative A, most BLM lands within the planning area would remain closed to locatable mineral entry due to existing ANCSA 17(d)(1) withdrawals. However, some BLM lands are open, and there are some active mining operations on BLM-managed lands where exploration or mining could take place or continue. Existing placer mining operations could continue. These operations and any future proposals for locatable minerals exploration and development would be subject to review through the administration of Plans of Operations. Measures to maintain the integrity of wildlife habitat in these areas would be implemented; where unavoidable, compensation for habitat loss would be identified and required as part of the individual mine operating plan.

Salable Minerals (Mineral Materials). Impacts to wildlife would be the same as under Impacts Common to All Alternatives. No impacts would be expected in areas withdrawn from mineral entry.

(4) Effects to Wildlife from Recreation Management (Alternative A)

Recreation Experience Opportunities - Under Alternative A, both commercial and non-commercial recreation would continue to be managed on a case-by-case basis. Consequently, no areas would be identified for commercial or non-commercial use limits, and impacts to wildlife associated with these activities would continue to be handled on a case-by-case basis. No recreation facility construction would be considered, which could lead to localized habitat degradation at heavy-use dispersed camp sites. Kinds of impacts to wildlife would be the same as discussed under those Common to All Alternatives.

Special Recreation Management Areas - Under Alternative A, no Special Recreation Management Areas would be established. Impacts to wildlife would be the same as those discussed under Common to All Alternatives.

Visual Resource Management - Under Alternative A, no VRM classes would be established in the Bay planning area. Impacts to wildlife would be the same as those discussed under Common to All Alternatives.

(5) Effects to Wildlife from Travel Management (Alternative A)

Kinds of impacts to wildlife would be the same as discussed under Impacts Common to All Alternatives. Under Alternative A, there would be no OHV designations within the Bay planning area. No vehicle weight limit would exist, and there would be no route restrictions. Cross country travel would be allowed everywhere on BLM-administered lands within the Bay planning area. The degree of potential impacts to wildlife and wildlife habitat would be greater than in Alternatives C or D.

(6) Effects to Wildlife from Special Management Area Designations (Alternative A)

Wild and Scenic Rivers - Under Alternative A, no Wild and Scenic Rivers would be recommended in the Bay planning area. These areas would therefore be open to all multiple use activities permitted on BLM lands except for mineral exploration and development in most areas. Impacts to wildlife from those activities would be the same as those discussed for each activity under Common to All Alternatives.

Area of Critical Environmental Concern - Under Alternative A, no Areas of Critical Environmental Concern would be recommended in the Bay planning area. BLM would manage wildlife habitat and would address concerns on a case-by-case basis during the review of permits. No habitat management plan would be developed for wildlife habitat.

c) Effects to Wildlife for Alternative B

(1) Effects to Wildlife from Soil, Water, and Vegetation Management (Alternative B)

There would be beneficial impacts to wildlife from proper management of soils, water, and vegetation resources. Implementation of Required Operating Procedures, stipulations, and project-specific requirements would reduce disturbance to wildlife habitats and would assist the recovery of habitat from permitted uses.

(2) Effects to Wildlife from Realty and Lands Actions (Alternative B)

Land Exchanges - Large blocks of BLM-managed lands would be retained in Federal ownership, reducing the potential for habitat fragmentation. Small isolated parcels identified in Alternative B for disposal could result in privatization of some tracts and could increase levels of access and human activity in wildlife habitat. Wildlife may be displaced from preferred habitats, and habitat may be destroyed or degraded. Exchanges could result in larger, contiguous blocks of BLM lands that are of high wildlife value. Land would have to meet the criteria for disposal in the Federal Land Policy Management Act (FLPMA).

Withdrawals - ANCSA 17(d)(1) withdrawals would be revoked under this Alternative. Because of the constraints currently in place under these withdrawals, rejection of the withdrawals could increase potential resource development and wildlife and habitat disturbing activities. Associated impacts to wildlife and wildlife habitat would be expected from minerals exploration and development and infrastructure development. Proposals would be handled on a case-by-case basis, and would be subject to Required Operating Procedures and Stipulations.

Rights-of-Way - Impacts to wildlife from Rights-of-Way would be the same as those in Alternative A.

(3) Effects to Wildlife from Minerals (Alternative B)

Fluid Leasable Minerals

Under Alternative B, ANCSA 17(d)(1) withdrawals would be removed. Because of the constraints currently in place under these withdrawals, removal of the withdrawals could increase resource development and wildlife and habitat disturbing activities. Potentially wildlife and habitat disturbing activities associated with oil and gas exploration and development would be limited in footprint. However, another risk to wildlife and wildlife habitat would be presented by the possibility of an oil, fuel, or diesel spill. Impacts to wildlife from leasable minerals could come from several activities.

Seismic Exploration - Seismic exploration would have direct impacts on wildlife, including temporary disturbance or stress on wildlife. In one study, seismic activities within 1.15 miles of a grizzly bear den caused changes in heart rate and movement of the female bear and cubs (Reynolds et al. 1986). The investigators suggest that seismic testing activities within approximately 600 feet of the den may cause abandonment of the den.

For approximately the past 15 years, the Mulchatna Caribou Herd has been inconsistent and unpredictable in its choice of overwintering and calving areas within the larger herd range (Hinkes et al. 2005). In spring 2006 there are two large calving groups, one located near Lime Village and the other located south of Koliganek, in a generalized area that includes BLM unencumbered lands. Caribou are also in the Goodnews Bay area this year (J. Denton 2006, Pers. Comm.). Planning for seismic exploration on BLM lands in the Bay planning area for a time when caribou are not present could prove challenging with such unpredictable behavior.

The National Research Council's report, *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* (2003), suggests that the optimum time to conduct seismic activities in caribou winter range and primary calving areas is in summer when caribou are not present. However, even in winter on winter range, the Committee believed that direct effects on caribou in the National Petroleum Reserve - Alaska in the 1970s and 1980s from low intensity two-dimensional (2-D) surveys with low seismic line density were temporary and minor (NRC 2003). Wintering bands of caribou tend to be small and often widely dispersed, so few caribou would have come in contact with seismic activities at the same time. Additionally, Roby (1978, NRC 2003) suggests that caribou appear least sensitive to human-induced disturbance during winter.

Dyer and others (2001) suggests that avoidance of seismic lines and the attendant human activity could reduce caribou's ability to avoid areas of deep snow. Bradshaw and others (1998) propose that the energy costs of multiple encounters with seismic disturbance could increase winter weight loss and reduce calf production and survival (NRC 2003).

Information about the effects of noise on moose was gathered for the Mackenzie Gas Project in Canada (AMEC 2005). In a 1974 study recording the response of moose in the Richardson Mountains to fixed-wing aircraft, McCourt and others found that of 46 observations, moose reacted visibly to aircraft overflights of less than 60 meters of altitude 55% of the time, and to overflights of 60 meters to 180 meters 37.5% of the time. Moose are known to avoid roads, pipelines and seismic lines (Horesji 1979, Rolley and Keith 1980, Morgantini 1984, Rudd and Irwin 1985, Singer and Beattie 1986, Jalkotzy et al. 1997). Horesji (1979) also reported that moose were less likely to be found within 1 km of seismic lines while seismic operations were underway.

Based on data from prior studies, caribou, moose, and bears can all be hazed away from their habitats by seismic testing. The following factors would be key in the degree of effects:

- The timing and location of tests and whether caribou, moose, or bears are present or absent.
- The number of seismic lines involved, the amount of temporary infrastructure developed, and the amount of ancillary human activity accompanying the testing, including helicopter activities.
- The total duration and intensity of the project or cumulative projects in a specific area.
- The type of testing, subsurface or above ground; 2-D or 3-D procedures.

Seismic camps may provide additional food sources for foxes and bears at dumpster sites near the galley and dining halls and at dump sites (Eberhardt et al. 1982, Rodrigues et al. 1994). However, seismic crews are required by stipulation to incinerate and remove waste materials from BLM lands. This activity is not expected to enhance the survival of foxes. Bears would generally be hibernating during seismic exploration it is carried out in winter, and so would not be expected to be affected by human sources of food. Testing by helicopter-supported ground crews could easily be done in summer months (which has been the case in the past) and so would also be expected not to be a source of impacts.

Small mammals (lemmings, voles) and their predators would be affected locally at camps and along seismic lines by direct mortality and loss of habitat. The numbers lost would be insignificant in the greater population.

Should seismic surveys occur during winter months, many birds are absent from the region. Overwintering birds including ravens, ptarmigan, and gyrfalcons could be temporarily displaced by seismic activities. In the unlikely event that a seismic operation extended into May, disturbance of early breeding season activities of some species could occur. Because the campsites and survey areas are occupied for relatively brief periods, and most of the birds are dispersed in relatively low numbers over a large area, the duration of disturbance incidents is likely to be brief and infrequent. Stipulations, Required Operating Procedures, and project-specific requirements such as those describing seasonal activities and buffers, for example, would be available to minimize potential impacts.

Indirect impacts to wildlife from seismic operation may include degradation of habitat (impacts to soil and vegetation) due to seismic exploration. These types of impacts would be reduced by implementation of the Required Operating Procedures, including limiting seismic surveys to the winter when the ground is frozen and covered with snow.

Exploratory Drilling - Effects to wildlife from exploratory drilling for oil and gas or coal would be similar to those discussed under seismic exploration. As exploratory drilling should occur during winter, potential disturbance would come primarily from aircraft and surface traffic, and activities associated with road and drill pad construction. Numerous studies show that wildlife such as caribou react to low flying aircraft by exhibiting various behaviors from panic to strong escape responses (Calef et al. 1976). Disturbance reactions to each incident with aircraft would be brief, lasting only minutes to less than one hour; however, effects of cumulative incidents must also be considered. Wildlife may be temporarily disturbed from ground traffic and activities associated with ice road construction. Wildlife may temporarily avoid the local area but would reoccupy the area after the exploration activities were complete. Small and less mobile animals such as lemmings and voles may suffer direct mortality during ice road or pad construction. These losses would not result in population level effects.

Development - Based on the Reasonably Foreseeable Development Scenario, one site in the Koggiling Block of BLM lands is explored and potentially developed for natural gas and a pipeline is constructed to Dillingham. Using this scenario, the following effects could occur.

Although initial construction could occur primarily during winter, development of oil and gas resources would bring year-round facilities and activities to wildlife habitat on BLM unencumbered lands in the southern part of the Nushagak - Kvichak drainages. Potential effects of development activities include direct habitat loss for bears, caribou, moose, waterfowl, small mammals and their predators, and other animals from gravel mining and oil field facilities, and indirect habitat loss through reduced access caused by physical or behavioral barriers created by roads, pipelines, and other ancillary facilities, and by road and air traffic. Depending on location and season, oil and gas activities, and human conduct in areas where waterfowl, caribou, moose, bear and other species occur could result in increased disturbance and mortality to individual animals from routine aircraft operations, gravel-mining operations, presence of gravel pads and facilities, associated improved human access for vehicle and foot traffic from both workers and the general public.

For example, the National Research Council (2003) found that intensive oil and gas development on the North Slope has altered the distribution of female caribou during the summer insect season, and that elsewhere a network of roads, pipelines, and facilities has interfered with caribou movements between

coastal insect relief and inland feeding areas. Radio-collared female caribou west of the Sagavanirktok River shifted their calving concentration area from developed areas near the coast to undeveloped areas inland, to an area of lower green-plant biomass. During a six year period parturition rates of radio-collared females in regular contact with oil-field infrastructure were lower than those of undisturbed females, exacerbated by intense insect harassment during the period. Possible consequences of these disturbances include reduced nutrient acquisition and retention throughout the calving and midsummer periods, poorer condition in autumn, and a lowered probability of producing a calf the following spring (NRC 2003).

Disturbance and stress impacts would be similar to those discussed under Seismic Exploration, but would be more extensive and long term due to the yearlong exposure. Various species could be affected to some extent by disturbance events such as passage of aircraft, although most incidents are expected to result in negligible effects from which individuals would recover within hours to one day. However, the cumulative effect of repeated disturbance could extend for longer periods and potentially may adversely affect physiological condition, reproductive success, productivity, and the use of key seasonal and life function habitats.

Disturbance impacts to grizzly bears would be similar to those discussed under seismic impacts. A similar effect could occur from construction activities within 600 feet of dens. The National Research Council (2003) found that oil and gas activities on Alaska's North Slope had changed the demographics of the grizzly bear population. Harding and Nagy (1980) found that grizzly bears initially avoid human settlements because of the noise and disturbance, but if the area includes an important food source, some bears are likely to habituate to the noise and human presence, leading to an increase in encounters and mortalities.

Fox populations also increase, primarily because of the availability of human food sources. One concern is that increasing fox populations could affect regional populations of some bird species.

Development of infrastructure in the region would increase potential hunter access by road and airstrip and would enhance opportunity for both legal and unauthorized harvest of wildlife as well as introduce injury or mortality factors such as vehicle collisions. Contaminated food, hydrogen sulfide gas poisoning, and other oil-development related sources could contribute to increased wildlife mortality. Defense of life and property mortality for brown bears could increase with increase in human residence and increased presence of human food. Increased access to caribou, moose, bears, and migratory waterfowl for sport and subsistence hunting could increase the number of animals taken with the development of additional roads and landing strips.

Other effects on birds observed at other oil and gas sites in Alaska include shifts in nesting distribution of shorebirds and artificially high densities of ravens and gulls (NRC 2003).

Effects of Oil, Gasoline, or Diesel Spills - Oil or diesel spills and water treatment pits could negatively affect wildlife in several ways. Animals may be coated with oil or diesel and suffer from loss of thermal insulation, loss of flight capability, and buoyancy; breathe toxic aromatics; ingest oil during grooming; or absorb toxic hydrocarbons through the skin. Oil or diesel may be ingested through contamination of forage or prey.

Oil may adhere to birds' feathers, causing the feathers to lose their insulating capabilities, resulting in hypothermia (Patten et al. 1991). This effect would be particularly severe for birds that come in contact with water where feather integrity is necessary to maintain their water-repellent qualities and buoyancy. Birds could also suffer toxic effects from ingestion of oil by consumption of food contaminated by a spill or from oil ingestion resulting from preening oiled feathers (Hansen 1981). Oil contacting bird eggs could cause toxic effects to embryos (Patten and Patten 1979, Stickel and Dieter 1979). Oil could come in contact with eggs directly as a result of a spill, or indirectly from oiled feathers of incubating adults.

A spill occurring during the summer breeding, fledging, and molting seasons would have a greater impact on birds than a spill occurring during the winter, when most birds are on wintering grounds. Cleanup of spilled oil during periods when water is ice-covered or during periods of broken ice, and lingering oil may

be present and may be hazardous to spring migrating birds. Lingering effects from a winter spill could impact returning birds during the following breeding season if clean up activities did not adequately remove contaminants from bird habitats. In addition, oiled carcasses of dead birds could also be hazardous to scavenging birds and mammals.

Adult caribou may ingest, inhale, or absorb toxic hydrocarbons through the skin. The oiling of young calves could reduce their thermal insulation, leading to death (BLM and MMS 1998). Control and clean up operations at a spill site would frighten caribou and moose away from the spill and would limit the likelihood that they would ingest oiled vegetation.

If an oil spill were to contaminate grizzly bear habitat, some bears (and other predators and scavengers, such as bald eagles) would likely ingest contaminated food. An oiling experiment on captive polar bears indicated that if a bear's fur becomes oiled and the bear ingests a considerable amount of oil while grooming, kidney failure and other complications could lead to the bear's death (Oritsland et al. 1981). One young bear on the Shelikof Strait Coast in an area effected by the EXXON Valdez oil spill, was observed to have oil on its fur and to be consuming oil contaminated foods. The bear died with high concentrations of aromatic hydrocarbons in its bile and might have died from oil ingestion (Lewis and Sellers 1991).

Treatment - Clean up response may result in temporary disturbance and displacement of wildlife, or may put wildlife at risk. Bears in Katmai National Park were observed seeking out and rolling in fuel-contaminated soil that had been removed from a contaminated site and was being treated in another location (McClenahan 2006, Pers. Comm.). This behavior has been commonly observed in logging areas where equipment waste oil dump sites are used by bears in a similar way (Denton 2006, Pers. Comm.).

Chemical dispersants, used to treat spills, break up substances such as oil into small droplets. They contain surfactants. They should only be used when the associated impacts of dispersed oil are less harmful than non-dispersed oil. All wildlife in the dispersant target zone should be identified prior to approving the use of dispersants. Birds within the dispersant target zone should be hazed or they should be captured if they become contaminated. Dispersants should not be applied where there are large concentrations of birds (FWS 2005).

Locatable Minerals

This Alternative would anticipate the greatest exploration and development for locatable minerals given the revocation of all ANCSA 17(d)(1) withdrawals. Dependent on gold prices, a moderate increase in small placer operations on BLM-managed lands could occur during the life of this plan. Large operations could be possible, but would most likely occur on State or Native lands. Roads or infrastructure necessary for those operations, however, could cross BLM-managed lands.

Approximately 1,176,269 acres would be available for locatable mineral entry. Existing placer mining operations would continue. Approximately 3,999 acres would remain withdrawn due to other withdrawals. Existing mining operations and any future proposals for locatable minerals exploration and development would be subject to review and Required Operating Procedures through the administration of Plans of Operations. Measures to maintain the integrity of wildlife habitat in these areas would be implemented; and where unavoidable, compensation for habitat loss would be identified and required as part of the individual mine operating plan.

The Required Operating Procedures (ROPs) common to Alternatives B, C, and D are designed to minimize or prevent impacts to wildlife and wildlife habitats. Strict adherence to the ROPs would minimize effects to wildlife and wildlife habitat within the planning area. The protection provided to wildlife and wildlife habitat under Alternatives B, C, and D would be superior to that provided under Alternative A.

Salable Minerals (Mineral Materials)

Impacts to wildlife would be the same as under Impacts Common to All Alternatives. No impacts would be expected in areas withdrawn from mineral entry.

(4) Effects to Wildlife of Off-highway Vehicles (Alternative B)

Impacts to wildlife would be the same as those discussed under Common to All Alternatives. Under Alternative B, all lands would be open to OHV use, a vehicle weight limit of 2000 GVWR would exist, and there would be no route restrictions. In the Bay planning area, vehicles weighing 2000 GVWR currently are the vehicles of choice off established highways, and so establishing the vehicle weight limit would do little to change the current situation with regard to effects to wildlife and wildlife habitat. Lack of restrictions in this Alternative would mean that cross country travel would be allowed everywhere on BLM-administered lands within the Bay planning area. Wildlife harvest could potentially increase and impacts of access could affect important wildlife habitat, and access to important seasonal and life function habitats could still occur. Impacts from OHVs on fish and fish habitat might impact terrestrial predators and scavengers by altering availability, seasonal abundance, and distribution of important fish-related food resources.

(5) Effects to Wildlife of Recreation Experience Opportunities (Alternative B)

Under Alternative B, lands would be managed as roaded natural under the Recreation Opportunity spectrum. Impacts to wildlife would be the same as those in Alternative A.

(6) Effects to Wildlife of Recreation -Special Recreation Management Areas (Alternative B)

Under Alternative B, lands would be managed as an Extensive Recreation Management Area. Wildlife impacts would be mitigated with Required Operating Procedures, Stipulations, and other conservation actions.

(7) Effects to Wildlife of Visual Resource Management (Alternative B)

Under Alternative B, all lands would be managed under VRM class IV. This classification could result in fragmentation of wildlife habitat and may indirectly affect population distribution, productivity and movements.

(8) Effects to Wildlife of VRM in Special Management Areas (Alternative B)

Under Alternative B, no Special Management Areas are proposed. BLM lands would be managed under VRM class III. This classification could result in fragmentation of wildlife habitat and may indirectly affect population distribution, productivity and movements outside of the viewshed.

(9) Effects to Wildlife of Special Management Area Designations - Wild and Scenic Rivers Effects on Wildlife (Alternative B)

Under Alternative B, the impacts to wildlife would be the same as for Alternative A.

(10) Effects to Wildlife of Special Management Area Designations - Area of Critical Environmental Concern (Alternative B)

Impacts to wildlife would be the same as in Alternative A.

d) Effects to Wildlife for Alternative C***(1) Effects to Wildlife from Soil, Water, Air, and Vegetation Management (Alternative C)***

There would be beneficial impacts to wildlife from proper management of soils, water, and vegetation resources. Implementation of Required Operating Procedures, stipulations, and project-specific

requirements would reduce disturbance to wildlife habitats and would assist the recovery of habitat from permitted uses.

(2) Effects to Wildlife of Realty and Lands Actions (Alternative C)

Land Exchanges - Impacts to wildlife for land exchanges and acquisitions would be the same as for Alternative A.

Withdrawals - Actions addressing ANCSA 17(d)(1) withdrawals would be the same as in Alternative B, except for withdrawals on proposed wild river segments on the Alagnak, Goodnews mainstem and Goodnews Middle Fork (97,344 acres) would be retained until Congress had had an opportunity to act. This would be beneficial for wildlife habitat.

Rights-of-Way - Impacts to wildlife from Rights-of-Way would be the same as in Alternative A, with the exception that the proposed Bristol Bay and Carter Spit ACECs would be identified as avoidance areas. This would conserve important wildlife habitats and high interest species.

(3) Effects to Wildlife of Minerals (Alternative C)

Fluid Leasable Minerals

Under Alternative C, ANCSA 17(d)(1) withdrawals to mineral entry would be removed, with the exception of 15,125 acres in the Alagnak, Goodnews and Goodnews Middle Fork Rivers, where (d)(1) withdrawals would be retained until Congress has had an opportunity to act. The retention of the withdrawal would conserve wildlife habitat within these areas. Outside those areas, removal of the withdrawals could increase potential resource exploration and development and wildlife and habitat disturbing activities. Impacts to wildlife would be the same as under Impacts Common to all Alternatives.

Locatable and Salable Minerals (Alternative C)

Locatable Minerals - The effects to wildlife of Locatable Minerals would be the same as those in Alternative B, except segments of the Alagnak River, the mainstem of the Goodnews River, and the Goodnews Middle Fork, the proposed Carter Spit ACEC, and the proposed Bristol Bay ACEC would be closed to mineral entry. Conservation of these areas would benefit fish and wildlife by protecting important habitats.

Salable Minerals (Mineral Materials) - Same as Alternative A except the proposed Carter Spit ACEC, the proposed Bristol Bay ACEC, and segments of the Alagnak, Goodnews mainstem and Goodnews Middle Fork rivers proposed for Wild and Scenic River designation would be closed to mineral sales. This Alternative would provide the highest benefit to wildlife populations by protecting important river and coastal habitats.

(4) Effects to Wildlife of Off-highway Vehicles (Alternative C)

Under Alternative C, all lands would receive a "limited" designation for OHV use, which would require vehicles to stay on existing trails whenever possible. A vehicle weight limit of 2000 pounds would be proposed. These restrictions would benefit wildlife by reducing proliferation of trails and degradation of habitats, and would reduce the indirect impacts to wildlife created by noise and disturbance, causing abandonment from preferred habitats.

(5) Effects to Wildlife of Recreation Experience Opportunities (Alternative C)

Under Alternative C, the entire recreation area setting would be managed as semi-primitive motorized. Impacts to wildlife would be the same as those common to all Alternatives.

(6) Effects to Wildlife of Recreation - Special Recreation Management Areas (Alternative C)

Impacts to wildlife would be the same as those identified in Alternative B.

(7) Effects to Wildlife of Visual Resource Management (Alternative C)

Under Alternative C, portions of the planning area would be managed under VRM Class III up to 5 miles from established trail systems and National Conservation Units. All other BLM lands would be managed at VRM Class IV. This Alternative would offer some benefit to wildlife near areas where development is more restricted, but would still result in loss of habitat and restriction of movement to wildlife and may indirectly affect population distribution and productivity.

(8) Effects to Wildlife of Visual Resource Management in Special Management Areas (Alternative C)

Under Alternative C, lands in the proposed Carter Spit and Bristol Bay ACECs and the Alagnak, Goodnews and Middle Fork Goodnews proposed as National Wild and Scenic Rivers would be managed under VRM class III. This classification could result in less fragmentation of wildlife habitat and could indirectly positively affect population distribution, productivity and movements, and could benefit wildlife by conserving habitat within the viewshed in the two ACECs and three proposed Wild and Scenic Rivers.

(9) Effects to Wildlife of Special Management Area Designations - Wild and Scenic Rivers (Alternative C)

Under Alternative C, segments of the Alagnak, Goodnews mainstem and Middle Fork Goodnews rivers would be proposed as Wild and Scenic Rivers, closed to mineral exploration or development. These actions would be beneficial to wildlife by protecting riparian habitats from disturbance and providing undisturbed wildlife habitats to riparian species.

(10) Effects to Wildlife of Special Management Area Designations - Areas of Critical Environmental Concern (Alternative C)

Under Alternative C, the Carter Spit ACEC (62,862 acres) and the Bristol Bay ACEC (989,202 acres) would be proposed. These designations would benefit wildlife populations by proposing development of Habitat Management Plans that would to mitigate impacts from development and other resource uses.

e) Effects to Wildlife for Alternative D

(1) Effects to Wildlife from Soil, Water, Air, and Vegetation Management (Alternative D)

There would be beneficial impacts to wildlife from proper management of soils, water, and vegetation resources. Implementation of Required Operating Procedures, stipulations, and project-specific requirements would reduce disturbance to wildlife habitats and would assist the recovery of habitat from permitted uses.

(2) Effects to Wildlife of Realty and Lands Actions (Alternative D)

Land Exchanges - Impacts to wildlife habitat would be the same as those discussed for Alternative B.

Withdrawals - Impacts to wildlife habitats from removing ANCSA 17(d)(1) withdrawals would be the same as those in Alternative B.

Rights-of-Way - Impacts to wildlife from Rights-of-Way would be the same as those for Alternative A; however, the proposed Carter Spit ACEC would be identified as an avoidance area for Rights-of-Way.

(3) Effects to Wildlife of Minerals (Alternative D)

Leasable Minerals. Under Alternative D, ANCSA 17(d)(1) withdrawals would be removed. Because of the constraints currently in place under these withdrawals, removal of the withdrawals could increase potential resource development and wildlife and habitat disturbing activities. Impacts to wildlife would be the same as under Impacts Common to All Alternatives.

Portions of the leasable lands in the Goodnews Block and the Bristol Bay area would be open to leasing, subject to seasonal and other minor constraints (included in project-specific requirements). In addition, Required Operating Procedures and Stipulations would be required. However, impacts to wildlife in all Alternatives would still occur, but potentially to a lesser degree.

Locatable Minerals. Impacts to wildlife of Locatable Minerals would be the same as for Alternative B, except that the proposed Carter Spit ACEC would be subject to more stringent Required Operating Procedures and project-specific requirements.

Salable Materials (Mineral Materials). Impacts to wildlife would be the same as for Alternative B, except the Carter Spit ACEC (62,862 acres) would be closed to mineral sales. This Alternative would benefit wildlife populations by protecting important riverine and coastal habitats.

(4) Effects to Wildlife of Off-highway Vehicles (Alternative D)

Under Alternative D, all lands would be designated as limited to OHV use, which requires vehicles to stay on existing trails whenever possible. A maximum vehicle weight of 2000 pounds would be designated. These restrictions would benefit wildlife by reducing the proliferation of trails and degradation of habitats, and would reduce the indirect impacts to wildlife of noise and disturbance, and wildlife abandonment from preferred habitats. In addition, OHV limitations in the proposed Carter Spit ACEC would be developed to meet the proposed objectives of the Special Management Area. These limitations would benefit wildlife by protecting riverine and coastal habitats in the ACEC.

(5) Effects to Wildlife of Recreation Experience Opportunities (Alternative D)

Impacts to wildlife would be the same as those discussed in Alternative C.

(6) Effects to Wildlife of Recreation - Special Recreation Management Areas (Alternative D)

Impacts to wildlife would be the same as those discussed in Alternative B.

(7) Effects to Wildlife from Visual Resource Management Effects on Wildlife (Alternative D)

Under Alternative D, portions of the planning area would be managed under VRM Class III up to 1 mile from certain rivers and National Conservation Units. All other BLM lands would be managed at VRM Class IV. This Alternative would offer some benefit to wildlife near areas where development is more restricted, but would still result in loss of habitat and restriction of movement to wildlife and could indirectly affect population distribution and productivity. This Alternative would offer less protection to wildlife than Alternative C, but more than Alternatives A and B.

(8) Effects to Wildlife from VRM in Special Management Areas (Alternative D)

Under Alternative D, lands in the Carter Spit would be managed under VRM Class III. This classification could result in less fragmentation of wildlife habitat and may indirectly affect population distribution, productivity and movements, and would benefit wildlife by conserving habitat within the Carter Spit ACEC. This Alternative would provide less wildlife habitat conservation than Alternative C, but more than Alternative A or B.

(9) Effects to Wildlife from Special Management Area Designations - Wild and Scenic Rivers (Alternative D)

Impacts to wildlife would be the same as in Alternative A.

(10) Effects to Wildlife from Special Management Area Designations -Area of Critical Environmental Concern (Alternative D)

Under Alternative D, the Carter Spit ACEC (62,862 acres) would be proposed. This designation would benefit wildlife populations in this area by preparing a Habitat Management Plan that would further plan to mitigate impacts from development and other resource uses.

6. Direct and Indirect Effects for Special Status Species: Fish, Wildlife, and Vegetation Species

Direct and Indirect Effects for Special Status Fish Species

There are no known Special Status fish species in the Bay planning area.

Direct and Indirect Effects for Special Status Wildlife Species

Proposed management of the following resources, resource uses or programs would have no anticipated effects on Special Status Animal Species: Cultural Resources, Paleontological Resources, Visual Resources, Forest Products, Fisheries Management, Wild and Scenic Rivers, Social and Economic Conditions, and Subsistence.

a) Direct and Indirect Effects to Special Status Wildlife Species Common to All Alternatives

(1) Effects to Listed Species (Common to All)

Four listed species are present or potentially present in the Bay planning area: *Numenius borealis*, the Eskimo curlew (extremely rare or extinct; has not been seen in the Bay planning area); *Polystricte stelleri*, Steller's eider; *Eumetopias jubatus*, Steller sea lion (there are no sea lion haulouts on BLM lands in the Bay planning area); and *Somateria fischeri*, spectacled eider. Of those, the Eskimo curlew is an "accidental species," or one that does not breed regularly or occur annually in western North America. Curlews are shorebirds that breed in tundra-covered mountainous areas in summer and winter on ocean beaches.

The Steller sea lion is not likely to be found on BLM lands in the Bay planning area. The only ocean beaches under BLM jurisdiction in the planning area are in Goodnews block, and there are no known sea lion haulouts on coastal BLM lands there.

The Steller's eider and the spectacled eider are diving ducks. They inhabit coastal tundra habitats during spring and fall migration. They spend much of their lives at sea. The Carter Spit area and the adjacent spits and wetlands in the Goodnews Block are important to the Steller's eider and the spectacled eider, which are present during spring and fall migration. The area provides important staging and tundra nesting, molting and brooding habitat (Larned 1998, Seppi 1997, Shaw et al. 2005) among the tundra lakes and ponds.

(2) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation (Common to all)

Wildlife Special Status Species would benefit from proper management of soil, water, air and vegetation resources in the planning area. Implementation of mitigation measures to protect these resources on a

project-specific basis would reduce disturbance to habitat of special status wildlife and would facilitate the recovery of habitat from permitted uses.

(3) Effects to Special Status Wildlife Species from Fire and Fire Management (Common to all)

Listed Species - Effects on Steller's and spectacled eiders are described in more detail in the Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska Environmental Assessment (BLM 2004). Both of these species are Federally listed as threatened.

Fire within the breeding habitat of either eider species could have negative effects on the breeding population. However, fire frequency in the wet tundra habitat of the coastal Bay planning area is very low, and the threat of wildland fires to the breeding population of Steller's and spectacled eider and their habitat is negligible. Since fire frequency is so low in these habitats, no fire suppression activity would be likely to occur on BLM-administered lands and there would be no impacts from suppression activities to eiders or their habitat. There is no designated critical habitat within the Bay planning area.

Candidate Species - Fire within the breeding habitat of Kittlitz's murrelet, which uses talus slopes of high mountain habitats for nesting, could have negative effects on the breeding populations. However, fire is rare in these mountainous habitats, and there is rarely adequate vegetation to burn on unstable rock falls and talus slopes. The threat of wildland fire to breeding Kittlitz's murrelet is negligible. Since fire frequency is so low in these habitats, no fire suppression activity would be likely to occur and there would be no impacts from suppression activities. Other than nesting, this bird inhabits ocean waters and bays, and so would not otherwise be impacted by fire or fire suppression activities.

BLM Sensitive Species - Some sensitive species would benefit from fire suppression that minimizes loss of individuals, populations, or habitats. However, fire suppression activities can also affect sensitive species through mortality, disturbance, displacement, and damage or alteration of key habitat components (BLM 2004b).

It is difficult to generalize impacts of fire on passerine birds due to the great variety of habitat requirements. Shrub communities often support the greatest number and diversity of passerine birds (Spindler and Kessel 1980, Kessel 1989). Shrub communities are maintained by periodic fires. Within forested areas, fire creates openings in the forest and provides snags used for nesting, perching, and foraging. Fire may cause direct impacts to birds when it occurs during the nesting season, killing nestlings and destroying nests. Raptors may benefit from fire due to increased populations of small mammals and birds in response to vegetative changes after fire. The timing of the benefit varies depending upon the type of prey favored by the raptor. Over the short-term, fires reduce cover available for prey species, making them more visible to hunting raptors and other predators.

Fire suppression activities also cause both direct and indirect impacts to wildlife. Wildlife habitat may be destroyed, fragmented, or degraded due to construction of fire breaks or use of OHVs. Small mammals may be killed by the use of mechanized equipment. Mitigation measures designed to reduce the impacts of suppression activities include limitations on the use of tracked, or off-road vehicles; measures to prevent the introduction of invasive or noxious plant species; establishment of riparian buffer zones; and rehabilitation of fire and dozer lines. These types of impacts are expected to be minimal within the planning area as most BLM-managed lands are well removed from the road system, minimizing the potential for the use of mechanized equipment.

Potential direct and indirect effects from fire management include:

- Mortality or injury of adults, young, or eggs from smoke inhalation, or crushing by vehicles or equipment used during fire management activities.
- Disturbance or displacement of individuals from smoke, noise, and other human activities associated with fire management operations. This disturbance or displacement may affect foraging, roosting, or reproductive behavior.
- Nest abandonment or mortality of young, resulting in the loss of one year's recruitment.
- Loss or conversion of key habitat components needed for nesting, foraging, roosting, or cover.

- Creation of key habitat components.
- Increased risk of predation associated with removal of cover.
- Changes in the quantity or quality of available forage and prey species.
- Long-term changes in habitat quality or quantity for nesting, roosting, foraging, or cover that affects the ability of a species continuing to occupy an area or facilitating the return of a species to its historic range.

(4) Effects to Special Status Wildlife Species from Livestock Grazing (Common to all)

Special Status wildlife species that are found or that have the potential to be found in the Bay planning area are birds, which are only present during spring and fall migration for feeding, molting and brooding, generally in the Goodnews Block of BLM-administered lands. Currently there are no livestock grazing or reindeer herding operations in the Bay planning area, and no interest has been expressed for decades. It is unlikely that this type of activity would be a source of impact. Should such activities take place, potential impacts might include trampling of vegetation, cratering and exposure of mineral soils by grazing animals, potential direct mortality of nestling birds or eggs of ground nesting species due to trampling by grazing animals, or by OHVs used in association with herding activities.

(5) Effects to Special Status Wildlife Species from Minerals (Common to all)

Locatable Minerals. Some mining exploration and development activity could occur under any Alternative. Potential impacts to Special Status wildlife would include temporary disturbance or displacement in very localized areas, temporary loss of habitat, long-term degradation of habitat, and possible direct mortality of nestling birds or eggs. These impacts would be minimal due to the low level of activity anticipated, and the temporary nature of the activity.

Mineral Materials. *Impacts from mineral material acquisition and disposal would be negligible under all Alternatives. Sufficient material sources exist on State and private lands located nearer to most communities than BLM-administered lands. One exception is mineral materials needed for oil and gas development. These impacts are discussed under fluid leasable minerals, Alternatives B, C, and D.*

(6) Effects to Special Status Wildlife Species from Recreation Management (Common to all)

Minor impacts to Special Status wildlife could occur from both commercial and non-commercial recreation activities under all Alternatives. The primary impacts would be temporary stress and displacement of individual animals due to recreational activities, or to recreation associated access such as aircraft overflight and landing in remote areas. In areas that are repeatedly used for camping sites, there may be minor, site-specific degradation of habitat. OHV use associated with commercial recreational activities could occasionally result in mortality of nestlings and eggs of ground nesting birds. Given the low to moderate level of recreational use on most BLM-managed lands within the planning area, these impacts would be minimal and would not have population level effects.

(7) Effects to Special Status Wildlife Species from Renewable Energy (Common to all)

Impacts to Special Status wildlife would be the same as those described under wildlife, common to all Alternatives. There is a potential for bird mortality due to collisions with wind turbines. Some of the avian mortality could involve Special Status Species, particularly if wind-generating facilities were located within breeding habitats for these species. Since BLM unencumbered lands in the Bay planning area are fairly remote from villages, use of BLM lands for development of such projects is unlikely during the life of this plan.

(8) Effects to Special Status Wildlife Species from Lands and Realty Actions (Common to all)

Upon completion of conveying BLM selected lands to the State and Native corporations, anticipated by 2010, only approximately 5% of lands in the Bay planning area will remain in BLM jurisdiction. These lands are generally remote, and the numbers and kinds of Realty actions that will be required would be limited under any Alternative. While there would be both direct and indirect impacts to Special Status wildlife under all Alternatives, including temporary displacement and disturbance during activities authorized under this program, those impacts would be expected to be low, and to affect a very small percentage of BLM-managed land in the planning area. Impacts would vary among species depending on the proposal, the species' range, life history, and habitat preferences.

b) Effects to Special Status Wildlife Species for Alternative A

(1) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation (Alternative A)

Impacts would be the same as they are today. Proposals would be managed on a case-by-case basis. Projects would have project-specific guidelines.

(2) Effects to Special Status Wildlife Species from Livestock Grazing (Alternative A)

Impacts would be the same as they are today. Proposals would be managed on a case-by-case basis. Projects would have project-specific guidelines.

(3) Effects to Special Status Wildlife Species from Minerals (Alternative A)

Leasable Minerals. No impacts to Special Status wildlife under this Alternative would occur because all BLM lands in the Bay planning area would remain withdrawn from Leasable Mineral entry under ANCSA 17(d)(1).

Locatable Minerals. Impacts to Special Status wildlife under this Alternative from locatable minerals would be similar to those for leasable minerals. Most of the BLM lands in the Bay planning area would remain withdrawn from Locatable Mineral entry under ANCSA 17(d)(1).

Salable Minerals. Impacts to wildlife would be the same as for Locatable Minerals. No impacts would be expected in areas withdrawn from mineral entry.

(4) Effects to Special Status Wildlife Species from Recreation Management (Alternative A)

There would be minor impacts to special status wildlife from both commercial and non-commercial recreation activities. The primary impacts would be temporary stress and displacement of individual animals due to recreational activities, or to recreation associated access, such as aircraft overflight and landing in remote areas. In areas that are repeatedly used for camping sites, there may be minor, site-specific degradation of habitat. OHV use associated with commercial recreational activities could occasionally result in mortality of nestlings and eggs of ground nesting birds. Recreational use of most BLM-managed lands within the planning area is believed to be low to moderate. The described impacts would be expected to be minimal and would not have population level effects.

(5) Effects to Special Status Wildlife Species from Travel Management (Alternative A)

The planning area would remain undesignated with regard to OHV use, and so the impacts would remain similar to today, with some possible increase in intensity should population increase. Currently effects from OHVs on BLM-administered lands is limited to areas immediately adjacent to villages, to areas between the Alagnak River and Lake Iliamna, and to portions of the Goodnews Block. Most access to BLM unencumbered lands is by aircraft or by boat. No vehicle weight limits would be recommended; however, off-road vehicles in use today on the remote BLM-administered lands in the Bay planning area

are 2,000 pounds GVWR. Impacts from heavier vehicles would not be expected during the life of this plan.

(6) Effects to Special Status Wildlife Species from Special Designations (Alternative A)

No ACECs or Wild and Scenic River designations would be proposed under this Alternative.

c) Effects to Special Status Wildlife Species for Alternative B

(1) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation Management (Alternative B)

There would be beneficial impacts to special status wildlife from proper management of soils, water, air, and vegetation resources. Implementation of Stipulations and Required Operating Procedures would reduce disturbance to special status wildlife habitats and assist in the recovery of habitat from permitted uses. Proactive management of vegetative resources would benefit Special Status wildlife. Vegetation would be managed to maintain a diversity of habitats. Proactive management to prevent introduction and spread of invasive and noxious plants would help maintain habitats in good condition.

(2) Effects to Special Status Wildlife Species from Livestock Grazing (Alternative B)

Impacts would be the same as discussed under Common to All Alternatives.

(3) Effects to Special Status Wildlife Species from Minerals (Alternative B)

Leasable Minerals

Under this Alternative, ANCSA 17(d)(1) withdrawals would be removed, and all unencumbered BLM lands would be open for mineral leasing. Potential impacts would be of several kinds:

Seismic Exploration - Seismic exploration would only occur in the Koggiling Block, in the south central portion of the planning area, during the life of this plan based on the Reasonable Foreseeable Development Scenario. This area includes habitat for the geese and the trumpeter swan, the eiders, the sea ducks, the gray-cheeked thrush, and the olive-sided flycatcher. In the event that seismic exploration occurs during the winter months, there would be no effect on these species as they are not present in the planning area at this time.

However, summer geophysical work, including field sampling would involve helicopter support and could have negative effects on these species depending on the location of the work in relation to their habitat. Summer seismic work, including aircraft overflights would have temporary and non-lethal effects on special status wildlife, the effects probably lasting less than an hour (BLM 2003b). Elevated activity and air traffic in the vicinity of large summer camps could result in minor impacts on both local and regional populations of these species. The Steller's eider, the spectacled eider, all but two of the other sea ducks, the geese, and the trumpeter swan are ground nesters in tundra habitats. The eggs and the nestlings could be susceptible to trampling or crushing. Depending on the nature of the effects and the nature and duration of behavioral changes caused by disturbance, such effects could be considered a "taking" under the Endangered Species Act for the listed species.

It is not known if lynx, a sensitive species, inhabit the Koggiling Creek block, which is largely a tundra environment. Isolated patches of forest along drainages may provide sufficient habitat for lynx, who seek boreal forest settings. Lynx have been observed at Brooks River in Katmai National Park, for example. Lynx may be temporarily disturbed or displaced by seismic activities, with reoccupation of the area after the exploration activities are complete.

Indirect impacts to special status wildlife from seismic operations may include degradation of habitat through impacts to soil and vegetation. These types of impacts would be minimized by implementation of the Stipulations and Required Operating Procedures, including limiting seismic exploration to the winter when many of these species are not present.

Exploratory Drilling for Oil and Gas - Based on the Reasonable Foreseeable Development Scenario for oil and gas, exploratory drilling would only be expected to occur in the Koggiling Block in the planning area, which may be utilized seasonally by migratory waterfowl, including the Federally- listed threatened Steller's eider and spectacled eider, and by a number of sensitive migratory waterfowl species, including the Tule white-fronted goose, the dusky Canada goose, isolated instances of the trumpeter swan (whose summer concentrations tend to be northeast of Koggiling Block) (Seppi 2006, Pers. Comm.), the king eider, the long-tailed duck, the black scoter, the surf scoter, and the red-throated loon. Other migratory waterfowl on the sensitive species list would be considered to be rare or accidental visitors to the Koggiling Block. Sensitive species of land birds that may be found in the Koggiling Block include the rusty blackbird, the gray-cheeked thrush, the olive-sided flycatcher, and the blackpoll warbler. The American peregrine falcon and the Arctic peregrine falcon, two sensitive species, might also be present in the Koggiling Block. All of these birds, if present, are in this area during spring through fall. Exploratory drilling in the Koggiling Block if carried out in the winter would not affect these species. Lynx, a possible year-round inhabitant of the Koggiling Block, may be temporarily disturbed or displaced by exploratory drilling, with reoccupation of the area after the exploration activities are complete.

Oil and Gas Development - Although construction would occur primarily during winter, development would bring year-round facilities and activities to the Koggiling Block in the planning area, which includes seasonal habitat for migratory waterfowl, including the Federally- listed threatened Steller's eider and spectacled eider, and for a number of sensitive migratory waterfowl species, including the Tule white-fronted goose, the dusky Canada goose, isolated instances of the trumpeter swan (whose summer concentrations tend to be northeast of Koggiling Block), the king eider, the long-tailed duck, the black scoter, the surf scoter, and the red-throated loon. Other migratory waterfowl on the sensitive species list would be considered to be rare or accidental visitors to the Koggiling Block. Sensitive species of land birds that may be found in the Koggiling Block include the gray-cheeked thrush, the olive-sided flycatcher, and the blackpoll warbler. The American peregrine falcon and the Arctic peregrine falcon, two sensitive species, might also be present in the Koggiling Block. All of these birds, if present, are in this area during spring through fall. Oil and gas development in the Koggiling Block would have the potential to affect these species directly and indirectly. Lynx, a shy creature and a possible year-round inhabitant of the Koggiling Block, would also be potentially affected. Potential sources of disturbance would be ground vehicles, humans on foot, and low-flying aircraft associated with oil development. Potential effects would include direct and indirect habitat loss. Direct loss of habitat would result from gravel mining and gravel deposition on the tundra for roads, pads, and airstrips. Indirect habitat loss could occur through reduced access caused by physical or behavioral barriers created by roads, pipelines, and other facilities.

The oil and gas development activities with the greatest potential for causing loss of habitat are gravel mining and placement (BLM 2005b). Roads and pads are constructed using gravel, and tundra covered by gravel would no longer be available for nesting, brood-rearing, or foraging for those tundra-nesting threatened and sensitive migratory waterfowl species listed above and others that use this habitat. This loss of habitat would continue for as long as the proposed development was in operation. If abandonment plans called for allowing gravel pads and roads to "bed" naturally, loss of habitat might extend considerably longer than the end of the operational life of the field. Under this Alternative, development of one gas discovery could affect approximately 1,280 acres in the Koggiling Block. Because of the density of migratory waterfowl use of this area, this potential loss of breeding, feeding and staging habitat for most species would likely result in some population effects. To provide perspective, there are 159,732 acres of unencumbered BLM land in the Koggiling Block, of which 48,230 acres or roughly 30%, are wetlands and open water (lakes, ponds, streams and rivers).

Steller's and spectacled eiders may use the Koggiling Block during spring migration and during fall migration for feeding, molting and staging. Currently Steller's eiders and spectacled eiders breed along the coastal fringe of the Yukon-Kuskokwim Delta, and so, while a few may breed and brood in the planning area, no impacts to eiders at a population level are anticipated.

Effects of Oil, Gasoline, or Diesel Spills - The Reasonable Foreseeable Development Scenario for Oil and Gas development in the planning area includes assumptions that only one field would be developed over the life of the plan, and it would be natural gas. Potential impacts related to this field would include potential associated mechanical equipment and storage facility spills (for example, fuel bladders). Impacts to special status species would be similar to those discussed under Wildlife, Effects of Spills in a previous section. Most of the BLM sensitive species occurring in the planning area are migratory birds that are only found in the area from spring through fall. The area where an oil or diesel spill might occur includes habitat for migratory waterfowl, including the Federally-listed threatened Steller's eider and spectacled eider, and for a number of sensitive migratory waterfowl species, including the Tule white-fronted goose, the dusky Canada goose, isolated instances of the trumpeter swan (whose summer concentrations tend to be northeast of Koggiling Block) (Seppi 2006, Pers. Comm.), the king eider, the long-tailed duck, the black scoter, the surf scoter, and the red-throated loon. Other migratory waterfowl on the sensitive species list would be considered to be rare or accidental visitors to the Koggiling Block. Sensitive species of land birds that may be found in the Koggiling Block include the gray-cheeked thrush, the olive-sided flycatcher, and the blackpoll warbler. The American peregrine falcon and the Arctic peregrine falcon, two sensitive species, might also be present in the Koggiling Block. All of these birds, if present, are in this area during spring through fall. The Canada Lynx might also be present in the Koggiling Block. Oil spills onto tundra, into freshwater, or into marine habitats could negatively impact these species. Birds may be oiled, causing feathers to lose their insulating ability, resulting in hypothermia. This effect would be more severe in fresh water and marine habitats than in tundra habitats. Birds could also suffer toxic effects from inhalation of hydrocarbon aromatics and from ingestion of oil from preening or oil contaminated foods (Hansen 1981). Oil contacting bird eggs could cause toxic effects to embryos (Patten and Patten 1979, Stickel and Dieter 1979).

A spill occurring in the spring to fall migrating, staging, breeding, molting season would have greater impact than a spill occurring during the winter when most of these species are on wintering grounds. However, lingering effects from a winter spill could impact birds during the following breeding season.

Steller's and spectacled eiders are believed to breed outside of the Koggiling Block of the Bristol Bay area, but likely migrate through the area. Although it is outside of their primary breeding area on the Yukon-Kuskokwim Delta, it is possible that a few Steller's or spectacled eiders breed in the area; however, they do move through the area during migratory seasons (Seppi 2006, Pers. Comm.), and so a few individual eiders could potentially be affected by a spill.

Locatable Minerals

Impacts would be the similar to those discussed under Impacts Common to All Alternatives. However, under Alternative B, ANCSA 17(d)(1) withdrawals would be removed and lands currently closed to locatable mineral exploration and development would be open. Based on the Reasonable Foreseeable Development Scenario for Locatable Minerals (RFD), two types of mining activity could take place in the Bay planning area, lode mineral exploration and development and placer mining. Should locatable mineral activity occur on every existing operation, an estimated total of 115 acres could potentially be disturbed in the Bay planning area, including 14 acres on BLM unencumbered land, 36 acres on State-selected land, 47 acres on Native-selected land, and 18 acres on active Federal claims on Native land. These existing operations are all small. While removal of the ANCSA 17(d)(1) withdrawals would open BLM unencumbered lands to the potential for more mineral exploration and development, it is most likely that should any placer mining projects occur they would occur at sites of existing operations, at locations where mineral deposits are already known to exist.

Lode Mineral Activities - Lode mineral activities in the Goodnews Bay area could occur on BLM unencumbered lands at Tatlignagpeke Mountain and at Mitlak Mountain within the life of this plan. The RFD suggests that the platinum group elements (PGE) content of Tatlignagpeke Mountain might be explored during the life of this plan, with disturbance on BLM unencumbered land projected sometime before 2026.

Additionally, lode activities could occur on Native-selected lands at the Wattamuse-Granite Lode property, in the Kasna Creek area at South Current Creek and Upper South Current Creek properties, in the Kijik Lake area at the Dicks Lode, Gull, and Kijik Mountain properties, and in the Pebble Copper area at Hill 1759. On State-selected lands, lode operations could occur in the Iliamna/Fog area at the Dutton, Easy, Karen, and Meadow properties.

While migratory waterfowl move through the Goodnews Bay corridor in very large numbers during migratory seasons and many of the species listed above can be found nesting on BLM lands in the Goodnews Block, they probably would be unlikely to be found in these mountainous areas. However, BLM sensitive species that might seek out this kind of habitat during breeding and nesting season are the rare Kittlitz's murrelet, the marbled murrelet and the harlequin duck, all of which are sea birds that nest inland at higher elevations. The sensitive American peregrine falcon and the arctic peregrine falcon might also be found in these areas.

Overall, projected lode mineral activities on BLM lands in the Bay planning area are not anticipated to have a population-level effect on any BLM Special Status animal species during the life of this plan.

Placer Mineral Activities - Placer mineral activities in the Goodnews Bay area could occur at the Barnum Creek, Domingo Creek, Faro Creek, and Jacksmith Creek Tributary on BLM unencumbered land, which could result in surface disturbance to a total of 14 acres of BLM unencumbered lands. Placer activities on selected land includes Slate Creek, which could result in disturbance to a total of 36 acres on selected land. Placer activities on the Arolik River, Malaria Creek, Snow Gulch, Tyrone Creek, and Wattamuse Creek in the Goodnews area, and lands in the Iliamna/Fog area and unnamed property west of Chekok on selected land could impact up to 47 acres of selected land. An additional 18 acres on active Federal claims on Native land could be disturbed on the Salmon River.

All locatable mineral related activities occurring on BLM-managed land are subject to current BLM surface regulations as outlined in 43 CFR 3809. Operators are required to have an approved Plan of Operations which contains site-specific guidelines as listed in the BLM-Alaska Required Operating Procedures. All operations are required to meet applicable Federal and State air and water quality standards for permitting. Placer mineral activities are not expected to have population-level effects on any BLM Special Status animal species during the life of this plan.

Salable Minerals (Mineral Materials)

Salable material (sand and gravel) activities on Federally administered surface/minerals and split estate are available for exploration and development unless specifically closed by Public Land Order (PLO). Approximately 1,176,269 acres of BLM unencumbered lands are available for the sale of mineral materials. Native-selected lands would be made available if their selections are revoked or relinquished. An additional 3,000 acres are closed to material sales due to withdrawals other than 17(d)(1).

As discussed in a previous section, sand and gravel would be needed for the construction of access roads and gravel pads should oil and gas exploration and development go forward in the Koggiling Block sometime in the future. Since the entire Bay planning area consists of glacial rubble, large reserves of salable material exist on State and Native land, much of it in greater proximity to villages and potential oil and gas project sites than BLM unencumbered lands. No disturbance of BLM unencumbered land is anticipated for this purpose during the life of this plan. Should BLM unencumbered land be judged to be the closer and more practical source of these materials for an oil and gas-related project, because the materials are so common, borrow pits can be selected carefully so as to avoid impacts to other resources.

Should they occur, mineral materials projects would require an approved Plan of Operations containing Required Operating Procedures based on site-specific resource concerns and would be subject to all BLM and State laws and regulations. No effects from mineral materials projects to BLM Special Status animal species are anticipated during the life of this plan.

(4) Effects to Special Status Wildlife Species from Recreation Management (Alternative B)

Impacts would be the same as discussed under Alternative A.

(5) Effects to Special Status Wildlife Species from Travel Management (Alternative B)

Impacts would be the same as discussed under Alternative A.

(6) Effects to Special Status Wildlife Species from Special Designations (Alternative B)

No special designations would be proposed under Alternative B.

d) Effects to Special Status Wildlife Species for Alternative C

(1) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation (Alternative C)

Impacts would be the same as discussed under Alternative A.

(2) Effects to Special Status Wildlife Species from Livestock Grazing (Alternative C)

Impacts would be the same as discussed under Alternative A.

(3) Effects to Special Status Wildlife Species from Minerals (Alternative C)

Leasable Minerals. Impacts to Special Status wildlife species from Leasable Mineral activities would be greater than in Alternative A, and would be similar to those in Alternative B. Based on the Reasonable Foreseeable Development Scenario, Leasable Mineral exploration and development would consist of one site, potentially located in the Koggiling Creek Block of BLM unencumbered land, for gas exploration and development. Development probably would not occur during the life of the plan. Because it is part of a proposed Area of Critical Environmental Concern, any project proposal for this location would include Stipulations, Required Operating Procedures, and project-specific requirements.

Locatable Minerals. Impacts to Special Status wildlife under this Alternative would be the same as discussed under Alternative B. However, based on the Reasonable Foreseeable Development Scenario, proposed projects would be expected to most likely occur on BLM unencumbered lands in the Goodnews Block, outside of the proposed Carter Spit ACEC. Two types of Locatable Mineral activity could occur, exploration and development of placer mines, and exploration and development of lode mines. No Special Status wildlife species would be expected to be affected by placer mining in the Goodnews Block; however, the Kittlitz's murrelet nests along most coastal regions from southwestern to western Alaska (Day et al. 1999). The scarcity of breeding records makes determination of exact breeding range difficult. Nesting habitat consists of unvegetated scree slopes or steep, rocky slopes. Nesting sites are most often inland, up to 16 miles from the coast (Kessel 1989). This species is sparsely distributed within the planning area. The only potential nesting area where a risk to the habitat might exist is on the scree-covered slopes of lode-bearing mountains on BLM-administered lands in the Goodnews block. To date no Kittlitz's murrelets have been observed nesting in that area.

Salable Minerals. Impacts from Mineral Materials would be the least under Alternatives A and C. The Carter Spit and Bristol Bay ACECs would be closed to use of Salable Minerals. Additionally, because of the ready availability of mineral materials from State and Native corporation lands, it is unlikely that BLM-administered lands would be utilized for their extraction for oil and gas or other infrastructure-development projects. The Koggiling Block, potential site of future oil and gas development, is located in the proposed Bristol Bay ACEC. It would be closed to development of Mineral Materials, which would have to be brought in from lands other than BLM unencumbered lands in this area.

(4) Effects to Special Status Wildlife Species from Recreation Management (Alternative C)

Impacts would be the same as discussed under Impacts Common to All Alternatives.

(5) Effects to Special Status Wildlife Species from Travel Management (Alternative C)

Impacts to special status wildlife from OHV use and travel management would be similar to that discussed under Common to All Alternatives but would be fewer because the planning area would be designated as "limited" to designated roads and trails. Additional restrictions such as seasonal closures might be implemented within ACECs. The proposed Carter Spit ACEC and Bristol Bay ACEC could receive additional protection from OHV impacts.

(6) Effects to Special Status Wildlife Species from Lands and Realty (Alternative C)

Impacts would be the same as under Impacts Common to All Alternatives.

(7) Effects to Special Status Wildlife Species from Special Designations (Alternative C)

Designation of 1,052,065 acres as ACECs and proposing an additional 15,125 acres as Wild Rivers would provide additional protection of special habitats. Designation of the two ACECs would provide protection to the threatened Steller's eider and spectacled eider and to the list of sensitive migratory birds that utilize the flyways that pass through the Goodnews Bay and Bristol Bay areas for feeding, resting, and molting during the spring and fall migrations, and some that use the areas for nesting and brooding.

Determination of three river segments as suitable for designation as wild under the WSR Act would provide some additional protection of habitats for Special Status Species using these habitats.

e) Effects to Special Status Wildlife Species for Alternative D

(1) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation (Alternative D)

Impacts would be the same as discussed under Impacts Common to All Alternatives.

(2) Effects to Special Status Wildlife Species from Livestock Grazing (Alternative D)

Impacts would be the same as discussed under Impacts Common to All Alternatives.

(3) Effects to Special Status Wildlife Species from Minerals (Alternative D)

Leasable Minerals. Impacts would be the same as discussed under Alternative C, except that no Bristol Bay ACEC would be proposed. However, the Koggiling Creek Block would be open to Leasable Mineral exploration and development subject to seasonal and other minor constraints as well as Stipulations and Required Operating Procedures.

Locatable Minerals. Impacts would be the same as discussed under Alternative C, except that no Bristol Bay ACEC would be proposed. Locatable Mineral projects would be expected to be outside of the proposed Carter Spit ACEC.

Salable Minerals. Impacts would be the same as discussed under Alternative B. The Carter Spit ACEC would be closed to Salable Minerals.

(4) Effects to Special Status Wildlife Species from Recreation Management (Alternative D)

Impacts from Recreation Management would be the same as discussed in Alternative C.

(5) Effects to Special Status Wildlife Species from Travel Management (Alternative D)

Impacts from Travel Management would be the same as discussed in Alternative C.

(6) Effects to Special Status Wildlife Species from Lands and Realty (Alternative D)

Impacts would be the same as discussed in Alternative B.

(7) Effects to Special Status Wildlife Species from Special Designations (Alternative D)

Impacts to Special Status wildlife would be similar to those discussed under Alternative C except that only one ACEC, the Carter Spit ACEC, would be proposed, and no rivers would be determined suitable. There would be less protection of waterfowl habitat on portions of the Alagnak and Goodnews rivers and in the Bristol Bay area.

Direct and Indirect Effects for Special Status Vegetation and Rare Vegetation Species

Proposed management of the following resources, resource uses or programs would have no anticipated effects on Special Status Plants: Cultural Resources, Paleontological Resources, Visual Resources, Forest Products, Renewable Energy, Lands and Realty Actions, Wildlife and Wildlife Habitat, Fisheries Management, Wild and Scenic Rivers, Social and Economic Conditions, and Subsistence.

a) Direct and Indirect Effects to Special Status Vegetation Species Common to All Alternatives

One BLM Sensitive Species of plant is located within the planning area, *Smelowskia pyriformis*, or pear-fruited smelowskia. It has been located in the western Alaska Range north of the planning area and in the southernmost Kuskokwim Mountains in the Goodnews Bay region (Drury and Rollins 1952; Hultén 1968; Murray 1981; Murray and Lipkin 1987; Parker 1994; Rollins 1993; Welsh 1974).

(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation (Common to all)

Special Status Species of plants would benefit from proper management of soil, water, air and vegetation resources in the planning area. Implementation of mitigation measures to protect these resources on a project-specific basis would reduce disturbance to habitat of special status plants and would facilitate the recovery of habitat from permitted uses.

(2) Effects to Special Status Vegetation Species from Wildlife (Common to all)

Special Status plants would benefit indirectly as a result of protecting wildlife habitats and mitigating impacts to wildlife habitat through the NEPA and permitting processes.

(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Common to all)

It is unlikely for the Bay planning area that the issue of whether or not the smelowskia would benefit from fire suppression activities, or whether fire is a natural and beneficial part of the plant's natural history would arise. The known plants' habitat consists of isolated, steep, sparsely vegetated, unstable alpine scree from 2,000 to 5,500 feet in elevation. Wildland fires are uncommon in the Bay planning area, and fire is not likely to burn well on this type of unvegetated scree.

(4) Effects to Special Status Vegetation Species from Livestock Grazing (Common to all)

Although there is currently no form of livestock grazing in the Bay planning area, livestock grazing could be permitted on a case-by-case basis under all Alternatives. Livestock grazing has the potential to negatively impact special status plants. Depending on the type of grazing animal, either part of the plant or the entire plant including its roots could be removed. In addition, trampling of vegetation could occur. The degree of impact from livestock would depend not only on the number and class or type of animals but also the timing and duration of their presence in the area of special status plants. Because the plant lives on sparsely vegetated unstable alpine screes at higher elevations, some animals might not elect to graze there if better grazing opportunities were available.

(5) Effects to Special Status Vegetation Species from Leasable Minerals (Alternatives B, C, and D)

Oil, gas, and coalbed natural gas exploration are not expected to occur on BLM-managed lands in the Goodnews Bay area or in the Bristol Bay area at elevations between 2,000 and 5,500 feet during the life of this plan.

(6) Effects to Special Status Vegetation Species from Minerals (Alternatives B, C, and D)

Locatable Minerals. There is a low probability for BLM-managed lands in the Bristol Bay area and a low to moderate probability for BLM-managed lands in the Goodnews Bay area for locatable mineral exploration activities to take place at elevations between 2,000 and 5,500 feet asl during the life of this plan. Only one area of BLM unencumbered lands, Tatlignagepeke Mountain in the Goodnews Bay region, has both habitat for the smelowskia and known lode mineral occurrences, with elevations of as much as 2,500 feet.

Other locations in the Goodnews Bay region with potential habitat but no known mineral resources include Twin Mountain and Figure Four Mountain, in the proposed Carter Spit ACEC, and the southern half of Figure 4 Mountain, located just south of the proposed ACEC. An area of BLM unencumbered lands in the northeast Bristol Bay region with potential habitat but no known mineral resources is the Chekok Creek area, with elevations to 4,000 feet.

Existing and future locatable mineral activities have the potential to unfavorably impact Special Status plants and their habitat by stripping away the vegetative mat as part of mine site overburden, trampling or eliminating vegetation and compacting soils throughout the mine site area by development of social trails, roads, camp buildings, airstrips, and other temporary or semi-permanent mine associated infrastructure. Site-specific mitigation measures would be implemented.

Salable Minerals (Mineral Materials). *In a region of glacial deposits, including sand and gravel, quantities of materials are available on private lands, State-owned and selected lands, Native-owned and selected lands, and BLM unencumbered lands at sufficiently low elevations that it is doubtful the materials would be sought in the difficult terrain where the habitat of the smelowskia would be located.*

(7) Effects to Special Status Vegetation Species from Recreation Management (Common to all)

The sources of impacts to vegetation from commercial and non-commercial recreation activities would include hiking, aircraft landings at remote sites, occasional or repeated use of remote camp sites and associated social trails. Potential effects might include trampling and crushing of plants and disturbance or compaction of the soil. With respect to the Special Status plant the smelowskia and its habitat, the only potential effect might occur from hiking. However, the potential location of the plant on steep unconsolidated scree-covered slopes would present a hazard to hikers, who might elect other more favorable areas to hike. These plants also appear to inhabit areas as isolated, scattered individual plants. The likelihood of impacts from recreational activities in this lightly-populated, lightly-used region would be low, and would not have population level effects.

(8) Effects to Special Status Vegetation Species from Travel Management (Common to all)

Direct and indirect impacts to vegetation could occur from travel management and OHV use, including the potential to destroy the vegetation mat, compact soils, accelerate permafrost melt, and contribute to soil erosion. Higher, rockier terrain in remote areas, where the smelowskia and its habitat might be located, are becoming more accessible over time as OHVs become more sophisticated and powerful. However, the population and visitation in the Bay planning area in the more mountainous regions is low.

b) Effects to Special Status Vegetation Species for Alternative A***(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation (Alternative A)***

Special Status Species of plants would benefit from proper management of soil, water, air and vegetation resources in the planning area. Implementation of mitigation measures to protect these resources on a project-specific basis would reduce disturbance to habitat of special status plants and would facilitate the recovery of habitat from permitted uses.

(2) Effects to Special Status Vegetation Species from Wildlife (Alternative A)

Special Status plants would benefit indirectly as a result of protecting wildlife habitats and mitigating impacts to wildlife habitat through the NEPA and permitting processes.

(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Alternative A)

It is unlikely for the Bay planning area that the issue of whether or not the smelowskia would benefit from fire suppression activities, or whether fire is a natural and beneficial part of the plant's natural history would arise. The known plants' habitat consists of isolated, steep, sparsely vegetated, unstable alpine screes from 2,000 to 5,500 feet in elevation. Wildland fires are uncommon in the Bay planning area, and fire is not likely to burn well on this type of unvegetated scree.

(4) Effects to Special Status Vegetation Species from Livestock Grazing (Alternative A)

Although there is currently no form of livestock grazing in the Bay planning area, livestock grazing could be permitted on a case-by-case basis under all Alternatives. Livestock grazing has the potential to negatively impact special status plants. Depending on the type of grazing animal, either part of the plant or the entire plant including its roots could be removed. In addition, trampling of vegetation could occur. The degree of impact from livestock would depend not only on the number and class or type of animals but also the timing and duration of their presence in the area of special status plants. Because the plant lives on sparsely vegetated unstable alpine screes at higher elevations, some animals might not elect to graze there if better grazing opportunities were available.

(5) Effects to Special Status Vegetation Species from Minerals (Alternative A)

Leasable Minerals. Under Alternative A, BLM-managed lands in the Bay planning area would be closed to oil and gas exploration under ANCSA 17(d)(1) withdrawals.

Locatable Minerals. Under Alternative A, most BLM-administered lands in the Bay planning area would be withdrawn from exploration and development under ANCSA 17 (d)(1).

Salable Minerals. In a region of glacial deposits, including sand and gravel, quantities of materials are available on private lands, State-owned and selected lands, Native-owned and selected lands, and BLM unencumbered lands at sufficiently low elevations that it is doubtful the materials would be sought in the difficult terrain where the habitat of the smelowskia would be located.

(6) Effects to Special Status Vegetation Species from Recreation Management (Alternative A)

Impacts would be the same as those discussed under Common to All Alternatives.

(7) Effects to Special Status Vegetation Species from Travel Management (Alternative A)

Direct and indirect impacts to vegetation could occur from travel management and OHV use under this Alternative, which allows unrestricted travel. These impacts include the potential to destroy the vegetation mat, compact soils, accelerate permafrost melt, and contribute to soil erosion. Higher, rockier terrain in remote areas, where the smelowskia and its habitat might be located, are becoming more accessible over time as OHVs become more sophisticated and powerful. However, the population and visitation in the Bay planning area in the more mountainous regions is low.

c) Effects to Special Status Vegetation Species for Alternative B

(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation Management (Alternative B)

Special Status Species of plants would benefit from proper management of soil, water, air and vegetation resources in the planning area through measures to protect one of the resources can conflict and negatively affect another, especially Special Status Vegetation Species. An example might be a project to re-establish native grasses on a stream bank, which may eliminate a Special Status Vegetation Species unless care is taken to protect it or, in some cases, the rehabilitation project may have to be forgone or delayed. Implementation of mitigation measures to protect these resources on a project-specific basis would reduce disturbance to habitat of special status plants and would facilitate the recovery of habitat from permitted uses.

(2) Effects to Special Status Vegetation Species from Wildlife (Alternative B)

Special Status plants should usually benefit indirectly as a result of protecting wildlife habitats and mitigating impacts to wildlife habitat through the NEPA and permitting processes.

(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Alternative B)

Impacts would be the same as those discussed under Common to All Alternatives.

(4) Effects to Special Status Vegetation Species from Livestock Grazing (Alternative B)

Impacts would be the same as those discussed under Common to All Alternatives.

(5) Effects to Special Status Vegetation Species from Minerals (Alternative B)

Leasable Minerals. Oil, gas, and coalbed natural gas exploration are not expected to occur on BLM-managed lands in the Goodnews Bay area or in the Bristol Bay area at elevations between 2,000 and 5,500 feet during the life of this plan.

Locatable Minerals. There is a low probability for BLM-managed lands in the Bristol Bay area and a low to moderate probability for BLM-managed lands in the Goodnews Bay area for locatable mineral exploration activities to take place at elevations between 2,000 and 5,500 feet asl during the life of this plan. Only one area of BLM unencumbered lands, Tatlignagpeke Mountain in the Goodnews Bay region, has both habitat for the smelowskia and known lode mineral occurrences, with elevations of as much as 2,500 feet.

Other locations in the Goodnews Bay region with potential habitat but no known mineral resources include Twin Mountain and Figure Four Mountain, in the proposed Carter Spit ACEC, and the southern half of

Figure 4 Mountain, located just south of the proposed ACEC. An area of BLM unencumbered lands in the northeast Bristol Bay region with potential habitat but no known mineral resources is the Chekok Creek area, with elevations to 4,000 feet.

Existing and future locatable mineral activities have the potential to unfavorably impact Special Status plants and their habitat by stripping away the vegetative mat as part of mine site overburden, trampling or eliminating vegetation and compacting soils throughout the mine site area by development of social trails, roads, camp buildings, airstrips, and other temporary or semi-permanent mine associated infrastructure. Site-specific mitigation measures would be implemented through implementation of Required Operating Procedures.

Salable Minerals. In a region of glacial deposits, including sand and gravel, quantities of materials are available on private lands, State-owned and selected lands, Native-owned and selected lands, and BLM unencumbered lands at sufficiently low elevations that it is doubtful the materials would be sought in the difficult terrain where the habitat of the smelowskia would be located.

(6) Effects to Special Status Vegetation Species from Recreation Management (Alternative B)

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

(7) Effects to Special Status Vegetation Species from Travel Management (Alternative B)

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

d) Effects to Special Status Vegetation Species for Alternative C

(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation Management (Alternative C)

Except under conditions discussed previously, Special Status Species of plants would benefit from proper management of soil, water, air and vegetation resources in the planning area. Implementation of Stipulations, Required Operating Procedures, and project-specific requirements in addition to mitigation measures to protect these resources on a project-specific basis would reduce disturbance to habitat of special status plants and would facilitate the recovery of habitat from permitted uses.

(2) Effects to Special Status Vegetation Species from Wildlife (Alternative C)

Special Status plants would benefit indirectly as a result of protecting wildlife habitats through Required Operating Procedures, Stipulations, and project-specific requirements as well as mitigating impacts to wildlife habitat through the NEPA and permitting processes. Additional protection would be provided through designation of two ACECs and nominating three river segments as Wild Rivers.

(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Alternative C)

Impacts would be the same as those discussed under Common to All Alternatives.

(4) Effects to Special Status Vegetation Species from Livestock Grazing (Alternative C)

Impacts would be the same as those discussed under Common to All Alternatives.

(5) Effects to Special Status Vegetation Species from Minerals (Alternative C)

Leasable Minerals. Impacts would be the same as those discussed under Common to All Alternatives. Special Status vegetation species would benefit from Stipulations, Required Operating Procedures, and project-specific requirements.

Locatable Minerals. There is a low probability for BLM-managed lands in the Bristol Bay area and a low to moderate probability for BLM-managed lands in the Goodnews Bay area for locatable mineral exploration activities to take place at elevations between 2,000 and 5,500 feet asl during the life of this plan. Only one area of BLM unencumbered lands, Tatlignagpeke Mountain in the Goodnews Bay region, has both habitat for the smelowskia and known lode mineral occurrences, with elevations of as much as 2,500 feet.

Other locations in the Goodnews Bay region with potential habitat but no known mineral resources include Twin Mountain and Figure Four Mountain, in the proposed Carter Spit ACEC, and the southern half of Figure 4 Mountain, located just south of the proposed ACEC. An area of BLM unencumbered lands in the northeast Bristol Bay region with potential habitat but no known mineral resources is the Chekok Creek area, with elevations to 4,000 feet.

Existing and future locatable mineral activities have the potential to unfavorably impact Special Status plants and their habitat by stripping away the vegetative mat as part of mine site overburden, trampling or eliminating vegetation and compacting soils throughout the mine site area by development of social trails, roads, camp buildings, airstrips, and other temporary or semi-permanent mine associated infrastructure. Projects would implement Required Operating Procedures and site-specific mitigation measures.

Salable Minerals. Impacts would be similar to those discussed under Common to All Alternatives. The Carter Spit and Bristol Bay ACECs would be closed to Salable Minerals.

(6) Effects to Special Status Vegetation Species from Recreation Management (Alternative C)

Impacts would be the same as those discussed under Common to All Alternatives.

(7) Effects to Special Status Vegetation Species from Travel Management (Alternative C)

Impacts would be similar to those discussed under Common to All Alternatives. However, they would be less than in Alternative A or B. Under this Alternative, travel would be designated as “limited” to existing roads and trails.

e) Effects to Special Status Vegetation Species for Alternative D

(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation Management (Alternative D)

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

(2) Effects to Special Status Vegetation Species from Wildlife (Alternative D)

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

(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Alternative D)

Impacts would be the same as those discussed under Common to All Alternatives.

(4) Effects to Special Status Vegetation Species from Livestock Grazing (Alternative D)

Impacts would be the same as those discussed under Common to All Alternatives.

(5) Effects to Special Status Vegetation Species from Minerals (Alternative D)

Leasable Minerals. Impacts would be the same as those discussed under Common to All Alternatives.

Locatable Minerals. Impacts would be the same as those discussed under Alternative C.

Salable Minerals (Mineral Materials). Impacts would be similar to those discussed under Alternative C. Carter Spit ACEC would be closed to Salable Minerals.

(6) Effects to Special Status Vegetation Species from Recreation Management (Alternative D)

Impacts would be the same as those discussed under Common to All Alternatives.

(7) Effects to Special Status Vegetation Species from Travel Management (Alternative D)

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

7. Direct and Indirect Effects for Cultural Resources

a) Direct and Indirect Effects to Cultural Resources Common to All Alternatives

Both Federal undertakings and unauthorized uses have the potential to cause irreversible harm to cultural resources. BLM authorized undertakings will avoid impacts to cultural resources through project redesign or alternative siting. Unavoidable impacts from undertakings will be mitigated through data recovery investigations in accordance with the National Cultural Programmatic Agreement and the Alaska Protocol for Managing Cultural Resources. Unauthorized impacts will be addressed as feasible through monitoring, law enforcement investigation and public education efforts.

All undertakings occurring on BLM managed land are evaluated by a qualified cultural resources specialist. Because of budget, personnel, and seasonal constraints, level I inventories (literature searches) are a common practice. Level III (Class III) inventory (intensive on the ground survey) occurs when the potential for cultural resources is considered to be high or surface disturbance is likely. This is due to funding and accessibility issues as well as low resource development in this area. Therefore, the exact number, kind, and variability of cultural resources within the planning area are unknown. New cultural resources will continue to be found and evaluated for eligibility to the National Register of Historic Places as future inventories are completed. If significant sites are found they will be appropriately mitigated under Federal law and policy.

b) Direct and Indirect Effects to Cultural Resources for Alternative A

Under Alternative A, existing management practices would continue. Few impacts to cultural resources are anticipated from authorized activities due to the remoteness of most BLM-managed lands and the nature of most permitted activities. Currently the primary permitted activity in the planning area is Special Recreation Permits for big game guides, and these involve little potential for impacts. Other activities that have been authorized under current management included geophysical surveys, Plan of Operations for a platinum mine, rights-of-way for an existing power line and a gravel airstrip, leases for a trapping cabin, a gravel airstrip and a road, and film permits. These activities have happened infrequently, and to date significant conflicts with cultural resources have not occurred. There is some potential for impacts from unauthorized activities, but it is difficult to estimate the extent of this, as the cost of monitoring known sites is prohibitive and there has been no consistent attempt to track the condition of the resource in these remote areas.

The greatest impact from authorized activities occurs in the area of OHV use. Under Alternative A, there would be no travel restrictions for OHVs on BLM lands. As stated above most BLM lands are distant from

population centers; however, should activity increase in the future cultural resources could be adversely impacted.

c) Direct and Indirect Effects to Cultural Resources for Alternative B

Under Alternative B, there could be an increase in the potential for impacts to cultural resources. Development of both leasable and locatable minerals would result in substantial surface disturbance. With the Stipulations, Required Operating Procedures, and project-specific requirements, impacts to cultural resources should be avoided.

Exploration for leasable minerals involves little potential for impacts, assuming that final oil and gas leasing stipulation and operating procedures are similar to those currently used in the National Petroleum Reserve-Alaska. Exploration and development of oil is considered unlikely for the life of the plan, and based on the Reasonable Foreseeable Development Scenario for oil and gas, gas exploration and development would be limited to the Koggiling Block of BLM-managed lands. However, if it occurs, such development would probably result in surface disturbance that could pose a threat to cultural resources. However, BLM would have required inventory and appropriate mitigation in advance of allowing any on-the-ground development. In some areas, it is also possible that no cultural resources may be impacted by a development. Based on the Reasonable Foreseeable Development scenario, 720 acres would be disturbed by construction of well pads, utilities, pipelines and associated airstrips and roads for each project.

Some impacts to cultural resources can be anticipated from locatable mineral development under this Alternative. Historically, placer mines have occurred in the Goodnews Bay area of the plan and this area seems to have the most potential for future mineral discovery and development.

The greatest impact from authorized activities lies in the “open” designation for OHVs on BLM lands. BLM is presently drafting a memorandum on the subject of Section 106 and OHV designations. Such designations are subject to Section 106 compliance. As stated above most BLM lands are distant from population centers; however, should activity increase in the future cultural resources could be adversely impacted. Adverse impacts to cultural resources are anticipated from other resource uses such as erosion, looting and vandalism, but it is not possible to develop a reliable estimate of the probable extent of this impact. Increased monitoring of this activity would give more information about this problem and provide insights to a solution.

d) Direct and Indirect Effects to Cultural Resources for Alternative C

Impacts to cultural resources under Alternative C would be much the same as for Alternative B, although they would be expected to be fewer. A “limited” designation for OHVs under this Alternative would also provide beneficial impacts for cultural resources since OHV will be confined to existing trails. It would provide more flexibility to manage some types of potential impacts to cultural resources and to mitigate possible damage to cultural resources from OHV designations. Beneficial effects to cultural resources would also occur under this Alternative with the proposed Carter Spit ACEC, the proposed Bristol Bay ACEC, and within the proposed wild river segments of the Alagnak, Goodnews mainstream and Goodnews Middle Fork rivers.

e) Direct and Indirect Effects to Cultural Resources for Alternative D

Impacts to cultural resources under Alternative D would be much the same as for Alternative C. Beneficial effects to cultural resources would also occur because of a “limited” designation for OHVs as described in Alternative C, and since OHVs will be confined to existing trails. Beneficial effects to cultural resources would also occur under this Alternative with the proposed Carter Spit ACEC (52,863 acres).

8. Direct and Indirect Effects for Paleontological Resources

a) Direct and Indirect Effects to Paleontological Resources Common to All Alternatives

Federal undertakings and unauthorized uses have the potential to cause irreversible disturbance and damage to non-renewable paleontological resources. The BLM would mitigate impacts to significant paleontological resources from authorized uses through project redesign, specimen recovery or other appropriate mitigation. Geologic formations with exposures containing vertebrate and non-vertebrate fossils would be impacted from natural agents, unauthorized public collection, and vandalism. Given the little information we have about paleontological resources in most of the planning area, it is difficult to estimate the extent and nature of anticipated impacts.

b) Direct and Indirect Effects to Paleontological Resources for Alternative A

Under Alternative A there are no restrictions on OHVs. This could adversely impact paleontological resources.

c) Direct and Indirect Effects to Paleontological Resources for Alternative B

Under Alternative B, anticipated development associated with leasable and locatable minerals could have adverse impacts on paleontological resources.

Exploration and development of oil and gas is considered unlikely for the life of the plan; however, if it occurs, such development could result in surface disturbance that could pose a threat to paleontological resources. Based on the Reasonable Foreseeable Development scenario, 720 acres would be disturbed by construction of well pads, utilities, pipelines and associated airstrips and roads.

Some impacts to paleontological resources can be anticipated from locatable mineral development under this Alternative. Depending on the location of these mines and the methods utilized for stripping overburden, these operations could result in disturbance and destruction of paleontological materials. Historically, placer mines have occurred in the Goodnews Bay area of the plan and this area seems to have the most potential for future mineral discovery and development.

Little or no impact to paleontological resources is anticipated from other resource uses for the more isolated parcels in the planning area. A higher amount of impact to paleontological resources is anticipated in those parcels closer to inhabited areas from unauthorized OHV traffic.

Under Alternative B there is an “open” designation for OHVs. This could adversely impact paleontological resources. Other expected adverse impacts to paleontological resources would also stem from unauthorized uses and natural causes.

d) Direct and Indirect Effects to Paleontological Resources for Alternative C

Impacts to cultural resources under Alternative C would be much the same as for Alternative B, with the addition that beneficial impacts to paleontological resources would also occur because of a “limited” designation for OHVs since OHVs will be confined to existing trails. Beneficial impacts to paleontological resources may also occur under this Alternative with the proposed Carter Spit ACEC, the proposed Bristol Bay ACEC, and within the proposed wild river segments of the Alagnak, Goodnews mainstream and Goodnews Middle Fork rivers.

e) Direct and Indirect Effects to Paleontological Resources for Alternative D

Impacts to paleontological resources under Alternative D would be much the same as for Alternative B. Beneficial impacts to paleontological resources would also occur because of a “limited” designation for OHVs since OHVs will be confined to existing trails. Beneficial impacts to paleontological resources may also occur under this Alternative with the proposed Carter Spit ACEC (52,863 acres).

9. Direct and Indirect Effects for Visual Resource Management

In order to meet responsibilities to maintain the scenic values of public lands, BLM has been utilizing a Visual Resources Management (VRM) system that considers that different levels of scenic values require different levels of management, and that assessing scenic values and determining visual effects can be a subjective process. For this plan, assessments were collected from existing long-term staff and past VRM inventory reports. The inventory process is described in detail in BLM Handbook 8410-1 (BLM 1984).

a) Effects to Visual Resources Management Common to All Alternatives

(1) Effects to Visual Resources Management from Wildlife Management (Common to All Alternatives)

Under all Alternatives, Critical Habitat Areas for listed species across Alaska has, or is in the process of being determined for USFWS and NFMS T&E species. Critical Habitat Area designation may provide additional protection for visual resources located within the area by preventing or minimizing development activities.

(2) Effects to Visual Resources Management from Vegetation Management and Fires and Fuels Management (Common to All Alternatives)

Ninety-two percent of Alaska BLM-managed lands statewide are designated as Limited and Modified fire management option areas, meaning that naturally occurring fires are desired, but do have some constraints. Although direct loss of vegetation would occur from wildland fires, mechanical or manual treatments, and prescribed burns, the change to the existing landscape character would be considered relatively short-term. The impacts of wildland fire and fuels management will be few within the Bay planning area.

(3) Effects to Visual Resource Management from Forestry Management (Common to All Alternatives)

No commercial forestry is carried out within the Bay planning area. Therefore, no impacts to Visual Resource Management are anticipated within the foreseeable future.

(4) Effects to Visual Resource Management from Lands and Realty Management (Common to All Alternatives)

BLM is working to complete the conveyance of Native- and State-selected lands by 2009. Once these lands are conveyed, the entity would own both the surface and subsurface mineral rights, unless otherwise stipulated. Should BLM-managed lands be relinquished, the visual resources of those lands would likely be maintained at their current levels.

(5) Effects to Visual Resource Management from Leasable, Locatable, and Salable Minerals (Common to All Alternatives)

Mining and oil and gas leasing may have adverse effects on the visual resources of an area. If roads were authorized through Rights of Way associated with development on non-BLM-managed lands, or other development associated with mining or oil and gas leasing, there may be localized, but long-term impacts to the form, line, color, and texture of the visual landscape.

(6) Effects to Visual Resource Management from Renewable Energy (Common to All Alternatives)

Under all Alternatives, land available as potential renewable energy program sites would be evaluated on a case-by-case basis. Effects to visual resources associated with renewable energy programs are generally less severe in magnitude and extent relative to other development activities.

Wind, hydroelectric and solar power projects would affect visual resources in similar ways. These effects would largely result from construction activities, such as the creation of new utility corridors, access roads, and transmission lines, creating access opportunities to new visual resources, or modifying the existing landscape character. The magnitude and extent of these effects may vary for each project.

(7) Effects to Visual Resource Management from Socioeconomics (Common to All Alternatives)

The lives of many Alaskan residents are tied to the natural environment. While many of the BLM-managed lands within the Bay planning area are difficult to access and not located in proximity to communities, visual resources are utilized and valued in varying degrees by Alaska residents, as well as tourists. As the population within the Bay planning area continues to increase, there would be increasing pressure on the ability to maintain visual resources that can be closely tied to regional economies, recreational opportunities, employment, and quality of life issues for residents.

b) Effects to Visual Resource Management for Alternative A

(1) Effects to Visual Resource Management from Lands and Realty (Alternative A)

Access (Rights of Way) - There are no avoidance or exclusion areas identified within the Bay planning area under this Alternative. Rights of Way are typically used for communication sites, utility corridors, or for access to mining claims, timber resources, and conservation areas, and usually remain under BLM management. As growth and development continues in the Bay planning area, the need for ROWs for transportation and utility corridors would increase. Potential new access routes may change the existing form, line, color, and texture of the visual landscape. However, the number of annual ROW applications for the Bay planning area is extremely low, so any effects would be minimal.

Withdrawals - No withdrawal review would occur under this Alternative, and all existing withdrawals would stay in place. Because of the constraints in place under these withdrawals, there would be less potential for resource development and activities that would alter the visual landscape.

(2) Effects to Visual Resource Management by Leasable, Locatable, and Salable Minerals (Alternative A)

BLM lands in the Bay planning area may be subject to localized adverse effects on visual resources from existing mineral claims. Potential effects from mineral exploration and development are discussed above under Direct and Indirect Effects Common to All Alternatives. For BLM-administered lands, the likelihood of these effects occurring would be low to moderate for fluid minerals, and low for metalliferous metals given the mineral potential for BLM-managed lands.

(3) Effects to Visual Resource Management by Off-Highway Vehicles (Alternative A)

All lands within the Bay planning area would remain open for OHV use. The numbers of OHV trails throughout planning may stay the same or increase slightly within the next ten years. These trails

fragment the natural landscape, creating varying degrees of changes to the existing visual character of the area. Braided trail sections more than 200 feet wide have been documented in Alaska (Meyer 2004). Important viewpoints and visual resources that may have been previously inaccessible may become part of an expanding network of OHV trails, especially in areas of established moderate use, such as in the north and east Goodnews area.

(4) Summary of Effects to Visual Resource Management (Alternative A)

The management actions proposed under Alternative A would have a variety of effects on visual resources occurring on BLM-managed lands. Management would maintain any effects on visual resources at their current levels, although changes to the existing visual landscape would be expected with increases in regional populations. No VRM classes are established under this Alternative. As OHV use continues to go unmanaged, minimal adverse effects to BLM-managed visual resources may continue, primarily in area of Goodnews. Potential mineral exploration and development, and the creation of new Rights of Way both have the potential to adversely affect visual resources; however, any effects would likely be minimal based on current trends. Available information described in the sections above indicates that the adoption of the current management actions as described under Alternative A may have localized, adverse effects on visual resources.

c) Effects to Visual Resource Management for Alternative B

(1) Effects to Visual Resource Management from Lands and Realty (Alternative B)

Exchanges - Several parcels have been identified for exchange under this Alternative. However, due to the small, scattered nature of these parcels, any development or alterations in the visual landscape resulting from their sale would be minimal.

Acquisitions - Under Alternative B, the acquisition of lands and easements from willing landowners would be considered on a case-by-case basis. Easements provide access to lands managed by the NPS, USFS, or USFWS, and once lands are conveyed, the easement is managed by the respective agency. The visual quality of these easements would likely be maintained.

Access (Rights of Way) - There are no avoidance or exclusion areas identified within the Bay planning area under this Alternative. Rights of Way (ROWs) are typically used for communication sites, utility corridors, or for access to mining claims, timber resources, and conservation areas, and usually remain under BLM management. As growth and development continues in the Bay planning area, the need for ROWs for transportation and utility corridors would increase. Potential new access routes may change the existing form, line, color, and texture of the visual landscape. However, the number of annual ROW applications for the Bay planning area is extremely low, so any effects would be minimal.

(2) Effects to Visual Resource Management from Leasable, Locatable, and Salable Minerals (Alternative B)

Under this Alternative, localized adverse effects to Off Highway Vehicle (OHV) use may occur through Stipulations and Required Operating Procedures. There is low to moderate potential for oil and gas development and low potential for metalliferous mineral development on BLM lands in the foreseeable future. Any permitted or leasing activities would have to comply with guidelines outlined in the Stipulations and Required Operating Procedures, which would include protections for visual resources.

(3) Effects to Visual Resource Management from Off-Highway Vehicle Management (Alternative B)

All lands within the Bay planning area would be designated as "Open" under Alternative B. Because OHV use on BLM-managed lands is currently unrestricted, this management action would have similar effects as Alternative A. Increasing OHV trail creation and widening causes changes to the existing form, line,

color, and texture of the visual landscape. Important viewpoints and visual resources that may have been previously inaccessible may become part of an expanding network of OHV trails, especially in areas of established moderate use such as Goodnews Bay.

(4) Effects to Visual Resource Management from Wild and Scenic Rivers (Alternative B)

There would be no Wild and Scenic Rivers recommended for designation to the National System under Alternative B. Thus, the scenic quality of river segments within the Bay planning area would not be afforded additional protections, other than those outlined in the Stipulations and Required Operating Procedures.

(5) Summary of Effects to Visual Resource Management (Alternative B)

All lands under Alternative B would be managed as VRM Class IV, which would allow actions that make major modifications to the existing character of the landscape. OHV use would continue to be designated as Open on all lands within the Bay planning area, and may create changes in the existing landscape character and access to visual resources. Effects from Rights of Way, mining, and oil and gas developments may occur in the foreseeable future. Required Operating Procedures and Stipulations or other permit requirements around mineral exploration and development may contain protections for visual resources in specific locations. Available information described in the sections above indicates that effects would be on a localized scale, primarily in moderate OHV use areas, such as Goodnews Bay.

d) Effects to Visual Resource Management for Alternative C

(1) Effects to Visual Resource Management from Lands and Realty (Alternative C)

Access (Rights of Way) - The proposed Carter Spit ACEC and Bristol Bay ACEC would be identified as Special Management Areas. Projects would be designed to contain mitigation to limit impacts to biological resources. Impacts to the current visual landscape in this area would be minimized through stipulations proposed on major ground disturbing projects such as road building, which may impact the biological resources. Other areas requiring avoidance on a local level for its impacts on visual resource management would be identified on a case-by-case basis.

(2) Effects to Visual Resource Management from Leasable, Locatable, and Salable Minerals (Alternative C)

The level of development potential and overall effects for leasable, locatable, and salable minerals would be similar to that in Alternative B.

(3) Effects to Visual Resource Management from Off-Highway Vehicles (OHVs) (Alternative C)

Lands would be designated as limited to OHV use consistent with ADNR's *Generally Allowed Uses on State Land*, which require such actions as restricting use to existing trails whenever possible. Protections for visual resources, and limitations on OHV use would also be further refined within the proposed Carter Spit ACEC, Bristol Bay ACEC, and the nominated Wild Rivers. Limiting use within the Bay planning area may reduce adverse effects to visual resources relative to the current level of effects. Areas of low to moderate OHV use, the Goodnews Bay area, may feel the highest level of beneficial effects towards changing the existing landscape character.

(4) Effects to Visual Resource Management from Recreation (Alternative C)

Under Alternative C, no Special Recreation Management Areas would be proposed for designation. ACECs would be proposed for the Carter Spit and Bristol Bay areas. All resources would be managed to meet the objectives of the specific Special Management Area.

(5) Effects to Visual Resource Management from Wild and Scenic Rivers (Alternative C)

Under Alternative C, BLM would recommend three river segments for Wild and Scenic River designation, and would maintain the Outstandingly Remarkable Values of the river segments if they were designated in order to maintain their wild, scenic, or recreational classifications. This designation provides legal protections from adverse development and provides a mechanism for management of the rivers' resources. Further planning efforts along these river segments may contain permitting conditions that protect the scenic quality and existing visual landscape around the rivers.

(6) Summary of Effects to Visual Resource Management of Alternative C

Effects to visual resources from management proposed under Alternative C are likely to be concentrated in specific areas. BLM would designate all lands recommended as Wild and Scenic Rivers with a "wild" classification as VRM Class III. The proposed Carter Spit and Bristol Bay ACECs would be designated as VRM Class III. Changes in the existing landscape for these areas would be low and would not attract attention. All lands within the Bay planning area would be designated as "limited" to OHV use, following ADNR's *Generally Allowed Uses on State Lands*, which may provide changes in the visual setting in moderate OHV-use areas such as the Goodnews Bay area. Effects from Rights of Way, mining, oil and gas would likely be limited in extent; consequently only a small portion of visual resources on BLM-managed lands may be affected. Resources would receive further levels of protection through the development of activity plans, such as a Special Recreation Permit management plan for guides and transporters. Three river segments would also be recommended for Wild and Scenic River designation, which may place protections around the scenic values of these rivers. The majority of these actions would have beneficial effects on visual resources through increased protections and regulation efforts. Actions that may adversely affect the visual landscape may occur in the form of mining activities BLM-managed lands.

E) Effects to Visual Resource Management for Alternative D

(1) Effects to Visual Resource Management by Lands and Realty (Alternative D)

Access (Rights of Way) - The proposed Carter Spit ACEC would be identified as a Special Management Area. Projects would be designed to contain mitigation to limit impacts to biological resources. Impacts to the current visual landscape in this area would be minimized through stipulations proposed on major ground disturbing projects such as road building, which may impact the biological resources. Other areas requiring avoidance on a local level for its impacts on visual resource management would be identified on a case-by-case basis.

(2) Effects to Visual Resource Management by Leasable, Locatable, and Salable Minerals (Alternative D)

Under Alternative D, effects would be the same as discussed under Alternative B. Any effects to visual resources occurring on those lands would continue at current levels.

(3) Effects to Visual Resource Management by Off-Highway Vehicles (OHVs) (Alternative D)

Under Alternative D, OHV use on BLM-administered lands would be managed as described under Alternative C, designated as "limited" to OHV use. Because OHV use on BLM-managed lands is currently unrestricted (open), this management action would likely reduce OHV effects to the existing landscape character, especially in areas where activity planning has outlined further resource protection guidelines and objectives.

(4) Effects to Visual Resource Management by Recreation (Alternative D)

Management actions proposed under Alternative D are the same as those described under Alternative C. An ACEC would be designated in the Carter Spit area. In areas of moderate recreational use, the surrounding visual landscape plays an important part in the recreation experience. The area would be managed to meet the objectives of the specific Special Management Area.

(5) Effects to Visual Resource Management by Wild and Scenic Rivers (Alternative D)

There would be no Wild and Scenic Rivers recommended for designation to the National System under Alternative D. Thus, any special management actions to help protect scenic resources associated with identified river segments within the Bay planning area would not be afforded additional protections, other than those outlined in the Stipulations and Required Operating Procedures.

(6) Effects to Visual Resource Management Summary of Alternative D

Effects to visual resources from future management under Alternative D are likely to be concentrated in specific areas. The proposed Carter Spit ACEC would be managed as VRM Class III, where changes to the landscape character should be low, and should not be readily visible to the casual observer. BLM would designate all lands as “limited” to OHV use, following ADNR’s *Generally Allowed Uses on State Lands* (Appendix F), which may provide changes in the visual landscape. Effects from Rights of Way, mining, and oil and gas development may affect a portion of visual resources on BLM-managed lands. Resources would receive further levels of protection through the development of activity plans such as a Special Recreation Permit plan addressing guides and transporters. The majority of these actions would have beneficial effects on visual resources through increased protections and regulation efforts.

10. Direct and Indirect Effects for Recreation Management

a) Direct and Indirect Effects on Recreation Common to All Alternatives

Recreation use tends to be focused on existing trails accessible from small to moderate villages and communities. Soil compaction can lead to erosion, increased runoff, and potential flooding. Trail construction and use may lead to changes in soil compaction and erosion. Also, trails on ridge tops and steep slopes tended to have higher amounts of erosion (Meyer 2002). Concentrated camping can lead to soil compaction and actual loss of topsoil. Long-term camping increases both the level of soil compaction as well as the size of the spatial footprint of effects on soil.

In areas of moderate to substantial recreational foot and/or vehicle traffic, soil compaction may occur and increase the amount of impervious surface within a watershed. Impervious surfaces can lead to increases in runoff potential and downstream flooding, particularly during storm events. Sensitive riparian areas, such as lakeshores and stream banks, are especially susceptible to increased tramping and soil compaction from camping, foot traffic, and vehicles. Reduced viability and rooting capacity of the riparian vegetation can in turn reduce stream bank stability and increase erosion. The effect of soil compaction is generally more severe on moist or clay-rich soils and with higher incidents of use. Discharge from two-stroke snowmachine engines can lead to pollutant deposition on snow, and wash into surface and groundwater (Meyer 2002).

b) Direct and Indirect Effects on Recreation for Alternative C

An ACEC would be designated in the Carter Spit and Bristol Bay areas. All resources would receive further levels of protection through the development of activity plans in various areas. Soil resources may receive indirect beneficial effects through the limiting of development activities.

c) Direct and Indirect Effects on Recreation for Alternative D

An ACEC would be designated in the Carter Spit area. All resources would receive further levels of protection through the development of activity plans in various areas. Soil resources may receive indirect beneficial effects through the limiting of OHV use or development activities.

11. Direct and Indirect Effects for Travel Management

a) Direct and Indirect Effects for Travel Management Common to all Alternatives

Off Highway Vehicle (OHV) trails may compact soil and adversely affect water resources in areas of high use. As the soil is compacted, it begins to absorb less water, thereby increasing runoff potential. Substantial runoff during storm events can result in downstream flooding. The generation of ruts and puddles can alter surface drainage, and extensive OHV use can create progressively larger ruts and further decrease soil strength and water holding capacity. Off-highway vehicle use in wetland areas and around stream banks and lakeshores can result in erosion, destruction of aquatic habitat, increased stream sedimentation, and changes to stream channel morphology (USDA 2005; USDA 2006; Sinnott 1990; Weeden 1978; Abele et al. 1984). Under all Alternatives, OHV use may adversely affect water quality as a result of fuel leaks, chemical spills, and increased littering. Deposition pollutants on snow, particularly from two-stroke engine discharge, can wash into surface and ground water and degrade water quality (Meyer 2002). Excessive use areas can result in increased erosion and sedimentation, and subsequent sediment load in receiving waters. OHV trails, especially the designation of new ones in otherwise unvisited areas, have the potential to damage important cultural and paleontological resources either directly by OHVs running over and damaging them, or indirectly by bringing in more people, leading to the potential for increased vandalism to sites. Trail designation should take into account valuable resources that may be impacted by establishing a trail through that location. The resource protection that designation allows and provides should be taken into account.

b) Direct and Indirect Effects for Travel Management for Alternative A

Under Alternative A, there are no OHV designations in place within the Bay planning area. As currently managed, OHV use is allowed on all terrain, including sensitive habitats such as wetlands, near fish-bearing streams, and possibly through areas that support sensitive species. OHV use may cause some minor, localized adverse effects on water quantity and quality through soil compaction, increased levels of erosion and sedimentation, or the alteration of surface drainage patterns across scattered parcels throughout the planning area. In areas of moderate use, such as the Goodnews Block and the Alagnak Block, clear water streams that are adjacent to or feeding into the rivers can be affected without appropriate management of OHVs if use increases.

The use of OHVs is often detrimental to soil and leads to compaction and degradation (USDA 2005; USDA 2006). OHV use damages soils when the type and level of use exceed the capacity of the soil to resist impact. The capacity of a soil to resist impact varies depending on textural class, moisture level, and other environmental factors, but the processes by which soils are affected are generally the same. OHV use destroys soils through both the mechanical impact from surface traffic and the indirect impact from hydraulic modifications, soil transport, and deposition.

The level of effect from OHV use is a function of the natural resilience of the soil and the intensity of trail use. In a healthy situation, a natural balance is maintained between soils resilience and use. This leads to OHV use without soil damage, although on sites with wet, unstable, and sensitive soils, that natural equilibrium hangs precariously and is easily upset. Depending on the type of soil and its condition, even light levels of trail use can have environmental consequences. Once soils on trails have reached the degradation level that they make it difficult for OHV use, riders pioneer a new route across virgin

landscape and the sequence begins anew. Depending on the amount of snow on the ground, these effects can occur in winter as well as summer (Meyer 2002).

c) Direct and Indirect Effects for Travel Management for Alternative B

All lands within the Bay planning area would be designated as “open” to OHV use. Because there are currently no OHV designations on BLM-managed lands within the Bay area, use occurs over all terrain and habitat types. Therefore, the potential adverse effects under this Alternative would be the same as described under Alternative A, although the management decision to allow unrestricted OHV use on all lands may increase the duration and/or magnitude of adverse effects on water resources, especially in areas of moderate use.

d) Direct and Indirect Effects for Travel Management for Alternative C

Lands will be designated as limited to OHV use consistent with ADNR’s *Generally Allowed Uses on State Land* (Appendix F), which require such actions as restricting use to existing trails whenever possible. Limitations on OHV use would also be further refined within the proposed Carter Spit and Bristol Bay ACEC management plans. The effects to soil from OHV use under Alternative C would likely be less than those under the currently unrestricted management directive. The decrease in effects to soils would be especially pronounced in areas of previously low to moderate use.

e) Direct and Indirect Effects for Travel Management for Alternative D

Under Alternative D, OHV use on BLM-administered lands would be managed as described under Alternative C, except that limitations on OHV use would be further refined within the proposed Carter Spit ACEC management plan. All lands under this Alternative would be designated as “limited” to OHV use. Limiting use within the Bay planning area may reduce adverse effects to water resources relative to the current level of effects. Areas of moderate high OHV use may feel the highest level of beneficial effects on water resources if use is limited, presuming that any area that might be designated for open OHV use in this area sufficiently guards against effects to water resources.

D. Resource Uses

1. Forest Products

Currently there is no forest products program on BLM lands in the Bay planning area and, due to a lack of available timber suitable for commercial use or sale, no forest products projects are anticipated within the life of this plan. Commercial logging is not likely to occur in the reasonably foreseeable future in the planning area due to low timber volume, low productivity, unsuitability of the timber for commercial use or sale, scattered locations of timber stands, and long distances involved in timber transport.

2. Livestock and Reindeer Grazing

a) Effects to Livestock and Reindeer Grazing Common to All Alternatives

Effects to livestock and reindeer grazing would be the same under all Alternatives. Proposed management of the following resources/resource uses/programs would have no anticipated impacts to livestock grazing: Air Quality, Cultural Resources, Paleontological Resources, Visual Resources, Forest Products, Mineral Materials, Renewable Energy, Lands and Realty Actions, Wild and Scenic Rivers, and Public Safety.

(1) Effects to Grazing from Soil Resources Management (Common to All)

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed class and age of livestock, seasons of use, numbers and locations; application of grazing suitability of vegetative communities criteria, proper forage plant use factors, grazing suitability of topography criteria, grazing management systems, ROPs, stipulations and mitigation to protect soils from erosion, degradation and conversion from grazing may be required to protect fragile soils, soil structure, soil productivity and soil cover.

(2) Effects to Grazing from Water Resources Management (Common to All)

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed class and age of livestock, seasons of use, numbers and locations standardized field site evaluation and application of grazing suitability of vegetative communities criteria, proper forage plant use factors, grazing suitability of topography criteria, determine carrying capacity, grazing management systems, ROPs, stipulations and mitigation to protect soils from erosion, degradation and conversion from grazing may be required to protect water and water related resources including wetlands, riparian vegetation, fish and wildlife habitat, subsistence uses, stream bank integrity, water quality, instream flow, and Federal water rights.

(3) Effects to Grazing from Cultural Resources Management (Common to All)

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed grazing related structures and infrastructure, class and age of livestock, seasons of use, numbers and locations standard field inspections and cultural resource clearance and mitigation or protection requirements may be implemented to comply with laws concerning antiquities and paleontology resources and sites.

(4) Effects to Grazing from Vegetation Management (Common to All)

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed grazing related structures and infrastructure, class and age of livestock, seasons of use, and numbers and locations of livestock, there could be a number of requirements for operation. These might include requiring one or more of the following: a field site evaluation; application of grazing suitability criteria for vegetative communities and proper forage plant use factors; the use of grazing management systems; and implementation of protection practices for sensitive plant species, wetland and fragile tundra and other fragile vegetative communities, subsistence plant gathering traditional use areas, and targeted species of subsistence plants. The potential for introduction and damaging proliferation of invasive and noxious plants can be high with livestock grazing practices and specific monitoring and control/compliance measures may be required. There is a potential for lost or abandoned livestock to become feral and to be the source of local impacts to vegetative communities and other ecosystem components. Trespass and removal actions may be necessary.

(5) Effects to Grazing from Fish and Wildlife Management (Common to All)

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed grazing related structures and infrastructure, class and age of livestock, seasons of use, and numbers and locations of animals, some of the following requirements could be imposed: a complete site evaluation; implementation of wildlife forage allocations and other measures to maintain wildlife habitat; development of grazing systems; application and enforcement of stipulations to protect fish migration, spawning and rearing habitats, and key life function wildlife habitats such as nesting, brooding, staging, molting, and parturition areas, winter ranges, breeding ranges, and migration routes. Further modification of grazing use may be necessary to protect subsistence uses and users from alterations in fish and wildlife abundance, distribution, movement and subsistence user access. Subsistence uses of predators

for fur and other craft materials may require maintenance of healthy populations of large predators such as brown bear, black bear, wolf and wolverine, which would also utilize livestock as prey.

The high value of salmon related commercial fishing in the region may require placing restrictions on grazing to protect spawning, rearing, and migratory habitats for salmon and to maintain water quality, temperature and riparian protection of stream banks/channels/spawning beds. This may restrict open range grazing by some classes of livestock.

Disease transmission between wildlife and livestock could limit successful livestock grazing without added vaccination and other measures. Alaska protocols for quarantine and other disease control related measures may need to be installed for BLM lands. For example, brucellosis is widespread in wild ungulates in the Bay planning area. Insects from both the standpoint of harassment and disease transmission may also require greater measures to insure successful livestock grazing and to avoid impacts to production of waterfowl and other wildlife.

(6) Effects to Grazing from Special Status Species Management (Common to All)

Special Status wildlife species that are found or that have the potential to be found in the Bay planning area are birds, which are primarily only present during spring and fall migration for feeding, molting and resting, and occasionally for nesting and brooding, especially in the Goodnews Block of BLM-administered lands. Currently there are no livestock grazing or reindeer herding operations in the Bay planning area, and no interest has been expressed for decades. In the future, there may be a requirement for species and habitat protection that could alter grazing opportunities, practices, or use.

(7) Effects to Grazing from Fire and Fire Management (Common to All)

Potential effects of fire and fire management on livestock and reindeer grazing would involve the removal by wild land fire all or a portion of annual forage resources allocated to livestock or reindeer. Existing growing season forage production and availability would be eliminated by a fire. A minimum of two post-fire growing seasons are required for forage plants to recover vigor and production to tolerate resumption of livestock and reindeer grazing, depending on rainfall and other factors. Any range improvements, structures, or facilities would be vulnerable to damage or destruction from a wildland fire. Grazing permit holders would be responsible for fire protection of their facilities, including line cabins, corrals, and fences. Livestock could be vulnerable to injury and mortality resulting from wildland fire.

(8) Effects to Grazing from Recreation Management (Common to All)

Recreation management could impact grazing uses by interference from commercial and public recreation uses that may conflict in time or place with livestock operations. Incidental and accidental mortality of livestock or reindeer could occur when livestock or reindeer are mistaken for harvestable wildlife and animals available for subsistence use. Damage to livestock facilities from recreational or commercial users of BLM lands may occur. There is a potential for aircraft hazing or running livestock in the Bay planning area due to the high levels of aircraft use for access and for other uses. Increased infrastructure development such as roads would increase public, subsistence user, and commercial user access to livestock use areas and would increase management intensity for permit holders.

(9) Effects to Grazing from Subsistence (Common to All)

In the event that livestock or reindeer grazing would be authorized there is a potential for livestock to be taken by subsistence users participating in subsistence activities. It is likely that reindeer would be harvested, being mistaken for caribou.

(10) Effects to Grazing from Social and Economic Conditions (Common to All)

Current and projected socio-economic conditions have potential impacts to livestock and reindeer grazing management. Prevailing subsistence lifestyles and lack of robust cash economies in the region make it

clear that residents of the Bay planning area are dependent upon wild plant, fish and wildlife resources. Constraints for grazing activities in order to maintain soils, vegetation and other ecosystem components; maintain the Federal rural resident subsistence priority; and keep subsistence uses in traditional use areas, as well as in important subsistence fish and wildlife habitat, may increase costs to livestock operators and limit local marketing for livestock products.

3. Direct and Indirect Effects to Minerals

Leasable Minerals

a) Effects to Leasable Minerals for Alternative A

There are no active oil and gas leases in the planning area and no oil and gas leasing would occur under Alternative A. BLM-managed lands within the planning area would remain closed. It is assumed that no leasing would occur as appropriate NEPA analysis must be completed and approved before Federal oil and gas lease sales can occur. Leasing may take place without a land-use plan in the event of drainage of oil and gas resources from adjacent development. Additionally, no withdrawal review would occur and all 17 ANCSA (d)(1) withdrawals would remain in place, pending future legislation or unrelated management direction. Therefore, under this Alternative no oil and gas exploration and development would occur, rendering these resources unavailable for future generations.

b) Effects to Leasable Minerals for Alternative B

Under Alternative B, all existing ANCSA 17(d)(1) withdrawals would be revoked to allow increased opportunities for mineral exploration and development, pending Native and State conveyances.

Approximately 2,499,941 million acres (1,327,671 selected) of the BLM-administered lands within the planning area would be open to mineral entry subject to the ROPs and Stips. There would be no restriction under this Alternative for seasonal closures or no surface occupancy. Additionally, stipulations #6 and #7 would not be applicable under this Alternative. Withdrawals, excluding the ANCSA 17(d)(1), would close approximately 3,999 acres to leasing. Closing this acreage would preclude oil and gas exploration and development, rendering these resources unrecoverable.

Given the few restrictions impose/d on this Alternative, it would likely be the most supportive to oil and gas activity.

c) Effects to Leasable Minerals for Alternative C

Under Alternative C, withdrawals would be maintained or recommended for 1,067,190% acres including two ACECs (Bristol Bay, Carter Spit) and on proposed Wild River segments of the Alagnak River, Goodnews River, Goodnews River Middle Fork. These withdrawals would eliminate areas that possess geologic potential for oil and gas resources. Additional closures would come from State and Native land selections which have a segregation against oil and gas leasing and would only be open if retained in long-term Federal ownership.

Approximately 1,432,752 acres (57%) of the BLM-administered lands within the planning area would be open subject to the ROPs and Stips. All of these lands are State-selected or Native-selected, leaving no lands available for leasing unless portions of the selected lands are retained in long-term Federal ownership.

Acreage available subject to minor (seasonal) constraints is roughly 1,768,450 acres (71%) with 773,767 acres on selected lands. To protect caribou habitat on identified aggregation areas, oil and gas exploration and development activities will be closed from May 20 through August 15. An additional closure to protect calving caribou will restrict exploration and development activities from May 1 through

June 15. Lands under seasonal closure will be dependant upon the location and size of caribou aggregation.

Approximately 2,355 acres (>1%) of the planning area would be open to leasing subject to major constraints (No Surface Occupancy). Areas subject to NSO include a 300 foot buffer on either side of the East and South Fork Arolik River, Faro Creek, and South Fork Goodnews River. This region, the Goodnews Block, is not projected to be oil or gas-bearing, based on current knowledge. Oil and gas development in an NSO area could require directional drilling to extract hydrocarbon resources. Should areas with major constraints occur beyond the technically feasible reach for directional drilling, some hydrocarbon resource may be rendered unrecoverable. Product price fluctuations may require premature abandonment that would decrease the recoverability of the resource and potentially create an irretrievable incremental loss of resources. This is not likely with an NSO area composed of a 300 foot buffer around select sensitive streams. However, an NSO buffer of any width could potentially limit exploration and development. For example, if an exploration target was determined to be within the NSO zone, the added cost of directional drilling could render the project uneconomical, and therefore miss the discovery. Additionally, if a shallow target pool were previously defined through geophysical exploration, it could be technically unfeasible for an operator to directionally drill such a reservoir. Consequently, these resources would be unavailable for future generations.

Oil and gas leasing closures exist on withdrawals other than ANCSA 17(d)(1)s that make up approximately 3,999 acres (>1%). Existing ANCSA 17(d)(1) withdrawals totaling 15,125 acres (>1%) would be proposed to be maintained on proposed wild river segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork until Congressional action could be completed. None of these river segments are located in the Koggiling Block, the area projected to be most likely to have oil and gas reserves. Remaining ANCSA 17(d)(1) withdrawals would be revoked or modified to allow for oil and gas exploration and development, pending Native and State conveyances. The acreage closed would preclude oil and gas exploration and development, rendering these resources unrecoverable.

It is unlikely that these constraints on less than 1% of BLM-administered lands judged to be of low potential for oil and gas would deter oil and gas exploration and development in higher potential areas under this Alternative.

d) Effects to Leasable Minerals for Alternative D

Under Alternative D, existing ANCSA 17(d)(1) withdrawals would be revoked or modified to allow for increased opportunities for oil and gas exploration and development, pending Native and State conveyances. This Alternative would not close any lands, but rather would implement an adaptable management approach. Oil and gas activities would be subject to timing restrictions and the guidelines list in the Required Operating Procedures and Stipulations.

Approximately 1,447,877 acres (59%) of the BLM-administered lands within the planning area would be open to leasable mineral activities subject to the Required Operating Procedures and Stipulations. Of that amount, 1,176,629 acres are selected.

Acreage available subject to minor (seasonal) constraints is roughly 1,768,450 acres (71%) with 773,767 acres on selected lands. To protect caribou habitat on identified aggregation areas, oil and gas exploration and development activities would be closed from May 20 through August 15. An additional closure to protect calving caribou would restrict exploration and development activities from May 1 through June 15. These closures would be dependant upon the actual location of caribou aggregation. These constraints would limit exploration and development during specific time periods and increase recovery costs.

There would be no lands identified under this Alternative subject to No Surface Occupancy (NSO).

There are no oil and gas leasing closures proposed. Existing withdrawals other than ANCSA 17(d)(1) make up approximately 3,999 acres (>1%). Closing this acreage would preclude oil and gas exploration and development, rendering these resources unrecoverable.

Leasable oil and gas potential does exist for the leasing of oil and gas on BLM-managed lands. Exploration and development would proceed at the level described in the Reasonably Foreseeable Development Scenario under the *Analysis Assumptions and Guidelines* for leasable minerals. Should Federal leasing take place, the BLM-Alaska State Office would assume lease administration responsibilities and oversight of field operations.

Locatable Minerals

a) Effects to Locatable Minerals for Alternative A

Under the No Action Alternative 1,023,523 acres of BLM managed land in the Bay planning area are currently closed to mineral entry either by ANCSA 17 (d)(1) withdrawals or by State or Native selection. Approximately 152,746 acres are currently open for mineral entry. An additional 3,999 acres are closed to material entry due to withdrawals other than ANCSA 17(d)(1). At the time conveyances are completed (2010) all segregated land returning to BLM-management would be open for mineral entry. Currently locatable lode mineral activity is occurring at the Iliamna Project, D Block and Iliamna Project, H Block locations on State-selected land and placer activity on the Arolik River on Native-selected land and the Salmon River (active Federal mining claims) on Native land. All current active Federal and State mining claims and 2005 APMA's are in the Bonanza Creek, Goodnews Bay/Snow Gulch, Iliamna/Kvichak, Kemuk, Pebble Copper, Platinum, and Shotgun Hills areas. Current mineral activities would occur in the Iliamna/Kvichak and Platinum areas.

If locatable mineral activity were to occur on every active Federal mining claim, as allowable by present BLM authority on BLM-managed land, an estimated total of 23 acres (5 lode and 18 placer) could potentially be disturbed in the Bay planning area on State-selected and Native land. No disturbance would occur on BLM unencumbered or Native-selected land. Under this Alternative no further disturbance would be anticipated until the conveyance process is completed. Future mineral activities could be expected to occur on those lands returning to BLM management.

All mineral related activities occurring on BLM-managed land are subject to current BLM surface regulations as outlined in 43 CFR 3809. Operators are required to submit Plan of Operations which contains stipulations based on site-specific resource concerns. All operations are required to meet applicable Federal and State air and water quality standards for permitting.

b) Effects to Locatable Minerals for Alternative B

Under the Development Alternative all future mineral activities would be allowed in the Bay planning area as all ANCSA 17(d)(1) withdrawals would be repealed and all segregated lands returning to BLM management would be open for mineral entry. Approximately 1,176,269 acres of BLM unencumbered lands would be available for locatable mineral entry. Selected lands would be made available for locatable mineral entry if the selection is revoked or relinquished. An additional 3,999 acres are closed to material entry due to withdrawals other than ANCSA 17(d)(1). If all reasonable foreseeable future mineral activities were to occur in the Bay planning area on BLM-managed land, activities would occur in the Goodnews Bay/Snow Gulch, Iliamna/Fog, Iliamna/Kvichak, Kasma Creek, Kijik Lake, and Pebble Copper areas.

Lode mineral activities in the Goodnews Bay/Snow Gulch area would occur at the Tatlignagpeke Mountain and Mitlak Mountain properties on BLM unencumbered land and Wattamuse-Granite Lode property on Native-selected land. Lode activities in the Iliamna/Fog area would occur at the Dutton, Easy,

Karen, and Meadow properties on State-selected land and the Duryea and Ground Hog properties on Native-selected land. Lode activities in the Iliamna/Kvichak area would occur on the Iliamna Project, D Block; Iliamna Project, H Block; and LSS 1-3 properties on State-selected land. Lode activities in the Kasna Creek area would occur at the South Current Creek and Upper South Current Creek properties on Native-selected land. Lode activities in the Kijik lake area would occur at the Dicks Lode, Gull, and Kijik Mountain properties on Native-selected land. Lode activities in the Pebble Copper area would occur at the Hill 1759 property on Native-selected land.

Placer activities in the Goodnews Bay/Snow Gulch area would occur at the Barnum Creek, Domingo Creek, Faro Creek, and Jacksmith Creek Tributary on BLM unencumbered land; the Slate Creek property on State-selected land; and the Arolik River, Malaria Creek, Snow Gulch, Tyrone Creek, and Wattamuse Creek properties on Native-selected land. Placer activities in the Iliamna/Fog area would occur at the Unnamed (west of Chetok) property on Native-selected land. Placer activities in the Kijik lake area would occur at the Bertha M. property on Native-selected land.

If locatable mineral activity were to occur on every existing operation, as allowable by present BLM authority on BLM-managed land, an estimated total of 115 acres could potentially be disturbed in the Bay planning area. Total includes surface disturbance of 14 acres on BLM unencumbered land, 36 acres on State-selected land, 47 acres on Native-selected land, and 18 acres on Native land (active Federal claims). Depending upon the results of conveyances, some of this locatable mineral activity may occur on land owned by the State and Native corporations. Due to the small size of the existing operations as well as the short period of operation there would be a minor impact on the local air and water quality.

All locatable mineral related activities occurring on BLM-managed land are subject to current BLM surface regulations as outlined in 43 CFR 3809. Operators are required to have an approved Plan of Operations which contains site-specific guidelines as listed in the BLM-Alaska Required Operating Procedures. All operations are required to meet applicable Federal and State air and water quality standards for permitting.

c) Effects to Locatable Minerals of Alternative C

Under the Conservation Alternative limited future locatable mineral entry would be allowed on lands retained in BLM management in the Bay planning area. Given the current land status, approximately 1,071,189 acres of BLM unencumbered lands would be closed to locatable mineral entry. Only 152,746 acres would be open to locatable mineral entry. 3,999 acres are closed to material entry due to withdrawals other than ANCSA 17(d)(1). Two areas, the Proposed Carter Spit (62,863 acres) and the Proposed Bristol Bay (989,202 acres) are recommended as ACECs and the proposed wild river segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork rivers (15,125 acres) would be closed to locatable mineral entry.

However, locatable mineral activity would still be allowed on existing “grandfathered” Federal mining claims within the Bay planning area. Active Federal lode mining claims occur at the Iliamna Project, H Block property in the Iliamna/Kvichak area on BLM unencumbered and State-selected land. Active Federal placer mining claims occur on the Salmon River in the Platinum area on Native land. Locatable mineral activity may also occur on lands within the planning area that are conveyed to the State and Native corporations.

If locatable mineral activity were to occur on every active Federal mining claim, as allowable by present BLM authority on BLM-managed land, an estimated total of 23 acres (5 lode and 18 placer) could potentially be disturbed in the Bay planning area on BLM unencumbered, State-selected, and Native land. Under this Alternative no further disturbance would be anticipated as land returning to BLM-management would be included into existing or future withdrawals that would be closed to mineral entry. Due to the

small size of the existing and future anticipated operations, as well as the short yearly period of operation, there would be a minor impact on the local air and water quality.

All locatable mineral related activities occurring on BLM-managed land are subject to current BLM surface regulations as outlined in 43CFR 3809. Operators are required to have an approved Plan of Operations which contains site-specific guidelines as listed in the BLM-Alaska Required Operating Procedures. All operations are required to meet applicable Federal and State air and water quality standards for permitting.

d) Effects to Locatable Minerals of Alternative D

Under the Development Alternative all future locatable mineral activities would be allowed in the Bay planning area as all ANCSA 17(d)(1) withdrawals would be repealed and all segregated lands returning to BLM-management would be open for mineral entry. Approximately 1,176,269 acres of BLM unencumbered lands would be available for locatable mineral entry. Approximately 62,863 acres would be considered for one ACEC (Carter Spit) and subject to more stringent Required Operating Procedures. An additional 3,999 acres are closed to material entry due to withdrawals other than ANCSA 17(d)(1). If all reasonable foreseeable future mineral activities were to occur in the Bay planning area on BLM-managed land, activities would occur in the Goodnews Bay/Snow Gulch, Iliamna/Fog, Iliamna/Kvichak, Kasma Creek, Kijik Lake, and Pebble Copper areas.

Lode and placer mineral activities on BLM-managed land are the same as discussed in Alternative B - Development.

If locatable mineral activity were to occur on every existing operation, as allowable by present BLM authority on BLM-managed land, an estimated total of 115 acres could potentially be disturbed in the Bay planning area. Total includes surface disturbance of 14 acres on BLM unencumbered land, 36 acres on State-selected land, 47 acres on Native-selected land, and 18 acres on Native land (active Federal claims). Depending upon the results of conveyances, some of this locatable mineral activity may occur on land owned by the State and Native corporations. Due to the small size of the existing operations as well as the short period of operation there would be a minor impact on the local air and water quality.

All locatable mineral related activities occurring on BLM-managed land are subject to current BLM surface regulations as outlined in 43 CFR 3809. Operators are required to have an approved Plan of Operations which contains site-specific guidelines as listed in the BLM-Alaska Required Operating Procedures. All operations are required to meet applicable Federal and State air and water quality standards for permitting.

Salable Minerals (Mineral Materials)

a) Effects to Mineral Materials for Alternative A

Salable material (sand and gravel) activities on Federally administered surface/minerals and split estate are available for exploration and development unless specifically closed by Public Land Order (PLO). Approximately 1,176,269 acres of BLM unencumbered lands are available for the sale of mineral materials. State-selected and Native-selected lands would be made available if their selections are revoked or relinquished. An additional 3,999 acres are closed to material sales due to withdrawals other than ANCSA 17(d)(1). Large reserves of salable material exist on State and Native land and no disturbance of BLM unencumbered land is anticipated. Activities would require an approved Plan of Operations containing stipulations based on site-specific resource concerns and are subject to all BLM and State laws and regulations.

b) Effects to Mineral Materials for Alternative B

Salable material (sand and gravel) activities on Federally administered surface/minerals and split estate are available for exploration and development unless specifically closed by Public Land Order (PLO). Approximately 1,176,269 acres of BLM unencumbered lands are available for the sale of mineral materials. State- and Native-selected lands would be made available if their selections are revoked or relinquished. An additional 3,999 acres are closed to material sales due to withdrawals other than ANCSA 17(d)(1). Large reserves of salable material exist on State and Native land and no disturbance of BLM unencumbered land is anticipated. Activities would require an approved Plan of Operations containing Required Operating Procedures based on site-specific resource concerns and are subject to all BLM and State laws and regulations.

c) Effects to Mineral Materials for Alternative C

Salable material (sand and gravel) activities on Federally administered surface/minerals and split estate are available for exploration and development unless specifically closed by Public Land Order (PLO). Approximately 1,176,269 acres of BLM unencumbered lands are available for the sale of mineral materials. State-selected and Native-selected lands would not be made available if their selections are revoked or relinquished. However, two areas, the Proposed Carter Spit (62,863 acres) and the Proposed Bristol Bay (989,202 acres) are recommended as ACECs and the proposed wild river segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork rivers (15,125 acres) would be closed to the sale of mineral materials. An additional 3,999 acres are closed to mineral material sales due to withdrawals other than ANCSA 17(d)(1). Large reserves of salable material exist on State and Native land and no disturbance of BLM unencumbered land is anticipated. Activities would require an approved Plan of Operations containing Required Operating Procedures based on site-specific resource concerns and are subject to all BLM and State laws and regulations.

d) Effects to Mineral Materials of Alternative D

Salable material (sand and gravel) activities on Federally administered surface/minerals and split estate are available for exploration and development unless specifically closed by Public Land Order (PLO). Approximately 1,176,269 acres of BLM unencumbered lands are available for the sale of mineral materials. State-selected and Native-selected lands would be made available if their selections are revoked or relinquished. However, one exception in the Bay planning area would be closed to material sales, the Proposed Carter Spit ACEC containing 62,863 acres. An additional 3,999 acres are closed to material sales due to withdrawals other than ANCSA 17(d)(1). Large reserves of salable material exist on State and Native land and no disturbance of BLM unencumbered land is anticipated. Activities would require an approved Plan of Operations containing Required Operating Procedures based on site-specific resource concerns and are subject to all BLM and State laws and regulations.

4. Special Designations

a) Areas of Critical Environmental Concern

(1) Effects to Areas of Critical Environmental Concern for Alternative A

There are currently no ACECs in the planning area. Under this Alternative, no ACECs would be created; therefore, there would be no impacts to them.

(2) Effects to Areas of Critical Environmental Concern for Alternative B

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

(3) Effects to Areas of Critical Environmental Concern for Alternative C

Alternative C would propose the application of special management provisions to 1,052,065 acres (approximately 4%) of the planning area. Management identified under Stipulations, Required Operating Procedures, and project-specific requirements would provide protection of relevant and important values of these ACECs. The following sites would be designated under this Alternative:

- Carter Spit ACEC
- Bristol Bay ACEC

These two potential ACECs would be designated based on resource values and the need for special management beyond standard provisions to protect relevant and important values, values of which for each area are discussed in Chapter III and Appendix A. Management would result in limitations or restrictions placed on other resource uses and activities in order to prevent irreparable damage to the identified values. In both cases, habitat management plans would be written. The area would be subject to Stipulations, Required Operating Procedures, and project-specific requirements and conditions such as seasonal restrictions. Except for Alternative A, retaining ANCSA 17(d)(1) withdrawals, this Alternative provides the most protection to fish and wildlife habitat.

Carter Spit ACEC

Impacts to fish, wildlife, vegetation, Special Status Species, and cultural resources under Alternative C are discussed in this chapter under each topic heading, beginning on page 4-22. This ACEC would remain open to mineral leasing and location, would be closed to salable minerals (mineral materials: sand and gravel), designated as a right-of-way avoidance area, closed to livestock grazing, OHV travel limited to designated roads and trails, closed to FLPMA leases, and would be unavailable for disposal. Should the selected lands immediately adjacent to this ACEC revert to BLM, they will be incorporated into the ACEC.

Bristol Bay ACEC

Impacts to fish, wildlife, vegetation, Special Status Species, and cultural resources under Alternative C are discussed in this chapter under each topic heading. This ACEC would remain open to mineral leasing and location, would be closed to salable minerals (mineral materials: sand and gravel), designated as a right-of-way avoidance area, closed to livestock grazing, OHV travel limited to designated roads and trails, closed to FLPMA leases, and would be unavailable for disposal. Should the selected lands immediately adjacent to this ACEC continue under BLM management, they will be incorporated into the ACEC. Impacts from commercial recreation could be reduced by placing limitations on the number of special recreation use permits issued. A fire management plan developed to protect lichen range for caribou would support one of the purposes for this ACEC.

(4) Effects to Areas of Critical Environmental Concern for Alternative D

Alternative D could result in special management provisions being applied to an estimated 62,863 acres (less than 1%) of the planning area providing protection of relevant and important values. BLM managed lands in one area would be designated as an ACEC. After conveyances are complete, selected lands remaining in BLM ownership would be incorporated into the existing ACEC. The following site would be designated under this Alternative:

- Carter Spit ACEC

This area would be designated based on resource values and the need for special management beyond standard provisions to protect relevant and important values (Chapter III and Appendix A). Management would result in limitations or restrictions placed on other resource uses and activities in order to protect identified values and to prevent irreparable damage to the identified values. A habitat management plan

would be developed for the ACEC. The area would be subject to Stipulations, Required Operating Procedures, and project-specific requirements and conditions such as seasonal restrictions.

Carter Spit ACEC

Impacts to fish, wildlife, vegetation, Special Status Species, and cultural resources under Alternative C are discussed in this chapter under each topic heading, beginning on page 4-14. This ACEC would remain open to mineral leasing and location, would be closed to salable minerals (mineral materials: sand and gravel), designated as a right-of-way avoidance area, closed to livestock grazing, OHV travel limited to designated roads and trails, closed to FLPMA leases, and would be unavailable for disposal. Should the selected lands immediately adjacent to this ACEC remain in long-term BLM administration, they will be incorporated into the ACEC.

b) Wild and Scenic Rivers

Wild and Scenic River areas are not essentially natural resources or resource uses, but represent statutory decisions to protect certain resources or uses over a long period of time. For this reason, impacts of various Alternatives to proposed Wild and Scenic River areas should be examined by looking at the impacts to resources and uses described elsewhere in this chapter.

The most basic characteristics of a wild and scenic river are its free-flowing nature and its unpolluted waters. Impacts of the various Alternatives on the quality and free-flow of water are described in the Air Quality, Soil and Water Resources section of this chapter.

Seven outstandingly remarkable values were identified for the eligible river areas: Free-flowing nature and water quality, scenery, subsistence use, prehistory and history, recreational use, fish habitat, and wildlife habitat. Each of these values has a corresponding section in this chapter where an assessment of potential impacts may be found. Appendix A provides the Wild and Scenic River matrix used to determine the river segments' eligibility.

(1) Effects to Wild and Scenic Rivers Common to All Alternatives

The three river areas described as eligible will be managed---to the extent possible using BLM discretionary authority---to protect the outstandingly remarkable values identified until a final decision is made on the suitability or non-suitability of these rivers as additions to the National Wild and Scenic River System.

(2) Effects to Areas of Critical Environmental Concern for Alternative A

There are currently no Wild and Scenic Rivers designated on BLM-administered lands in the planning area. Under this Alternative, no rivers would be nominated.

(3) Effects to Areas of Critical Environmental Concern for Alternative B

No Wild and Scenic Rivers would be nominated under this Alternative.

(4) Effects to Areas of Critical Environmental Concern for Alternative C

Under Alternative C, three river segments would be proposed for Wild and Scenic River Designation: the Alagnak River (Wild/Recreational), the Goodnews River Mainstem (Wild), and the Goodnews River Middle Fork (Wild) (15,125 acres). This would provide maximum protection to water quality and free-flow, as the BLM would gain additional authority to review Federal authorizations for water resources projects, and would be mandated to protect the outstandingly remarkable values of designated rivers. ANCSA 17(d)(1) withdrawals would be retained until Congress had an opportunity to act on the proposal.

(5) Effects to Areas of Critical Environmental Concern for Alternative D

Under Alternative D, no Wild and Scenic Rivers would be proposed.

5. Social and Economic Conditions

a) Effects to Social and Economic Conditions Common to All Alternatives

(1) Effects to Social and Economic Conditions from BLM Expenditures (Common to All)

Income generated by BLM expenditures in the planning area, including expenses for field operations, services, and personnel are expected to remain similar to current contributions, or increase slightly, across all Alternatives.

(2) Effects to Social and Economic Conditions from Livestock Grazing (Common to All)

No livestock grazing currently occurs under permit, nor has any interest been expressed in requesting livestock grazing authorization. The only anticipated grazing uses might be incidental use associated with recreational and commercial use of pack animals for hunting, fishing, and other back country recreation. Authorizations for grazing by pack animals will be examined on a case-by-case basis. No requests for reindeer grazing permits are anticipated. There are no current reindeer grazing authorizations within the Bay planning area. Therefore, no effect on the regional economy is expected under any Alternative.

(3) Effects to Social and Economic Conditions from Forest Products (Common to All)

Individual and subsistence use of forest products is typical in the planning area. There is virtually no commercial demand, few permits for individual use, and no expectation of change in current pattern of use. The demand for forest products on BLM administered land within the plan area is not expected to change in the foreseeable future. Therefore, the effect on the regional economy is very low for all Alternatives.

(4) Effects to Social and Economic Conditions from Recreation Management, Travel Management, and Special Designations

BLM issues approximately 6 annual special recreation use permits to commercial guides or outfitters using BLM administered or Public Land inside the planning area. Little visitor use or trip data is available. BLM assumes access to the planning area for commercial or public recreation is largely provided by local businesses.

OHV management will not have economic effects on the area. Access to subsistence resources will remain unaffected under all Alternatives.

(5) Effects to Social and Economic Conditions from Hazardous Materials Management

The BLM management actions proposed under all Alternatives for hazardous or solid wastes may have localized, beneficial effects on socioeconomic resources through prevention measures and mitigation practices as site become known that are near known communities.

b) Effects to Social and Economic Conditions for Alternative A

(1) Effects to Social and Economic Conditions from Leasable Minerals (Alternative A)

The area would be closed to mineral leasing. Therefore, management under this Alternative would not result in changes in the regional economy.

(2) Effects to Social and Economic Conditions from Locatable Minerals (Alternative A)

A small portion of the planning area is currently open to mineral location, and would be open under Alternative A. The ANCSA Section (d)(1) withdrawals, State, and Native selections segregate most of the land, preventing new mineral entry. Mining activity is currently taking place only on claims predating ANCSA and selections. Planning decisions would not limit mining on existing claims.

Under this Alternative, no new mining activity would be likely to occur on BLM managed land. Therefore, management under this Alternative would not result in changes in the regional economy.

(3) Effects to Social and Economic Conditions from Lands and Realty Actions (Alternative A)

FLPMA permits, leases, and sales would continue to be processed on a case by case basis. There is no record of previous FLPMA sales. No disposal or exchange activity would be allowed under this Alternative. Therefore, management under this Alternative would not result in changes in the regional economy.

c) Effects to Social and Economic Conditions Alternative B

(1) Effects to Social and Economic Conditions from Minerals (Alternative B)

Most of the planning area (2,499,941 acres) would be recommended for opening to mineral leasing. Leasing would occur after ANCSA (d)(1) withdrawal orders were modified, and after segregated land either was conveyed or was returned to the public domain when land conveyances are complete.

Leasable Minerals

Revenues - Long term gas prices must be over \$12.45 per Mcf to encourage production where a gas pipeline must be constructed to deliver product to Dillingham (Craig 2004). This is based on current costs. Leases may be offered as early as 2010 and exploration may begin during the period 2010 to 2014. Leases are most likely to lie approximately 40 miles east northeast of Dillingham in this scenario. Economic effects of a gas field will more likely result within the Dillingham area, and less likely to result in change in the remainder of the planning area.

Bonus bids in the Alaska Peninsula Area wide 2005 oil and gas lease sale of state land brought the State of Alaska \$1,268,121 in revenue. State leases covered about 213,000 acres in this sale. The total area in the Koggiling Creek Block of unencumbered land is 159,732 acres. Bonus bids are expected to be lower for an offering here. The State of Alaska transfers part of its share of bonus bids to boroughs, for example, in 1998 following the NE NPRA lease sale. (DOI, 2003) However, the likely location of a lease sale is not within an organized borough in the planning area.

Rent is charged for lease acreage until it produces oil or gas and thereafter royalty. The Federal government charges \$1.50/acre for the first five years and \$2.00/acre for the second five years of a typical 10 year lease. Rents are split with the State in the same manner as royalties. 1,404,000 of 5,816,919 acres offered were leased in the 1998 NW NPRA sales, for example.

Royalties will be based on 12.5% of the well head value of gas and be split between the State (90 percent) and Federal government 10%. The State received a total of approximately \$1.755 billion from rents, bonus bids, and royalties statewide during calendar year 2005.

Property tax may be assessed by the state and shared with a borough. The scenario used and analyzed in this EIS predicts development outside of existing boroughs in the planning area. Therefore, even if the state assesses property tax it will not go directly to a local government.

Employment and Income - Crew estimates presented in BLM's Reasonably Foreseeable Development Scenario (RFD) for Leasable Minerals estimate manpower requirements for gas exploration and related activities. Seismic testing is predicted to begin in the period 2010 . Crews will range from 20 to 50 workers. These workers may be based in a central location, or may be based in a field camp, as is often the case in other parts of Alaska where remote operations occur.

All other activities would occur in 2014 or later. Drilling would require 17 to 34 workers. Production would require 19 to 73 workers. Construction of a 3 inch diameter steel transmission pipeline would require 21 to 34 workers.

It is assumed that development activities would be based from a camp located on one of the gravel pads associated with development and production. Camp operations would require 10-20 additional workers in trades or laborers during set up, and catering services indicated in the following tables during operation.

Direct and indirect impact to the central location during exploration would include effect on local lodging and catering services, and could be a significant input to an economy such as Dillingham. Later construction and operations may have a lower effect on lodging and food service in Dillingham, but may increase transportation service requirements for material barged or flown from supplier locations outside the planning area. It is possible all direct and indirect input in the Dillingham area would be new jobs, though temporary and paralleling the project timeline. Tables 4.3 through 4.6 show direct employment under a camp scenario. Direct employment includes catering service at camp facilities, which is not included in the BLM RFD labor requirement. Therefore, the figures in preceding paragraphs will be lower than shown in the tables. Indirect employment would likely occur in Dillingham, at hotels and in the transportation sector. This is estimated as 2 to 12 jobs during the life of the project. Personal income derived from the project would be most likely to result in the construction, service, and transportation sectors.

Table 4.3. Potential Seismic Manpower Requirements for Proposed Yukon Flats Oil and Gas Development (Adapted from Doyon 2004)

Position	2D Seismic	3D Seismic
Supervisor and Co. Rep	3	4
Surveyors	8	16
Drilling Crew	15	20
Recording Crew	18	25
Catering	4	6
Total	48	71

Table 4.4. Potential Drilling Manpower Requirements for the Proposed Activity in This Planning Scenario (adapted from Doyon 2004)

Position	Number
Supervisors/Tool Pushers	2-4
Rig Crews	6-14
Welders, Electricians, Mechanics & Roustabouts	3-6
Drilling Services	6-10
Catering	6
Total	23-40

Table 4.5. Potential Production Operations Manpower Requirements for the Proposed Activity in This Planning Scenario (adapted from Doyon 2004)

Position	Number
Production Supervisors	2-4
Production Operations	10-50
Roustabouts	5-12
Support Services such as Mechanics, Electricians	2-7
Catering	6
Total	25-79

Table 4.6. Potential Pipeline Construction Manpower Requirements for the Proposed Activity in This Planning Scenario (adapted from Doyon 2004)

Position	Number
Project Management	1-2
Welders & Helpers	10-15
General Laborers	5-7
Support Services such as Mechanics, Electricians	5-10
Catering	6
Total	25-40

Bristol Bay area oil and gas industry employment and income will vary from low levels during exploration phase (2010 to 2014) increase during development and drop during production phases. Workers will travel to the gas field from other parts of the United States (27%) and from other parts of Alaska (58%), with very few workers originating from the planning area (15%), based on comparisons drawn from the North Slope oil industry. (Hadland 2005)

Continuing, the Interim Report *The Economic Multiplier* shows that in rural areas the multiplier has a value only a little more than one (ISER 2005). Most goods and services purchased by businesses and households in small towns come directly from larger trade centers outside the local market. In this instance, sources are outside the planning area. The Institute of Social and Economic Research at the University of Alaska in Anchorage estimates that in rural census areas in Alaska it would take \$15 or more of purchasing power flowing into the region to produce \$1 of income in a support business within the region itself. According to the report, additional spending would generate more support wages in Dillingham than the same amount of spending in Bristol Bay Borough.

The effect of the employment and income on the United States is negligible.

Locatable Minerals. The revocation of all ANCSA Section 17 (d)(1) withdrawals would allow new mineral entry. Under this Alternative one to three new placer operations could begin over the life of the plan. Up to 15 new seasonal jobs at mining locations may be created, adding income of \$150K to \$250K per annum to the regional economy.

Exploration for resources leading to lode mine potential will begin to occur over the life of the plan. From four to 40 new seasonal jobs may be created in various stages of exploration. In initial exploration, one or

more small crews consisting of two well qualified geologists and two lesser qualified assistants would receive an average of \$300 per day for approximately six months work. Work would be conducted from small field camp(s) with all supplies shipped to location using commercial air transport, and all local transportation by helicopter on contract. Using these assumptions, each crew could receive about \$216,000 for 180 days seasonal employment. This is the most likely scenario for the period 2010-2015.

If potential lode resources are located, additional employment may result as exploration to define a deposit continues. Additional capital and labor will be required to drill, sample, and process findings. This scenario indicates spending may increase by a factor of ten in later stages of exploration or assessment of resources. Primary labor resources will continue to be imported from outside the planning area. Depending upon location of activity, a field camp may still be required, with little use of local lodging.

A large portion of wages will be paid to workers who do not live in the region, and much of the capital investment will occur outside the region. The effect to the regional economy is expected to be low. As development begins, the likelihood of local resource utilization, lodging and air taxi service, and participation by local labor is likely to increase.

No revenues would result to the state or Federal government under this scenario.

(2) Effects to Social and Economic Conditions from Lands and Realty Actions

FLPMA permits, leases, and sales would continue to be processed on a case by case basis. Effect of future disposal or land exchange proposals may be assessed when the value of specific parcels is determined. BLM is unlikely to act until land conveyance to the State of Alaska, ANCSA Native Corporations, and Native Allottees is complete. At that time BLM may attempt to consolidate land management responsibilities.

d) Effects to Social and Economic Conditions for Alternative C

(1) Effects to Social and Economic Conditions from Minerals

Leasable Minerals

Most of the planning area (2,488,815 acres) is open to mineral leasing. The effect on the regional economy is expected to be the same as Alternative B.

Locatable Minerals

Impacts would be the same as Alternative A.

(2) Effects to Social and Economic Conditions from Lands and Realty Actions

Impacts would be the same as Alternative B.

e) Alternative D

(1) Effects to Social and Economic Conditions from Minerals

Leasable Minerals

Most of the planning area (2,499,941 acres) is open to mineral leasing. The effect on the regional economy is expected to be similar to Alternative B.

Locatable Minerals

Impacts would be the same as Alternative B.

(2) Effects to Social and Economic Conditions from Lands and Realty Actions

Impacts would be the same as Alternative B.

6. Environmental Justice

The Alutiiq, Athabascan, and Central Yup'ik Native people, recognized minorities in the planning area, engage in a particularly subsistence based economy. It is characterized by high unemployment in the cash-based economy, low labor force participation, and relatively low income where the cost of living is very high. Therefore, activities restricting subsistence practices, access, and resources will certainly affect a large segment of the local population. Arguably, creation of jobs and income provide positive effects on the Native population.

Activities not associated with mineral extraction or oil and gas activities likely to occur in the Planning Area would primarily be transitory in nature, of short duration, and highly localized. Under all Alternatives the effects of recreation, and forestry, lands and realty actions, and grazing would be similar. Activities could temporarily divert, deflect, or disturb subsistence species from their normal patterns. These activities could alter the availability of subsistence species in traditional harvest areas, which could in turn affect harvest patterns by requiring hunters to travel further in pursuit of resources. Increased travel distances would result in greater expenditures for fuel and equipment, and increased wear and tear on equipment. Consequently, there could be an effect on the subsistence hunting activities of local minority populations as a result of these activities. The effect would be likely minor, short term, and highly localized.

Alternatives B, C, and D would allow oil and gas activities in areas formerly unavailable for leasing. Year-round activities could increase the amount of area affected, increase the duration of effects, and spread the effects where development occurs in the Planning Area. Disturbances caused by development under Alternatives B, C, and D would be potentially greater or more likely than under the No Action Alternative. Mining of locatable minerals under Alternatives B or D would not be likely to adversely affect local people since small placer operations would be seasonal and of short duration. Mineral exploration will have little effect on the local populations as employees and supplies will originate outside the planning area.

7. Subsistence

The potential of initiation of gas exploration and development, continuation and possible expansion of locatable mineral exploration and development, and development of infrastructure in the form of connecting roads, bridges, and supporting infrastructure for commercial development, taken together they would have cumulative impacts on caribou, moose, brown bear, some migratory waterfowl, and anadromous and freshwater fish in the planning area. Consequently, subsistence would also be affected, as all communities within the planning area rely on caribou, moose, and anadromous fish as their primary sources of protein.

Privatization of State and Native corporation lands would have the potential to negatively affect wildlife, wildlife habitat, and subsistence use by opening up areas to private development.

Development of regional connecting roads within the planning area would have the potential to negatively affect wildlife, wildlife habitat, and subsistence. These impacts would include habitat fragmentation, increased access into wildlife habitats, increased disturbance impacts, increased potential for mortality (road kills) and possible alteration of behavior or movement patterns of wildlife. If the proposed road(s) linked small or regional communities to the already existing road system within Alaska, then increased

competition for subsistence resources would likely result, as non-local hunters would be able to more readily access the area. Currently, access for non-local hunters is primarily by airplane or by boat. This may also result in an increase in visitor traffic and recreational use of the area, causing additional impacts to wildlife.

Small roads that connect communities within the planning area may aid subsistence users in accessing their traditional harvest areas. However, they may also concentrate hunting efforts along the road corridor, depleting resources from the immediate area, and potentially altering harvest from currently-used traditional harvest areas.

E. Cumulative Effects

1. *Methods*

The National Environmental Policy Act (NEPA) and its implementing guidelines require an assessment of the proposed project and other projects that have occurred in the past, are occurring in the present, or are likely to occur in the future, which together may have cumulative impacts that go beyond the impacts of the proposed project itself. According to the Act (40 CFR Sec. 1508.7 and 1508.25[a][2]):

A **cumulative impact** is the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In addition, to determine the scope of environmental impact statements, agencies shall consider cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.

The analysis of cumulative impacts is a four-step process that follows guidance provided in Considering Cumulative Effects under NEPA (CEQ 1997).

- **Specify the class of actions whose effects are to be analyzed.** Activities allowed under the RMP and advances in technology are considered in the analysis. The assumptions and scenarios used by the resource specialists in the analysis of the cumulative impacts include those identified for the planning area in Analysis Assumptions beginning on page 4-3.
- **Designate the appropriate time and space domain in which the relevant actions occur.** For some resources and uses, the area of which an effect could be felt would be the “footprint,” but for others the effect may extend well beyond that area. For example, noise effects to wildlife can extend beyond the footprint of the development. For purposes of this analysis, the spatial domain for past, present, and reasonably foreseeable activities is primarily the planning area. However, this document also considers effects to resources that could occur outside of the planning area, primarily to migratory birds and mammals. Due to the difficulty of predicting advances in technology and the need for oil and gas very far into the future, the analysis period which most of the cumulative effects analysis is focused, is 50 years into the future.
- **Identify and characterize the set of receptors to be assessed.** The set of receptors assessed in the cumulative effects analysis are the physical, biological, and human systems discussed in Chapter III.

- **Determine the magnitude of effects on the receptors and whether those effects are accumulating.** The potential extent of the total cumulative effects (e.g., number of animals and habitat affected, jobs and revenues created or lost), and how long the effects might last (e.g., population recovery time, duration of income flows) are estimated to determine the magnitude of effects that could accumulate for each resource. Where possible, the assessment of effects on a resource is based on quantitative analysis (e.g., number of miles of gravel constructed; number of animals killed). However, many effects are difficult to quantify, and a qualitative assessment of effects is made.

2. Activities Considered in the Cumulative Case

The following are past, present, and reasonably foreseeable future actions on Federal lands and non-Federal lands within the planning area or outside of the planning area. Actions outside the planning area include those that could contribute to cumulative effects on resources within the planning area.

a) Past Development

- **History of Oil and Gas Exploration** - To date, oil and gas exploration has been limited to 26 onshore wells and 2 offshore wells in the Bristol Bay region, an area comprising about 40,000 square miles (Magoon et al. 1996). None of the wells were drilled in the planning area, nor have any produced oil or gas in commercial quantities.
- **First Lease Sales** - The State of Alaska first made land available for oil and gas leasing in the Bristol Bay area in the 1960s. Sales #2 and #5 resulted in the leasing of five isolated tracts in Nushagak Bay and on the Alaska Peninsula (State of Alaska 2005). A total of 476,824 acres were leased. In 1961 Pure Oil Company received a contract from the State of Alaska to drill three wells in the Nushagak Bay area. The project was abandoned when Pure Oil Company failed in an attempt to land a drilling rig in the area due to icing conditions (State of Alaska 1961).
- **Historic Wells** - The North Aleutian COST #1 well (1983) and the Amoco Becharof #1 well (1985) were drilled in the Aleutian Islands region. The North Aleutian COST #1 well was drilled offshore by ARCO into the Bear Lake Formation, which exhibited good reservoir properties. Approximately 33 feet of coal was also found (Reifenstuhl and Finzel 2005).

Becharof #1, the nearest well on the Alaska Peninsula to the planning area boundary is located approximately 30 miles south of the boundary. It was drilled in 1985 by the Amoco Petroleum Company. Significant gas shows were encountered in Tertiary rocks (Reifenstuhl and Brizzolara 2004).

- **Cook Inlet Basin Oil and Gas** - Alaska's first commercial oil production came from discoveries in Cook Inlet. In 1959, the State of Alaska established a competitive leasing program. Since then over 5.6 million acres of State land have been leased in 40 State oil and gas lease sales in the Cook Inlet region. Prior to Statehood in 1959 the Federal government conducted non-competitive lease sales. About 67,000 acres of the non-competitive Federal leases remain active in the Cook Inlet basin. One competitive Federal lease has been issued to date: a 400-acre parcel. In 1960, annual production rose to 600,000 bbls, and peaked at 83 million bbls in 1970. Industry-related developments include a Unocal ammonia-urea plant in Nikiski, the first oil refinery developed by Tesoro in 1969 near Kenai, and a liquid natural gas (LNG) plant in Nikiski in 1969.
- **History of Locatable Mineral Production** - Known mineral deposits within the Bay planning area that have seen historical production include one deposit of placer platinum, placer gold, and one small mercury lode deposit. Placer platinum mining has historically occurred on the Salmon River near the Goodnews Mining Camp and associated side drainages including Dowery Creek, Squirrel Creek, and Clara Creek. Between 1928 through 1982 an estimated 646,312 troy ounces of platinum were mined from these drainages. Early open cut mining was conducted by draglines/slucice-boxes in the side

drainages. In 1937 a large bucket-line dredge was brought in to mine the Salmon River which operated through 1982.

- Placer gold mineralization has been identified and mined in the past but these operations were small and have been inactive for many years. Placer gold mining has occurred in the headwaters of the Arolik River and the Wattamuse/Slate Creek area, north of Goodnews Bay; at Trail Creek, a tributary of the Togiak River; at American Creek, north of Naknek Lake; and at Portage Creek and Bonanza Creek, north of Port Alsworth. The largest gold placer operation occurred around Wattamuse Creek and associated drainages, where between 1917 through 1947 an estimated 30,041 troy ounces of gold were mined (BLM, 2005 AMS).
- Mercury was discovered at the Redtop Mercury Mine, located on Marsh Mountain north of Dillingham. Production occurred from 1952 to 1959 with a total of approximately 100 flasks (Hudson, 2001a OFR 01-192). Several abandoned mine projects have been conducted at the Redtop Mercury Mine during the last decade, including hazardous waste removal of the retort and contaminated soil at the Redtop Millsite along the Wood River. Additionally, dynamite demolition, and a closure of the main underground adit have occurred at the associated mine site on top of Marsh Mountain (BLM 2005).
- **Omnibus Roads** - Three Omnibus roads were constructed in the Bay planning area.

b) Present and Reasonably Foreseeable Future Development

- **Commercial Fishing** - Commercial fishing in Bristol Bay continues as the key economic driver in the region. Residents in every village in the region participate in the fishery, with members of every community holding set net and drift net limited entry permits.
- **The Oil Industry** - Oil provides approximately 85% of the State of Alaska income, Permanent Fund Dividends to residents, and has resulted in infrastructure development in the Bristol Bay Region.
- **Oil and Gas in Bristol Bay Basin** - Offshore drilling is currently off limits following a 1996 presidential moratorium; however, directional drilling from onshore is authorized (State of Alaska 2004). The moratorium on offshore drilling is in effect until June 30, 2012, but can be revoked by the President prior to that date (Sherwood et al. 2006).
- **Alaska Peninsula and Nushagak Peninsula Oil and Gas Leasing Program** - On March 17, 2004, ADNOR, Lake and Peninsula Borough, Bristol Bay Borough, and Aleutians East Borough signed a Memorandum of Understanding (MOU) in support of oil and gas lease sales and licensing of State land in the Bristol Bay and Alaska Peninsula regions. Similar MOUs were already in place between the ADNOR and the Aleut Corporation and the Bristol Bay Native Corporation (State of Alaska 2004).
- **Oil and Gas Exploration Licensing Near Dillingham** - The multi-agency coordination resulted in the State of Alaska initiating an Exploration Licensing area near Dillingham, which originally totaled 329,113 acres, only applicable for lands owned by the State (State of Alaska 2004). Bristol Shores, LLC, the primary interested licensee, was granted a license but let it lapse. In June 2005, Bristol Shores applied for a new license application for a reduced area consisting of 20,154 acres on the east side of Nushagak Bay, south of Dillingham (Petroleum News 2005) with the intent of conducting initial exploration. Currently there is no proposed or pending license in the Bristol Bay license area. Commercial oil finds are unlikely, but the area may contain up to 1 tcf of natural gas (Loy 2004).
- **Oil and Gas Lease Sales** - ADNOR held an oil and gas lease sale October 26, 2005, offering 1,047 tracts of 5.8 million acres within the Alaska and Nushagak peninsulas (Decker 2005). Lands offered within the planning area include the lower Nushagak Peninsula and the southern portion of land extending from south of Ekuk eastward to the Kvichak River delta (State of Alaska 2005). About 510,000 acres lie within the Bay planning area boundary, none of which are BLM administered lands. At that time, 213,120 acres were leased, non of which were within the planning area. Interested was

limited to Port Moller and vicinity, on the lower Alaska Peninsula approximately 200 miles south of the planning area. According to ADNR the next sale for the Alaska Peninsula is scheduled for February 2007 (State of Alaska 2006).

- **Cook Inlet Basin Leasables-** The Cook Inlet basin is currently the only commercially producing oil and gas region in southern Alaska. Between 1997 and 2001 Cook Inlet natural gas production remained relatively stable at an average of 213 Bcf per year.
- **Locatable Mineral Exploration in the Bay Planning Area -** During 2005, the last complete year of information, 7 APMAs and AHEAs were submitted for Locatable Mineral projects located within the Bay planning area. Four lode exploration applications and 3 placer mining applications were filed (AK DNR 2005). APMAs are currently being submitted for 2006.
- **Lode and Placer Exploration -** Lode exploration projects include the Big Chunk, Kamishak Project, Pebble Copper, and Shotgun/Mose projects located on State land. One placer mining project on the Arolik River is located on Native-selected land and one location at Salmon River Bench is located on Native land. One placer mining operation on State land includes the Syneeva Creek (Northern Bonanza). There are no lode or placer mining activities on BLM unencumbered land at this time.
- **Pebble Copper Mine Project -** State lode mining claims are located on the Big Chunk (BC), FUR, GDH, KAK, Pebble Copper, Pebble South, 25 Gold: Sill, 37 Skarn, and 38 Porphyry properties. The Pebble gold-copper-molybdenum-silver deposit is located in the Lake and Peninsula Borough, just north of Frying Pan Lake and 18 miles northwest of Iliamna. The exploration and planning phase of this project is likely to continue for several years, and provides income for lodge and hotel owners in Iliamna as well as jobs for locals.

In 2004, Northern Dynasty Minerals, Ltd. began a program to collect engineering, environmental, and socioeconomic data required for completion of a Bankable Feasibility Study and submission of permit applications for the Pebble Copper Mine. New finds in 2005 have delayed the permit application submission timeline. Production is not expected to begin before 2010 (Northern Dynasty Minerals Ltd. 2005).

In conjunction with the mining project, ADOT&PF is examining the feasibility of constructing a 75 mile road from the Pebble Copper mine site to a port site at Iniskin Bay or Williamsport. Draft reconnaissance engineering started in July 2004, and final reconnaissance engineering was to be completed in 2005 (ADOT&PF 2004).

- **Big Chunk (BC) Project -** Liberty Star conducted a comprehensive exploration project to evaluate copper-gold deposits on state mining claims adjacent to the Pebble Copper Mine deposit (Alaska Minerals Commission 2005).
- **Locatable Mineral Claim Staking -** Mining claims have been staked throughout the Bay planning area for both lode and placer deposits. Extensive claim staking has historically occurred in the Bonanza Hills, Kemuk, Kvichak, Pebble Copper, Shotgun Hills, Sleitat Mountains, Snow Gulch, and Red Top areas. As of January 2005 there were a total of 257 Federal claims covering approximately 10,280 acres and as of December 2005 there were a total of 5,824 State claims and no State prospecting sites covering a total of approximately 232,960 acres (BLM, 2005).
- **Bonanza Creek Area -** State placer mining claims are located on Bonanza Creek and Syneeva Creek. State lode mining claims are located on the Bonanza Hill and Bonanza property.
- **Goodnews Bay/Snow Gulch Area -** State placer mining claims are located on the Arolik River.
- **Iliamna/Kvichak Area -** Federal and State lode mining claims are located on the Iliamna Project, H Block property. State lode mining claims are located on the Iliamna Project, D Block and LSS properties.

- **Kemuk Mountain Area** - State lode mining claims are located on the Kemuk and NAP properties.
- **Platinum Area** - Federal placer mining claims are located on the Salmon River Bench property.
- **Shotgun Hills Area** - State lode mining claims are located on the Shot, Shotgun/Mose, and Win properties.
- **Exploration and Development Activities Bonanza Creek Area** - There are no identified exploration projects reported in the Bonanza Creek area as of 2004 (Szumigala and Hughes, 2005). One APMA placer mining project was submitted for Syneeva Creek for 2005 (AK DNR, 2005).
- **Exploration and Development Activities Goodnews Bay/Snow Gulch area** - There are no identified exploration projects reported in the Goodnews Bay/Snow Gulch area as of 2004 (Szumigala and Hughes, 2005). One APMA placer mining project was submitted for the Arolik River for 2005 (AK DNR, 2005).
- **Exploration and Development Activities Iliamna/Fog Area** - There are no identified exploration projects reported in the Iliamna/Fog area as of 2004 (Szumigala and Hughes, 2005). No APMA or AHEA exploration projects were submitted for 2005 (AK DNR, 2005).
- **Exploration and Development Activities Iliamna/Kvichak Area** - Detailed geophysical survey and core drilling was completed in 2004 on the Iliamna Project H Block by Geocom Resources Inc. Over 3,303 feet of core drilling was completed at four locations outlining a 2,296 by 4,921 foot gold, copper, and molybdenite mineralized zone. At their Iliamna Project, D Block additional geophysical studies were conducted to delineate drill targets (Szumigala and Hughes, 2005). No APMA or AHEA exploration projects were submitted for 2005 (AK DNR, 2005).
- **Exploration and Development Activities Kasna Creek Area** - There are no identified exploration projects reported in the Kasna Creek area as of 2004 (Szumigala and Hughes, 2005). No APMA or AHEA exploration projects were submitted for 2005 (AK DNR, 2005).
- **Exploration and Development Activities Kemuk Mountain Area** - There are no identified exploration projects reported in the Kemuk Mountain area as of 2004 (Szumigala and Hughes, 2005). No APMA or AHEA exploration projects were submitted for 2005 (AK DNR, 2005).
- **Exploration and Development Activities Kijik Lake Area** - There are no identified exploration projects reported in the Kijik Lake area as of 2004 (Szumigala and Hughes, 2005). No APMA or AHEA exploration projects were submitted for 2005 (AK DNR, 2005).
- **Recent Exploration and Development Activities Pebble Copper Area** - Three properties had extensive exploration activities conducted during 2004; Pebble Copper, Big Chunk (BC), and Pebble South. Northern Dynasty Minerals, LTD. conducted comprehensive drilling, base-line environmental and socioeconomic studies to support Federal and State project permit applications. Also, Northern Dynasty conducted site testing and engineering studies for a bankable feasibility study which will be started in 2005. In-fill drilling to upgrade resources to measured and indicated status and to finalize pit design as conducted. During 2004, more than 157,614 feet of core drilling in 227 holes was completed, in-fill drilling totaled 101,539 feet in 122 holes, metallurgical and process drilling totaled 21,335 feet in 26 holes, geotechnical drilling totaled 32,502 feet in 70 holes, and exploration drilling totaled 13,815 feet in 9 holes. A new higher-grade, laterally extensive gold, copper, and molybdenite "East Zone" was discovered on the east side of the "Central Zone" of Pebble Copper. Mineralization has been discovered to a depth of 2,379 feet, and extends beyond to an unknown depth. More extensive drilling was conducted during 2005. This deposit would be mined by underground methods and is richer than the Central Zone (Szumigala and Hughes, 2005).

Liberty Star Gold Corporation conducted exploration activities on the Big Chunk (BC) property, abutting the northwest corner of the Pebble Copper claims. Airborne magnetic survey, geologic, geochemical, space imagery, and aeromagnetic studies identified 21 anomalous areas. Geological sampling, mapping, and diamond drilling activities were conducted during 2004 (Szumigala and Hughes, 2005).

Full Metal Minerals, Ltd. conducted exploration activities on the Pebble South property, abutting the south side of the Pebble Copper claims. A geological sampling program, geophysics and ground magnetic studies were completed in 2004. Eleven anomalous areas were identified with two high priority targets identified; the Boo and TYP properties (Szumigala and Hughes, 2005).

Two AHEA exploration projects were submitted for the Big Chunk (BC) and Pebble Copper projects for 2005 (AK DNR, 2005).

- **Exploration and Development Activities Platinum Area** - There are no identified exploration projects reported in the Platinum area as of 2004 (Szumigala and Hughes, 2005). One APMA placer mining project was submitted for the Salmon River for 2005 (AK DNR, 2005).
- **Exploration and Development Activities Shotgun Hills Area** - TNR Gold Corp. conducted geological and geochemical exploration programs during 2004. This resulted in acquiring 14,080 acres of new State mining claims. The claims follow a north-south trend from the Main Shotgun Zone and are called the Shot, King, and Winchester areas. New drill targets for 2005 were identified along this zone as well as more extensive drilling of the Main Zone. One AHEA exploration projects were submitted for the Shotgun/Mose project for 2005 (AK DNR, 2005).
- **Sleitat Mountain Area** - There are no identified exploration projects reported in the Sleitat Mountain area as of 2004 (Szumigala and Hughes, 2005). No APMA or AHEA exploration projects were submitted for 2005 (AK DNR, 2005).
- **Construction of the Wood River Bridge** - The Alaska Department of Transportation and Public Facilities (ADOT&PF), with the Federal Highway Administration, have made an Environmental Assessment and Finding of No Significant Impact for the proposed construction of the Wood River Bridge in Alaknagik. The bridge is currently in the design phase, with construction to begin in late 2007 or in 2008 (ADOT&PF 2005).
- **Iliamna Airport Improvements** - The ADOT&PF began study of ways to improve the Iliamna airport in 2005, including identifying improvement options, preparing engineering and environmental reports, and completing a master plan that outlines short-term (5 years), intermediate (10 years), and long-term (20 year) airport improvements (ADOT&PF 2005).
- **Manokotak Airport Improvements** - The ADOT&PF with the Federal Aviation Administration is proposing improvements to Manokotak Airport in Manokotak. Improvements include expanding the runway, surfacing the entire facility, providing adequate area for snow storage, constructing an apron and taxiway system, installing an airport lighting system and precision approach path indicators and runway end identification lighting, adding two snow removal equipment storage building bays, and extending overhead electrical lines to the new facility. A draft Environmental Assessment was published in July, 2005 (ADOT&PF 2005; FAA 2005).
- **Proposed Naknek River Bridge and Aviation Operations Improvements** - The proposed ADOT&PF project would entail a bridge spanning the Naknek River and connecting the three communities of the Bristol Bay Borough, South Naknek, Naknek, and King Salmon. The bridge would tie into the existing Omnibus road that connects Naknek and King Salmon. A bridge would influence aviation use patterns and the priority of aviation operations and improvements at the individual airport facilities, some of which had been identified by 2005 and were awaiting funding (ADOT&PF 2005).

- **Near-Term Recommendations for Community Linkages** - In its Transportation Plan, the ADOT&PF recommends five community linkage projects, three of which are in or immediately adjacent to the Bay planning area: Williamsport-Pile Bay roadway improvements; Iliamna-Nondalton road improvements and bridge construction connection; and Dillingham-Aleknagik road improvements and bridge construction connection (ADOT&PF 2005).
- **ADOT&PF Recommendations for Port and Harbor Improvements** - One recommended set of port improvements is Williamsport navigation improvements and dock facility and Pile Bay dock and boat launch facility. While this is outside the Bay planning area, it is seen as providing an intermodal complement to key transportation infrastructure, some of which would probably be within the planning area (ADOT&PF 2005).
- **ADOT&PF Marked Winter Trail System** - Provides a system of trail markers that permits safe travel by snowmachine between Bristol Bay communities during the winter months (ADOT&PF 2005).

c) Speculative Development

- **ADOT&PF Corridor Delineation** - The purpose of corridor delineation is to recognize the patterns of existing travel and desired travel in the region and to establish and protect the surface transportation “highways” that would best serve the region’s long term social and economic infrastructure needs. The Transportation Plan identifies four primary corridors, three of which are in or immediately adjacent to the Bay planning area: Cook Inlet to Bristol Bay corridor; Alaska Peninsula corridor and Dillingham/Bristol Bay corridor (ADOT&PF 2005). It is possible that all or segments of these projects may be completed during the life of this plan.
- **ADOT&PF “Triggers” for Planning** - ADOT&PF’s Transportation Plan recommends a series of triggers for re-evaluation of lower-priority projects that could lead to their development within the 20-year period considered by the plan (ADOT&PF 2005). This is dependent on such factors as a dramatic increase in population and increased demand from the economic sector.

3. Resources

a) Cumulative Effects to Air Quality, Vegetation, Soils, and Water Resources

(1) Cumulative Effects to Air, Vegetation, Soils, and Water from Minerals

Cumulative effects to soil and vegetation resources would largely result from surface disturbing activities that degrade the vegetative cover, compact soils, and expose ice-rich permafrost soils causing thermokarst erosion and subsidence. Wetland soils, stream bank soils and vegetation, and lakeshore soils and vegetation would be particularly vulnerable due to the increased possibility of additional vegetation loss, weed invasions, and erosion from seasonal breakup ice scouring and wave action. Thermokarst erosion could also result from the cumulative effect of seismic and exploration activity when less than ideal snow conditions expose tussock tundra to surface disturbance during winter months. Habitat maintenance and enhancement through adherence to the Required Operating Procedures, Stipulations, and project-specific requirements would normally reduce the unnecessary long-term disturbance to soils.

Past and present events and actions that have affected fresh water resources within and adjacent to the Bay planning area have included climate change, mining activities, transportation projects and transportation-related accidents, military activities, industrial and domestic activities and related disposal of hazardous materials, and construction of facilities. Climate change could affect annual precipitation amounts. Future reasonably foreseeable development activities associated with transportation projects

and mineral exploration may have adverse effects on water quality, although this would depend upon the location and area of activity. Mineral exploration and development can substantially decrease water supply in local aquifers, alter drainage patterns, and degrade the water quality in receiving waters.

Cumulative effects to water resources from oil and gas exploration, development, and production in the planning area and the greater Southwest Alaska region could result from:

- Disturbance of stream banks or lake shorelines from oil and gas operations and the possible subsequent melting of permafrost.
- Temporary blockage of natural channels and floodways during construction of roads and pipelines that would result in the disruption of drainage patterns.
- Increased erosion and sedimentation in rivers and lakes.
- The removal of water from lakes for dust abatement for roads and pads.
- Increased use of the tundra for both oil and gas and non-oil and gas related activities.
- An increased number of seismic surveys.
- Removal of gravel from riverine pools and lakes.

Cumulative effects to water from placer mining, including small informal projects may include deposition of concentrations of arsenic and mercury (Mueller and Matz 2002).

The cumulative case assumes exploration and development for all of the planning area. The planning area is comprised of several distinct watersheds or drainages that do not extend into adjacent areas outside the Bay planning area boundary. Therefore, activities involving surface water that are taking place outside the planning area would not be expected to directly impact water resources within the planning area; however, activities affecting surface water within the planning area could also have an effect downstream and in the bays the waterbodies empty into. Additionally, water resources in aquifers which may extend beyond planning area boundaries could be affected by activities polluting or drawing from surface or underground water sources.

The State of Alaska DEC Division of Spill Prevention and Response provides records for contaminated sites and leaking underground storage tanks for communities within the Bay planning area that have the potential to affect water, soil, and vegetation. Table 4.7 probably does not represent a comprehensive list of all such sites in the Bay planning area. It is probable that many sites have not yet been identified.

Table 4.7. State of Alaska DEC Division of Spill Prevention and Response Contaminated Sites by Community (ADEC 2006)

Community	Number of Contaminated Sites Identified	Number of Leaking Underground Storage Tanks Identified
King Salmon	49	9
Naknek	2	3
South Naknek	0	0
Iliamna	12	3
Nondalton	2	0
Pedro Bay	1	0
Manokotak	1	0
Aleknagik	1	0
Clark's Point	0	0
Dillingham	4	8
Ekwok	0	0
Goodnews Bay	0	0
Platinum	1	0
Igiugig	0	0
Kokhanok	0	0
Koliganek	1	0
Levelock	0	0
New Stuyahok	0	0
Newhalen	2	0
Port Alsworth	0	0
Portage Creek	0	0
Togiak	0	0
Twin Hills	1	0
Quinhagak	2	0

Cumulative air quality impacts may result from the emissions of hydrocarbons and byproducts of combustion. These impacts may be regionally additive (e.g., increased concentrations of specific pollutants) or synergistic (e.g., chemical reactions that form ozone), and could degrade air quality. Ambient air quality in the Goodnews Bay - Bristol Bay region is relatively pristine.

Arctic haze is a phenomenon resulting from elevated concentrations of fine particulate matter found over the Arctic, primarily in winter and spring. Scientists believe that most of the pollutants contributing to Arctic haze are from combustion sources in Europe and Asia. Particulates from burning coal include mercury, arsenic, chromium, and selenium; those from oil combustion contain nickel and vanadium (AMAP 1997). It is not known to what extent local sources in Alaska contribute to Arctic haze in the southwest Alaska region. No major degradation of air resources as a result of any of the proposals in this plan is expected during the life of the plan.

Cumulative effects to water from placer mining, including small informal projects may include deposition of heavy metals, including concentrations of arsenic and mercury (LaRoche et al. 2006; BLM 2006; Hunerlach et al. 1999; Alpers and Hunerlach 2005; Allan 1995). A problem that has been identified is determining whether the source of the heavy metal is the mining operation, or whether it occurs naturally in the environment (Mueller and Matz 2002).

Adherence to Required Operating Procedures, stipulations and project-specific requirements, limitations on OHV use, and activity planning for BLM-administered lands would protect water resources and keep impacts to a minor to moderate level. The fact that there is no forestry program, and based on a reasonably foreseeable projection of a low level of mineral development and low to moderate recreation use on BLM-managed lands within the Bay planning area during the life of this plan, the contribution to cumulative effects on soil, water, air, and vegetation resources from these activities is projected to be low.

(2) Cumulative Effects to Air, Vegetation, Soils, and Water from Lands and Realty Actions

Privatization of State or Native corporation lands has the potential to open up areas to private development. After the land conveyance process is completed, BLM would seek to consolidate remaining unencumbered lands through land exchanges. The anticipated level of development would remain low during the life of this plan.

(3) Cumulative Effects to Air, Vegetation, Soils, and Water from Oil and Fuel Spills

With reference to Table 4.7, a number of contaminated sites already exist in the Bay planning area. The greatest concentration is in and around King Salmon, and is related to historic activities at the King Salmon Air Force Base and the King Salmon Airport. The aquifer has been affected, but it is not known to what extent the contaminants are hydrocarbons, and how far this particular aquifer reaches.

Because there have been no oil and gas exploration or development activities in the planning area, there have been no spills related to these activities. Other types of oil and fuel spills, if they have occurred, have been small, and have occurred in conjunction with other small-scale activities, generally taking place in and around the villages. Due to the minor degree of potential for oil and gas exploration and development in the Bay planning area during the life of this plan, the potential for Locatable mineral development-related oil or fuel spills to occur is considered to be low during the life of this plan. Effects to air, vegetation, soils and water would be the same as described in Section II.b. Direct and Indirect Effects for Air Quality, Soils, Vegetation and Water, and so will not be repeated here.

b) Cumulative Effects to Fish and Wildlife Resources

(1) Cumulative Effects to Fisheries and Aquatic Habitat

With reference to the previous discussion, future development activities associated with transportation projects and mineral exploration may have adverse effects on drainage patterns and aquatic habitat, although this would depend upon the location and area of activity. Naturally occurring events may also lead to the destruction of fish habitat; however, these events are unpredictable and often localized. Should BLM continue to allow OHV use to go unrestricted, adverse effects to fish habitat could continue through changes in drainage patterns and degradation of water quality.

(2) Cumulative Effects to Wildlife

The effects of initiating oil, gas, and locatable mineral exploration and development and development of supporting infrastructure, including ADOT&PF carrying out plans to connect portions of the planning area to the larger urban centers of Alaska would have cumulative impacts on wildlife, including caribou from the Northern Alaska Peninsula and Mulchatna caribou herds, moose, brown bears, and migratory waterfowl in all of the blocks of BLM unencumbered lands. Depending on the location of development, these impacts could include short or long-term disturbance to caribou calving habitat, insect relief habitat, migratory routes and winter range; disruption of caribou movements; stress and disturbance impacts to caribou during all seasons of the year; and possible reductions in herd productivity and recruitment. Cumulative impacts would be fewer under Alternatives A and C. Under Alternative A, no oil, gas, or locatable mineral development would occur beyond current activities. Under Alternative C, oil, gas, and locatable development could occur but only under certain conditions, and two areas would be managed as Areas of Critical Environmental Concern designations.

Development of connecting transportation corridors would open the planning area to additional hunters, thereby increasing access to caribou, moose, brown bears, black bears, and other sports and subsistence animals and habitat. Other impacts would include habitat fragmentation, increased disturbance impacts, increased potential for mortality (road kills) and possible alteration of behavior or movement patterns of wildlife. Construction of major road projects within the life of the plan would be dependent upon social and economic conditions and it is not clear which of these projects would be completed within the life of

this plan. Those projects connecting two or three local communities are farther along in planning than those proposing to connect the Bristol Bay area with Anchorage, for example.

Should oil, gas, or locatable mineral projects go forward during the life of the plan, temporary and/or long-term influxes of people could be expected, increasing the hunter pool and affecting wildlife species, especially big game animals. The activities with the greatest potential for cumulative effects to wildlife are mineral development in the Bristol Bay region and attendant infrastructure development, which would likely occur in sensitive habitat areas for the Mulchatna caribou herd, moose, brown bears, and migratory waterfowl species.

c) Cumulative Effects to Special Status Species

(1) Special Status Plants

Only one Special Status plant species is known to occur on BLM lands in the Bay planning area. The widely scattered nature of special status plant populations and incomplete knowledge of their distribution and range complicate efforts to predict cumulative impacts. However, current and potential increased levels of mining and mineral leasing development on State and private lands, combined with the potential for such development on BLM-managed lands could result in cumulative adverse effects on special status plants and habitats over the long term. Dispersed recreation activities, including gradual increases in amounts and frequency of Off Highway Vehicle travel, remote landing sites for bush aircraft, temporary campsites, and hiking may have minor adverse and cumulative impacts to sensitive plants and habitats on BLM-managed lands; however, it is unlikely that anything other than lode mining in the Goodnews Bay block would affect the sensitive *Smelowskia pyriformis*, or pear-fruited smelowskia. Tatlignagepeke Mountain has both habitat for the smelowskia and known lode mineral occurrences.

(2) Special Status Fish

There are no known Special Status fish species in the Bay planning area.

(3) Special Status Wildlife

The widely scattered nature of special status wildlife populations and incomplete knowledge of their distribution and range complicate efforts to predict cumulative impacts. Potential increased levels of all types of mineral exploration and development on State, Native corporation, and BLM lands could result in cumulative, adverse effects on Steller's eider and their habitats over the long term. The exploration and development of one gas field in the Koggiling Block during the life of this plan under Alternative B, C, or D would result in minimal addition to cumulative impacts to these species due to the transient nature of their presence in this part of the planning area.

d) Cumulative Effects to Fire Management and Ecology Resources

Under the current fire management strategies being implemented across the planning area there are few if any anticipated cumulative impacts on BLM-managed lands. Wildland fire management is accomplished on an interagency basis and across administrative boundaries.

e) Cumulative Effects to Paleontological Resources

Cumulative effects to significant paleontological resources, such as attrition from weather, trail use, or permitted activities in the planning area could occur. Activities such as development on non-BLM managed lands could affect the resource on BLM lands.

f) Cumulative Effects to Cultural Resources

Cumulative impacts to cultural resources could occur through incremental degradation of the resource base from a variety of sources which reduce the information and interpretive potential of historic and prehistoric properties, or which affect traditional cultural values important to Native Alaskans. Much of the anticipated development within the planning area would occur on nonfederal lands that are not covered by Federal cultural resource laws. As a result, there could be losses to the regional resource base that could potentially limit management options within the planning area. Fire is a natural process that could damage some types of cultural resources.

g) Visual Resources

Continued development of Off-Highway Vehicle trails, roads, mining activities and associated infrastructure development, and wildland and prescribed fire could lead to changes to existing visual resources by altering basic visual elements of form, line, color, and texture at the landscape level. These changes will influence the design of similar projects on adjacent BLM lands where repeating these basic elements is an objective of the visual resource management class. However, the VRM Class is not likely to change during the life of this plan.

4. Resource Uses

a) Cumulative Effects to Forest Products

There currently is no forest products program due to a lack of forests, lack of trees appropriate for commercial market, remoteness of the few trees that are located on BLM administered lands in the planning area, and lack of infrastructure to transport trees to market. It is unlikely that the situation will change during the life of this plan; therefore, there would be no impacts to a forest products program.

b) Cumulative Effects to Livestock Grazing

Currently there are no livestock anywhere in the Bay planning area, and no interest has been shown for decades. Livestock grazing could occur on a case-by-case basis by permit under any of the Alternatives. Management changes implemented on BLM-managed lands by this plan would therefore have few cumulative impacts on grazing.

c) Cumulative Effects to Minerals

Leasable Minerals. The cumulative impacts to oil and gas resources would be the removal of the resources by producing wells on leases with the fewest restrictions and lowest operating costs. Production of oil and natural gas from one geologic reservoir would not affect the recovery of oil and/or natural gas from other geologic reservoirs. The production of natural gas and oil is a beneficial irretrievable commitment of the resource as the produced natural gas or oil no longer would be available for future use. The amount of oil, gas, or heat produced would vary depending on the number of wells drilled in the field and the ability to recover the resource.

The cumulative impact to Federal leases would be a reduction in lease value resulting from the application of stipulations and regulations. The cumulative impacts to lease developments would result from a reduction in wells drilled on leases encumbered with stipulations, an increase in wells drilled on leases with minimal constraints, and an increase in operating costs because of land use decisions, lease stipulations, and regulations. Restrictions on Federal leases could impact the leasing and development of adjacent non-Federal leasable minerals. If an exploration company cannot put a block of leases together because of restrictions on Federal leasable minerals, the private or State minerals may not be leased or

developed either. Leasing of Federal minerals on the other hand, could encourage the leasing of private or State minerals.

Oil and natural gas activities could be located in parts of planning area where other mineral resources are mined or potentially could be mined. However, the production of oil and natural gas resources is not expected to be a significant impact on other mineral resources within the planning area. A potential conflict exists between coal and CBNG. Should coal resource development precede CBNG development in a specific area, the biogenic gas would be displaced. Similarly, if CBNG were to occur first, coal development would be delayed which could affect economics. The long-term aerial extent of the Reasonably Foreseeable Development Scenario (RFD) (e.g., the acreage affected) for petroleum activities is small relative to the planning area. After abandonment of the facilities and wells, exploitation of the other minerals still can occur.

Cumulative impacts would be greatest under Alternatives B and D as no leasing will occur in Alternative A, and leasing would be less in Alternative C. Under Alternatives B, C and D, larger acreages of fluid mineral estate would be made available due to the revocation of ANCSA (d)(1) withdrawals. However, exploration and development are not readily anticipated on BLM lands as indicated by the low and very low development potential assigned to the resource locations in the RFD. Lands with the greatest resource potential are in ownership by other entities or on State or Native selected lands. In the case of selected lands, mineral activity will be delayed by segregation until the ownership status can be finalized. If conventional or coalbed resource development were to occur, the market would likely be local as indicated in the RFD.

Roads resulting from mineral exploration and development or community support would add infrastructure to a region largely without cost and could increase interest in exploration on BLM lands by reducing logistics costs. However, these types of benefits to industry could be offset by restrictions. An area on the cusp of showing economic development could become non-profitable by imposing restrictive guidelines. This would result in the displacement of mineral activities to adjacent landowners.

Locatable Minerals. Impacts to the Locatable Minerals program that are individually minor may cumulatively reduce exploration and production of commodities from public lands. Factors that affect mineral extraction and prospecting include, but are not limited to, permitting and permitting delays, regulatory policy, public perception and concerns, travel management, transportation, mitigation measures, proximity to sensitive areas, low commodity prices, taxes, and housing and other necessities for workers. BLM has no control over many of these issues. Most result in additional costs and/or permitting delays that could individually or cumulatively add additional costs to projects.

Public land with no access could reduce the amount of mineral exploration and development that may occur. Mineral resources in other ownership may not be developed if the adjacent public lands are withdrawn from mineral entry. The deposit may not be economically feasible to develop if it crosses multiple ownerships and only a portion is available for development.

Overall, Alternative A would be the most restrictive to mineral developments. Existing ANCSA 17(d)(1) withdrawals, specific to closure to mineral entry, would be retained. The next most restrictive would be Alternative C, which would revoke ANCSA 17(d)(1) withdrawals but would recommend two Areas of Critical Environmental Concern and propose three Wild and Scenic River segments.

Salable Minerals (Mineral Materials). Under Alternative C the closure of two ACECs to sale/permit of mineral materials would essentially close all BLM unencumbered lands in the planning area to mineral materials development and production.

d) Cumulative Effects to Travel Management, Off-Highway Vehicles, and Recreation Management

The planning area currently provides and would continue to provide a diversity of recreation experiences, regardless of the Alternative selected. The greatest influence on recreation experience within the

planning area is the use of Off-Highway Vehicles (OHVs). Without management and some limitations on OHV use, the general trend in OHV-accessible topography, is for recreation experiences to trend toward semi-primitive motorized and roaded natural experiences. However, most of the planning area is dominated by steep topography, wetlands, dense vegetation, and remote settings with no road infrastructure, making it inaccessible to most OHVs unless they are flown in to a destination. These areas provide for primitive and generally inaccessible recreation experiences except by aircraft or by boat, regardless which Alternative is selected.

e) Cumulative Effects to Renewable Energy

No cumulative impacts to renewable energy are anticipated under any Alternative.

f) Cumulative Effects to Special Designations

(1) Areas of Critical Environmental Concern

A wide range of cumulative effects could occur to the variety of resources intended to benefit from designation of one or two Areas of Critical Environmental Concern in Alternatives C and D. These impacts would derive mostly from actions that are not guided by BLM management decisions. Management within certain ACECs could be significantly diminished by cumulative impacts should numerous development projects occur either inside or immediately outside the boundaries of the ACEC.

(2) Wild and Scenic Rivers

No cumulative impacts to the Wild and Scenic Rivers are anticipated under any Alternative.

g) Cumulative Effects to Social and Economic Conditions

The onshore and offshore oil industry in and near Prudhoe Bay is anticipated to decline. An authoritative source, DOE's Energy Information Administration (U.S. Dept. of Energy, 2001a), projects North Slope oil production to decline from 1.084 million barrels per day (MMbpd) in 2005 to 0.208 MMbpd in 2034. This decline encompasses oil exploration, development, and production and associated direct employment.

Associated indirect employment in Southcentral Alaska, Fairbanks, and the North Slope Borough (NSB), and revenues to the Federal, State, and NSB governments are also anticipated to decline. Fluctuations in Alaska's economy from 1975-1995 directly tracked fluctuations in oil prices and other industry factors (McDowell Group, Inc., 1999b). Even though the Alaskan economy currently is not nearly as dependent on the oil sector as it was in the mid-1980's (when a major crash in the Alaska economy occurred), additional oilfield development in any region would generate employment, economic opportunity, and benefits to the cash economy of Alaska.

The effects below are expressed (in most cases) in annual averages for the sake of simplicity. However, the effects generally would be higher in the early years and lower in latter years, corresponding to the decline in production.

Cumulative effects have been addressed in other recent documents, including the Northwest National Petroleum Reserve-Alaska IAP/FEIS (USDOI 2003), and in the Alpine Final Development Plan FEIS (USDOI 2004). These are herein incorporated by reference and summarized in this section.

(1) Impacts to State and Local Revenues

Oil & gas development in other parts of the state would generate additional revenue to the Boroughs, the state of Alaska, and the Federal government.

Other developments in the Planning Area resulting from forestry, recreation, grazing, and mining are considered to have little cumulative economic effect.

In 2001 State operating budget was \$4.3 billion, and 2001 Federal receipts of all types of \$1.7 trillion.

(2) Impacts to Employment and Personal Income

The cumulative gains in direct employment would include additive jobs in oil & gas exploration, development, and production, plus oil-spill cleanup activities. The direct employment would generate indirect and induced employment and associated personal income for all the workers. The cumulative effects are projected to generate additive employment and personal income increases as follows (USDOl 2004):

In addition to the North Slope workers who reside in Southcentral Alaska and Fairbanks, additional workers commute to residences outside the State. As much as 30% of the North Slope workforce in the classification of oil and gas workers commutes to locations outside the State. However, the workers commuting to residences outside the State would not generate economic effects of indirect and induced employment or expenditure of income in the State and would have a negligible effect on the economy of the rest of the U.S. Total NSB employment exclusive of oil workers in 1998 was 4,651. The projected employment for workers on the North Slope residing in Southcentral Alaska and Fairbanks is in comparison to 1998 NSB employment in mining (assumed to be all oil employment) of 4,753. Of these, 70 percent (3,329) reside in the rest of Alaska outside the NSB, primarily in Southcentral Alaska and Fairbanks. Employment projections can also be compared to the total number of workers in Southcentral Alaska and Fairbanks in 2002 (284,000).

Aggregate personal income in 1999 was \$200 million for the NSB and \$13.2 billion for Southcentral Alaska and Fairbanks.

h) Cumulative Effects to Environmental Justice

Alaska Natives are the predominant residents of southwestern Alaska, the area potentially most affected by activities under Alternative B, C, and D and other activities associated with cumulative projects in Alaska. Effects on Alaska Natives could occur because of their reliance on subsistence foods, and potential effects could impact subsistence resources and harvest practices. Potential cumulative effects from noise, disturbance, and oil spills on subsistence resources and harvest practices and socio-cultural patterns would focus on communities throughout the planning area.

It is acknowledged that cumulative socio-cultural impacts have occurred on the North Slope and that regional culture has undergone a noticeable change. The influx of money from wage employment has added benefits and raised the standard of living, but has also given rise to an array of social pathologies, including increased alcoholism. In southwest Alaska, arguably, the commercial fishing industry has long since had similar effects.

Expanded oil and gas development in Alaska, on both Federal and State leases, would expand the extent of disturbance effects on subsistence species and harvest patterns. While each individual project would likely be a small incremental increase, the cumulative effect would eventually become more repressive to the subsistence lifestyle. In addition to potentially diverting, deflecting, or disturbing subsistence species, oil and gas development could affect subsistence harvest by causing subsistence hunters to avoid certain areas because of concerns about firearm safety, and perhaps for aesthetic reasons. Southwestern Alaska still has vast undisturbed areas, yet the subsistence hunting environment continues to change in response to increased visitation and development.

Transportation facilities and activities would also contribute to cumulative effects to subsistence resources and, consequently, to the Native population. Any new permanent road connection in southwestern Alaska would also facilitate development, use, and visitation.

Contamination and oil spills could affect the food chain in the area of development and subsistence harvest. If this were experienced, the effects would fall largely on indigenous people.

i) Cumulative Effects to Subsistence

Exploration and development of a gas field, development of infrastructure, and exploration and development of Locatable minerals in the planning area would be the three most important sources of cumulative impacts to wildlife habitat and subsistence resources the residents of the planning area depend on, as well as the cumulative changes to the existing mixed subsistence-cash economy which most residents participate in. Cumulative effects to subsistence would come as a consequence of those cumulative effects noted for fish, wildlife, and vegetation resources, discussed above.

F. Irreversible and Irrecoverable Commitment of Resources

Only those programs or resources that would have irreversible or irretrievable commitment of resources are included here.

1. Resources

a) Air Quality, Soil, Water, and Vegetation Resources

The reasonably foreseeable activities that would cause irreversible or irretrievable commitment of soil, water, and vegetation resources (habitat) would be large scale oil and gas development, placer mining, lode mining, the material site operations required for these large ventures, and certain kinds of infrastructure development. These activities would be likely to occur under Alternatives B, C, and D. These activities all require extensive material site excavation for gravel sources from road, pad, and airstrip construction. Impacts include irreversible loss of vegetation (ground cover) and habitat, soil compaction, soil erosion, thermokarst erosion, stream diversions, impoundments, and increased sediment runoff. These impacts would likely persist for the duration of the development, which once constructed, would continue for the foreseeable future. These impacts could be mitigated but not entirely removed. Pre-impact botanical and habitat inventories and associated habitat mitigation would minimize but would not eliminate these harmful impacts to vegetation and habitat.

b) Fish and Wildlife Management

(1) Fish

Actions that alter an aquatic community sufficiently to change the potential of a particular stream could represent an irreversible or irretrievable commitment of resources. The only reasonably foreseeable activity that would occur within the range of Alternatives considered would be placer mining or lode mining, which would be more likely to occur under Alternatives B, C, and D.

(2) Wildlife

Under Alternatives B, C, and D some irretrievable and irreversible loss of wildlife habitat could occur from the placement of gravel for oil and gas infrastructure, road construction, and other development-related surface disturbing activities. Loss of wetland habitat occupied by waterfowl and shorebirds could be particularly important. In most cases, alternate habitats would be available adjacent to development, and any habitat loss would have a minor effect.

c) Special Status Species

(1) Special Status Plants

Irreversible impacts to the special status plant, *Smelowskia pyriformis*, or pear-fruited smelowskia, could occur should lode mineral exploration or development occur on Tatlignapeke Mountain. Under Alternatives B, C, and D, lode mining could occur.

(2) Special Status Wildlife

Under Alternatives B, C, and D, some irretrievable and irreversible loss of habitat could occur from placement of gravel infrastructure for oil and gas facilities in the Koggiling Block, potential habitat for Steller's eider and spectacled eider habitat. While the eiders probably would not be nesting or brooding, they would use the area for eating, resting, and molting as they migrate through the area. Alternative habitat would likely be available in areas adjacent to proposed development. The density of eiders in Koggiling Block may be low. Habitat loss of this type would be considered to have a minor effect on eiders at the population level.

Should gas facilities be developed, Steller's and spectacled eider mortality could result from collisions with vehicles or structures during the life of the gas field. A loss of an individual eider would be irretrievable, but would not affect eiders at the population level.

d) Fire Management and Ecology

Areas that are in the Critical, Full, or Modified Management Options have the potential to lose key ecosystem components due to fire exclusion and move from condition class 1 to condition class 2 or 3. Based on desired conditions for land use and resources objectives, these conditions may be mitigated through fuel management projects or a change in management option. If the areas were not treated, fire size and severity could increase, life and property could be lost, and resources could be adversely impacted.

e) Cultural Resources

Mitigation through data recovery investigations at archaeological sites would recover information pertinent to current research concerns, but would also permanently remove the resource from future research and interpretive use, which would constitute an irretrievable and irreversible commitment of these resources. Any management actions that cause the inadvertent destruction of a cultural resource or make them susceptible to illegal collection could lead to the loss of these resources and would also be an irretrievable and irreversible commitment of these resources. Wildland fire may damage some types of cultural resources.

f) Paleontological Resources

Mitigation through data recovery investigations at significant paleontological sites would recover information pertinent to current research concerns, but would also permanently remove the resource from future research and interpretive use. This would constitute an irretrievable and irreversible commitment of these resources. Any management actions causing the inadvertent destruction of a paleontological resource or make them susceptible to illegal collection could lead to the loss of these resources and would also be an irretrievable and irreversible commitment of these resources. There would continue to be impacts on paleontological resources associated with unauthorized activities such as OHV use, dispersed recreation, and illegal collecting.

g) Visual Resources

Activities identified in this planning area under all Alternatives by direct, indirect and cumulative effects analysis may affect the visual resources within the planning area by the changes in the existing landscape character. Actions by the following activities may affect visual resources: OHV use, timber harvest, mining activities, exploration, recreation, infrastructure and industrial development, research projects, and activities on privately owned land. These activities may adversely affect the visual resources, and in some cases may be irreversible and irretrievable.

2. Resource Uses

a) Livestock and Reindeer Grazing

Currently there is no livestock program. In the unlikely event of a livestock or reindeer proposal, loss of native forage to invasive species, although not necessarily permanent, would be an irretrievable loss of the resource because of the number of years needed to restore native vegetation. The incremental degradation of rangeland within the planning area from the effects of climate change, over-utilization, and the spread of invasive plant species could be an irreversible loss of the resource.

b) Minerals

Leasable Minerals. The production of oil and gas results in the irretrievable and irreversible loss of those natural, non-renewable resources. Most, if not all, surface disturbance and use can be restored through proper reclamation techniques.

Locatable Minerals. The removal of minerals from public lands results in the irretrievable and irreversible loss of those non-renewable natural resources, and their extraction causes potentially irreversible impacts to the natural environment and to the subsistence resources and habitat upon which residents of the region depend. However, this extraction may produce a short-term positive impact to a few residents of the region by providing them with a cash income. Most surface disturbances from Locatable Minerals extraction can be restored via reclamation techniques.

Mineral Materials. The extraction of mineral materials from the natural environment within the planning area would be an irreversible and irretrievable commitment of those extracted mineral material resources. All impacts identified in prior sections are insignificant for mineral materials as the forecast need is negligible, and can be mitigated.

c) Renewable Energy

Lands developed for renewable energy projects would no longer be available for various other purposes.

d) Lands and Realty Actions

Lands transferred out of public ownership generally stay in private hands unless they are subsequently acquired for a public purpose. The right-of-way avoidance areas proposed in Alternatives C and D would limit the issuance of new rights-of-way in these locations.

3. Social and Economic Conditions

a) Social and Economic Conditions

Small increases in employment and personal income would occur over the life of gas field exploration, development, and operation activities. Employment in oil and gas related activities represent a loss of opportunity for workers to pursue employment in other fields. Investment by the lessees and operators in oil and gas exploration and development activities in the planning area represents a loss of opportunity to invest those monies elsewhere. Revenue increases to the State and Federal Governments occurring during production years would result in the irreversible and irretrievable commitment of those revenues. Development would result in new infrastructure that would be removed at the end of production.

b) Environmental Justice

Long-term population and productivity effects to the Mulchatna Caribou Herd from oil and gas development in calving and critical insect-relief areas could produce irreversible and irretrievable effects to the herd and to the subsistence caribou hunt to most villages in the planning area.

4. Subsistence

Exploration and development of a gas field, development of infrastructure, and exploration and development of Locatable minerals in the planning area would be the three most important sources of irretrievable loss of wildlife habitat and subsistence resources to the residents of the planning area, as well as the potentially irreversible changes to the existing mixed subsistence-cash economy which most residents participate in. One of the sources of this change would include loss of opportunity to participate in subsistence activities due to participation in the cash economy. Since participation in subsistence, sharing and eating subsistence foods have meaning well beyond the economic aspects of the practice, the individual's physical, social, and spiritual well-being could be affected.

G. Unavoidable Adverse Impacts

Unavoidable adverse impacts are either impacts that remain following the implementation of mitigation measures or impacts for which there are no mitigation measures. Some unavoidable adverse impacts occur as a result of proposed management under one or more Alternatives. Others are a result of public use of BLM-managed lands. Only those programs or resources that would have unavoidable adverse impacts are included here.

1. Resources

a) Air Quality and Soil and Water Resources

Unavoidable adverse impacts to soil and water occur from road construction and material site excavation. Gravel roads, airstrips, and pads destroy soil structure through compaction and thermokarst erosion (where extensive permafrost exists), block natural drainage patterns, create stream flow diversions, impoundments, and increase sediment runoff that impairs water quality. By limiting the length of the roads and requiring that all permanent facilities have an approved drainage plan, a reduction in adverse impacts from project and related infrastructure development is possible but not unavoidable (Walker et al. 1987). Limiting development on floodplains and wetlands would assist compliance with regulations that direct Federal agencies to minimize the destruction, loss, or degradation of floodplains and wetlands.

b) Vegetation

While recognized as a natural part of northern ecosystem, occasional large, intense wildland fires will temporarily destroy vegetation and priority habitats such as lichen-rich plant communities that caribou are dependent upon. Recovery would be expected, but not always within the life of the plan. Scarring of the landscape could also result from unauthorized cross-country travel. If climate change occurs the effects of fires will be essentially permanent.

c) Fish and Wildlife

(1) Fish

Unavoidable direct disturbance to aquatic and riparian habitat would require many years (25-50+) to rehabilitate to healthy functioning condition. Therefore, most of the habitat disturbed in the next 20 years would be additive to that lost in the past (at sites of previous placer mining). Some of the mining, especially placer mining, may take place on previously worked claims. This would result in setting back aquatic/riparian recovery by the number of years between the previous and future operation.

Ground water drawdown and associated impacts to surface waters and nearby wetlands can be a serious concern in some areas. The impacts resulting from ground water drawdown could last for many decades. The aquifer may take many decades to recharge and may result in continued stream flow reduction. This could potentially affect seeps and springs that provide thermal refugia in both summer and winter.

The removal of streamside riparian-wetland vegetation during mining would result in loss or degradation of aquatic habitat until proper functioning condition could be reestablished. In general, the time required for riparian-wetland areas to attain proper functioning condition would be dictated by natural processes and may require decades to centuries before it approximates the structure and function of the original aquatic habitat (NCSU 1998; BLM and Montana Dept. of Environ. Quality 1996; BLM 1988).

Natural erosion processes, unauthorized travel, and permitted land use activities may increase sedimentation into fish-bearing streams with possible adverse effects. A summary of potential sources of effects, as discussed in an earlier section follows. Many of these can be controlled through use of Required Operating Procedures, project specific requirements, and mitigation of effects:

- Surface mining activities can increase erosion and accelerate sediment production and input into nearby streams and lakes.
- Mine development may also alter the natural input rate of organic matter and nutrients to aquatic systems.
- Surface mining operations may disrupt surface and ground water flow patterns.
- Mining operations have the potential to release pollutants to surface waters and ground water, the deposition of contaminants into soils, and the eventual incorporation of pollutants into plant and animal tissue.
- Both water and soil contamination may be harmful to riparian-wetland vegetation and ultimately to fish.
- Placer mining inherently degrades or completely destroys channel features and riparian habitat, resulting in increased erosion and sedimentation. As a result, new channels are often straighter, have a higher gradient, and consequently have more energy than the natural channel; new channels often lack the diversity of habitats and cover components that enhance the quality of habitat in natural channels.
- Mining activities, placer operations in particular, may lead to a loss of riparian-wetland vegetation. Riparian-wetland vegetation has a significant influence on the stability of uplands and certain stream types. Changes in the composition, vigor, and density of riparian vegetation can result in changes in sediment input from uplands, stream shade, and protection from instream erosional processes, terrestrial insect habitat, and the contribution of detritus and structural components to the stream

channel. Water quality and esthetic values are also affected by disturbance to riparian-wetlands (Rosgen 1996).

- The altering of surface hydrology often results in stream conditions that are no longer suitable to species or life stages of fish and other aquatic organisms that occurred before disturbance. (Swanston 1991; Hicks and others 1991; National Research Council 1992; Strouder and others 1997).
- The current state of knowledge of suction dredging and its impacts on aquatic resources suggests that the practice could be either detrimental or beneficial, depending on site-specific use by aquatic organisms and physical habitat limitations. Suction dredging has been shown to locally reduce benthic (bottom dwelling) invertebrates (Thomas 1985; Harvey 1986) and cause mortality to early life stages of fish due to entrainment by the dredging equipment (Griffith and Andrews 1981).
- Suction dredging may destabilize spawning and incubation habitat, remove large roughness elements important for forming pool habitat and governing the location and deposition of spawning gravels (Harvey and Lisle 1998).
- Suction dredging may increase suspended sediment, decreasing the feeding efficiency of sight-feeding fish (Barrett and others 1992); reducing living space by depositing fine sediment (Harvey 1986); and causing fish to avoid certain habitats (Roelofs 1983).
- Suction dredging may temporarily improve fish habitat by creating deep pools or by creating more living space by stacking large unembedded substrate (Harvey and Lisle 1998).
- Invertebrates and periphyton rapidly recolonize small patches of new or disturbed substrate in streams as long as the area of disturbance is not so widespread as to limit the number of organisms to recolonize (Griffith and Andrews 1981; Thomas 1985; Harvey 1986).
- Dredge tailings may increase spawning sites in streams lacking spawning gravel or streams that are armored by substrate too large to be moved by fish (Kondolf and others 1991).
- In some cases the reduction in the feeding efficiency of fish may be offset by reduced visibility and the corresponding reduced risk of predation at moderate levels of suspended sediment (Gregory 1993).
- Bridges, culverts, and low-flow crossings can interfere with stream bedload (substrate) movement, migrations to spawning, feeding, rearing, and overwintering sites if improperly designed.
- Surface mining and road placement effects may include diverting or eliminating flow from small tributaries that connect lakes or connect lakes and rivers. Fish species found in the planning area that move between these habitat types are vulnerable to impact. Potential loss of migratory capacity could stress or kill these fish if they are unable to migrate to food-rich habitat in the summer, reach spawning areas, or move into overwintering habitat.

These sources of unavoidable impacts would be expected to be related to placer mining in localized areas on BLM unencumbered lands in the Goodnews Block during the life of this plan. They are expected to be moderate to significant in their effects, except where Required Operating Procedures, project-specific requirements, and mitigation are applied.

(2) *Wildlife*

Some disturbance and disruption of wildlife under all Alternatives, and some habitat alterations from mineral development under Alternatives B, C and D are unavoidable. Displacement or reduced habitat use by wildlife are likely to be local (within one-half to 2 ½ miles of development or activity). Disturbance and displacement from most activities occurring in the planning area except for Locatable Mineral exploration or development activities would be short-term (a few hours to a few weeks). Disturbance and displacement due to mineral development would be long-term and would persist over the life of the development. Most unavoidable adverse impacts to wildlife, being short-term and localized, would not substantially affect populations.

d) Special Status Species

(1) *Special Status Plants*

One BLM Special Status Species of plant is located within the planning area, *Smelowskia pyriformis*, or pear-fruited smelowskia. It has been located in the western Alaska Range north of the planning area and in the southernmost Kuskokwim Mountains in the Goodnews Bay region (Drury and Rollins 1952; Hultén 1968; Murray 1981; Murray and Lipkin 1987; Parker 1994; Rollins 1993; Welsh 1974). This plant prefers higher elevations and rocky, scree-covered mountain slopes, and so is not likely to be affected by wildland fires. However, it is found on BLM-administered land in an area where lode minerals are present, and so it could be affected by the development of those minerals during the life of the plan. The degree of impact would depend on the extent and type of mineral operation. The fact that the plant was observed to grow in scattered locations would provide some advantage to its survival at the population level in this case.

(2) Special Status Fish

There are no Special Status Fish species in the Bay planning area.

(3) Special Status Wildlife

Unavoidable adverse impacts to Special Status Species of wildlife would be similar to those discussed under wildlife. Under Alternatives B, C, and D some disturbance to spectacled and Steller's eiders and other bird species by routine activities associated with oil and gas exploration and development would be unavoidable. Effects would include temporary disturbance such as displacement of incubating females from nests or broods, or disturbance of feeding, molting and migrating birds. Eiders could habituate to some disturbances or move to alternate habitats for foraging, nesting, and brood-rearing. Lease Stipulations, Required Operating Procedures, and project-specific requirements would effectively mitigate many of the effects of disturbance to spectacled and Steller's eiders, but some impacts could be unavoidable. Some eider habitat could be permanently lost due to construction of oil and gas related facilities, as discussed previously. Most disturbances of endangered and threatened species associated with routine activities would be minimized or avoided through compliance with mitigation measures developed through the Section 7 consultation process.

e) Fire Management and Ecology

Large landscape-scale high severity fires would be unlikely to occur within the planning area. However, should the current warming and drying trend continue, such fires could occur in portions of the planning area within the life of the plan. Fire suppression activities pose an unavoidable risk to other resources, and have the potential to be high impact and long-term in nature. The use of heavy mechanical equipment on the ground surface could cause severe soil erosion and increase silt load into streams and rivers, as well as damage to or loss of cultural resources.

f) Cultural Resources

While measures are in place to identify threats to cultural resources and prioritize management actions, some impacts would be unavoidable. Wildland fire could damage some types of cultural resources. There would continue to be impacts to cultural resources from dispersed recreation activities, OHV use, vandalism, and other types of activities not authorized by the BLM. Natural processes such as erosion and natural decay or deterioration could also result in unmitigated damage to cultural resources.

g) Paleontological Resources

While measures are in place to identify threats to significant paleontological resources and prioritize management actions, some impacts would be unavoidable. Natural processes such as erosion and natural decay or deterioration result in unmitigated damage to paleontological resources and probably are the most common kinds of threats to these resources in this planning area. The other type of threat to these resources are human impacts from dispersed recreation activities, OHV use, vandalism, and other types of activities not authorized by the BLM.

h) Visual Resources

Natural disasters or wildland fires would be an agent of change for visual resources, and could have unavoidable, adverse impacts to visual resources values at the landscape scale. These impacts may be relatively short-term, except in the instance of environmental change, where the vegetation would have no chance of recovery.

2. Resource Uses

a) Forest Products

The future of forest products in the Bay planning area may provide even fewer opportunities than at present should the current warming and drying trend continue, and current insect infestations worsen. Other unavoidable effects in this case would include additional standing dead and fallen timber and the potential for larger, more intense wildland fires. There may be an increase in other types of drought-resistant vegetation in the place of existing forests. Alteration of forest habitat from placer mine development would result in long-term loss of trees in limited areas.

b) Recreation Management

Changes in the amount of recreational visitation and associated duration and patterns of use could result in increased conflicts between users and unanticipated changes in resource conditions. These resource conditions may include declines in fish and game resources through over harvest and environmental degradation from increased localized use.

c) Travel Management

Regardless of the Alternative, access to public lands will become more complex as Native corporation entitlements are met. As public lands become private lands, net access is lost even if BLM reserves 17(b) easements.

d) Renewable Energy

Mitigation measures would reduce the potential of bird strikes on wind turbines, but would not eliminate the possibility of incidents entirely.

3. Social and Economic Conditions

Economic effects of oil and gas leasing, exploration, development, and production in the planning area may be considered positive effects by many people. Increases in employment opportunity and potential personal income would occur over the life of the exploration, development, and production activities. Revenue increases to the State and Federal Governments would occur during production years. However, these increases would be short-term (less than 30 years). They would occur only for the duration of the activities. Development activity would establish infrastructure that could enhance the future productivity of oil and gas exploration, development, and production.

4. Environmental Justice

The Environmental Justice Executive Order includes consideration of potential effects to Native subsistence activities. The only substantial source of potential unavoidable environmental justice related effects on Native communities from oil and gas exploration and development in the Planning Area would

occur from displacement of caribou as a result of exploration and development in calving or insect relief areas. The Native communities throughout southwest Alaska harvest caribou from the Mulchatna Caribou Herd. Noise and disturbance from routine activities would be unavoidable, but not expected to produce disproportionate, high adverse Environmental Justice impacts on the Alaskan Native minority populations in any community.

5. Subsistence

Unavoidable adverse impacts that would affect fish and wildlife would also affect subsistence. They include sedimentation of fish-bearing streams by natural erosion, unauthorized travel, alteration of habitat, and temporary or permanent localized disturbance and/or displacement of subsistence species. These unavoidable impacts are not expected to be significant during the life of this plan, and would not substantially affect populations or access to resources by the subsistence user.

Chapter V: Consultation and Coordination

A. Introduction.....	5-2
B. Public Participation Opportunities	5-2
1. Scoping	5-2
2. Draft Alternative Development.....	5-3
3. Other Outreach Efforts	5-3
C. Consultation	5-3
1. U.S. Fish and Wildlife Service Consultation	5-3
2. National Marine Fisheries Service Consultation	5-3
3. Tribal Consultation	5-4
D. Collaboration with the State of Alaska	5-4
E. Plan Distribution	5-4

Chapter V: Consultation and Coordination

A. Introduction

Chapter 5 describes the public participation opportunities made available for the development of the Bay Draft Resource Management Plan (RMP) Environmental Impact Statement (EIS). Formal consultation and collaborative efforts were made with the State of Alaska and Resource Advisory Council to date. Also provided is a listing of the documents preparers, agencies, and organizations that received copies of the Draft RMP/EIS for review. Public participation was conducted during the preparation of the document and will continue to involve the public through managing efforts at the Anchorage Field Office (AFO).

The Anchorage Field Office (AFO) interdisciplinary team and BLM Alaska State Office were preparers of the Bay RMP/EIS. The Bristol Bay Environmental Inc. prepared the leasable mineral inventory report. Both teams provided technical analysis and review for organizing the document. Formal and informal consultation was conducted with the RMP/EIS team, agencies, groups, and individuals.

Throughout the scoping process consultation, coordination, and public involvement occurred while developing this document. There were Alternative development meetings and briefings with various Federal, State, Native groups and Agencies. Government to government consultation was also conducted within the scoping process. Also, informational meetings with interested individuals and organizations were included as part of the scoping process.

B. Public Participation Opportunities

For purposes of planning, there are several methods offered for public participation. The types of public participation approaches used are described below:

1. Scoping

During the period of public scoping, public meetings were held from January 2005 until the end of March. These public meetings included communities such as: Anchorage, Dillingham, Homer, Soldotna, and smaller communities of Aleknagik, Koliganek, Iliamna, and Naknek. The publication of the Notice of Intent (NOI) for the Bay RMP/EIS was published on December 6, 2004. The public scoping meeting discussed a variety of issues which included: purpose for preparing a new plan, planning area and adjacent lands to BLM, planning schedule, planning criteria, framework of the plan, and examples of specific decisions addressed for the plan.

BLM identified preliminary management concerns which were addressed in the project's first newsletter December 2004. Other management concerns were gathered by public input. A series of issues and topics were identified by Federal, State, Native groups and agencies for consideration in the RMP/EIS during the planning process. Over 2,000 members of the public provided a total of 264 scoping comments during the scoping process. These comments were reviewed, organized by issue, and entered into a scoping comments database to facilitate retrieval and tracking through the RMP/EIS process. The final Bay Plan Scoping Report is a separate document, available from BLM Anchorage Field Office. You may request a copy of the report at: akbayrmp@blm.gov.

Scoping comments and input were collected during formal scoping meetings, Government-to-Government consultations, via email, telephone calls, FAXes, and United States mail. Prior to the scoping period, representatives of BLM published public announcements in regional and local newspapers and provided public announcements on local radio to inform the public that BLM was beginning the Bay RMP/EIS process. A brochure was developed, and an electronic copy of it and a map of the planning area were posted on the Bay RMP/EIS planning website at www.blm.gov/ak/ado/BayRMP01.html.

2. Draft Alternative Development

A newsletter containing a summary of the draft Alternatives was mailed to the public and organizations for their review and informal comment on May 14, 2006.

3. Other Outreach Efforts

After the formal scoping period, a number of briefings and Government-to-Government consultations and/or briefings were carried out in the communities of Anchorage, Dillingham, King Salmon, New Stuyahok, and Quinhagak. Comments were recorded and became a part of the Administrative Record.

Comments continue to be received by email, by telephone, and by postal mail, and they are also made part of the Administrative Record. Comments will be taken throughout the RMP process.

Briefings were conducted for organizations upon request. Briefings were provided for the Alaska Miner's Association, the Alaska Coalition, and the Bristol Bay CRSA in April and May, 2006. Newsletters were mailed out periodically to keep approximately 2,600 interested members of the public informed of BLM's progress on the Bay RMP/EIS.

C. Consultation

1. U.S. Fish and Wildlife Service Consultation

As required by Section 7 of the Endangered Species Act (ESA) of 1973, prior to initiating any project by BLM that may affect any federally-listed threatened or endangered species or its habitat consultation with the U.S. Fish and Wildlife Service (USFWS) must be made.

Section 7 consultation with USFWS was initiated by AFO via a letter, describing the proposed project, which included a detailed description of Alternatives. During the consultation, an endangered species list was requested by BLM. The FWS provided a written response of listed threatened and endangered species found throughout the planning area, and indicated that the threatened and endangered species of Steller eiders, Southwestern sea otters, and Kittlitz's murrelet occur in the area of the proposed Bay Resource Management Plan and Environmental Impact Statement.

2. National Marine Fisheries Service Consultation

The National Marine Fisheries Service (NMFS) is responsible for the administration of the ESA as it applies to the listed cetaceans and pinnipeds in Alaska. These include seven species of endangered whales, the threatened eastern population of Steller sea lions, and the endangered western population of Steller sea lions.

Informal consultation with NMFS was initiated by the AFO via a letter describing the proposed project area and the project Alternatives, and requesting a species list.

3. Tribal Consultation

Tribal Consultation was conducted in accordance with the National Historic Preservation Act (NHPA) of 1966 to maintain BLM's Government-to-Government relationship between Native villages and corporations, via a letter to over 50 Native villages and corporations.

In order to continue with Government-to-Government coordination and consultation BLM will maintain communication with the villages throughout the planning process and during future planning efforts.

D. Collaboration with the State of Alaska

Since there is a vast amount of State-selected land involved within the Bay planning area it is necessary for BLM to consult with the State of Alaska. Therefore, BLM involved the State of Alaska at the beginning of the planning process via a letter inviting the State of Alaska to participate in the RMP/EIS process. The State of Alaska and the BLM developed a strategy for interagency cooperation and consultation for land use planning efforts for the Bay RMP/EIS. As part of this strategy, the State of Alaska and the BLM jointly funded a liaison position. That person channeled information between the State and BLM during the planning process. This method has been effective in involving the State personnel with the review of draft materials and the exchange of information.

E. Plan Distribution

Since initial scoping, BLM has maintained a mailing list of individuals, businesses, special interest groups, and Federal, State, Tribal, and local government representatives interested in the development of the Bay RMP/EIS (currently at approximately 2,600 individuals/groups).

In an effort to reduce printing costs notices were mailed to everyone on the mailing list in August 2006 asking whether they wished to remain on the mailing list, and in which format (hard copy or CD) they wished to receive the document for review. Copies of the Draft RMP/EIS are also available for public inspection at the following locations:

- Alaska State Library 2
- ADEC Library
- Dillingham Public Library
- Homer Public Library 2
- Anchorage Municipal Library (Z.J. Loussac Library)
- ARLIS 4
- Naknek Public Library
- DOI Natural Resource Library 2
- Department of the Army CRREL Library
- Kenai Peninsula College Library
- Library of Congress
- UAF Rasmuson Library
- UAF Wildlife Library
- U.S. Department of Interior Library
- Soldotna Public Library

Federal Government Agencies

- Alaska Maritime NWR
- Kenai NWR
- Alaska Peninsula/Becharof NWR
- Togiak NWR
- Bureau of Indian Affairs
- BLM- Director's Office
- Minerals Management Service
- U.S. Fish and Wildlife Service
- USDI - National Park Service
- Katmai National Park and Preserve Complex
- Lake Clark National Park and Preserve
- NPS-Division of Environmental Quality
- NMFS, Protected Resource Management Division
- Federal Aviation Administration
- U.S. Army

- U.S. Air Force
- U.S. Department of the Interior-
Office of Environmental Policy and
Compliance

- U.S. Department of the Interior-
Office of External Affairs
- U. S. EPA Alaska Regional Director

State Government Agencies and Organizations

- Alaska Chamber of Commerce
- Alaska Department of Natural
Resources (ADNR)
- Alaska Department of Fish and
Game
- Alaska State Historic Preservation
Officer

- Honorable Frank Murkowski,
Governor of Alaska
- University of Alaska, Anchorage-
Land Management
- University of Alaska, Fairbanks
Cooperative Ecosystem Study Unit
(CESU)

Local Governments and Communities

- City of Aleknagik
- City of Clark's Point
- City of Dillingham
- City of Ekwok
- City of Goodnews Bay
- City of Quinhagak
- City of Manokotak
- City of Togiak

- City of New Stuyahok
- City of Newhalen
- City of Nondalton
- City of Pedro Bay
- City of Platinum
- Bristol Bay Borough
- Lake and Peninsula Borough

Tribal Government and Communities

- Bristol Bay Native Corporation
- Bristol Bay Native Association
- Ekwok Village Council
- Aleknagik Natives, Ltd.
- Calista Corporation
- Igiugig Native Corporation
- Iliamna Natives Limited
- Choggiung Limited
- Koliganek Natives Limited
- Olsonville Inc.
- Levelock Natives Limited
- Saguyak, Inc.
- Manokotak Natives Limited
- Ekwok Natives Limited
- Paugvik Incorporated, Limited
- Kuitsarak, Inc.
- Stuyahok Limited
- Kijik Corporation
- Pedro Bay Native Corporation
- Aleknagik Traditional Council

- Native Village of Goodnews Bay
- Arviq, Inc.
- Qanirtuuq, Inc.
- Iliamna Village Council
- King Salmon Village Council
- Togiak Natives Corporation
- Kokhanok Village Council
- Twin Hills Native Corporation
- New Koliganek Village Council
- Levelock Village Council
- Portage Creek Village Council
- Manokotak Village Council
- Native Village of Kwinhagak
- Naknek Village Council
- South Naknek Village Council
- Newhalen Tribal Council
- Twin Hills Village Council
- Nondalton Tribal Council
- Pedro Bay Village Council
- Platinum Traditional Council

Congressional Delegation

- U.S. Representative Don Young
- U.S. Senator Lisa Murkowski
- U.S. Senator Ted Stevens

State Legislators

- Rep. John Coghill Jr.
- Rep. John Harris
- Rep. Vic Kohring
- Rep. Peggy Wilson
- Rep. Harry Crawford
- Rep. Sharon Cissna
- Rep. Eric Croft
- Rep. Ethan Berkowitz
- Rep. Norman Rokeberg
- Rep. Lesil McGuire
- Rep. Beth Kerttula
- Rep. Kevin Meyer
- Rep. Mike Chenault
- Rep. Carl Moses
- Rep. Mary Kapsner
- Rep. Richard Foster
- Rep. Reggie Joule
- Rep. Kim Elton
- Rep. Albert Kookesh
- Rep. Gary Wilken
- Rep. Gene Therriault
- Rep. Lyda Green
- Rep. Gretchen Guess
- Rep. Bettye Davis
- Rep. Johnny Ellis
- Rep. Ben Stevens
- Rep. John Cowdery
- Rep. Gary Stevens
- Rep. Lyman Hoffman

Non-Governmental Organizations and Businesses

- Alaska Coalition
- Alaska Miners Association
- Alaska Quiet Rights Coalition
- Alaska Sportsmans Lodge
- Delta Discovery
- Mountain Defense League
- The Nature Conservancy
- The Wilderness Society

Table 5.1. List of Preparers

Name	Responsibility	Education	Experience
Gary Reimer	Field Office Manager Project Lead	B.A. Political Science California State-Los Angeles	31 Years
Mike Zaidlicz	Acting Field Manager	B.S. Forestry, University of Montana at Missoula	31 Years
Mike Kasterin	Regional Economist		
Doug Ballou	Outdoor Recreation Planner	B.A. Geography University of New Mexico	25 Years
Larry Beck	Hazardous Materials	B.B. Ad. Gonzaga University, Certified Hazardous Materials Manager IHMM	14 Years
Dorothy Bonds	Realty Specialist (Lead)	B.A. Business	
Robert Brumbaugh	Minerals Specialist		
Charles Denton	Air, Water, Wetlands Specialist	M.S. Hydrology, University of Nevada	8 Years
Jeff Denton	Subsistence, Wildlife, T&E Species	M.S. Wildlife Biology/Management, University of Montana	35 Years
Rodney Huffman	Realty Group Manager	B.A. History, Humboldt State University	10 Years
Jeff Kowalczyk	Outdoor Recreation Planner	B.A. Natural Res. Mgmt. Polytechnical Univeristy	18 Years
Sarah McCabe	GIS Coordinator	GIS Certification University of Anchorage	3 Years
Paxton McClurg	GIS Coordinator	B.A. GIS Georgia Institute Technology	10 Years
Charmain McMillan	Planning Assistant	M.S. Urban Planning A&M University Huntsville, Alabama	5 Years
James Moore	Realty Specialist		
Darla Pindell	Minerals Economist		
Donna Redding	Archaeologist	Ph.D. Anthropology, UCLA	32 Years
Bruce Seppi	Wildlife, T&E Species	B.S. Wildlife Biology, Fairbanks University	32 Years
Brian Sterbenz	Fire and Fuels	B.S. Forest Management, Iowa State University	21 Years
Mark Meyer	Locatable Minerals		30 Years
Tim Sundlov	Fisheries	B.S. Fishery Biology, Colorado State University	8 Years
Sindra Wolfsen	Physical Scientist		
Patricia McClenahan	Compiler/Writer	Ph.D. Environmental Science, University of Arkansas	27 Years
Caron Gibson	Editor	B.S. Natural Resource Mgmt., Colorado State University	

Table 5.2. List of Reviewers

Name	Title
Bureau of Land Management Alaska	
Jeanie Cole	Land Use Planner
Gene Ervine	Interpretive Specialist
Randy Goodwin	Outdoor Recreation Planner
Scott Guyer	Natural Resource Specialist
Terry Hassett	17(b) Easement Specialist
Bruce Hollen	Special Status Species Biologist
Mike Kasterin	Regional Economist
Lon Kelly	Manager Arctic Field Office
Robert King	Archaeologist
Lee Koss	Hydrologist
Susan Lavin	Realty Specialist
Mary Lynch	Planning and Environmental Coordinator
Mark Meyer	Physical Scientist
Stacie McIntosh	Subsistence Coordinator (Acting)
David V. Mushovic	Realty Specialist
Bill Overbaugh	Outdoor Recreation Planner
John Payne	Wildlife Biologist
Jerri Sansone	Realty Specialist
Carolyn Spoon	Realty Specialist
Larry Standley	Hydrologist
Jeanne Standley	Natural Resource Specialist
Wayne Svejnoha	Hazmat Specialist
Dennis Tol	Fisheries Biologist
Bill Diel	Leasable Minerals
Curtis Wilson	Supervisory Land Use Planner
Alaska Department of Natural Resources Representative	
Carol Fries	Natural Resources Manager