

U.S. Department of the Interior
Bureau of Land Management

East Alaska
Proposed Resource Management Plan
and
Final Environmental Impact Statement

Volume I

Prepared By
Glennallen Field Office
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United States Department of the Interior



BUREAU OF LAND MANAGEMENT
Alaska State Office
222 W. 7th Avenue, #13
Anchorage, Alaska 99513-7599
<http://www.ak.blm.gov>

1610 (050)

APR 18 2006

Dear Reader:

Enclosed for your review is the Proposed Resource Management Plan and Final Environmental Impact Statement (Proposed RMP/Final EIS) for the lands administered in East Alaska by the BLM Glennallen Field Office. The Proposed RMP/Final EIS is a refinement of the Preferred Alternative (Alternative D) presented in the Draft RMP/EIS released in April 2005.

The Draft RMP/EIS was available for a 90-day public comment period ending on July 28, 2005. Approximately 4,500 comments were received. Appendix J of the Proposed RMP/Final EIS contains an analysis of and BLM responses to the comments received on the Draft RMP/EIS. When reviewing changes between the Draft RMP/EIS and the Proposed RMP/Final EIS, it is most effective to have both documents available for comparison purposes. BLM's responses to public comments reference page numbers in both the Draft RMP/EIS and the Proposed RMP/Final EIS.

As a result of public comment and internal review, Alternative D has been modified and is now considered the Proposed Action. All changes between the draft and final have been highlighted in grey as a additional guide to the reviewer. Both the Proposed RMP/Final EIS and the Draft RMP/EIS are available from the Glennallen Field Office or on their website at <http://www.ak.blm.gov/gdo/landplan/index.html>. The Proposed RMP/Final EIS is subject to a 30-day protest period. **The protest period ends 30 days after EPA's Notice of Availability is published in the Federal Register.**

The Proposed RMP/Final EIS contains land use planning decisions that are subject to public protest and implementation decisions on specific route designations in the Delta and Gulkana Wild and Scenic River corridors discussed in the Travel Management section of the plan. Implementation decisions on route designations may be appealed to the Interior Board of Land Appeals (IBLA) following the publication of the Record of Decision (ROD) and Approved Plan which is anticipated for July of 2006. The ROD will include information on the appeal process.

A letter of protest must be filed in accordance with the planning regulations at 43 CFR 1610.5-2(a)(1). Any person who participated in the East Alaska RMP planning process and has an interest which is or may be adversely affected may protest this proposed land use plan and/or decisions contained within it (see 43 CFR 1610.5-2) during the 30-day review and protest period. The protest period begins when the Environmental Protection Agency publishes its Notice of Availability of the final environmental impact statement in the Federal Register. Only those persons or organizations who participated in the planning process leading to this Proposed RMP may protest. A protesting party may raise only those issues submitted for the record during the planning process leading up to

publication of this Proposed RMP. New issues may not be introduced into the record at the protest stage.

In order to be considered complete, your protest must contain, at a minimum, the following information:

1. The name, mailing address, telephone number, and interest of the person filing the protest.
2. A statement of the issue or issues being protested.
3. A statement of the part or parts of the Proposed RMP being protested. To the extent possible, this should be done by reference to specific pages, paragraphs, sections, tables, maps, etc., included in the document.
4. A copy of all documents addressing the issue or issues that you submitted during the planning process, or a reference to the date the issue or issues were discussed by you for the record.
5. A concise statement explaining why the Alaska BLM State Director's proposed decision is believed to be incorrect. This is a critical part of your protest. Take care to document all relevant facts. As much as possible, reference or cite documents. A protest that merely expresses disagreement with the Alaska BLM State Director's proposed decision, without any data, will not provide us with the benefit of your information and insight. In this case, the Director's review will be based on the existing analysis and supporting data.

To be considered "timely", your protest, along with all attachments, must be postmarked no later than the last day of the protest period. There is no provision for an extension of time. Although not a requirement, we suggest that you send your protest by certified mail, return receipt requested. Press releases on the actual date ending the protest period will be sent to local and regional media contacts, information will be placed on the East Alaska RMP website, and a newsletter will be sent to all contacts on the East Alaska RMP mailing list .

Protests must be in writing. Electronic mail and faxed protests will not be accepted as valid protests unless the protesting party also provides the original letter by either regular or overnight mail postmarked by the close of the protest period. Under these conditions, BLM will consider the email or faxed protest an advance copy and it will receive full consideration. If you wish to provide BLM with such advance notification, please direct faxed protests to the attention of the BLM protest coordinator at 202-452-5112, and emails to Brenda.Hudgens-Williams@blm.gov.

If sent by regular mail, send to:

Director (210)
Attention: Brenda Williams
P.O. Box 66538
Washington, D.C. 20035

For overnight mail (i.e., Federal Express), send to:

Director (210)
Attention: Brenda Williams
1620 L Street, N.W., Suite 1075
Washington, D.C. 20036

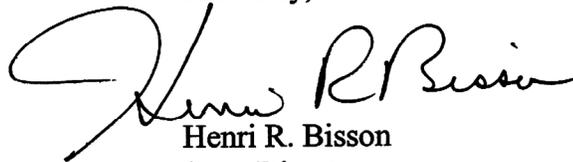
At the end of the 30-day protest period and after the Governor's 60-day consistency review, the Record of Decision and the Approved Resource Management Plan (RMP/ROD) will be prepared. Approval will be withheld on any portion of the Proposed RMP under protest until final action has been completed on such protest. The RMP/ROD will include a description of the appeal process for implementation decisions that can be appealed to IBLA. For the East Alaska RMP, this only includes decisions on route designations within the Wild and Scenic River corridors.

Freedom of Information Act Considerations/Confidentiality

All communications submitted, including names and street addresses of respondents, will be available for public review at the Glennallen Field Office in Glennallen, Alaska, during regular business hours (7:30 am to 4:30 pm), Monday through Friday, except holidays. Communications, including names and addresses of respondents, will be retained on file in the same office as part of the public record for this planning effort. Individual respondents may request confidentiality. If you wish to withhold your name or address from public inspection or from disclosure under the "Freedom of Information Act", you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

I thank the individuals and organizations who participated in this planning process. Your interest is appreciated. I hope your involvement will continue as we move forward to implement and monitor the plan and manage the public lands and resources administered by the Glennallen Field Office.

Sincerely,



Henri R. Bisson
State Director

EXECUTIVE SUMMARY

A. Introduction

The Bureau of Land Management (BLM) has prepared this Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) to provide direction for managing public lands within the Glennallen Field Office boundaries and to analyze the environmental effects that would result from implementing the alternatives presented in the Proposed RMP/Final EIS.

The planning area includes approximately 7.1 million acres in east Alaska administered by the Glennallen Field Office, including approximately 5.5 million acres of lands that are selected by the State of Alaska or Alaska Natives. The BLM is responsible for management of selected lands until conveyance occurs or until the selections are relinquished back to the BLM because of overselection. The planning area also includes private land (including Native Corporation land), State land, and lands managed by other Federal agencies. Management measures outlined in the Proposed RMP apply only to BLM-managed land in the planning area; no measures have been developed for private, State, or other Federal agency lands.

The Proposed RMP/Final 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 Glennallen 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 Southcentral Management Framework Plan approved in 1980, 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. Vision

Comments received during scoping represented a broad range of desires from both individuals and organizations. These same desires were expressed by the planning team during discussion of management of public lands in the planning area. As a result, the following vision statement provide the underlying vision for management of BLM lands in the planning area:

Within the capability of the resources:

- Provide diverse recreational and educational opportunities;
- Support a sustainable flow of benefits in consideration of the social and economic systems of eastern Alaska;
- Sustain and, where necessary, restore the health and diversity of forest, aquatic, and riparian ecosystems; and
- Maintain subsistence opportunities and resources.

D. 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
- Identify land adjustment categories.

Management under any of the alternatives would comply with State and Federal regulations, laws, standards, and policies. Each alternative considered in the Proposed RMP/Final 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 were reviewed and analyzed, the responsible officials have decided that Alternative D, with some minor modifications, will be BLM's Proposed RMP.

Following the 30-day protest period and the resolution of any protests, a Record of Decision will be signed and an approved RMP will be released.

E. Issues

A planning issue is a major controversy or concern regarding management of resources or uses on the public lands that can be addressed in a variety of ways. During scoping, the BLM suggested several broad categories as major issues that would drive the development of the planning alternatives. The BLM asked the public to comment on these issues and to provide other issues or concerns to be considered in development of the RMP. As a result, the Draft RMP/EIS primarily focused on seven planning issues and the decisions needed to resolve them. The issues were identified through public scoping, concerns raised to BLM staff in interactions with public land users, and resource management concerns of the BLM and cooperating agencies. These issues drive the formulation of the plan alternatives, and addressing them has resulted in the range of management options across the RMP alternatives. Additional discussion on each issue can be found in *Chapter 1: Introduction*. The following issue statements were developed to summarize the concerns surrounding each issue.

1. Issue 1: Travel Management

Manage access, roads, and use of OHVs for various purposes, including recreation, commercial uses, subsistence activities, and general enjoyment of public lands, while protecting natural and cultural resources.

2. Issue 2: Recreation

Manage recreation to provide a diversity of experiences on BLM-managed lands. Determine what measures are necessary to ensure that a diversity of recreational opportunities is maintained.

3. Issue 3: *Natural and Cultural Resources*

Manage to protect natural and cultural resources (including wildlife, fisheries, soil, water, air, and vegetation) identified by resource specialists and identified through the public scoping process.

4. Issue 4: *Lands and Realty*

Determine the appropriate mix of lands and realty actions needed to provide a balance between land use and resource protection. Establish conditions that would apply if the Slana settlement area is made available for disposal, considering the effects of disposal on the social and environmental conditions of the area.

5. Issue 5: *Vegetation Management*

Manage vegetation to provide for forest and riparian health, personal and commercial wood products, and fish and wildlife habitat. Determine what role fire will play in vegetation management.

6. Issue 6: *Leasable and Locatable Minerals*

Determine which areas should be made available for mineral exploration and development.

7. Issue 7: *Subsistence/Social and Economic Conditions*

Maintain and protect subsistence opportunities. Determine how the management actions, guidelines, and allowable uses prescribed in response to the other issues will affect both subsistence opportunities and resources and the social and economic environment.

F. 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 the public 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 and Proposed RMP/Final EIS. Alternative A (the No Action Alternative) was developed using available inventory data, existing planning and management documents, policies and decisions, and established land use allocations. Alternatives B, C, and D were developed with input from the public collected during scoping, from the BLM interdisciplinary planning team, and with sub-group recommendations from the Alaska Resource Advisory Council (RAC). Alternative D, with modifications outlined in this document, represents the BLM's Proposed RMP. Other alternatives that were considered but not analyzed in detail are described in *Chapter II: Alternatives*.

1. Alternative A

Alternative A is the No Action Alternative. This alternative would continue present management practices based on the existing Southcentral Management Framework Plan and other management direction documents. Valid decisions contained in the Southcentral Management Framework Plan would be implemented if not already completed. Direction contained in existing laws, regulations, and policies would also continue to be implemented, sometimes superseding provisions in the Southcentral plan. The current levels, methods, and mix of multiple use management of public lands in the planning area would continue, and resource values would receive attention at present levels. In general, most activities would be analyzed on a case-by-case basis and few uses would be limited or excluded as long as they were consistent with State and Federal laws.

2. Alternative B

Alternative B lays the groundwork for active management to facilitate resource development. In this alternative, constraints to protect resource values or habitat would be implemented in very specific geographic areas rather than across the planning area or in special designations. Most stipulations and guidelines would be developed on a site-specific basis. With the exception of the Delta and Gulkana Wild and Scenic River corridors, all ANCSA d(1) withdrawals would be revoked on lands retained in long-term Federal ownership. Public Land Order 5150, which withdrew lands for the transportation and utility corridor, would be revoked to allow for conveyance of the corridor to the State of Alaska. These actions would allow increased potential for mineral exploration and development. This alternative includes the highest level of forest and woodland treatments. Travel and trail restrictions would be maintained at the current levels. Recreation management would focus on development of facilities to handle increasing uses. Management of Native- and State-selected lands would be mostly custodial.

3. Alternative C

Alternative C emphasizes active measures to protect and enhance resource values. Production of minerals and services would be more constrained than under Alternative B or D, and, in some cases and in some areas, uses would be excluded to protect sensitive resources. Areas of Critical Environmental Concern (ACECs), Special Recreation Management Areas (SRMAs), and a Research Natural Area (RNA) are identified, and specific measures are proposed to protect or enhance values within these areas. All areas would be designated as limited or closed to off-highway vehicles (OHVs) to protect habitat, soil and vegetation resources, and recreation experiences. Some ANCSA d(1) withdrawals would be revoked, but others would be maintained to protect or maintain resource values. This alternative treats lands selected by the State and by Native or Village Corporations as if they were to be retained in long-term Federal ownership.

4. Alternative D

Alternative D, emphasizes a moderate level of protection, use, and enhancement of resources and services. Constraints to protect resources would be implemented, but would be less restrictive than those implemented under Alternative C. This alternative would designate one RNA and four SRMAs, but measures to protect resource values would be applied to other geographical areas that are also identified under Alternative C. This alternative would revoke many ANCSA d(1) withdrawals but would retain some

withdrawals in areas where strong resource protection is needed. It would retain most of PLO 5150, maintaining a viable federal subsistence hunting unit. This alternative describes interim and long-term management strategies for lands selected by the State or Native or Village Corporations.

5. **BLM Proposed RMP**

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

- Balance of use and protection of resources,
- Extent of the environmental impacts, and
- Incorporation of recommendations from the Alaska RAC on OHV management.

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 public lands in a sustainable fashion. Alternative D provides the best balance of resource protection and use within legal constraints.

G. 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. OHV use would remain unrestricted in most areas, resulting in the continued proliferation of unmanaged trails.

Implementation of Alternative B would allow for maximum resource development with the fewest area-wide constraints. This alternative would result in greater impacts on the physical and biological environment than would implementation of Alternative C or D. Uses would generally be least encumbered by management under this alternative, though legal constraints and Required Operating Procedures would be applied. This alternative would offer the greatest potential economic benefits on a local scale from resource extraction. Opportunities for Federal subsistence hunting would be negatively impacted by conveyance of the transportation and utility corridor to the State of Alaska.

Alternative C would have the least potential to impact physical and biological resources from BLM actions, but it would wield the greatest potential for short-term impacts to local economies and businesses that depend on public land for resource extraction. Implementation of Alternative C could result in economic benefits from non-motorized

recreational activities and protection of fish and wildlife habitats. Less aggressive forest treatments under this alternative could result in increased fire risk and habitat degradation in certain locations. Subsistence resources would be maintained or enhanced, but some access could be restricted through strong OHV regulations.

Implementation of Alternative D would allow for increased levels of resource development while providing for site-specific and some area-wide protection of resources. This alternative could result in economic benefits to local economies from resource extraction and from enhanced recreational experiences. Subsistence opportunities and resources would be maintained.

H. Public Involvement

Public involvement has been an integral part of the BLM's East Alaska planning effort. In order to engage the public during the timeframes involved in development of an RMP, newsletters have been mailed throughout the process to update interested parties on the progress of the planning team and stages of the planning process. Thirty public meetings were held by the BLM during the initial scoping period, followed by 16 public meetings to review draft alternatives and distribute packets of information on the alternatives. In addition, numerous briefings were held with various groups and organizations during the preparation of the Draft RMP/EIS.

In addition to public involvement opportunities, one subgroup was convened by the Alaska RAC to engage in collaborative problem solving and consensus-based decision-making to assist the BLM with recommendations on the major issue of OHV management. The BLM also invited all Native villages and Corporations in the area for consultation during the course of the process. These invitations have resulted in numerous briefings and development of several Memorandums of Understanding to increase government-to-government communications.

The 90 day comment period on the Draft RMP/EIS began on April 29, 2005 with the Environmental Protection Agency's Notice of Availability in the Federal Register (Federal Register 2005). Seven public meetings and eight subsistence hearings were held throughout the planning area. Comments received before July 28, 2005 were reviewed and analyzed by the BLM planning team. *Appendix J: Responses to Comments* outlines all substantive comments received on the Draft RMP/EIS and BLM's responses to those comments.

The changes made between the Draft and the Final resulted from public and internal review of the Draft RMP/EIS. A summary of the changes can be found on pages xiii-xx and are highlighted in grey throughout the Proposed RMP/Final EIS.

A 30 day protest period will begin with the publishing of the Notice of Availability of the Proposed RMP/Final EIS in the Federal Register by the Environmental Protection Agency. All protests received will be reviewed and addressed by the Director of the BLM before a Record of Decision and Approved Plan is released.

CHANGES FROM DRAFT TO FINAL

A. Introduction

This section summarizes changes that have occurred from the Draft RMP/EIS to the Proposed RMP/Final EIS. Editorial changes will not be described here. It is assumed that all changes needed for accuracy, clarity, consistency, improved readability, and incorporation of improved GIS data have been made based on public comment and internal review.

For a more detailed description of the comments received on the Draft RMP/EIS, the content analysis process, and BLM's responses to those comments see *Appendix J: Responses to Comments* in Volume II of the Proposed RMP/Final EIS.

Throughout the Proposed RMP/Final EIS, any change that has taken place between the Draft and the Final is highlighted in grey. Any new table has only the Table Title highlighted, not all of the information presented in the table. Any new section added (e.g. a new Appendix) has only the Appendix title highlighted, not all of the information in the Appendix. The Table of Contents at the beginning of each chapter highlights new sections added in grey. The master Table of Contents highlights any new map, table, figure, or section of the document in grey.

B. Summary of changes from draft to final

1. Changes to the Draft's preferred alternative that are now a part of the Final's Proposed RMP (Alternative D)

NOTE: These changes required additional analysis in Chapter IV and changes to Chapter II narrative or comparison tables in the Appendices.

- **OHV Management:** Specific trail designations for OHVs for the Delta and Gulkana Wild and Scenic River corridors have been moved from "Implementation-level considerations" to RMP decisions. This change is based on public comment and the need to comply with ANILCA, which allows OHV use in Conservation System Units if OHVs are on designated routes (43 CFR, 36.11).
- **OHV Management:** McCallum Creek drainage has been added to the Delta Mountain sub-unit with appropriate boundaries and acreage changes adjusted in

all tables and on all maps referring to the Delta Mountains sub-unit. This area will be managed to maintain the traditional non-motorized backcountry skiing and mountaineering experiences through a closure on snowmachines. The addition of McCallum Creek is based on supportive public comment as well as a resolution from the BLM Resource Advisory Council. Additional analysis has been added to Chapter IV to consider the effects of the action.

- **Wild and Scenic Rivers:** Wild and Scenic River Suitability determination will be deferred until ANCSA and State entitlements are met. An updated discussion of the eligibility of river segments as well as the addition of Appendix (J) which outlines the Outstandingly Remarkable Values and interim management actions for each eligible river segment are included. This decision (to defer suitability) was based on strong public comment supportive of a valid suitability assessment, something that would be difficult given the current interim land status.
- **Slana:** Disposal actions pertaining to the Slana area have been modified to state that any disposal action taken by BLM after disposal priorities 1 and 2 have been met will be done in close consultation with Ahtna Inc. and the Slana community. Disposals at this stage would be used to consolidate land patterns or provide lands for community infrastructure. Disposal to the general public at large by competitive or modified competitive bid will not be considered. The decision to make this change was based on overwhelming public comment opposing large scale disposal to the public under a competitive bid system.
- **PLO 5150:** Public Land Order (PLO) 5150 will be modified to allow conveyance of approximately 83,000 acres of lands withdrawn for the transportation and utility corridor to the State of Alaska. The area consists of a parcel northeast of Paxson through which the pipeline does not run and several townships to the west of the Delta River by Rainy Creek. This change was made based on comments received from the State of Alaska. Analysis of the effects of this action have been added to Chapter IV and to the ANILCA 810 evaluation.

2. Other changes that required supplementary information added to the Proposed RMP/Final EIS, including minor additions to Chapter III or Chapter IV analysis

- **Access:** RS-2477 routes have been removed from Maps 3 and 4 but not from Map 27. A disclaimer has been added to Map 27 explaining that the routes shown may or may not exist on the ground and encourages consultation with local land owners and managers. The BLM acknowledges R.S.2477s in narrative text in both Chapters II and III. This change was made based on comments by Ahtna, Inc. and others.
- **Access:** Information has been added in Chapters II and III to clearly define BLM's responsibilities in 17(b) easement management, according to law. In addition, text has been added to emphasize that BLM will work cooperatively with Ahtna, Inc. in implementation of a 17(b) easement cooperative plan.

- **Access:** A paragraph has been added in Chapter II to explain BLM's responsibilities in complying with ANILCA as it pertains to transportation and utility systems across conservation system units. This information was added to respond to comments from the State.
- **Access:** A short discussion was added in Chapter III regarding navigable waterways. This is in response to public comment.
- **OHV management/access:** Text added in Chapter II to say that BLM would comply with closure procedures outlined under 43 CFR Part 36.11 in limiting snowmachine use in Conservation System Units (Delta WSR) during implementation-level planning. This addition based on a comment from the State.
- **OHV management:** Trail density information has been added to Chapter III. This information added to respond to public comments asking for more justification to support OHV limitations. This information includes two aerial photos demonstrating high trail density and scale of trail braiding.
- **OHV management:** Justification has been added in Chapter II wherever proposed restrictions to OHV use are discussed under the Proposed RMP. This additional information added to respond to public comment and comment from the State.
- **OHV management/recreation:** Justification has been added for a seasonal motorized closure in the Delta Mountains. This justification was added to respond to comments from the State.
- **Recreation:** Clarification added on motorized use in primitive ROS classes. This addition was in response to several public comments.
- **Recreation:** Appendix H has been added and shows the description of benefits based analysis for each SRMA described in the Proposed RMP (Alternative D). This description is consistent with objectives described for each SRMA in the Draft RMP/EIS. This addition is based on internal (BLM) review of the Draft RMP/EIS and is included to facilitate implementation-level planning for the SRMAs and to provide state-wide consistency in BLM-Alaska land use planning.
- **Recreation:** Discussion of the cumulative effects of the Copper River Princess Lodge on recreation in the planning area is discussed in Chapter IV under Cumulative Effects. This discussion was added based on public comment.
- **Recreation:** Language has been added under specific SRMA descriptions to emphasize that recreation facility development may be avoided in specific areas to maintain primitive recreation experiences. This wording was added to respond to public comment to manage to "keep things the same".
- **Fisheries:** A discussion is included in Chapter III regarding the Gulkana hatchery. Although ADF&G is responsible for population management and oversees the operation of the hatchery, this information is added in response to public comment.
- **Fisheries:** A short discussion of the economic importance of Copper River salmon is added to Chapter III in response to public comments.
- **Fisheries:** ROP F&W-a-6 is modified to include exploratory oil and gas drilling in activities that are excluded within 500 feet of anadromous streams (Appendix C).

This change based on strong public comment for stronger protective measures for anadromous streams.

- **Wildlife:** Information was added to Chapter III Wildlife on the Mentasta caribou herd, Townsend's Warbler, and ptarmigan distribution, based on public comment.
- **VRM:** Visual Resource Management classes changed under Alternative C along the Tok Cut-off Road from VRM Class IV to VRM Class III. Based on comments from Mentasta Village asking BLM to give stronger consideration to the visual resource values in this area.
- **ACECs:** Specific objectives are described for the Bering Glacier RNA under the Proposed RMP. Objectives added to respond to a comment from the State.
- **ACECs:** Added a section in Chapter II, under Alternative Analyzed but not Considered in Detail on why BLM did not consider a Copper River ACEC in it's range of alternatives. This information is added to respond to numerous public comments.
- **Climate change:** More information has been added to Chapter III on climate change and its anticipated effects within the planning area. This information added to respond to public comments.
- **Slana:** The Slana area was added to Chapter II as an area that would be an emphasis area for rights-of-way. Not including this in the Draft RMP/EIS was an oversight on BLM's part.
- **Withdrawals:** Information added to Chapter II to clarify the original purpose of the ANCSA d(1) withdrawals and their review during the land use planning process. In addition, Table 28 was added in Chapter III displaying the major ANCSA d(1) withdrawals. This text added to respond to public confusion about withdrawal review.
- **PLO 5150:** Discussion of potential spill of TAPS on water quality has been added to Chapter IV, Cumulative Effects. Change made based on public comment requesting such a discussion.
- **PLO 5150:** Information added to Chapters III and IV explaining administration of the Trans Alaska pipeline and how revocation of PLO 5150 would effect the administration. This includes a table displaying members of the Joint Pipeline Office. This information added to provided more complete analysis of the alternative B proposal to revoke PLO 5150.
- **PLO 5150:** Text has been added in Chapter II explaining the justification for considering the revocation of PLO 5150 as part of Alternative B.
- **Forestry:** An estimated total anticipated timber harvest (in acres) was added to each alternative in Chapter II. This information added to clarify the scope of the analysis of effects in Chapter IV and added to respond to public concern about acres suitable for timber harvest identified in the Draft RMP/EIS.
- **Minerals:** Wording added in Chapter II and Chapter IV regarding anticipated level of mineral development in different alternatives, based on segregative effects of selected lands, access limitations, and marketability. This information was added to emphasize that revoking a withdrawal and allowing for mineral entry or leasing does not automatically equate to mineral development on every "open" acre. This information added to respond to public concern about effects of mineral development on all areas identified as "open".

- **Minerals:** An additional map has been added showing the specific area of the Bering glacier where existing withdrawals would be revoked. This information provided for clarification.
- **Minerals:** Discussion of the potential for actual mineral development from the opening of eastern 1/3 Bering Glacier RNA to mineral leasing and entry has been added to Chapter IV under Resource Assumptions. This discussion added to address concerns from the Yakutat borough over the likelihood of mineral development in the area and it's potential effects on anadromous streams.
- **Minerals:** More information has been added to Chapter III regarding mining history and activity for the Nicolai Belt and the Chistochina mining district. This responds to public comment and BLM review.
- **Subsistence:** More information has been added to the Chapter III write-up on subsistence, including a description of subsistence use patterns and traditional use areas and subsistence fisheries. This information is added to respond to numerous public comments and to better define subsistence use to provide for a more thorough analysis of the effects of revocation of PLO 5150.
- **ROPs and stips:** Discussion describing monitoring and enforcement of ROPs and Stips has been added to the Introduction of Appendix C. This discussion was added to clarify how ROPs and stipulations are applied in the field and how compliance monitoring takes place. This information added based on public and EPA comment.
- **ROPs and stips:** Required Operating Procedure ROP-Water-c-2 has been modified to not exclude placer mining. This change made based on a comment made by the State.
- **ROPs and stips:** ROP-F&W-a-7 deleted (it was a duplication of 6). ROP-F&W-a-6 modified. It now allows exploratory drilling within 500 feet of fish bearing streams, rivers, and lakes, under frozen conditions, utilizing ice roads. It still excludes oil and gas facilities and roads within 500 feet.
- **Maps:** More location and orientation information has been added to selected maps as scale would allow (meridian lines, township lines, more towns, glaciers, rivers, etc.). This was added in response to public comment.
- **Document Format:** A "How to Read This Chapter" section was added to Chapter II, with an explanation explaining the difference between RMP decisions and implementation-level decisions. This clarification was added to respond to a comment from the State.
- **NEPA:** An alternative comparison table was added to the end of Chapter II. This was added to respond to BLM comments and in order to comply with NEPA.
- **Public Involvement:** Text was added to Chapter V listing the government entities that Glennallen Field Office currently has an MOU with. This was added in response to a request from Ahtna, Inc.
- **Public involvement:** Discussion of public involvement efforts current through the Draft RMP/EIS 90 day public comment period have been included in Chapter I, Chapter V, and Appendix F.
- **Socio-economics:** A more detailed explanation of the expected trend in population growth within the planning area is included in Chapter IV.

3. Minor changes that required only editorial change

- **Access:** Changes have been made throughout the document to recognize and acknowledge valid existing rights. This is in response to a comment by the State.
- **Access:** Clarified language regarding R.S. 2477s in Chapter II and Chapter III . These changes made based on suggestions during BLM review and from the State.
- **Roads:** Miles of existing roads have been added. We have clarified the definition of moderate, slight, and minor as it relates to roads in Chapter IV. These in response to public comment.
- **OHV Management:** Clarified when trails limitations pertain to snowmachines and when they are only for summer OHV use in both the Chapter II narrative and the related tables. Changes made in response to comment by the State.
- **OHV Management:** Included reference to 11AAC 96.025 Conditions for Generally Allowed Uses as well as 11ACC 96.020. This clarification provided in response to a comment from the State.
- **Recreation:** Added consistency in the way commercial use and future limits on commercial use are portrayed throughout the document. Changes made based on a comment received from the State.
- **Recreation:** Updated Recreation Opportunity Spectrum Classes, boundaries and acreages, to reflect improved GIS data.
- **Editorial:** Corrected acreages for Chistochina-Cantwell Travel Management Area in Chapter II. The correct acreage of this area is 683,000 acres. This error was due to inaccurate GIS information.
- **Editorial:** Non-motorized areas in the Delta Range SRMA are referred to as the Delta Mountains Sub-unit, not Canwell and Augustana Sub-units. The management objectives do not change for the different areas and can therefore be expressed as one sub-unit.
- **Editorial:** Clarified roles of BLM and ADF&G with regards to habitat and population management throughout the document. This in response to comments from the State.
- **Selected lands:** Where necessary, we have distinguished between State-selected and Native-selected lands in narrative descriptions. This is particularly important in Chapter II travel management discussions. These changes were made based on comments by Ahtna, Inc.
- **Navigable waterways:** Clarified that all restrictions or limitations on motorized use on navigable waters considered in implementation level planning would be BLM recommendations to the State of Alaska. This is in response to a comment from the State.
- **Water Quality:** Acknowledged all non-point source water pollution prevention measures that are currently in place. This information added to respond to a comment from the State.
- **Wildlife:** The Migratory Bird Treaty Act is cited where appropriate. This in response to comments from Ahtna, Inc.

- **Subsistence:** In Chapter III the percentage of land that is within the Federal Subsistence Boundaries as well as within PLO 5150 is actually 63% not 42% as stated in the Draft RMP/EIS. This figure has been corrected.

Other minor editorial changes are made that are not noted here. Specific changes can be tracked through page references in responses to comments in Appendix J.

4. Summary of additional maps, tables, and figures

- **New maps added to the Proposed RMP/Final EIS:** Map 1 portrays the land managers of the planning area. Map 18 shows the portions of PLO 5150 that will be revoked under Alternative D. Map 26 shows which lands in the Bering Glacier area would be open to oil and gas leasing and mineral entry under Alternative D. Maps 54-57 show Recreation Management Zones for each of the SRMAs. Maps 58-60 show the river segments that are eligible for inclusion into the NWSRS.
- **New Tables added to the Proposed RMP/Final EIS:** Table 12. Subsistence - Alternative Summary; Table 12. Effects Comparison by Issue and Alternative; Table 13. Existing Roads within the Planning Area; 18. Average Trail Densities; Table 28. Major Withdrawals within the Planning Area; Table 29. Members of the Joint Pipeline Office; Table 32. Use of Subsistence Resources; Table 57. Recreation Benefits Based Planning – Delta River SRMA; Tables 58-61 Delta River RMZs 1-4; Table 62. Recreation Benefits Based Planning – Denali SRMA; Tables 63-67 Denali Highway RMZs 1-5; Table 68. Recreation Benefits Based Planning – Gulkana SRMA; Tables 69-72 Gulkana RMZs 1-4; Table 73. Recreation Benefits Based Planning: Tielkel SRMA; Tables 74-76 Tielkel RMZs 1-3
- **New Figures added to the Proposed RMP/Final EIS:** Figure 1. Trail Braiding within the Planning Area; Figure 2. Trail Network within the Planning Area

TABLE OF CONTENTS

Volume I

Cover Sheet	
Dear Reader Letter	
Abstract	i
Executive Summary	iii
Summary of Changes from Draft to Final	xiii
Table of Contents	xxi
I. Chapter I: Introduction	
A. Background	5
B. Purpose and Need for the Plan	6
C. Planning Area	6
1. Land Ownership and Administration in the Planning Area	6
2. Geographic and Social Setting.....	8
D. Scoping and Issues	9
1. The Scoping Process	9
2. Identification of Issues.....	9
3. Issues Addressed.....	10
4. Issues Beyond the Scope of the Plan	15
E. Planning Criteria and Legislative Constraints	18
F. Planning Process.....	19
1. Relationship between the RMP and EIS	21
2. Implementation of the RMP	21
3. Relationship of the RMP to BLM Policies, Plans, and Programs.....	22
4. Collaboration	22
G. Related Plans	24
II. Chapter II: Alternatives	
A. How to Read this Chapter	35
B. General Description of the Alternatives	36
1. Alternative A: No Action	36
2. Alternative B: Resource Development	36
3. Alternative C: Resource Conservation	37
4. Alternative D: Proposed RMP	37
5. Alternatives Considered but not Analyzed in Detail.....	37
C. Alternative Descriptions Related to Issues	39
1. Issue 1: Travel Management.....	40
2. Issue 2: Recreation	65
3. Issue 3: Natural and Cultural Resources.....	82

4. Issue 4: Lands and Realty 113
 5. Issue 5: Vegetation Management..... 127
 6. Issue 6: Leasable and Locatable Minerals 137
 7. Issue 7: Subsistence/Social and Economic Conditions 166
 D. Effects Comparison by Issue and Alternative 171

III. Chapter III: Affected Environment

A. How to Read this Chapter 183
 B. Issue 1: Travel Management 184
 1. Transportation and Facilities 184
 2. Off-highway Vehicle (OHV) Management and Trails..... 191
 C. Issue 2: Recreation..... 199
 1. General Recreation 199
 2. Special Recreation Permits 200
 3. Recreation Opportunity Spectrum 201
 4. Areas of Concentrated Recreation Opportunities 203
 5. Recreation Area Designations..... 208
 D. Issue 3: Natural and Cultural Resources 210
 1. Soils 210
 2. Water Quality 215
 3. Air Quality..... 218
 4. Vegetation (including Sensitive Status Plant Species) 220
 5. Wildlife (including Sensitive Status Wildlife Species) 232
 6. Fish (including Sensitive Status Fish Species)..... 273
 7. Cultural Resources..... 282
 8. Paleontological Resources..... 300
 9. Visual Resources 303
 10. Areas of Critical Environmental Concern (ACEC) 305
 11. Wild and Scenic Rivers 309
 12. Climate Change 315
 E. Issue 4: Lands and Realty 316
 1. Lands and Realty Programs and Administration 316
 2. Utility and Communication Corridors..... 322
 F. Issue 5: Vegetation Management..... 328
 1. Fire Management 328
 2. Forest Products..... 341
 G. Issue 6: Leasable and Locatable Minerals 347
 1. Geology..... 347
 2. Minerals Occurrence, Potential, and Administration..... 357
 H. Issue 7: Subsistence/Social and Economic Conditions 373
 1. Subsistence..... 373
 2. Social and Economic Conditions..... 379
 3. Environmental Justice 386
 I. Other Program Areas 389
 1. Hazardous Materials 389

IV. Chapter IV: Environmental Consequences

- A. How to Read this Chapter 397
- B. Introduction..... 398
 - 1. Types of Effects 399
 - 2. Availability of Data and Incomplete Information 400
 - 3. Critical Elements 401
- C. Analysis Assumptions and Guidelines..... 402
 - 1. General Assumptions 402
 - 2. Resource Assumptions 403
- D. Impacts By Alternatives 413
 - 1. Issue 1: Travel Management..... 413
 - 2. Issue 2: Recreation 418
 - 3. Issue 3: Natural and Cultural Resources..... 438
 - 4. Issue 4: Lands and Realty 544
 - 5. Issue 5: Vegetation Management..... 554
 - 6. Issue 6: Leasable and Locatable Minerals 559
 - 7. Issue 7: Subsistence/Social and Economics Conditions 564
- E. Cumulative Impacts 579
 - 1. Issue 1: Travel Management..... 579
 - 2. Issue 2: Recreation 580
 - 3. Issue 3: Natural and Cultural Resources..... 581
 - 4. Issue 4: Lands and Realty 588
 - 5. Issue 5: Vegetation Management..... 588
 - 6. Issue 6: Leasable and Locatable Minerals 590
 - 7. Issue 7: Subsistence/Social and Economic Conditions 591
- F. Irretrievable or Irreversible Commitment of Resources 593
 - 1. Issue 1: Travel Management..... 593
 - 2. Issue 2: Recreation 593
 - 3. Issue 3: Natural and Cultural Resources..... 593
 - 4. Issue 4: Lands and Realty 595
 - 5. Issue 5: Vegetation Management..... 596
 - 6. Issue 6: Leasable and Locatable Minerals 597
 - 7. Issue 7: Subsistence/Social and Economic Conditions 597
- G. Unavoidable Adverse Impacts 599
 - 1. Travel Management 599
 - 2. Recreation..... 599
 - 3. Cultural Resources..... 599
 - 4. Vegetation Management 600

V. Chapter V: Consultation and Coordination

- A. Introduction..... 605
- B. Public Participation Opportunities..... 605
 - 1. Scoping 606
 - 2. Draft Alternative Development 606
 - 3. Draft RMP/EIS Public Meetings and Subsistence Hearings..... 607

4. Other Outreach Efforts	608
C. Consultation.....	609
1. U.S. Fish and Wildlife Service Consultation	609
2. National Marine Fisheries Service Consultation.....	609
3. Tribal Consultation	610
D. Collaborative Efforts	610
1. Cooperation with the State of Alaska	610
E. Formal Government to Government Agreements.....	611
F. Plan Distribution	611
G. Interdisciplinary Team	615

Index.....	665
-------------------	------------

Volume II

Cover Sheet

Table of Contents.....	xxi
-------------------------------	------------

Appendices

Appendix A: SRMA Comparison Tables.....	A-1
Appendix B: ACEC and RNA Comparison Tables.....	B-1
Appendix C: Required Operating Procedures, Lease Stipulations, and Standard Lease Terms	C-1
Appendix D: Species Lists	D-1
Appendix E: ANILCA Section 810 Analysis of Subsistence Impacts	E-1
Appendix F: Public Involvement Opportunities	F-1
Appendix G: Laws, Regulations, and Policies.....	G-1
Appendix H: Recreation Benefits Based Planning.....	H-1
Appendix I: Wild and Scenic River Eligibility and Suitability	I-1
Appendix J: Response to Comments	J-1
Appendix K: Master Memorandum of Understanding between Alaska Department of Fish and Game and the Bureau of Land Management ...	K-1

Acronyms.....	619
----------------------	------------

Glossary.....	621
----------------------	------------

References.....	641
------------------------	------------

Index.....	665
-------------------	------------

List of Maps

1.	EARMP Planning Area Land Managers	27
2.	EARMP Planning Area General Land Status	29
3.	Travel Management Areas - Alternative C	61
4.	Travel Management Areas - Alternative D	63
5.	Delta River SRMA - Alternatives C and D	77
6.	Gulkana River SRMA - Alternative C and D	78
7.	Denali Highway SRMA - Alternative C	79
8.	Tielkel SRMA - Alternative C and D	80
9.	Delta Range SRMA – Alternative C and D	81
10.	Delta Bison Calving ACEC - Alternative C	101
11.	Nelchina Caribou ACEC - Alternative C	102
12.	West Fork ACEC - Alternative C	103
13.	Bering Glacier RNA - Alternative C and D	104
14.	Primary Trumpeter Swan Breeding Habitat	105
15.	Visual Resource Management Classes - Alternative B	107
16.	Visual Resource Management Classes - Alternative C	109
17.	Visual Resource Management Classes - Alternative D	111
18.	Revocation of Portions of PLO 5150 - Alternative D	127
19.	Areas Open to Oil and Gas Leasing - Alternative A	151
20.	Areas Open to Mineral Entry - Alternative A	153
21.	Areas Open to Mineral Entry and Oil and Gas Leasing - Alternative B	155
22.	Areas Open to Oil and Gas Leasing - Alternative C	157
23.	Areas Open to Mineral Entry - Alternative C	159
24.	Areas Open to Oil and Gas Leasing - Alternative D	161
25.	Areas Open to Mineral Entry - Alternative D	163
26.	Areas Open to Mineral Entry and Oil and Gas Leasing - Alternative D, Bering Glacier RNA	165
27.	GPSed Trails, ANCSA 17(b) Easements, and State-recognized R.S.2477 ...	189
28.	State Game Management Units	197
29.	Recreation Opportunity Spectrum Classes	205
30.	Major Soil Associations	213
31.	Alaska Earth Cover Classifications	221
32.	Black and Grizzly Bear Habitat	239
33.	Bison Habitat	241
34.	Caribou Habitat	243
35.	Dall sheep Habitat	245
36.	Mountain Goat Habitat	247
37.	Moose Habitat	249
38.	Bald Eagle Breeding and Nesting Habitat	255
39.	Dusky Canada Goose Breeding and Nesting Habitat	262
40.	Harbor Seal Habitat	264
41.	Trumpeter Swan Breeding and Nesting Habitat	269
42.	Anadromous Rivers and Streams	275
43.	EARMP Planning Regions	283

44.	Transportation Utility Corridor.....	323
45.	Fire History 1950 to 2002	331
46.	Wildland Fire Management Options	333
47.	Fuel Types.....	337
48.	Productive, Commercial Stands of Trees	344
49.	Areas Affected by Bark Beetle Infestation	345
50.	Physiographic Regions.....	349
51.	Mineral Terranes and Producing Placer Districts	355
52.	Coal Fields	359
53.	Oil and Gas Plays and Occurrence Potential	365
54.	Delta River SRMA – Recreation Management Zones	H-6
55.	Denali Highway SRMA – Recreation Management Zones	H-11
56.	Gulkana River SRMA – Recreation Management Zones	H-17
57.	Tielke SRMA – Recreation Management Zones	H-23
58.	Eligible River Segments – Denali Highway Region	I-25
59.	Eligible River Segments – Tielke Region	I-26
60.	Eligible River Segments – Bering Glacier Region	I-27

List of Tables

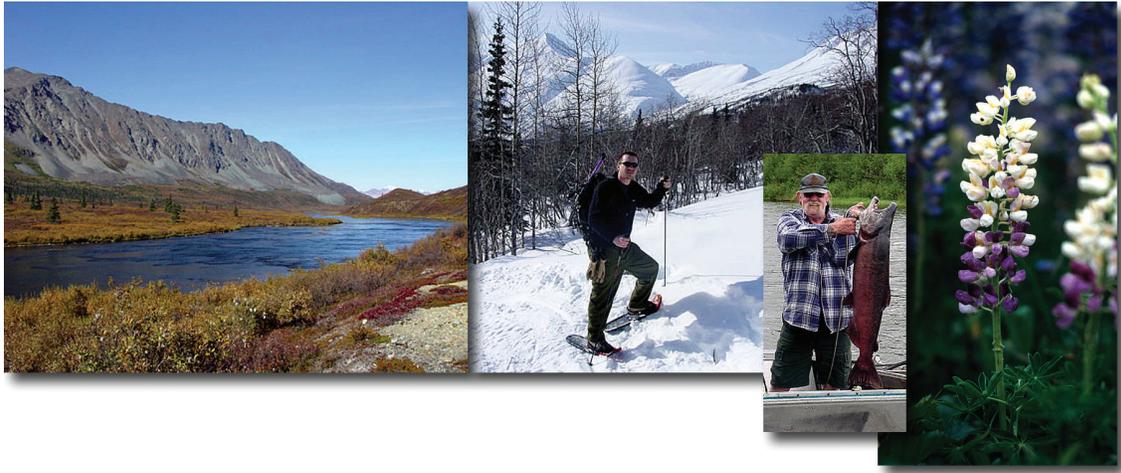
1.	Land Status within the East Alaska Planning Area.....	8
2.	Steps in the BLM Land Use Planning Process.....	20
3.	Travel Management - Alternative Summary	58
4.	Recreation - Alternative Summary.....	75
5.	Natural and Cultural Resources - Alternative Summary	98
6.	Summary of Withdrawals and Recommendations for Alternatives B, C, and D	118
7.	Lands and Realty - Alternative Summary	124
8.	Vegetation, Forestry - Alternative Summary.....	134
9.	Vegetation, Wildlife - Alternative Summary	136
10.	Leasable Minerals, Oil & Gas - Alternative Summary.....	145
11.	Locatable Minerals - Alternative Summary.....	148
12.	Subsistence – Alternative Summary.....	169
13.	Effects Comparison by Alternative and Issue.....	171
14.	Existing Roads within the Planning Area.....	184
15.	BLM Trail Maintenance Levels	185
16.	Inventoried Trails in the Glennallen Field Office	186
17.	Boat Ramp Facilities	191
18.	Average Trail Densities	194
19.	Recreation Facilities	199
20.	Recreation Opportunity Spectrum Classes	201
21.	Major Soil Associations	211
22.	Sensitive Status Plant Species Possibly Occurring within the Glennallen District	227
23.	Potential Future Listing as Sensitive Status Plant Species	228
24.	General Habitat Types within the Glennallen District	232

25.	BLM Alaska Sensitive Status Wildlife Species List.....	259
26.	Subsistence and Personal Use Fisheries Permits Issued and Harvested	279
27.	Rivers Eligible for Wild and Scenic Designation	313
28.	Major Withdrawals within the Planning Area	322
29.	Members of the Joint Pipeline Office.....	326
30.	Large Fire History within the Glennallen District, 1915-47.....	330
31.	Wildland Fire Management Options	335
32.	Use of Subsistence Resources	374
33.	Population Per Community, Historical Data U.S. Census-Copper River Basin Only.....	381
34.	Population of selected communities outside the Copper River Basin.....	382
35.	Copper River Basin Area Employment by Sector.....	384
36.	BLM Spending.....	386
37.	Environmental Justice Data from the Alaska Department of Labor and Workforce Development.....	388
38.	OHV Designations by Alternative	413
39.	Special Recreation Management Areas Designations by Alternative.....	418
40.	Area of Critical Environmental Concern Designations by Alternative	438
41.	Oil and Gas Leasing by Alternative	559
42.	Locatable Minerals by Alternative.....	559
43.	List of Preparers	615
44.	Delta Range SRMA - Alternative Comparison.....	A-3
45.	Delta River SRMA - Alternative Comparison.....	A-5
46.	Denali Highway SRMA - Alternative Comparison.....	A-9
47.	Tielke SRMA - Alternative Comparison	A-13
48.	Delta Bison Calving ACEC - Alternative Comparison.....	B-3
49.	Nelchina Caribou Calving ACEC - Alternative Comparison.....	B-6
50.	West Fork ACEC - Alternative Comparison.....	B-10
51.	Bering Glacier RNA - Alternative Comparison.....	B-15
52.	Oil and Gas Leasing Stipulations	C-23
53.	Mammal Species Known to Occur within the Glennallen District Boundaries	D-3
54.	Bird Species Known to Occur within the Glennallen District Boundaries.....	D-4
55.	Amphibian Species Known to Occur within the Glennallen District Boundaries	D-8
56.	Fish Species Known to Occur within the Glennallen District Boundaries	D-8
57.	Recreation Benefits Based Planning – Delta River SRMA	H-5
58.	Delta River RMZ 1 – Tangle Lakes Developed	H-7
59.	Delta River RMZ 2 - Tangle Lakes Dispersed	H-7
60.	Delta River RMZ 3 - Delta River Primitive	H-8
61.	Delta River RMZ 4 - Delta River Semi-primitive Motorized.....	H-9
62.	Recreation Benefits Based Planning – Denali SRMA.....	H-10
63.	Denali Highway RMZ 1 – Developed Facilities.....	H-12
64.	Denali Highway RMZ 2 - Paved portion of the highway	H-12
65.	Denali Highway RMZ 3 - Non-paved portion of the highway	H-13
66.	Denali Highway RMZ 4 - Semi-primitive motorized	H-14
67.	Denali Highway RMZ 5 - Semi-primitive non-motorized	H-15

68.	Recreation Benefits Based Planning – Gulkana SRMA	H-16
69.	Gulkana RMZ 1 – Upper River	H-18
70.	Gulkana RMZ 2 - Middle and Upper West Forks.....	H-19
71.	Gulkana RMZ 3 - Lower West Fork	H-20
72.	Gulkana RMZ 4 - Sourdough.....	H-21
73.	Recreation Benefits Based Planning: Tielkel SRMA	H-22
74.	Tielkel RMZ 1 - Tonsina Sub-Unit	H-24
75.	Tielkel RMZ 2 - Tielkel Dispersed	H-24
76.	Tielkel RMZ 3 - Tielkel Highway Corridor.....	H-25
77.	Summary of Substantive Comments Received by Issue	J-5

List of Figures

1.	Trail Braiding within the Planning Area.....	194
2.	Trail Network within the Planning Area.....	195
3.	Population Growth in the Copper River Basin 1880-2000	382
4.	Jobs Per Economic Sector	383
5.	Seasonal Unemployment Rates	385
6.	Comparison of Per Capita Income	386



Chapter I: Introduction

Chapter I: Introduction

- A. Background..... 5
- B. Purpose and Need for the Plan..... 6
- C. Planning Area 6
 - 1. Land Ownership and Administration in the Planning Area..... 6
 - 2. Geographic and Social Setting 8
- D. Scoping and Issues..... 9
 - 1. The Scoping Process 9
 - 2. Identification of Issues 9
 - 3. Issues Addressed 10
 - a) Issue 1: Travel Management..... 10
 - b) Issue 2: Recreation 11
 - c) Issue 3: Natural and Cultural Resources 12
 - d) Issue 4: Lands and Realty..... 13
 - e) Issue 5: Vegetation Management 13
 - f) Issue 6: Leasable and Locatable Minerals 14
 - g) Issue 7: Subsistence/Social and Economic Conditions..... 14
 - 4. Issues Beyond the Scope of the Plan 15
 - a) Land Conveyance 15
 - b) Federal Subsistence Program Management..... 15
 - c) Fishing and Hunting Regulations 16
 - d) Wilderness Inventory and Management..... 16
 - e) Lands with Wilderness Characteristics 17
- E. Planning Criteria and Legislative Constraints 18
- F. Planning Process 19
 - 1. Relationship Between the RMP and EIS 21
 - 2. Implementation of the RMP 21
 - 3. Relationship of the RMP to BLM Policies, Plans, and Programs 22
 - 4. Collaboration 22
 - a) Public Participation 22
 - b) Cooperating Agencies/Invitees 23
 - c) Collaboration with Native Corporations and Village Governments..... 24
- G. Related Plans 24

CHAPTER I: INTRODUCTION

This chapter contains background information on the Bureau of Land Management's Resource Management Plan planning process and sets the stage for the information presented in the rest of this document.

The identification of issues in the *Scoping and Issues* section on page 9 is especially critical to the entire planning process as these major issues are the main drivers in the formulation of alternative management scenarios presented for consideration.

A. Background

On March 18, 2003, 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 public lands administered by the Glennallen 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 (e.g., federally-owned mineral estate) that are administered by the Secretary of the Interior, specifically through the BLM. In this case, public lands also include lands selected, but not yet conveyed, to the State of Alaska and Native Corporations and villages.

The approved RMP will meet the BLM statutory requirement for a master land use plan as mandated by section 202 of FLPMA, which specifies the need for a comprehensive land use plan consistent with multiple use and sustained yield objectives. The RMP/EIS also fulfills the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended, to disclose and address environmental impacts of proposed major Federal actions through a process that includes public participation and cooperation with other agencies.

The BLM is the lead agency in preparing this RMP/EIS. The BLM is coordinating closely with the State of Alaska and with Ahtna and Chugach Native Corporations, as well as with all village councils located within or affected by actions occurring within the planning area. In addition, the BLM has coordinated with Wrangell-St. Elias National Park and Preserve, Chugach National Forest, Copper Valley Economic Development Council (there is no local government in the Copper Valley), and U.S. Fish and Wildlife Service in preparation of this document.

B. Purpose and Need for the Plan

Through completion of the RMP/EIS, the BLM proposes to provide a single, comprehensive land use plan that will guide management of the public lands and interests administered by the Glennallen Field Office. Site specific decisions and management actions, such as designation of specific trails, will occur through subsequent implementation-level plans.

Current management of these lands is guided by the Southcentral Management Framework Plan (MFP), completed in 1980 and amended in 1985 and 1998 (BLM 1980a). In the 25 years since this document's approval, many additional laws, regulations, and policies have created additional considerations that affect the management of public lands. As a result, 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. Coupled with new issues and concerns and increasing demands on certain resources in the planning area, these changes in management policy drive the need for an inclusive, comprehensive plan that provides clear direction for both the BLM and the public.

C. Planning Area

1. Land Ownership and Administration in the Planning Area

Maps 1 and 2, located at the end of this chapter, show the location of the planning area within the State of Alaska and depict the varying ownership and conveyance status within the planning area. Of the approximately 30,908,000 acres within the planning area, decisions in the RMP/EIS will apply to 7,056,000 acres, classified as follows:

- **BLM:** These are lands that will most likely be retained in long-term Federal ownership. They are not selected by the State or by Native corporations or villages. These lands constitute approximately 5 percent of the planning area.
- **State-selected:** These are formerly unappropriate and unreserved public lands that were selected by the State of Alaska as part of the Alaska Statehood Act of 1958 and Alaska National Interest Lands Conservation Act (ANILCA) of 1980. Until conveyance, State-selected lands not falling within the Wrangell-St. Elias National Park and Preserve or Chugach National Forest will continue to be managed by the Glennallen Field Office. ANILCA, which amended the Statehood Act, allowed for overselection by the State by as much as 25 percent 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 10 percent of the planning area.

- Native-selected: The Alaska Native Claims Settlement Act (ANCSA) of 1971 gave Alaska Natives an entitlement of 44,000,000 acres to be selected from a pool of public lands specifically defined and withdrawn by the Act for that purpose. As ANILCA provided for overselection by the State, ANCSA provided for the Natives to overselect lands (sec. 12); some of these lands will therefore be retained in long-term Federal ownership. Native-selected lands constitute approximately 1 percent of the planning area.
- Dual-selected: These are lands that have been selected by both the State and Natives. Again, because of overselection, some of these lands could be retained in long-term Federal ownership. Dual-selected lands constitute approximately 7 percent of the planning area.
- Mineral estate: All subsurface mineral estate lying beneath BLM lands is BLM administered. In addition, BLM administers 12,874 acres of subsurface mineral estate beneath private surface within the planning area. No mineral development occurs on State or Native-selected lands until conveyance occurs. After conveyance, mineral estate goes to the State or the Native corporation.

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

- State lands: These are lands that have already been conveyed to the State of Alaska. These lands constitute approximately 24 percent of the planning area.
- Native lands: These are lands already conveyed to Native allottees or village and regional corporations and are now private lands. These lands constitute approximately 4 percent of the planning area.
- National Park Service lands. These are lands within Wrangell-St. Elias National Park and Preserve and Denali National Park and Preserve. These lands constitute approximately 40 percent of the planning area.
- USDA Forest Service: These are lands managed by the Chugach National Forest. These lands constitute approximately 7 percent of the planning area.
- Private lands: These lands are privately owned, aside from Native corporations or villages. Most are located along the highway corridors. These lands constitute approximately 2 percent of the planning area.

Table 1. Land Status within the East Alaska Planning Area

Land Category	Acres
BLM-administered lands	
BLM public lands	1,572,000
State-selected	3,397,000
Native-selected	44,000
Dual-selected	2,100,000
Military	3,000
Total	7,116,000
National Park Service-administered lands	
National Park Service lands	11,630,000
State-selected	6,000
Native-selected	800,000
Total	12,436,000
State of Alaska lands	
State lands	7,022,000
Total	7,022,000
Forest Service-administered lands	
Forest Service lands	1,891,000
Native-selected	342,000
Total	2,234,000
Native-owned	2,036,000
Private	64,000
Total lands within planning area	30,908,000

2. Geographic and Social Setting

The planning area extends from the southern slopes of the Alaska Range to the Chugach Mountains, from the Talkeetna Mountains to the Wrangell Mountains, and includes an extensive area of coastline in Prince William Sound. The area is bisected by the Glenn, Richardson and Denali Highways, and is accessible by Alaska standards. The area is also bisected by the Trans-Alaska Pipeline, which runs north to south and roughly parallels the Richardson Highway.

Located at the core of the planning area, the Copper River Basin is very rural in nature, with small communities and villages scattered throughout the area. The 2000 Census reported a population of 3,120 in the Copper River Basin. The larger communities of Cordova and Valdez are within the planning area on Prince William Sound. Cordova is located near the mouth of the Copper River. Residents of the cities of Anchorage, Palmer, Wasilla, and Fairbanks utilize the area heavily for recreation as well as for sport and subsistence hunting and fishing.

The area experiences a climate of cold, relatively dry winters and warm summers. The Copper River Basin is quite dry as it is surrounded by four major mountain ranges. These ranges essentially block most storm systems that would affect the basin. Mean annual precipitation is only 9-10 inches in the Copper River Basin. Precipitation

amounts increase in all directions as the valley floor gradually increases in elevation toward the mountain ranges. Sixty percent of the annual precipitation occurs from June through September. The remaining precipitation falls mainly from October through December. The driest period of the year is January through May.

D. Scoping and Issues

1. The Scoping Process

Early in the planning process, the public was invited to help the BLM identify planning issues and concerns relating to the management of BLM-administered lands and resources in the planning area. The formal scoping period began with publication of the Notice of Intent (NOI) in the Federal Register in March 2003 (Federal Register 2003). The scoping process included 30 public meetings, most of which were held in small communities and villages within the Copper River Basin, though meetings were also held in Fairbanks, Anchorage, Valdez, and Cordova. Cumulatively, over 300 people attended these meetings. Concurrent with the meetings, an East Alaska Resource Management Plan website was developed (<http://www.ak.blm.gov/gdo/landplan/index.html>). The website contained a public meeting schedule and a detailed explanation of the RMP process. At the end of the scoping period, a scoping report was posted on the website and sent out via newsletter to all those who participated in the public meetings. News releases and radio announcements were also used to notify the public of the planning process and how to become involved.

Additional information on public involvement opportunities can be found in the *Collaboration* section on page 22 and in *Appendix F: Public Involvement Opportunities*.

2. Identification of Issues

Issue identification is the first step of the nine-step BLM planning process outlined in Table 2 on page 20. A planning issue is a major concern, controversy, or dispute regarding management of resources or uses on the public lands that could be addressed in a variety of ways. During scoping, the BLM asked the public to provide issues or concerns to be considered in development of the RMP. Analysis of the comments was completed and a Scoping Report was finalized in June 2003. After consideration of public responses, seven major issues were formulated. These issues drove the formulation of the plan alternatives. The issues are controversial and addressing them will result in a range of management options across the plan

alternatives. While other concerns will be addressed in the plan, management may or may not change in the alternative development. Issues are described below. The order of the issues does not reflect their level of importance. Subsistence is discussed last to consider potential impacts to subsistence that could result from proposed management actions or allowable uses described under the previous six issues.

3. Issues Addressed

a) Issue 1: Travel Management

Issue Statement: Manage access, roads, and use of OHVs for various purposes, including recreation, commercial uses, subsistence activities and general enjoyment of public lands, while protecting natural and cultural resources.

(1) Access

The planning area is comprised of a checkerboard pattern of mixed land status. As lands are conveyed from public management to private ownership (in the case of Native selections), some access routes to public lands are in danger of being lost if easements are not reserved as part of the conveyance process. Section 17(b) of ANCSA provided for the reservation of easements across lands being conveyed to Native regional and village corporations primarily to provide access to isolated public lands. In some cases, easements were reserved as a result of a paperwork exercise using maps without being field-checked. Easements were also frequently reserved for proposed roads and trails. The locations of some easements were not field verified or marked for public use. As a result, easements are often unusable due to terrain or land ownership patterns. Additionally, many easement reservations were effectively nullified by later conveyance of Native allotments across the easement, thereby making them discontinuous. Some 17(b) easement trails are nearly impassible due to wet or unstable surface conditions, resulting in trespass on Native land when users travel off the trail (and off the easement) to avoid boggy or impassable trail segments. Some members of the public use 17(b) easements for uses that are not allowed as specified in the conveyance document or regulations. These uses may constitute a trespass to Native lands underlying the easement or restrict others' valid use of the easement.

(2) Off-highway Vehicle (OHV) Management and Trails

The use of motorized off-highway vehicles (OHVs) is increasing throughout the planning area and is a concern for managers, interest groups, and some members of the general public. OHVs including four-wheelers, Argos, and tracked vehicles, are used recreationally, but their predominant use in Alaska is to access hunting and fishing areas. A 1996 ADF&G Division of Wildlife Conservation Report to the Alaska Board of

Game (Off Road Vehicle and Snowmachine Use in Alaska—A Report to the Alaska Board of Game, 1996) summarizes the issue below:

“Small, highly maneuverable, 4-wheel-drive ORVs [off-road vehicles] are a significant evolution in hunting methods and means during the snow-free season. The number of hunters using ORVs has increased in many areas; however, heaviest use extends from the road systems which connect urban areas in southcentral and interior Alaska. At low levels of use, ORVs may be advantageous to hunters and wildlife managers by enhancing ability to harvest and retrieve meat and trophies in remote areas and dispersing hunting pressure away from roads. However, several factors combine to concentrate ORV use. Terrain features tend to funnel ORV use, and hunters attempt to hunt in the most productive areas. At high use levels, this can adversely affect wildlife populations and the public’s perception of ORVs. In states with many ORVs, their use has damaged soils and vegetation; stressed, displaced, and killed wildlife; and conflicted with other outdoor uses. Increasing public complaints and observations of resource managers indicate that Alaska is no exception” (ADF&G 1996).

(3) Roads

Portions of the Richardson, Glenn, Parks, and Denali Highways all occur within the planning area. These highways connect the urban centers of Fairbanks, Anchorage, and Valdez and provide access for hundreds of thousands of tourists and out-of-state visitors every year. In addition, the highways provide access to recreational opportunities, hunting, and fishing for rural and urban residents alike. There are very few secondary roads in the area; most that do exist are associated with service access to the Trans-Alaska Pipeline or access to private residences. The issue in regards to roads is related to the future potential for development of an area, the consideration of access for resource development, and resolution of any resource conflicts that might occur from road construction.

b) Issue 2: Recreation

Issue Statement: Manage recreation to provide a diversity of experiences on BLM-managed lands. Determine what measures are necessary to ensure that a diversity of recreational opportunities is maintained.

A variety of outdoor recreational opportunities are provided within the East Alaska planning area. The existing road network makes these resources relatively easy to access for residents of the planning area, those living in Anchorage, Fairbanks, and Valdez, and the hundreds of thousands of visitors to the State who pass through the area every year. State of Alaska Department of Transportation counts on the Denali

Highway indicate at least 27,000 visitors during the 2001 summer season. This represents a small subset of the non-resident tourists as well as Alaskan recreationists who use the areas adjacent to the Glenn, Richardson, Parks, and Denali Highways. Access is more difficult off these highways, and opportunities for primitive and semi-primitive experiences are still readily available.

Recreational uses, demands, and impacts in the planning area are increasing. Thousands of visitors travel the Richardson, Glenn, and Denali Highways every summer season and utilize BLM developed facilities. Winter use is also on the rise – the annual Arctic Man Ski and Sno-Go Classic event in the foothills of the Alaska Range draws 10,000-15,000 spectators alone, most of whom spend time in the area using snowmachines. Recreational use on the Delta and Gulkana Wild and Scenic Rivers has doubled in the last 30 years. Increasing OHV use is mostly unmanaged, resulting in unquantified resource impacts to vegetation, cultural resources, soil, water, and wildlife. The number of applications received for commercial recreational activities such as guided fishing and float trips, organized races and events, and heli-skiing are also increasing. Increasing recreational activities have impacted cultural resources in areas such as the Tangle Lakes Archaeological District. Concerns are being raised about the impacts, both individually and cumulatively, of these activities on natural resources, subsistence resources, and the quality of recreational experiences.

c) Issue 3: Natural and Cultural Resources

Issue Statement: Manage to protect natural and cultural resources, including wildlife, fisheries, soil, water, air and vegetation, identified by resource specialists and identified through the public scoping process.

The planning area is rich in natural resources. Off the highway system, resource conditions are still relatively pristine with few human impacts. The planning area provides habitat for approximately 35 percent of Alaska's trumpeter swan population and for the Nelchina caribou herd; the herd is a significant subsistence resource for rural residents on the Copper River Basin. BLM-managed lands include the headwaters of the Copper River, which provide a salmon run that is vitally important to the economic and subsistence needs of Copper River Basin and Cordova residents. The Bering Glacier complex is the largest glacier in continental North America; the glacier forelands provide valuable habitat for waterfowl and contain ecologically unique plant and animal communities.

As Alaska's and the nation's population increases, so do demands for natural resources. Sustainable resource development is vital to the Copper River Basin's economy. How do we balance sustainable resource development with protection of resource values?

d) Issue 4: Lands and Realty

Issue Statement: Determine the appropriate mix of lands and realty actions needed to provide a balance between land use and resource protection. Establish conditions that would apply if the Slana settlement area is made available for disposal, considering the effects of disposal on the social and environmental conditions of the area.

In 1983, Public Land Order (PLO) 6456 opened 10,250 acres of lands in the Slana area to settlement. As claims in the area were patented, a pattern of isolated and unmanageable tracts emerged, creating an opportunity for an ongoing sale program in an area that is already identified for disposal. This opportunity must be balanced with the potential social and environmental impacts associated with increased population and settlement in an area with very little infrastructure.

e) Issue 5: Vegetation Management

Issue Statement: Manage vegetation to provide for forest health, personal and commercial wood products, and fish and wildlife habitat. Determine what role fire will play in vegetation management.

The planning area contains vast tracts of relatively undisturbed lands and vegetation. With the exception of the highway corridors, human-caused disturbance has been minimal and vegetation communities are able to progress naturally through their successional stages. Bark beetle kill in white spruce and fire have had the greatest effect so far on vegetation within the planning area. Wetlands are abundant within the Copper River Basin; consequently, there has not been an abundance of large stand-replacement fires. Some timber sales have occurred (mostly on Native Corporation lands), but they have been on a relatively small scale. With a lack of natural and human-caused disturbance, black and/or white spruce tend to dominate the potential natural communities. This has resulted in reduced amounts of shrub-dominated early seral vegetation types, important components of moose and other wildlife habitats.

There is local demand for personal and commercial harvest of firewood and house logs. Although approximately 65,000 acres of BLM-administered land within the planning area have commercial forest potential, most of these acres are inaccessible. Opportunities exist to utilize commercial and personal harvest to improve wildlife habitat, improve forest health, and reduce the potential for wildfire in the urban interface. There are also opportunities to utilize prescribed fire and wildland fire to improve wildlife habitat. These opportunities must be balanced with other resource values. Other activities such as mineral development and OHV use must be managed to minimize disturbance to vegetation, minimize the potential for introduction of noxious weeds, and reclaim damages to vegetation.

f) Issue 6: Leasable and Locatable Minerals

Issue Statement: Determine which areas should be made available for mineral exploration and development.

ANCSA opened Federal lands to selection by the State and Native Corporations; sec. 17(d)(1) withdrew most lands to mineral entry during the selection and conveyance process. These withdrawals are still in place. This planning process will assess the continued need for withdrawals, balancing the need for mineral development and production with protection of resource values.

There are no active Federal or State oil and gas leases in the planning area. The State of Alaska issued a 5-year oil and gas exploratory license in October 2000 for 398,000 acres in the Copper River Basin. The licensing program encourages exploration in areas of Alaska where there is higher investment risk and relatively low or unknown hydrocarbon potential. Under this program, the State will convert all or a portion of the license area to standard oil and gas leases if work commitments by the licensee have been met.

In addition, there are known mineral deposits throughout the planning area, particularly along the Denali Fault, which parallels the Alaska Range. If withdrawals are revoked, they will be replaced with site-specific measures for protection of resources.

g) Issue 7: Subsistence/Social and Economic Conditions

Issue Statement: Maintain and protect subsistence opportunities. Determine how the management actions, guidelines, and allowable uses prescribed in response to the other issues will affect both subsistence opportunities and resources and the social and economic environment.

Subsistence opportunities and resources are an important part of rural Alaskan lifestyles. ANILCA requires that rural residents have a priority over other users to take fish and wildlife for subsistence on Federal public lands where a recognized customary and traditional pattern of use exists. When it is necessary to restrict the taking of fish and wildlife on these lands, subsistence uses are given preference over other consumptive uses.

Resource development, increasing recreational activities, increased OHV use, and an increasing number of sport hunters and anglers all have the potential to affect subsistence resources and access to subsistence resources. ANILCA mandates that the BLM consider the effect of proposed management on subsistence resources.

The State of Alaska is seeking title to all lands in the planning area lying within the transportation and utility corridor created by PLO 5150. These lands are not currently allowed for conveyance, but were legally top-filed in accordance with ANILCA section 906(e) by the State. If the BLM's final planning decision recommends making these lands available for conveyance to the State of Alaska, the recommendation would be sent to the Secretary of Interior for approval. If the Secretary approves revocation of PLO 5150, conveyance of the land would end subsistence management by the Federal government in that area, and reduce the area subject to Federal subsistence regulation by 453,514 acres.

4. Issues Beyond the Scope of the Plan

Several concerns were raised during scoping that were either beyond the scope of this planning effort or represented questions about how the BLM would go about the planning process and RMP implementation. The planning process and RMP implementation are described in section (I)(F) *Planning Process* on page 19 of this document. The issues and concerns beyond the scope of the plan are summarized below and will not be analyzed further for the reasons stated.

a) Land Conveyance

Decisions made in the RMP will not speed up or affect the land conveyance process, nor will the RMP affect the legislation recently adopted to speed up the conveyance process. The RMP does not attempt to influence prioritization of selections by either the State or Native entities.

b) Federal Subsistence Program Management

Decisions made in the RMP will not change administration of the Federal Subsistence Program. The program will continue to be conducted through the Regional Advisory Councils and the Federal Subsistence Board, with input from the general public, Alaska Department of Fish and Game (ADF&G), and Federal staff. The RMP will, however, consider impacts and access to subsistence resources and subsistence opportunities from proposed actions associated with the alternatives considered in the EIS.

c) Fishing and Hunting Regulations

The BLM manages wildlife and fisheries habitat; ADF&G manages wildlife and fish populations and issues fishing and hunting regulations. Alaska Board of Game and Board of Fisheries create the regulations. Decisions made in the RMP will not affect fishing or hunting regulations. Any actions that might affect hunting and fishing will be coordinated with the ADF&G consistent with 43 CFR Part 24, the Secretary's Policy on relationship with State fish and wildlife management agencies, and the Master Memorandum of Understanding between the agencies.

d) Wilderness Inventory and Management

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 nearly 40 years ago.

Alaska lands were exhaustively inventoried, reviewed and studied for their wilderness values under the Wilderness Act criteria, beginning in 1971, when Congress enacted the Alaska Native Claims Settlement Act (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 the Alaska National Interest Lands Conservation Act of 1980 (ANILCA). In ANILCA, Congress chose to preserve more than 150 million acres in specially protected conservation units. This acreage represents more than 40 percent of the land area of the State of Alaska, and about 60 percent 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. Alaska has a higher percentage of land in wilderness than any other state.

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. Section 1001 of ANILCA mandated a study of Federal lands north of 68 degrees latitude and east of the western boundary of the National Petroleum Reserve – Alaska. These lands do not occur within this 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 areas, 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 not to 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 twenty years. On January 18, 2001, Secretary Babbitt adopted another approach that deviated from this long-term policy.

Clearly, Congress may direct 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. The current Secretary has instructed 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.”

The State of Alaska has asked BLM to adhere to this directive in its Resource Management Planning, stating “At this time it is clear that there is a lack of broad support for further wilderness proposals.” (State of Alaska 2003). In consideration of all of the above, wilderness inventory was not conducted as part of this planning process and wilderness areas are not considered in any of the alternatives.

e) Lands with Wilderness Characteristics

There are no BLM-managed wilderness areas or wilderness study areas within the planning area. There are areas that possess opportunities for a primitive recreation experience, solitude, and naturalness. These will not be designated or managed as Wilderness areas. In many cases, they will be managed to maintain the current primitive recreation experience. A description of the Recreation Opportunity Spectrum inventory, including primitive opportunities, is discussed in Chapter III in the *Recreation* section. Management prescriptions for recreation are described in Chapter II, and impacts to primitive recreation experiences are described in Chapter IV.

E. Planning Criteria and Legislative Constraints

The **Federal Land Policy Management Act** (FLPMA) is the primary authority for the BLM's management of public lands. This law provides the overarching policy by which public lands will be managed and establishes provisions for land use planning, land acquisition and disposition, administration, range management, land use authorizations, designated management areas, and the repeal of certain laws and statutes. **National Environmental Policy Act** (NEPA) 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 and ANILCA 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 development process. In conjunction with the planning issues, planning criteria assure that the planning process is focused. The criteria also help guide selection of the final RMP and provide a basis for judging the responsiveness of the planning options.

The following planning criteria were developed by the BLM and reviewed by the public as part of the East Alaska RMP scoping process:

- The principles of multiple use and sustained yield as set forth in FLPMA will be applied in the RMP.
- Opportunities for public participation will be encouraged throughout the RMP process.
- The RMP will address all lands within the Glennallen Field Office boundary that are currently administered by the BLM, including State- and Native-selected lands. Management of these lands will be consistent with section 906(k) of ANILCA, and section 22 (i) of ANCSA.
- Management of State-selected lands will be consistent with Alaska Department of Natural Resources (DNR) Area Plans currently in place.
- Valid existing rights will be recognized and protected.
- Subsistence uses and needs will be considered and adverse impacts will be minimized whenever possible in accordance with section 810 of ANILCA.
- The Planning Team will work cooperatively with the State of Alaska, Native corporations, municipal governments, other Federal agencies, interested groups, and individuals.
- The RMP will recognize Federal land management agency obligations under applicable tribal treaties and laws and executive orders relating to Native American reserved rights, religious freedoms, and traditional use areas.
- Wildlife habitat management will be consistent with ADF&G objectives.
- The RMP will use existing data, information, plans, and land use analyses. Some additional fieldwork and assessment will be needed.

- The RMP will be compatible with the river management plans for the Delta and Gulkana rivers completed in 1983.
- The RMP will be consistent with the mandates of FLPMA, NEPA, the Council on Environmental Quality (CEQ), the National Historic Preservation Act, the Wild and Scenic Rivers Act of 1968, and all other Federal laws, regulations, and policies as required. The planning process will include preparation of an EIS in compliance with NEPA guidelines.
- Off-highway vehicle designations for all public lands within the planning area will be completed in accordance with 43 CFR 8342.
- Areas proposed as Areas of Critical Environmental Concern (ACECs) will meet the criteria contained in 43 CFR 1610.7-2.
- Review of waterways as eligible for inclusion in the National Wild and Scenic River System will follow the criteria contained in 43 CFR 8351.
- Actions and activities that are potentially adverse to the existing Trans-Alaska Pipeline energy right-of-way will be avoided.
- Management actions, Required Operating Procedures, or Oil and Gas Leasing Stipulations will be consistent with BLM's Alaska Statewide Land Health Standards (BLM 2004d).

F. Planning Process

An RMP is a master land use plan that guides the management of public lands in a particular area or administrative unit. RMPs are usually prepared to cover the lands administered by a certain field office, in this case the Glennallen Field Office. An approved RMP establishes the following items:

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

Preparation of an RMP involves nine interrelated steps as depicted in Table 2.

Table 2. Steps in the BLM Land Use Planning Process

Step	Description
1: Identification of issues	This step is designed to identify major problems, concerns, or opportunities associated with the management of public land in the planning area. Issues are identified by the public, the BLM, and other governmental entities. The planning process is then focused on resolving the planning issues.
2: Development of planning criteria	Planning criteria are identified to guide development of the RMP and prevent the collection of unnecessary information and data.
3: Collect and compile inventory data	This planning step involves the collation and collection of various kinds of 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 at a broader scale than data required in implementation level planning and analysis.
4: Analysis of the management situation	This step calls for the deliberate assessment of the current situation. It identifies the way lands and activities are currently managed in the planning area, describes conditions and trends across the planning area, identifies problems and concerns resulting from the current management, and identifies opportunities to manage these lands differently.
5: Formulate alternatives	During this step, BLM formulates a reasonable range of alternatives for managing resources in the planning area. Alternatives include a combination of current management (no action) alternative and other alternatives that strive to resolve the major planning issues while emphasizing different management scenarios. Alternatives usually vary by the amounts of resource production or protection that would be allowed, or in the emphasis of one program area over another.
6: Estimation of effects	This step involves estimating 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: Selection of preferred alternative	Based on the information resulting from the estimation of effects, the BLM identifies a Preferred Alternative. The Draft RMP/EIS is then prepared for printing and distributed for public review.
8: Selection of RMP	Following review and analysis of public comments on the Draft RMP/EIS, BLM makes adjustments as warranted and selects a proposed RMP. The Proposed RMP and a final EIS is then published. A final decision is made after a 60-day Governor's Consistency Review and a 30-day public protest period are completed. BLM then publishes the Record of Decision (ROD) and prepares the Approved Resource Management Plan.
9: Monitoring and evaluation	This step involves the collection and analysis of resource condition and trend data to determine the effectiveness of the plan in resolving the identified issues and achieving desired results. 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.

1. Relationship Between the RMP and EIS

This document actually contains two documents: A **Proposed** RMP (Alternative D) and a **Final** EIS. As part of the EIS, the RMP is not a stand-alone document; rather, it consists of the text, data, and maps found in Chapter II. Chapter II describes four alternatives for the RMP and explains the differences between these alternatives as they relate to the seven issues. Each of the four alternatives represents a different RMP that would address the issues in different ways, though some decisions may be common to more than one alternative. Chapter II is also a required component of an EIS, written to compare and analyze the effects of implementation of each of the alternatives.

After public comments on the Draft EIS **were** analyzed, this Final EIS **was** prepared. The Final EIS **is** very similar in content to the Draft EIS but includes responses to all public comments. Any errors or corrections identified through the comment process or through internal review are addressed in the Final EIS through modifications to the proposed plan or alternatives, development and evaluation of alternatives not previously considered, corrections to the document, and/or improved, supplemented, or modified analyses.

No earlier than 30 days after the Proposed RMP/Final EIS document is issued, a Record of Decision (ROD)/Approved RMP will be approved and published in a single document. The approved RMP may be different from the proposed RMP identified in the Final EIS if the deciding official elects to combine elements of multiple alternatives into the final RMP. The RMP will describe the goals, objectives, and actions for fulfilling the direction and vision developed throughout the planning process. The ROD/Approved RMP will function as a stand-alone document to guide future land management decisions.

2. Implementation of the RMP

Resource Management Plans provide broad, general direction for management of BLM-managed lands. After an RMP is approved, many of the decisions made in the RMP become effective immediately. Other decisions will only be effective after additional action. For example, a decision to withdraw lands from mineral entry would not be effective until after formal action at the Secretarial level.

Before specific projects can be implemented on the ground, an implementation plan must be completed, and all implementation plans must tier to and be in compliance with the affected area's RMP. All implementation-level planning will be tiered to the management framework established in the RMP. For example, the RMP will describe

what areas will be available for land disposal. The implementation level plan would describe under what conditions the lands would be made available and other conditions necessary to facilitate land disposal (appraisal, fair market value determination, access, etc.).

3. Relationship of the RMP to BLM Policies, Plans, and Programs

A number of plans have been developed by the BLM that relate to or otherwise govern management in the planning area. These major plans and other major management guidance are listed below and provide a perspective of the many management considerations pertinent to the planning area.

- Southcentral Management Framework Plan, as amended (BLM 1980a).
- River Management Plan for the Delta National Wild and Scenic River (BLM 1983a).
- River Management Plan for the Gulkana National Wild River (BLM 1983b).
- BLM-Alaska Land Use Amendment for Wildland Fire and Fuels Management (BLM 2004c).
- Trans-Alaska Pipeline Right-of-Way Renewal EIS (BLM and JPO 2002).
- BLM's Alaska Statewide Land Health Standards (BLM 2004d).

4. Collaboration

Collaboration is often described as interaction with a wide range of external and internal working relationships. A variety of strategies have been implemented throughout the planning process to foster a collaborative approach, improve communication and develop understanding of the issues and the process in development of the RMP/EIS. Some of these strategies are widely accepted outreach tools; others have been implemented based on suggestions made by the public as to how they wanted to collaborate with BLM in development of the plan.

a) Public Participation

A Notice of Intent for the East Alaska RMP was published in the Federal Register on March 18, 2003. Public scoping began in mid-February, 2003 and extended to mid-June, 2003. A total of 30 public meetings were held, mostly within the Copper River Basin. The meetings were widespread and focused on scattered small communities and villages within the planning area. Meetings were also held at the larger towns/cities

of Fairbanks, Anchorage, Valdez, and Cordova. At communities within the Copper River Basin, two meetings were held, the first to identify issues and concerns and the second to discuss how (or if) those issues and concerns would be addressed within the RMP.

Concurrent with the meetings, an East Alaska RMP website was developed. The website contained a public meeting schedule and a detailed explanation of the RMP process. As the first round of meetings was completed, meeting notes and a summary of the issues/concerns/questions raised were listed on the website. The second meeting notes were also posted, as was the Scoping Report.

In addition to the initial round of public scoping, another series of public meetings was held to review draft alternatives. These were held in 17 different locations, and more than 500 draft alternative packets were distributed. No preferred alternative was identified. These draft alternatives were also posted on the website and comments taken electronically. The public was also able to review and comment on the Draft RMP/EIS.

The publishing of a Notice of Availability for the East Alaska Draft RMP/EIS by the Environmental Protection Agency on April 29, 2005 marked the beginning of a 90 day public comment period (Federal Register 2005.) During that 90 days, the BLM held 7 public meetings to answer questions, present the information within the Draft, and hear public testimony.

Alternative B of the Draft RMP/EIS proposed the revocation of Public Land Order 5150 which makes up the transportation and utility corridor that houses the Trans-Alaska Pipeline System. This action, as identified by the ANICLA section 810 Analysis, would significantly restrict subsistence uses and therefore required that subsistence hearings be held in the area affected by the proposed action. Seven subsistence hearings were held as well as a special session of the Southcentral Federal Regional Subsistence Advisory Council to allow the council to hear testimony on the revocation of PLO 5150 and submit a formal comment.

b) Cooperating Agencies/Invitees

Just after publication of the Notice of Intent, a cooperator's letter was sent out to agencies and Native Corporations within the area. The letter explained the RMP process, stressed the need for consultation and cooperation, and invited participation. Letters were sent out to the following agencies and Native Corporations:

- State of Alaska
- USDA Forest Service, Chugach National Forest
- USDA Natural Resource Conservation Service, Alaska State Office
- National Park Service, Wrangell-St. Elias National Park and Preserve and Denali National Park and Preserve

- Ahtna Native Corporation
- Chugach Alaska Corporation
- Copper Valley Economic Development Council

In addition, a letter was sent from the BLM State office in May of 2002, inviting the State of Alaska to participate in the process as a cooperator. A joint BLM-State position has been created, with that person acting as liaison between State of Alaska and BLM in this planning process. This has been effective in facilitating information exchange and review of draft materials by State personnel.

c) Collaboration with Native Corporations and Village Governments

In addition to the public meetings described above, scoping meetings were held with Ahtna Native Corporation, Chitina Native Corporation, and with each Village Council in the area. The purpose was to develop issues and concerns for management of BLM lands in the area. These meetings have resulted in the development of three different Memoranda of Understanding with different village governments: Cheesh-Na, Chitina, and Tazlina. These MOU will facilitate coordination with the villages throughout the planning process and open the door to increased coordination/consultation after the process is done. In addition, BLM has a contract with a cultural anthropologist to work the village councils and elders to identify cultural, traditional, and subsistence sites or areas important for maintenance or protection.

G. Related Plans

Plans formulated by Federal, State, local and tribal governments that relate to management of lands and resources 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 Federal, State, local and tribal governments to the extent those plans are consistent with Federal laws and regulations applicable to public lands.

Management of Federal and State lands immediately adjacent to public land administered by the BLM will be considered to the extent possible in the formulation of alternative management scenarios and land use allocations. The main planning documents of other Federal, State, local, and tribal governments to be considered in development of the RMP are listed below:

- Chugach National Forest Land and Resource Management Plan (Forest Plan) (FS 2003)

- Wrangell-St. Elias National Park and Preserve General Management Plan (NPS 1986)
- Susitna Area Plan (ADNR and ADF&G 1985)
- Copper River Basin Area Plan (ADNR and ADF&G 1986)
- Prince William Sound Area Plan (ADNR and ADF&G 1988)
- Yakataga Area Plan (ADNR 1995)
- Denali to Wrangell St. Elias, Assessment and Management of Scenic Resources along the Highways between Denali and Wrangell-St. Elias National Parks (ADNR 1982)
- Copper Valley Regional Plan Comprehensive Economic Development Strategy (Copper Valley Development Council 2003)

Map 1. EARMP Planning Area Land Managers

File size: 187 KB

File name: 01_mang.pdf

Map size: 11x17

Map 2. EARMP Planning Area General Land Status

File size: 189 KB

File name: 02_Is.pdf

Map size: 11x17



Chapter II: Alternatives

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A.	How to Read This Chapter.....	35
B.	General Description of the Alternatives.....	36
1.	Alternative A: No Action.....	36
2.	Alternative B: Resource Development.....	36
3.	Alternative C: Resource Conservation.....	37
4.	Alternative D: BLM Proposed RMP	37
5.	Alternatives Analyzed but Not Considered in Detail.....	37
a)	Eureka Special Recreation Management Area	37
b)	Stuart Creek Non-motorized Area.....	38
c)	Clearwater Mountains Non-motorized Area	38
d)	Transfer of BLM-managed Lands in the Bering Glacier Area to the National Park Service.....	38
e)	Denali Highway Area of Critical Environmental Concern	39
f)	Copper River Watershed Area of Critical Environmental Concern	39
C.	Alternative Descriptions Related to Issues	39
1.	Issue 1: Travel Management	40
a)	Goals	40
b)	Management Common to All Action Alternatives	40
c)	Alternative A.....	43
d)	Alternative B.....	43
e)	Alternative C	44
f)	Alternative D – Proposed RMP	49
2.	Issue 2: Recreation.....	65
a)	Goals	65
b)	Management Common to All Action Alternatives	65
c)	Alternative A.....	66
d)	Alternative B.....	67
e)	Alternative C	68
f)	Alternative D - Proposed RMP	70
3.	Issue 3: Natural and Cultural Resources	82
a)	Goals	82
b)	Management Common to All Alternatives.....	82
c)	Alternative A.....	86
d)	Alternative B.....	87
e)	Alternative C	90
f)	Alternative D – Proposed RMP	94
4.	Issue 4: Lands and Realty	113
a)	Goals	113
b)	Management Common to All Action Alternatives	113
c)	Alternative A.....	117
d)	Alternative B.....	117
e)	Alternative C	119
f)	Alternative D – Proposed RMP	121
5.	Issue 5: Vegetation Management.....	127
a)	Goals	128

b)	Management Common to All Alternatives	128
c)	Alternative A.....	130
d)	Alternative B.....	130
e)	Alternative C	131
f)	Alternative D – Proposed RMP	131
6.	Issue 6: Leasable and Locatable Minerals	137
a)	Goals	137
b)	Management Common to All Alternatives.....	137
c)	Alternative A.....	140
d)	Alternative B.....	141
e)	Alternative C	142
f)	Alternative D – Proposed RMP	143
7.	Issue 7: Subsistence/Social and Economic Conditions	166
a)	Goals	166
b)	Management Guidance Common to All Alternatives.....	166
c)	Alternative A.....	167
d)	Alternative B.....	167
e)	Alternative C	167
f)	Alternative D – Proposed RMP	168
D.	Effects Comparison by Issue and Alternative	171

CHAPTER II: ALTERNATIVES

A. How to Read This Chapter

This chapter presents the management alternatives that are considered and analyzed in this Environmental Impact Statement. Section B provides a brief summary of the basic “theme” of each alternative. Section B also provides a description of alternatives that were considered but not analyzed in detail.

Section C provides the detailed description of alternatives. Consistent with the rest of the document, this section is organized by Issue. For each major Issue, the alternative description provides the following:

- Goals
- Management Common to All Action Alternatives: These are management actions that would happen under any alternative. Sub-headings under this topic will vary by Issue, but may include Inventory and Monitoring, Land Use Requirements, or Implementation-level Planning.
- Detailed description of the alternative.
- Comparison table for each Issue.

In addition, as required by NEPA, there is an alternative effects comparison table for all alternatives presented in Table 13.

Some alternative descriptions in this chapter (particularly for Travel Management) include a description of “Implementation-level Considerations”. As described in Chapter I, Resource Management Plans (RMPs) provide broad, general direction for management of BLM-managed lands. After the RMP is approved, RMP decisions become effective immediately. Implementation-level decisions will only be effective after additional action. Before specific implementation-level projects can be implemented on the ground, an implementation plan must be completed, and all implementation plans must tier to and be in compliance with the RMP. Implementation-level considerations are described in this chapter for Travel Management to show the BLM’s intent for travel management in a given area. However, these considerations are subject to change based on public review and comment during subsequent implementation planning.

B. General Description of the Alternatives

1. *Alternative A: No Action*

Alternative A, the No Action Alternative, would continue present management practices and present levels of resource use based on the existing Southcentral Management Framework Plan (MFP) (BLM 1980a) and other management decision documents. Valid decisions contained in the Southcentral MFP would be implemented if not already completed. Direction contained in existing laws, regulation and policy would also continue to be implemented, sometimes superseding provisions in the Southcentral MFP. The current levels, methods and mix of multiple use management of public land in the planning area would continue, and resource values would receive attention at present levels. In general, most activities would be analyzed on a case-by-case basis and few uses would be limited or excluded as long as they were consistent with State and Federal laws.

2. *Alternative B: Resource Development*

Alternative B lays the groundwork for active management to facilitate resource development. In this alternative, constraints to protect resource values or habitat would be implemented in very specific geographic areas rather than across the planning area or in special designations. With the exception of the Delta and Gulkana Wild and Scenic River corridors, all ANCSA (d)(1) withdrawals would be revoked on lands retained in long-term Federal ownership. This would allow increased potential for mineral exploration and development. Revocation of PLO 5150, which established the transportation and utility corridor within which the Trans-Alaska Pipeline is located, would be recommended to the Secretary of the Interior. This revocation would allow for conveyance of this corridor to the State of Alaska. This alternative includes the highest level of forest and woodland treatments. Travel and trail restrictions would be minimized. Recreation management would focus on development of facilities to handle increasing uses. Management of State- and Native-selected lands is mostly custodial.

3. Alternative C: Resource Conservation

Alternative C emphasizes active measures to protect and enhance resource values. Production of minerals and services would be more constrained than in Alternatives B or D and in some cases and some areas, uses would be excluded to protect sensitive resources. Areas of Critical Environmental Concern (ACEC), Special Recreation Management Areas (SRMA), and a Research Natural Area (RNA) are identified, and specific measures proposed to protect or enhance values within these areas. Limited and closed areas are proposed for Off Highway Vehicles to protect habitat, soil and vegetation resources, or recreation experiences. Some ANCSA (d)(1) withdrawals are revoked but others are maintained in order to protect or maintain resource values. This alternative treats lands selected by the State and by Native Corporations or Villages as if it were to be retained in long-term Federal ownership.

4. Alternative D: BLM Proposed RMP

Alternative D is the BLM's Preferred Alternative and represents the Proposed Resource Management Plan. It emphasizes a moderate level of protection, use, and enhancement of resources and services. Constraints to protect resources would be implemented, but would be less restrictive than under Alternative C. This alternative would designate one RNA and four SRMAs, and measures to protect certain resource values would be applied to other geographical areas emphasized under Alternative C. This alternative would revoke many ANCSA (d)(1) withdrawals but would retain some of these withdrawals in areas where strong resource protection is needed. This alternative retains most of PLO 5150, except for 83,000 acres north of Paxson. This alternative describes interim and long-term management strategies for lands selected by the State, or Native Corporations or Villages.

Alternative D represents the mix and variety of actions that the BLM believes best resolves the issues and management concerns in consideration of all values and programs, and is thus considered the BLM's Preferred Alternative and Proposed RMP.

5. Alternatives Analyzed but Not Considered in Detail

a) Eureka Special Recreation Management Area

This area consisting of four townships of dual, State and Native, selected lands around Eureka was considered as an SRMA in a preliminary packet of draft alternatives put

together by the Glennallen Field Office during this planning process. This area was dropped from consideration as an SRMA for the following reasons:

- It is a relatively small area. Trail networks that start in this area continue onto State lands. A designated trail system on BLM-managed lands would be discontinuous with surrounding State lands, making administration very difficult.
- The State has indicated that this area is a high priority for conveyance if it is not conveyed to the Native Corporation. The BLM is reluctant to invest money in intensive trail management or facilities if there is a high probability of the area being conveyed.

b) Stuart Creek Non-motorized Area

The area west of the Richardson Highway in the headwaters of the Tonsina River and Stuart Creek area was proposed by the public for consideration as an area closed to motorized vehicles. Alternative C considers designation of 281,000 acres as closed to OHVs; however, this area was not included in that consideration for the following reasons:

- Existing uses, including Special Recreation Permits and established motorized trails, would make it difficult to administer this area as a non-motorized area.
- The area is predominantly State-selected and portions are shown by the State as being of high priority for conveyance.

c) Clearwater Mountains Non-motorized Area

The area of the Clearwater Mountains north of the Denali Highway and east of the Susitna River was also proposed by the public for consideration as an area closed to motorized vehicles. The preliminary alternative packet produced by the BLM showed this area as proposed for seasonal or yearlong closure to OHVs under Alternatives C and D. However, this area, which was State-selected, has since been conveyed to the State.

d) Transfer of BLM-managed Lands in the Bering Glacier Area to the National Park Service

This proposal to transfer lands in the Bering Glacier area to Wrangell-St. Elias National Park and Preserve was submitted by an organization. This Proposed RMP/Final EIS considers alternatives that provide a full range of protection for the natural and cultural resource values found in the Bering Glacier area. Additionally, this proposal is inconsistent with the planning criteria described in Chapter I.

e) Denali Highway Area of Critical Environmental Concern

This proposal was submitted by two different organizations. While this area meets the criteria for designation of an ACEC set forth in 43 CFR 1610.7, the BLM believed that it was better suited for consideration as a SRMA. This decision was based on the high level of recreation use that occurs in the area. Alternatives considered in this Proposed RMP/Final EIS consider a full range of protection for the area, including closure to mineral entry (considered under Alternative C).

f) Copper River Watershed Area of Critical Environmental Concern

A Copper River Watershed ACEC was brought up through scoping, but was eliminated from detailed analysis for the following reasons:

- BLM currently manages only 15 percent of the lands within the watershed, 50 percent of which are selected lands that will probably not be retained under Federal management.
- Strong protective measures will be continued along the Gulkana River, BLM's largest piece of unencumbered land in the watershed, through the proposed SRMA designation and continued management as a Wild and Scenic River.
- Protective measures will be put into place through measures identified for the West Fork Area and the Tiekkel SRMA.
- Application of ROPs and Stips for permitted activities apply strong protective measures for anadromous streams.

C. Alternative Descriptions Related to Issues

The following narrative provides a detailed description of proposed management that responds to each of the issues identified in Chapter I. Goals are listed under each issue. These are followed by a description of objectives, management actions, and allocations proposed to achieve the goals and to address the issue. Goals are constant across alternatives. Objectives, management actions, and allocations may change. Management that is common across the alternatives is presented first, followed by descriptions of management by alternative.

1. Issue 1: Travel Management

Issue Statement: Manage access, roads, and use of OHVs for various purposes, including recreation, commercial uses, subsistence activities, and general enjoyment of public lands, while protecting natural and cultural resources.

a) Goals

- Manage trails to provide access to public lands, recreation, and subsistence opportunities.
- Manage trails to provide a diversity of recreation experiences and opportunities, including motorized and non-motorized.
- Manage trails to minimize resource impacts and reduce user conflicts.
- Manage trails with an emphasis on education where appropriate.
- Manage OHV use associated with permitted and development activities to provide for access while protecting resources.

b) Management Common to All Action Alternatives

(1) Inventory and Monitoring

These monitoring/assessment projects would be common to all action alternatives (Alternatives B, C, and D):

- Trail inventory and assessment work would continue, with an emphasis on BLM public lands (unencumbered) designated as “limited” to OHVs. Inventory and assessment would be necessary in these areas to identify all existing trails and assess trail density and resource impacts. This information would be used in implementation-level designation of specific trails. Inventory and assessment information would also be used to prioritize trail maintenance needs.
- Through contract and survey, characterize trail users, their perception of resource impacts associated with trails (summer and winter), their tolerances of such impacts, user displacement, and tolerance of trail management actions (such as designations, hardening, etc.). Use this information in site-specific implementation decisions regarding identification, construction, or closure of trails. Priority for this work would be Delta Wild and Scenic River, followed by proposed Bering Glacier RNA, followed by any proposed SRMAs.

(2) Implementation-level Planning

Each area designated as “limited” or “closed” to OHVs would have an implementation-level plan completed. This plan would show a complete inventory of trails in the area, describe specific resource concerns or conflicts, and describe specific designated trails and conditions of limitations (seasonal, weight, or vehicle class, etc). These planning processes would include public, State, and Native coordination. These plans would describe tools necessary for implementation (method of signing specific trails, trailhead development, education/interpretation, map production, and law enforcement). These plans would identify and prioritize specific maintenance needs, as well as opportunities for trail development or loops, both motorized and non-motorized. Priority for implementation-level planning would be BLM public lands (unencumbered). Implementation-level planning for these lands would occur within five years of the signing of the Record of Decision for this RMP. Implementation-level considerations are included in the following description of alternatives for Travel Management in order to provide the public with an indication of the BLM’s management intent for each area. These considerations are subject to change based on public involvement and comment during implementation planning.

(3) Land Use Requirements

Permitted activities and uses that involve OHV use would contain stipulations stating that OHV use would be consistent with management in limited and closed areas. If necessary, permitted cross-country travel would be stipulated in a manner that minimizes impacts (i.e., winter use or low ground pressure tires). Specific operating procedures related to OHVs can be found in *Required Operating Procedures* in Appendix C.

(4) Access

The BLM will continue to review and reserve ANCSA section 17(b) easements under the law and regulations to ensure legal access to publicly owned lands as the remainder of the ANCSA corporation’s land entitlements are conveyed. Realignment of reserved 17(b) easements will be considered on a case-by-case basis to resolve on-the-ground issues.

BLM is committed to working with the land owner, state and other federal agencies and subject to availability of funds, personnel and approval, BLM will locate, mark and monitor easements and help educate easement users to understand the rights reserved to the U.S. and the rights of the private land owner with priority based on:

- Easements accessing lands that are permanently managed by the BLM or are important to BLM programs,
- Easements receiving high use,
- Easements required to implement an activity or implementation plan,
- Easements where land owners support the activity allowed by the easement, and

- Easements where maintenance or education would mitigate environmental damage to the easement or BLM-managed lands.

These criteria would be used to prioritize other discretionary actions such as maintenance on 17(b) easements. An implementation level plan for the management of 17(b) easements will be developed cooperatively with Ahtna Inc. to clearly outline management goals and actions associated with 17(b) easements.

The U.S. has a non-possessory interest in a reserved 17(b) easement, which is the right to use the land for a specified purpose. This does not allow BLM to take civil or criminal action against uses, such as wandering from the easement, camping more than 24 hours or fishing from the easement, when the uses do not interfere with the reserved uses of the easement.

A more detailed explanation of ANCSA section 17(b) easements is found in Chapter III on page 187.

To date, the State of Alaska has determined that approximately 650 R.S. 2477 routes throughout the State satisfy the requirements of R.S. 2477; the State continues to research additional routes. The assertion of these routes has not been recognized and current BLM policy is to defer any processing of R.S. 2477 assertions except where there is a demonstrated and compelling need to make a determination. Land use planning decisions do not affect valid R.S. 2477 rights or future assertions; however, if a route should be recognized, the BLM would consider it as a designated or existing trail where it crosses BLM-managed lands.

A more detailed explanation of R.S. 2477 routes is found in Chapter III on page 187.

All proposals for OHV management considered below 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.” The following would be employed in implementation-level planning to ensure consistency with section 811:

- Distinction (by area) between recreational and subsistence uses.
- Allowances in areas “limited” to OHVs for subsistence use, which may include
 - Travel off existing or designated trails for game retrieval,
 - Use of classes of vehicles otherwise restricted for recreational use, and
 - Lifting of seasonal restrictions during subsistence hunting seasons.

Applicable exceptions would be considered in implementation-level planning based on traditional use of a given area, use of the area for subsistence activities, and other management objectives for the area.

Decisions made within this RMP and in implementation-level planning will be consistent with Title XI of ANILCA, which addresses access into Conservation System Units, in this

case the Delta and Gulkana Wild and Scenic River corridors. The BLM, under any alternative, would consider application for Transportation and Utility System right-of-ways across the Wild and Scenic River corridors. Applications would be subject to NEPA analysis and Section 7 (WSRA) analysis. Analysis would need to consider impacts to the outstandingly remarkable values and the free-flowing nature of the rivers and would need to consider feasible alternative routes. Title XI also allows for access to inholdings and recognizes valid existing rights.

c) Alternative A

(1) OHV Management and Trails

Currently, the Tangle Lakes Archaeological District (TLAD) area is designated as “limited” to OHV use. OHVs must stay on designation roads and trails from May 15 to October 16 (Federal Register 1980). The Delta and Gulkana Wild and Scenic River corridors also carry a “limited” designation with OHVs having to stay on existing trails, according to 1983 river management plans (BLM 1983a; BLM 1983b). All other areas are “open.” There are no restrictions on snowmachines once there is adequate snow cover.

(2) Roads

Proposals for new road construction are considered in applications for Rights-of-Way on a case-by-case basis. The Delta and Gulkana Wild and Scenic River corridors are avoidance areas for new road construction.

d) Alternative B

(1) OHV Management and Trails

Same as under Alternative A.

(2) Roads

Proposals for new road construction would be considered in applications for Rights-of-Way on a case-by-case basis. There would be no avoidance areas, but guidelines and stipulations described in the *Required Operating Procedures*, Appendix C would be followed.

e) **Alternative C**

Roads and trails would be managed as follows for each of the travel management areas described below. Map 3 on page 61 shows the location of each travel management area, and all summer trails currently GPSed. Other (i.e., uninventoried) trails may exist in the area.

On State- and Native-selected lands, the following criteria would apply for OHVs, consistent with 11 AAC 96.025 and “Generally Allowed Uses on State Land” (ADNR 2004):

- Highway vehicles with a curb weight less than 10,000 pounds and off-road or all-terrain vehicles with a curb weight of less than 1,500 pounds will utilize existing trails, whenever possible.
- If necessary (game retrieval, etc.), travel off existing trails will be conducted in a manner that minimizes: a) disturbance of vegetation, soil stability, or drainage systems; b) changing the character of, polluting, or introducing silt and sediment into streams, lakes, ponds, water holes, seeps, and marshes; and c) disturbance of fish and wildlife resources.
- Interim management will emphasize education but citations could be issued if deliberate violations of these conditions result in significant resource damage.

(1) West Fork Area

Includes 490,000 acres, predominantly State-selected.

(a) RMP Decision

Area would be designated as “limited” to OHVs. No new road construction would be permitted in this area.

(b) Implementation-level Considerations

OHVs would be restricted to designated trails from May 1 to August 31. Designated trails would avoid primary trumpeter swan breeding and nesting habitat and wetlands. Outside of these seasonal dates, OHVs would be required to utilize existing trails, whenever possible, consistent with the description provided above under *Alternative C* on page 44. Designated trails for snowmachines may be considered in the future if research shows definitive impacts to quality of moose winter range or significant impacts to predator/prey relationships with increased use.

(2) Delta Bison Calving Area

Includes 19,000 acres, all BLM public lands (unencumbered).

(a) RMP Decision

Area would be designated as “limited” to OHVs. Road construction permitted for resource development but subject to seasonal restrictions from May 1 to June 30.

(b) Implementation-level Considerations

OHVs would be restricted to designated trails from April 15 to October 15. Designated trails would avoid calving areas. There would be no snowmachine restrictions.

(3) Nelchina Caribou Calving Area

Includes 389,000 acres, predominantly State-selected.

(a) RMP Decision

Area would be designated as “limited” to OHVs. No new road construction would be allowed.

(b) Implementation-level Considerations

OHVs would be restricted to designated trails from May 1 to June 15. Designated trails would avoid caribou calving areas. Outside of the indicated season, OHVs would be required to utilize existing trails, whenever possible, consistent with description provided above under (II)(B)(1)(e). There would be no snowmachine restrictions.

(4) Delta WSR Corridor Area

Includes 44,000 acres, all unencumbered BLM land.

(a) RMP Decision

Area would be designated as “limited” to OHVs. BLM’s management intent under Alternative C, consistent with protection and enhancement of outstandingly remarkable values on the river, is to permit no new road construction. However, BLM will comply with Title XI of ANILCA, as discussed on page 42.

(b) Implementation-level Consideration

OHVs would be limited to designated trails. Designated trails would be located to minimize resource damage, maintain primitive and semi-primitive recreation experience, and facilitate maintenance of designated trails. Some trails would be designated as non-motorized and a non-motorized trail system out of Tangle Lakes campground would be developed. Snowmachines would be limited to designated trails within the Wild and Scenic River corridor.

(5) Delta Range Area (including Delta Mountain Sub-unit)

Includes 359,000 acres, mostly BLM public lands (unencumbered) but some State-selected land.

(a) RMP Decision

This area would be designated as “limited” to OHVs. The Delta Mountain Sub-unit (labeled A on Map 3) would be closed year-round to motorized use, other than permitted uses associated with resource development. Snowmachine use outside the defined sub-unit would be unrestricted. New road construction would only be permitted to support the transportation and utility corridor.

(b) Implementation-level Considerations

OHV use would be limited to designated trails, which would be located to minimize resource damage; maintain primitive, semi-primitive, and roaded natural recreation experiences; and facilitate maintenance of designated trails. Non-motorized hiking trails may be considered off the Richardson Highway or in the Jarvis Creek area.

(6) Denali Highway Area

Includes 374,000 acres, most of which are State-selected.

(a) RMP Decision

This area would be designated as “limited” to OHVs. No new road construction would be permitted.

(b) Implementation-level Considerations

OHVs would be limited to designated trails. Designated trails would be located to minimize resource damage, minimize impacts to the viewshed, and maintain a diversity of recreational experiences. Some trails would be designated as non-motorized, with non-motorized trail loops developed out of campgrounds, waysides, or interpretive sites. Some vehicle class restrictions would apply. There would be

no immediate snowmachine restrictions, but designated trails for snowmachines may be considered in the future if winter trail density and encounters are exceeding user tolerances.

(7) Gulkana WSR Corridor Area

Includes 105,000 acres, most of which are unencumbered BLM lands.

(a) RMP Decisions

This area would be designated as “limited” to OHVs. BLM’s management intent under this alternative, consistent with management under a wild classification, is no new road construction. However, BLM will comply with Title XI of ANILCA, as discussed on page 42.

(b) Implementation-level Considerations

OHVs would be limited to the following designated trails: Swede Lake, Hungry Hollow, Middle Fork, and Haggard Creek. Haggard Creek trail would be closed to motorized use from April 15 to August 15. Within the Wild and Scenic River corridor, there would be a 1,500 pound GVW limit on vehicles used for recreational purposes. Snowmachines would be limited to designated trails within the Gulkana Wild and Scenic River corridor.

(8) Tiekel Area (including Tonsina Sub-units)

This area includes 848,000 acres, most of which are State-selected lands.

(a) RMP Decisions

This area would be designated as “limited” to OHVs. The northern portion of the Tonsina sub-unit (labeled B on Map 3) would be closed to motorized vehicles from April 15 to October 15. The southern portion of the Tonsina sub-unit (labeled C on Map 3) would be closed year-round to all motor vehicles, including helicopter-supported recreational activities. Snowmachines would not be permitted in the southern portion of the Tonsina sub-unit. No new road construction outside the transportation and utility corridor would be allowed.

(b) Implementation-level Considerations

OHVs would be limited to designated trails. Trails would be designated to minimize resource damage, to maintain semi-primitive and primitive recreation experiences, and to minimize impacts to the viewshed. Some specific trails would be designated as non-motorized. Construction of both non-motorized and motorized loops would be considered. Some vehicle class restrictions would apply on specific trails. Snowmachines would not be permitted on some specific non-motorized trails.

(9) Bering Glacier Area

This area includes 940,000 acres, most of which are BLM public lands (unencumbered).

(a) RMP Decisions

This area would be designated as “limited” to OHVs. No new road construction would be allowed.

(b) Implementation-level Considerations

OHVs would be limited to designated trails. Trails would be designated to avoid nunataks, sensitive waterfowl areas, and to prevent unmanaged proliferation of trails. There would be no snowmachine restrictions.

(10) Tangle Lakes Archaeological District (TLAD) Area

This area includes 196,000 acres, most of which is State-selected.

(a) RMP Decisions

Management of this area would continue as presently managed. OHVs must stay on designated trails (Swede Lake Trail, South Landmark Gap Trail, Osar Lake Trail, Dickey Lake Trail, and Alphabet Hills Trail) from May 15 to October 16. Trails would be designated to avoid cultural resources in the area and to prevent unmanaged proliferation of trails. Consideration would be given to class restrictions on specific trails (such as weight limits). No new road construction would be allowed.

(11) Chistochina-Cantwell Area

This area consists of Native-selected and dual-selected lands in the Chistochina planning region and in the Cantwell area. The area consists of 683,000 acres.

(a) RMP Decisions

This area would be designated as “limited” to OHVs. Road construction would be considered on a case-by-case basis, consistent with section 906(k) of ANILCA.

(b) Implementation-level Considerations

OHVs within this area would be limited to designated trails. Trails would be designated to protect traditional and culturally significant sites and areas associated with ANCSA 14(h) Native selections. A secondary goal of trail designation would be to limit unmanaged proliferation of trails and their associated impacts. Vehicle class restrictions such as weight limitations would be considered on specific trails,

consistent with existing 17(b) easement weight limitations. Some trails may be maintained as non-motorized.

(12) Other State- and Native-selected Lands

(a) RMP Decisions

Within these areas (2,470,000 acres), OHV use would be “limited,” consistent with the description provided above under *Alternative C* on page 44. Road construction would be permitted on a case-by-case basis, utilizing measures described in *Appendix C: Required Operating Procedures*.

(13) Other Unencumbered BLM Lands

(a) RMP Decisions

These areas (139,000 acres) would be designated as “limited” to OHVs.

(b) Implementation-level Considerations

OHVs would be limited to designated trails. In the Slana settlement area, trails and roads necessary to access homesites would be designated.

f) Alternative D – Proposed RMP

Roads and trails would be managed as follows for each of the travel management areas described below. Map 4 on page 63 shows the location of each travel management area, and all summer trails currently GPSed. Other (i.e., uninventoried) trails may exist in the area.

On State- and Native-selected lands, the following criteria would apply for OHVs, consistent with 11 AAC 96.025 and “Generally Allowed Uses on State Land” (ADNR 2004):

- Highway vehicles with a curb weight less than 10,000 pounds and off-road or all-terrain vehicles with a curb weight of less than 1,500 pounds will utilize existing trails, whenever possible.
- If necessary (game retrieval, etc.), travel off existing trails will be conducted in a manner that minimizes: a) disturbance of vegetation, soil stability, or drainage systems; b) changing the character of, polluting, or introducing silt and sediment into streams, lakes, ponds, water holes, seeps, and marshes; and c) disturbance of fish and wildlife resources.
- Interim management will emphasize education but citations could be issued if deliberate violations of these conditions result in significant resource damage.

(1) West Fork Area

This area includes 490,000 acres, predominantly State-selected, the same as under Alternative C.

(a) RMP Decisions

OHVs would be “limited” to existing trails, consistent with description provided above under *Alternative D* on page 49. The need for limitations is based on protection of wetlands and trumpeter swan breeding and nesting habitat and management of OHV trails to prevent unmanaged proliferation. This area consists of predominantly State-selected lands. BLM interim management of trails in the area would consist of inventory of trails in the area, definition of “existing” trails through mapping, and education regarding staying on existing trails. Under interim management there would be no snowmachine restrictions. Road construction would be considered if necessary for resource development, consistent with the measures described in *Appendix C: Required Operating Procedures and Oil and Gas Leasing Stipulations*.

(b) Implementation-level Considerations

If any lands in the area are retained in long-term Federal ownership, trails would be designated, with designation goals as described under Alternative C for this area on page 44. Long-term, designated trails for snowmachines may be considered in the future if research shows definitive impacts to quality of moose winter range or significant impacts to predator/prey relationships with increased use.

(2) Delta Bison Calving Area

This area includes 19,000 acres, all of which are BLM public lands (unencumbered), the same as under Alternative C.

(a) RMP Decisions

This area would be designated as “limited” to OHVs in order to minimize potential OHV impacts to bison calving habitat or calving bison. Road construction would be permitted for resource development, subject to seasonal restrictions from May 1 to June 15.

(b) Implementation-level Considerations

OHVs would be restricted to designated trails. Designated trails would avoid calving areas. There would be no snowmachine restrictions. Road construction would be permitted for resource development, subject to seasonal restrictions from May 1 to June 15.

(3) Nelchina Caribou Calving Area

This area includes 389,000 acres that are predominantly State-selected, the same as under Alternative C.

(a) RMP Decisions

OHVs would be “limited” to existing trails, consistent with description provided above under *Alternative D* on page 49. While the area currently has few trails, future OHV trail management is necessary in this area to prevent potential unmanaged proliferation of trails that might adversely impact caribou calving habitat or disturb calving caribou. This area consists of predominantly State-selected lands. BLM interim management of trails in the area would consist of inventory of trails in the area, definition of “existing” trails through mapping, and education regarding staying on existing trails. There would be no snowmachine restrictions. Road construction would be permitted for resource development, subject to seasonal restrictions from May 1 to June 15.

(b) Implementation-level Considerations

If any lands in the area are retained in long-term Federal ownership, trails would be designated, with designation goals as described under Alternative C for this area.

(4) Delta WSR Corridor Area

This area contains 44,000 acres, all of which are unencumbered BLM lands, the same as under Alternative C.

(a) RMP Decisions

This area would be designated as “limited” to OHVs. Designation of trails is necessary in this Wild and Scenic River corridor to comply with Title XI of ANILCA (specifically 43 CFR 36.11(g)) and to ensure management to protect outstandingly remarkable values. OHVs would be restricted to designated trails (Top of the World Trail, Rainy Creek Trail) from May 15 to October 16 or when there is an average of 12 inches snow or 6 inches frost. These are existing routes and will not limit access into the area for subsistence hunting or access to mining claims. Snowmachine use will not be limited at this time. There are other existing trails in the corridor (portage trail, trails out of Tangle Lakes Campground) that will be managed as non-motorized trails. This decision does not preclude future consideration of development of motorized or non-motorized trails, if consistent with protection of the outstandingly remarkable values of the river corridor.

Road construction would be avoided in all segments of the river, but overland transportation systems within or across the river corridor may be authorized if it is

determined that there are no economically feasible and prudent alternative routes. This is consistent with ANILCA, section 1105. Any road crossings of the river would be subject to evaluation consistent with section 7 of the Wild and Scenic River Act.

(b) Implementation-level Considerations

OHVs have been limited to designated trails by the RMP decisions listed above. If additional trails are considered for designation in the future, they would be located to minimize resource damage, maintain primitive and semi-primitive recreation experience, and facilitate maintenance of designated trails. Some trails would be designated as non-motorized and a non-motorized trail system out of Tangle Lakes Campground would be developed. Snowmachines may be limited to designated trails seasonally to minimize disturbance to heavy concentrations of wintering moose within the Wild and Scenic River corridor, subject to closure procedures in 43 CFR Part 36.11.

(5) Delta Range Area (including Delta Mountains Sub-unit)

This area consists of 276,000 acres, most of which are BLM public lands (unencumbered), though some are State-selected lands.

(a) RMP Decisions

This area would be designated as “limited” to OHVs. Limitations will be considered in order to prevent unmanaged proliferation of OHV trails and to maintain existing recreation experiences in the area. In order to maintain an existing non-motorized winter recreation experience in rugged, glaciated terrain, the Delta Mountains Sub-unit (labeled A on Map 4) would be closed to snowmachine use, though access to subsistence resources would be allowed. Seasonal closure would begin on October 15 or when there is 12 inches average snowfall or 6 inches of frost. Seasonal closure would run until May 15. Snowmachine use outside those defined sub-units would be unrestricted. OHV use for resource development will be permitted consistent with Required Operating Procedures. New road construction would be permitted in the transportation utility corridor and for resource development. Retention of temporary roads would be considered in areas managed for a roaded natural recreation experience.

(b) Implementation-level Considerations

OHV use would be limited to designated trails, which would be located to minimize resource damage; maintain primitive, semi-primitive, and roaded natural recreation experience; and facilitate maintenance of designated trails. Non-motorized hiking trails may be considered off the Richardson Highway or in the Jarvis Creek area.

(6) Denali Highway Area

This area consists of 374,000 acres, most of which are State-selected lands, the same as under Alternative C.

(a) RMP Decisions

OHVs would be “limited” to existing trails, consistent with the description provided above under *Alternative D* on page 49. OHV limitations will be considered in order to prevent unmanaged proliferation of OHV trails, to maintain existing recreation experiences and a diversity of dispersed and backcountry experiences, and to prevent visual impacts from unmanaged OHV use within the viewshed of the highway. This area is predominantly State-selected. BLM interim management of trails in the area would consist of inventory of trails in the area, definition of “existing” trails through mapping, and education regarding the importance of staying on existing trails. There would be no immediate snowmachine restrictions. Road construction would be permitted for resource development, utilizing guidelines for maintenance of VRM Class II and III viewsheds.

(b) Implementation-level Considerations

If any lands in the area are retained in long-term Federal ownership, trails would be designated, with designation goals as described for this area under *Alternative C* on page 44. Development of non-motorized loop trails would be considered on BLM recreational withdrawals located along the Denali Highway. Designated trails for snowmachines may be considered in the future (on lands retained in Federal ownership) if winter trail density and encounters are exceeding user tolerances, as determined through user surveys.

(7) Gulkana WSR Corridor Area

This area consists of 105,000 acres, most of which are unencumbered BLM, the same as under Alternative C.

(a) RMP Decisions

BLM’s management intent under this alternative, consistent with management under a wild classification, is no new road construction. However, BLM will comply with Title XI of ANILCA, as discussed on page 42. This area would be designated as “limited” to OHVs. Designated trails are necessary in this Wild and Scenic River corridor to comply with Title XI of ANILCA and to ensure management to protect outstandingly remarkable values. As identified through the Gulkana implementation planning process, use of OHVs would be limited to the following designated trails: Swede Lake Trail, Hungry Hollow Trail, Middle Fork Trail, Haggard Creek Trail, Dickey Lake Trail, Twelve Mile Creek Trail, South Middle Fork Trail, Northeast

Middle Fork Trail, Northwest Middle Fork trail, West Fork Trail, and Fish Lake Trail. Seasonal closure may be considered on Haggard Creek to minimize use during wet trail conditions, but access to subsistence resources would be allowed. Within the Wild and Scenic River corridor, there would be a 1,500 pound GVW limit on vehicles used for recreational purposes. There would be no snowmachine restrictions.

(8) Tielkel Area (including Tonsina Sub-units)

For Alternative D, this area only includes the unencumbered BLM lands within the Tielkel planning region, a large portion of which is located in the transportation and utility corridor.

(a) RMP Decisions

This area would be designated as “limited” to OHVs. Limitations will be considered in order to maintain existing backcountry and dispersed recreation experiences and to prevent unmanaged proliferation of OHV trails. If lands adjacent to the existing corridor are retained in long-term Federal ownership, management of OHVs would also be designated as “limited,” including some consideration of area closures for snowmachines consistent with the description under Alternative C for the Tonsina sub-unit (both North and South sub-units, labeled B and C, respectively, on Map 4), as described under the *Tielkel Area (Including Tonsina Sub-units)* section on page 47. Road construction would be permitted within the transportation and utility corridor for resource development or transportation and utility maintenance, consistent with measures identified in *Appendix C: Required Operating Procedures*. Use of temporary or winter roads would still be encouraged, but retention of roads may be considered if consistent with management for a roaded natural experience. If lands adjacent to the transportation and utility corridor are retained in long-term Federal ownership, new roads would not be permitted in areas being managed for a primitive recreation experience.

(b) Implementation-level Considerations

Within this area, OHVs would be limited to designated trails. Trails would be designated to minimize resource damage, to maintain a diversity of recreational opportunities, and to minimize impacts to the viewshed. Some specific trails would be designated non-motorized. Construction of both non-motorized and motorized loops would be considered. Some vehicle class restrictions (such as weight limitations) would apply on specific trails. Snowmachines would not be permitted on specific trails managed for non-motorized use.

(9) Bering Glacier Area

This area consists of 827,600 acres, all of which are BLM public lands (unencumbered).

(a) RMP Decisions

This area would be designated as “limited” to OHVs to prevent unmanaged proliferation of trails and to protect unique ecological values associated with this glacial environment. Road construction would be permitted for resource development, with special consideration for protection of resource values identified for the area. There would be no snowmachine restrictions.

(b) Implementation-level Considerations

OHVs would be limited to designated trails. Trails would be designated to avoid nunataks, sensitive waterfowl areas, and to prevent unmanaged proliferation of trails.

(10) Tangle Lakes Archaeological District (TLAD) Area

This area includes 196,000 acres, most of which is State-selected.

(a) RMP Decisions

Management of this area would continue as presently managed with “limited” designations in order to protect the high-density occurrence of archeological sites in the area. OHVs would be restricted to designated trails (Swede Lake Trail, South Landmark Gap Trail, Osar Lake Trail, Dickey Lake Trail, and Alphabet Hills Trail) from May 15 to October 16 or when there is an average of 12 inches snow or 6 inches frost. Trails would be designated to avoid cultural resources in the area and to prevent the unmanaged proliferation of trails. Road construction would be permitted if necessary for resource development. Proposed routes would be subject to compliance with requirements of the National Historic Preservation Act before potential authorization.

(b) Implementation-level Considerations

Consideration would be given to class restrictions such as weight limits on specific trails. Consideration would be given to designation of new trails (including non-motorized), consistent with recreation or subsistence management objectives for the area. New trails must be routed to avoid cultural resources.

(11) Chistochina-Cantwell Area

This area consists of Native-selected and dual-selected lands in the Chistochina planning region and in the Cantwell area. This area consists of 13,000 acres of Native-selected lands and 670,000 acres of dual-selected lands.

(a) RMP Decisions

OHV use within this area would be “limited” consistent with the description provided above under *Alternative D* on page 49 (OHVs to utilize existing trails whenever possible). The area will be limited in order to provide more intensive and proactive OHV management, as requested by Ahtna, Inc, the selecting entity. Where immediate concern exists regarding protection of traditional and cultural areas or sites, the BLM would work with the Native or village corporations to inventory, designate, and post trails to avoid negatively impacting such sites. Road construction would be considered on a case-by-case basis, consistent with section 906(k) of ANILCA and consistent with existing 17(b) easement limitations.

(b) Implementation-level Considerations

Consideration would be given to rerouting trails to avoid culturally sensitive sites, to maintaining some trails as non-motorized, and to education/interpretation at trailheads. Vehicle class restrictions (such as weight limitations) may be considered if necessary to minimize impacts. Where long-term traditional use is documented, consideration may be given to limiting some specific trails to recreational snowmachine use to allow for traditional trapping.

(12) Other State- and Native-selected Lands

(a) RMP Decisions

Within these areas (3,311,000 acres), OHVs use would be “limited,” consistent with the description provided above under *Alternative D* on page 49: OHVs must use existing roads and trails; activities must be conducted in a manner that minimizes disturbance of vegetation, soil stability, or drainage systems, and minimizes disturbance of fish and wildlife resources. Road construction would be permitted on a case-by-case basis, utilizing measures described in *Appendix C: Required Operating Procedures*.

(13) Other Unencumbered BLM Lands

(a) RMP Decisions

Within these areas (222,000 acres), OHVs would be “limited” to existing trails. On-the-ground management would consist of identification, posting, and education

regarding existing trails. Road construction would be permitted, consistent with measures identified in *Appendix C: Required Operating Procedures*.

Table 3 summarizes the preceding information.

Table 3. Travel Management – Alternative Summary

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
<p>OHVs: Open, Limited, and Closed Areas</p> <p>NOTE – Limitations do not apply to snowmachines unless specially stated.</p>	<p>Open: 6,755,000 acres (96%)</p> <p>Limited to designated trails: 196,000 acres (3%) in TLAD</p> <p>Limited to existing trails: 105,000 acres (1%) in the Delta and Gulkana Wild and Scenic River corridors</p> <p>Closed: 0 acres (0%)</p>	<p>Same as A.</p>	<p>Open: 0 acres (0%)</p> <p>Limited to designated trails: 3,392,000 acres (48%)</p> <p>Limited to existing trails: 3,369,000 acres (48%)</p> <p>Closed: 295,000 acres (4%). 170,000 closed to snowmachines.</p> <p>Limitations are based on resource values and objectives for each unit but generally consist of designation of trails. The following areas would be “limited” to OHVs:</p> <ol style="list-style-type: none"> 1. All areas listed in the narrative. 2. Includes State- and Native-selected lands within these areas until conveyance occurs. 3. All unencumbered BLM lands would have designated trails. <p>Limitations would include some designation of non-motorized trails within these areas.</p> <p>In addition, State- and Native-selected lands outside of identified units would be designated as “limited.” Limited would be consistent with “Generally Allowed Uses on State Land”, which requires OHVs to stay on existing trails whenever possible.</p>	<p>Open: 0 acres (0%)</p> <p>Limited to designated trails: 1,692,000 acres (24%)</p> <p>Limited to existing trails: 5,320,000 acres (75%)</p> <p>Closed: 44,000 acres (0.6%), closed to snowmachines.</p> <p>Most BLM-managed lands would be designated as “limited” to OHVs, as follows:</p> <p>All unencumbered BLM lands would be limited, with limitations defined specifically by area-specific resource objectives</p> <p>State- and Native-selected lands would be “limited” to OHVs, with limitations consistent with the State’s current generally allowed uses, which requires OHVs to stay on existing trails whenever possible. BLM’s interim role would be education regarding use of existing trails. Management of TLAD would not change.</p> <p>The following area would be “closed” to OHVs:</p> <ol style="list-style-type: none"> 1. Delta Mountain Sub-unit in the Delta Range Area closed to

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
<p>OHVs: Open, Limited, and Closed Areas (cont.)</p> <p>NOTE – Limitations do not apply to snowmachines unless specially stated.</p>			<p>The following areas would be “closed” to OHVs:</p> <ol style="list-style-type: none"> 1. Tonsina subunit in Tiekel Area (South unit closed year-round to motorized vehicles [including snowmachines], North unit closed 4/15 to 10/15); 2. Delta Mountain Sub-unit in Delta Range Area would be closed to OHVs (including snowmachines) year-round. 	<p>motorized vehicles (including snowmachines) 10/15 – 5/15 except snowmachine use to access subsistence hunting.</p>
Roads	<p>Proposals for new road construction considered in applications for Rights-Of-Way on a case-by-case basis. WSR corridors are avoidance areas for new construction.</p>	<p>Proposals for new road construction considered in applications for Rights-Of-Way on a case-by-case basis. No avoidance areas, but utilize guidelines described in <i>Required Operating Procedures</i>.</p>	<p>The following limitations would be applied to new road construction:</p> <ol style="list-style-type: none"> 1. Within West Fork Area, Nelchina Caribou Calving Area, Delta WSR Corridor Area, Denali Highway Area, Gulkana WSR Corridor Area, and Bering Glacier Area, there would be no new road construction, subject to Title XI of ANILCA in WSR corridors. 2. Within the Tiekel and Delta Range Areas there would be no new road construction outside the transportation and utility corridor. 3. Within the Delta Bison Area, construction would be allowed for resource development but closed seasonally 5/1 to 6/15. Outside of these areas, guidelines described in <i>Required Operating Procedures</i> would apply. 	<p>Proposals for new road construction considered in applications for Rights-Of-Way. Restrictions for new road construction and ROWs would be as follows:</p> <ol style="list-style-type: none"> 1. Delta Bison Area, Nelchina Caribou Calving Area, West Fork Area, Denali Highway Area: new roads permitted for resource development, but subject to seasonal or visual impact restrictions; 2. Delta WSR Corridor Area: Avoid in all segments subject to Title XI of ANILCA and recognition of valid existing rights. 3. Gulkana WSR Corridor Area no new construction, subject to Title XI of ANILCA and recognition of valid existing rights. 4. Tiekel and Delta Range Areas: permitted in transportation and utility corridor.

Map 3. Travel Management Areas - Alternative C

File size: 199 KB

File name: 03_travelc.pdf

Map size: 11x17

Map 4. Travel Management Areas - Alternative D

File size: 194 KB

File name: 04_traveld.pdf

Map size: 11x17

2. Issue 2: Recreation

Issue Statement: Manage recreation to provide a diversity of experiences on BLM-managed lands. Determine what measures are necessary to ensure that a diversity of recreational opportunities is maintained.

The following alternative descriptions rely heavily on Recreation Opportunity Spectrum (ROS) classes to identify specific recreation objectives for different areas. Map 29 shows the ROS classes, based on 2003 inventory and is included in *Chapter III, Issue 2: Recreation, Recreation Opportunity Spectrum*. Chapter III also includes a description of the recreation setting for each ROS class, including degree of naturalness, concentration of users, and expected impacts from management activities or roads and trails. The following alternative descriptions describe which areas would receive special recreation management emphasis (Special Recreation Management Areas or SRMAs) and how ROS classes would be managed within each area. Alternative tables that show all measures associated with each SRMA complement the narrative descriptions. These tables can be found in *Appendix A: SRMA Comparison Tables*. For specific measures regarding roads and OHV management, see *Issue 1: Travel Management Issue* described above on page 40.

a) Goals

- Manage recreation to maintain a diversity of recreational opportunities.
- Provide opportunities for commercial recreation consistent with area objectives for recreation management.

b) Management Common to All Action Alternatives

(1) Public Cabins

Public use cabins would be considered consistent with objectives described in each SRMA. In general, existing structures would be considered for public use cabins before the construction of new cabins. Planning may occur, but land status would need to be resolved before major investment occurs in a public cabin system. Outside of SRMAs, the following have been identified for potential public use cabins: Tyone cabin, Monsoon Lake cabin, and Welsh cabin on the Maclaren River.

(2) Inventory and Monitoring

Monitoring would include the following:

- Visitor use, both dispersed and developed sites.
- Characterization of trail users and tolerances, as described under *Issue 1: Travel Management* on page 40.
- Monitoring of campsite impacts, camp encounters, litter, and human waste, as described in the River Management Plan for the Delta National Wild and Scenic River, and the River Management Plan for the Gulkana National Wild River.
- Monitoring of commercial use activities and compliance with conditions of the permit.
- Assessment of visitor and resident recreation experiences and benefits.

Priority for monitoring would be based on:

1. Wild and Scenic River corridors,
2. Special Recreation Management Areas, and
3. Research Natural Areas.

(3) Gulkana Wild and Scenic River

Concurrent to the development of this RMP, the River Management Plan for the Gulkana is being revised. Under all alternatives, management of the Gulkana Wild and Scenic River corridor would be consistent with the revised plan, which would direct management to maintain primitive, semi-primitive motorized, and developed recreation experiences within the corridor. The revised plan would establish general visitor use limits through monitoring of camp encounters and appropriate management actions if standards are not met. In addition, it would set standards for campsite impacts, litter, and human waste, and take appropriate management actions to address these impacts (BLM 2005).

c) Alternative A

This alternative would continue current recreation management of rivers (two components of the National Wild and Scenic River System, the Delta and Gulkana), four campgrounds, two major waysides, and 24 developed trailheads. Current management guidance is provided by the 1980 Southcentral MFP and, except for the Wild and Scenic Rivers, there are no specific management objectives identified for recreation. Consequently, management reacts to the trend of increasing recreation use and associated impacts on a case-by-case basis. Generally, proposals for new recreational facilities or other recreational opportunities are generated by proponents outside the BLM. Applications for Special Recreation Permits (for commercial use) are handled on a case-by-case basis.

Under this alternative, no new recreation facilities would be developed, and no specific recreation objectives would be set. No areas would be designated as SRMAs.

d) Alternative B

In general, this alternative emphasizes resource development and development of recreational facilities to address increasing recreational use. Specific measures are identified for the specific areas described below.

(1) Delta WSR Corridor Area

No SRMA would be designated for this area. The area would be managed consistent with 1983 River Management Plan for the Delta National Wild and Scenic River. Management would be for semi-primitive non-motorized, semi-primitive motorized, and roaded natural experiences. Current primitive ROS classes would be allowed to trend towards semi-primitive non-motorized and semi-primitive motorized. Existing ANCSA (d)(1) withdrawals in the scenic and recreational portions of the river would be revoked to allow for mineral exploration and development. A public use cabin system would be considered. OHVs would be “limited” to existing trails. There would be no restrictions on snowmachine use. No general visitor use limits or commercial limits would be established. The following developed facilities would be considered: installation of more toilets along the river, improvement of the take-out to include installation of a toilet and increased signage, and renovation of the Tangle Lakes Campground.

(2) Gulkana WSR Corridor Area

No SRMA would be designated in this area.

(3) Denali Highway Area

The 135-mile Denali Highway would be designated as a Back Country Byway cooperatively with the State of Alaska, Department of Transportation. The area would not be designated as an SRMA, but it would be managed for semi-primitive motorized and roaded natural recreation experiences. Existing primitive recreation experiences would be allowed to trend towards semi-primitive motorized and roaded natural experiences. All existing ANCSA (d)(1) withdrawals would be revoked to allow for mineral exploration and development, with site-specific mitigation to protect visual resources. There would be no restrictions to OHV or snowmachine use. The public use cabin system would be considered. No general visitor use or commercial use limits would be considered. The following facilities would be considered to accommodate increased recreational use:

1. Three rest areas consisting of outhouses, garbage receptacles, education/interpretive displays, and possible day-hike trailheads. The areas

- would be located east of Canyon Creek, east of Susitna River crossing, and east of Maclaren Summit.
2. Two visitor centers: One at the junction of the Parks and Denali Highways in cooperation with the State, the Native Village of Cantwell, and Denali National Park and Preserve; and one in the Tangle Lakes area.
 3. Sixteen viewpoints consisting of pull-outs, garbage receptacles, and interpretive signs highlighting wildlife, geologic, cultural, or scenic features.
 4. A campground/boat-launch at Susitna River crossing.

(4) Tielkel Area

No SRMA would be designated; management would be for primitive, semi-primitive motorized, and roaded natural recreation experiences, with primitive experiences trending towards semi-primitive motorized experiences. The area would be open to OHVs and snowmachines. All existing ANCSA (d)(1) withdrawals would be revoked, except the inner corridor of the transportation and utility corridor. This would allow for increased mineral exploration and development. Public use cabins would be considered. No general visitor use or commercial capacities would be established. Recreational facilities would include development of two waysides in the Tielkel corridor on unencumbered BLM land, trailhead parking and signing at three different trails, and a bike path utilizing the old Richardson Highway.

(5) Other Areas

Outside of the areas described above, recreation management would be custodial, with most areas designated as “open” to OHVs and consideration of commercial or permitted activities on a case-by-case basis.

e) Alternative C

In general, this alternative emphasizes maintenance of existing recreational experiences through specific measures identified through designation of SRMAs.

(1) Delta WSR Corridor Area

See Map 5 on page 77. This area would be designated as an SRMA with a total area of approximately 44,000 acres. Objectives would be to maintain existing primitive, semi-primitive, and roaded natural recreation experiences and to protect the viewshed. The area would be designated as “limited” to OHVs, with implementation-level consideration given to designated trails for OHVs (including snowmachines), and maintenance of some trails for non-motorized use. BLM would recommend to the State that no motorized watercraft be permitted on Tangle Lakes. No public use cabins would be considered. General visitor use and commercial use limits to maintain the existing recreation experiences would be determined in an implementation-level plan. The river

corridor and viewshed would be managed as VRM Class I (Map 17 on page 111 displays the current VRM classes for the planning area). A discussion of VRM and definitions for VRM Classes are in Chapter III, *Issue 3: Natural and Cultural Resources, Visual Resources*.

(2) Gulkana WSR Corridor Area

See Map 6 on page 78. This area would be designated as an SRMA and would consist of 105,000 acres, 95 percent of which is unencumbered BLM lands. Specific management for this area is described above under *Management Common to All Alternatives* on page 66.

(3) Denali Highway Area

See Map 7 on page 79. This area would be designated as an SRMA, consisting of the foreground and middleground viewshed from the Denali Highway. This area consists of 559,000 acres, most of which are State-selected lands. Objectives would be to manage to maintain the existing recreation opportunities, including primitive, semi-primitive non-motorized, semi-primitive motorized, and roaded natural. The area would be designated as “limited” to OHVs, with implementation-level consideration given to designation of trails, vehicle weight limits on some trails, and closure to motorized use on some specific trails. The current ANCSA (d)(1) withdrawal against leasable minerals would remain in place and the area would be recommended for withdrawal from locatable mineral entry. No public use cabins would be considered. General visitor use and commercial use limits would be determined in an implementation-level plan, based on objectives described above. No new recreational facilities would be considered until visitor use limits are determined. The area would be managed as VRM Class II.

(4) Tiekel Area

See Map 8 on page 80. This area would be designated as an SRMA consisting of 848,000 acres, predominantly State-selected lands but also containing Native-selected and unencumbered BLM land. The area would be managed to maintain existing recreational opportunities (primitive, semi-primitive non-motorized, semi-primitive motorized, and roaded natural), with an emphasis (outside the transportation and utility corridor) on maintaining primitive recreation experiences. The area would be designated as “limited” to OHVs, with implementation-level consideration of designation of trails and maintenance of some specific trails as non-motorized. The Tonsina sub-unit would consist of two parts: the north sub-unit would be closed to motorized vehicles from April 15 to October 15; the south sub-unit would be closed yearlong to motorized vehicles.

Any existing ANCSA (d)(1) withdrawals against mineral entry would be maintained. No public use cabins would be considered. General visitor use and commercial use limits would be determined in implementation-level plans, based on objectives described above. Limits for commercial heli-skiing would be determined based on maintenance of

existing ROS classes. No commercial heli-ski operations would be permitted north of the Tiekel River or Stuart Creek. No new recreational facilities would be considered. The area would be managed under VRM Classes II, III, and IV.

(5) Delta Range Area

See Map 9 on page 81. This SRMA would consist of 359,000 acres, the majority of which are unencumbered BLM lands. Objectives for the area would be to maintain the existing ROS classes, which include primitive, semi-primitive non-motorized, semi-primitive motorized, and roaded natural classes, and to provide for opportunities for non-motorized recreation. OHVs (not including snowmachines) would be “limited” to designated trails and the area would include some non-motorized trails. BLM-managed portions of the Augustana, Fels, Canwell, Castner, and McCallum Creek glaciers and drainages would be designated non-motorized yearlong (see the Delta Mountains Sub-units on Map 9) in order to maintain existing opportunities for non-motorized backcountry skiing and mountaineering. The existing withdrawal against leasable mineral entry would be maintained and the area would be recommended for withdrawal against locatable mineral entry. No public cabins would be considered in the Jarvis Creek area. Recreational facilities would be limited to trailheads. Visitor use limits would be established for commercial recreational activities in the area, and no helicopter supported commercial activities would be permitted. The area would be managed under VRM Classes II and III.

(6) Other Areas

Areas outside those identified above would be managed as Extensive Recreation Management Areas, with recreation management based on maintenance of existing ROS classes within the areas. Inventory and monitoring identified in *Management Common to All Alternatives* on page 66 would occur.

f) Alternative D - Proposed RMP

This is the BLM’s Preferred Alternative. It identifies the following measures for these areas:

(1) Delta WSR Corridor Area

See Map 5 on page 77. This area, consisting of 44,000 acres of unencumbered BLM land, would be designated as an SRMA, with objectives to maintain existing recreation opportunities (primitive, semi-primitive non-motorized, semi-primitive motorized, and roaded natural), with emphasis on managing for a primitive experience in the portion of the Wild and Scenic River Corridor classified as wild. Another objective in this SRMA is managing to protect the VRM Class I viewshed. The area would be designated as “limited” to OHVs, with specific trails designated to minimize unmanaged proliferation of

trails, to reduce user conflicts, to continue to provide access to recreation and subsistence activities, and to maintain primitive and semi-primitive motorized experiences. Consistent with the 1983 River Management Plan for the Delta National Wild and Scenic River and during implementation-level planning, BLM would recommend to the State of Alaska limitations on motorized use on the Tangle Lakes. No public use cabins would be considered. General visitor use and commercial use limits would be established in implementation-level planning, consistent with objectives identified above. The Tangle Lakes Campground would be renovated, and the river take-out at mile 212 on the Richardson Highway would have increased signage. If the opportunity presents itself, acquisition of one of the area lodges for a visitor center would be considered.

(2) Gulkana WSR Corridor Area

See Map 6 on page 78. This area would be designated as an SRMA, including 105,000 acres, 95 percent of which is unencumbered BLM land. Specific management as described above under *Management Common to All Alternatives* on page 66.

(3) Denali Highway Area

See Map 7 on page 79. This area consists of the middleground and foreground viewshed off the Denali Highway. This is predominantly State-selected land. This section describes two management scenarios: *interim* describes management of State- and Native-selected lands in the area until conveyance occurs, and *long-term* describes management of lands if they are retained in long-term Federal ownership.

(a) Interim Management

No SRMA would be designated. Interim objectives would be to manage for roaded natural, semi-primitive non-motorized, and semi-primitive motorized recreation experiences, to mitigate impacts to the viewshed, and to provide education and interpretive opportunities. The area would be managed as “limited” for OHVs, consistent with State Statute 11 AAC 96.025, which limits OHVs to existing trails whenever possible. OHVs using areas within Tangle Lakes Archaeological District (TLAD) in this SRMA would be required to stay on designated trails from May 15 to October 16 or when there is an average of 12 inches snow or 6 inches frost. Snowmachine use would require adequate snow cover, but snowmachines would not be restricted to designated trails. There would be no mineral development on State- or Native-selected lands because of segregation due to selection. No public use cabins would be developed. On State- or Native-selected lands, no new recreational facilities would be considered until land status is resolved. Development of facilities may be considered on BLM recreational withdrawals along the highway, as described below. Education and interpretive sites would be consistent with direction in the Interpretive Master Plan for the Denali Highway (BUCY Associates 1999), with special consideration within TLAD given to protection

of artifacts. Applications for commercial recreation activities would be considered on a case-by-case basis.

(b) Long-term Management

SRMA designation would be considered if lands retained in Federal ownership are in large contiguous blocks. Objectives would be as described for the Denali Highway in *Alternative C* on page 69. The area would be designated as “limited” to OHVs, with implementation-level consideration of designated trails, maintenance of some non-motorized trails, and construction of day-hike and motorized trail loops, particularly associated with waysides and rest areas. Designated trails for snowmachines may be considered in future if winter trail densities and encounters are exceeding user tolerances, as determined through user surveys. The area would be open for locatable mineral entry and for leasable minerals. Public cabins would be considered in the area, in particular the Welsh cabin on the Maclaren River. Visitor use limits would be developed for commercial uses along the highway, consistent with management objectives and long-term development of recreational facilities. The following facilities would be developed if maintained in long-term Federal ownership or in association with BLM recreational withdrawals:

1. Day-use waysides at 39-mile (Maclaren River), 56-mile (Clearwater Creek), and 80-mile (Susitna River).
2. Possible boat launch at Susitna River.
3. Upgrade trailheads and use for presentation of education/interpretive material.
4. Develop education/interpretive sites to highlight the area’s wildlife, scenic, cultural, and geologic features, as outlined in the Interpretive Master Plan for the Denali Highway (BUCY Associates 1999).

(4) *Tiekel Area*

See Map 8 on page 80. This area consists predominantly of State-selected lands, although there is some Native-selected land as well. This section describes two management scenarios: *interim* describes management of State- and Native-selected lands in the area until conveyance occurs, and *long-term* describes management of the lands if they are retained in long-term Federal ownership.

(a) Interim Management

Under interim management, only the unencumbered BLM lands in the Tiekel corridor would be designated as an SRMA. Objectives would be to manage for roaded natural, semi-primitive non-motorized, and semi-primitive motorized recreation experiences within the corridor. OHVs would be “limited” to designated trails on unencumbered BLM lands. Implementation-level considerations would include maintenance of specific trails as non-motorized (including snowmachines), construction of both non-motorized and motorized trail loops, and vehicle class restrictions (such as weight limitations) on specific trails. Where these designations

affect trails on State-selected lands, the BLM would work with the State of Alaska on designations. Existing withdrawals against mineral leasing and locatable mineral entry within the transportation and utility corridor would remain in place. This area would be considered a priority area for forest management. This SRMA would not preclude timber management activities, but proposed timber sales would consider impacts to recreational facilities, experiences, and viewsheds. Temporary roads utilized for forestry access may be considered for retention if they are within areas managed for a roaded natural recreation experience. This SRMA is within the transportation and utility corridor; this would remain the area's primary purpose.

Visitor use limits would be determined for helicopter-supported commercial uses, consistent with existing ROS classes. Recreational facilities would include updating and development of selected trailheads, construction of one wayside, and consideration of a bike trail utilizing the old Richardson Highway. The Egan cabin would be considered for public use.

(b) Long-term Management

If large contiguous blocks within this area are retained in Federal ownership, they would be considered for inclusion into the SRMA, with objectives (for lands outside the transportation and utility corridor) emphasizing maintenance of primitive and semi-primitive recreation. OHVs would be "limited" to designated trails, with some trails designated non-motorized (including snowmachines). If contiguous blocks are retained in the southern portion of the Tonsina sub-unit, they would be managed consistent with direction described under Alternative C on page 47 (the area would be closed to recreational motorized use). Minimal or no development will be considered at trailheads that access areas managed for a primitive or semi-primitive recreation experience. Existing withdrawals associated with the transportation and utility corridor would be maintained, but other areas would be open to leasable and locatable mineral entry. Public use cabins would be considered, and visitor use limits for commercial heli-ski operations would be established based on maintenance of existing ROS classes. Consideration would be given to not authorizing heli-skiing in some areas managed for a primitive recreation experience.

(5) *Delta Range Area*

See Map 9 on page 81. This area would be designated a SRMA encompassing 276,000 acres, most of which are unencumbered BLM lands. Objectives for the area would be to maintain the existing ROS classes, which include primitive, semi-primitive non-motorized, semi-primitive motorized, and roaded natural. The area would be designated as "limited" to OHVs, with implementation-level consideration given to designated trails and maintenance of some non-motorized trails. BLM-managed portions of the Fels, Canwell, Castner, and McCallum Creek glaciers and drainages would be designated as closed to snowmachines (see Delta Mountains Sub-units on Map 9) from 10/15 – 5/15. This closure is based on the objective of maintaining existing non-motorized backcountry skiing and mountaineering experiences that have

traditionally occurred in this area and based on strong public comment requesting this specific closure (See Appendix J: Response to Comments). Snowmachines in these areas would be permitted to access subsistence hunting. The existing withdrawal against leasable mineral entry would be maintained but the area would be open for locatable mineral entry except within the inner corridor of the transportation and utility corridor. Public cabins would be considered in the Jarvis Creek area. Recreational facilities would include development of some trailheads and some improvement of dispersed camping sites in the Jarvis Creek area. Minimal or no development will be considered at trailheads that access areas managed for a primitive or semi-primitive recreation experience. No helicopter-supported commercial activities would be permitted in areas managed for a primitive recreation experience, in order to maintain primitive backcountry mountaineering experiences and to minimize potential safety concerns for backcountry skiers and mountaineers. Inventory and Monitoring identified in *Management Common to All Alternatives* on page 66 would take place to monitor use levels and to characterize winter users and their tolerance for increased snowmachine use and trail density. The area would be managed under VRM Classes II and III. Most of this SRMA is within the transportation and utility corridor; this would remain the area's primary purpose.

(6) Other Areas

Areas outside those identified above would be managed as Extensive Recreation Management Areas, with recreation management based on maintenance of existing ROS classes in the areas. Inventory and monitoring identified in *Management Common to All Alternatives* on page 66 could occur and standards may be identified for trail density in these areas based on monitoring and inventory information. Some education/interpretation at trailheads may occur, particularly at 17(b) easement trailheads within these areas.

Table 4 summarizes preceding information.

Table 4. Recreation – Alternative Summary

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Special Recreation Management Areas	<p>No SRMAs currently designated.</p> <p>Recreation management is custodial.</p>	<p>No SRMAs proposed.</p> <p>Some protection measures identified.</p> <p>See detailed alternative tables in Appendix A.</p>	<p>1,916,000 acres (27%) proposed for SRMA designation.</p> <p>The following SRMAs and objectives would be proposed:</p> <ol style="list-style-type: none"> Delta River (44,000 acres) Includes ANILCA-designated WSR corridor. Objective: Manage to maintain existing primitive, semi-primitive, and roaded-natural experiences. Gulkana River (105,000 acres) Includes ANILCA-designated corridor. Objective: Manage for primitive, semi-primitive, and undeveloped experiences. Delta Range (359,000 acres) Includes unencumbered BLM lands north of Summit Lake. Objective: Maintain primitive, semi-primitive motorized, and roaded natural experiences. Tiegel (848,000 acres) Objective: Manage for a primitive recreation experience outside of the transportation and utility corridor. 	<p>570,000 acres (9%) proposed for SRMA designation.</p> <p>The following SRMAs and objectives would be proposed:</p> <ol style="list-style-type: none"> Delta River (44,000 acres) Objective: Same as for Alternative C. Gulkana River (105,000 acres) Objective: Same as for Alternative C. Delta Range (276,000 acres) Objective: Same as for Alternative C. Tiegel (120,000 acres) Includes unencumbered BLM land. Objective: Manage for roaded natural, semi-primitive, and semi-primitive motorized experiences. <p>In other areas (Denali Highway and selected portions of Tiegel), some measures to meet objectives are identified. See alternative tables in Appendix A for detail. SRMA designation would be considered for lands retained in long-term Federal ownership in the Denali Highway and Tiegel areas.</p>

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Special Recreation Management Areas (cont.)			<p>5. Denali Highway (559,000 acres) Consists of fore and middle ground viewshed from Denali Highway. Objective: Manage to maintain primitive, semi-primitive motorized, and roaded-natural experiences.</p> <p>Specific measures are described in tables in Appendix A.</p>	
Back Country Byways	None designated	Denali Highway designated (135 miles)	None designated	None designated
Public Use Cabins	Public use cabins would be considered consistent with objectives described in each SRMA. Potential for public cabins would be emphasized in the Tielke SRMA. In general, existing structures would be considered for public use cabins before construction of new cabins. Planning may occur, but land status would need to be resolved before major investment occurs in a public cabin system. Outside of SRMAs, the following have been identified for potential public use cabins: 1) Tyone cabin; 2) Monsoon Lake cabin; 3) Welsh cabin, Maclaren River; 4) Jarvis Creek area.			
Education and Interpretation	Education and interpretation along the Denali Highway would follow the Interpretive Master Plan for the Denali Highway (BUCY 1999). Specific opportunities for education and interpretation for trailheads (including 17(b) easements) are described in "Management Guidance Common to All Alternatives." The BLM would continue to work with the Alaska Department of Transportation in identifying and implementing education and interpretive opportunities along the Glenn, Richardson, and Denali Highways.			
Commercial Use	Under Alternative D, appropriate levels of commercial use would be established: 1) Delta SRMA; 2) Gulkana SRMA; 3) Tielke SRMA (for heli-skiing); 4) Delta Range SRMA; and 5) Denali Highway, if lands are retained in long-term Federal ownership. Appropriate levels of use would be determined in implementation-level planning based on management objectives and anticipated encounters as determined through an activity planning process. Other factors such as current levels of use, safety, resource impacts, and operator tolerance and quality of experience would be considered.			

Map 5. Delta River SRMA - Alternatives C and D

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File name: 05_deltasrma.pdf

Map size: 8.5x11

Map 6. Gulkana River SRMA - Alternatives C and D

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Map size: 8.5x11

Map 7. Denali Highway SRMA - Alternative C

File size: 146 KB

File name: 07_denalistrma.pdf

Map size: 8.5x11

Map 8. Tiekel SRMA, Alternatives C and D

File size: 167 KB

File name: 08_tiekelsrma.pdf

Map size: 8.5x11

Map 9. Delta Range SRMA - Alternatives C and D

File size: 116 KB

File name: 09_deltarsrma.pdf

Map size: 8.5x11

3. Issue 3: Natural and Cultural Resources

Issue Statement: Manage to protect natural and cultural resources, including wildlife, fisheries, soil, water, air and vegetation, identified by resource specialists and identified through the public scoping process.

This section provides a narrative description of protective measures proposed under each alternative. For specific proposed areas (such as ACECs and the Bering Glacier RNA), detailed alternative comparison tables can be found in *Appendix B. Required Operating Procedures* and *Oil and Gas Leasing Stipulations* can be found in *Appendix C*.

a) Goals

Wildlife: In cooperation with ADF&G, ensure optimum populations and a natural abundance and diversity of wildlife resources, including those species that are considered BLM sensitive status species.

Wildlife: Perpetuate a diversity and abundance of waterfowl and wetland habitat.

Fisheries: Maintain and protect fish habitat on public lands and provide for the habitat needs of fish resources necessary to maintain or enhance such populations and to ensure the continued public use, economic and subsistence benefits of such resources. Maintain wild stocks of salmon and steelhead.

Cultural Resources: Protect and preserve important cultural and paleontological resources. Expand opportunities for scientific and educational uses of these resources.

Watersheds: Ensure that watersheds are in, or are making significant progress toward, a properly functioning physical condition that includes their upland, riparian, wetland, and aquatic areas. Manage to maintain riparian areas in proper functioning condition.

Vegetation and Soils: Manage to minimize negative impacts to soils and vegetation and to prevent soil erosion.

Delta and Gulkana Wild and Scenic River corridors: Manage to protect and enhance the values for which the rivers were designated, without limiting other uses that do not substantially interfere with public use and enjoyment of these values.

b) Management Common to All Alternatives

(1) Inventory and Monitoring

These monitoring/assessment projects would be common to all action alternatives (Alternatives B, C, and D) dependent on funding.

(a) Fisheries

- Support continued monitoring and assessment of riparian areas. Use this information as a baseline to support maintenance and enhancement projects.
- Continue the Gulkana fish counting tower operations. This cooperative effort with ADF&G provides the best Chinook salmon escapement data available for the Gulkana River.
- Continue inventorying for anadromous fish spawning habitat, particularly outside the Gulkana River.
- Continue to conduct Production Habitat Inventory.
- Continue to support work or studies to provide information on distribution and abundance of steelhead trout in the Gulkana River as well as other watersheds in the planning area.

(b) Cultural Resources

- Systematic (Section 110) surveys needed for most of the large blocks of land that BLM manages.
- Inventories needed on selected high probability areas that respond to planned management activities, including a) Holocene shorelines of Lake Ahtna; b) Gulkana and Delta River corridors; c) historic properties associated with Valdez trail; d) areas identified as “limited” for OHV use; e) proposed ACECs with cultural/paleontological values; f) proposed prescribed burning (habitat improvement) areas; g) any trail reroutes or construction; and h) lands identified for disposal.
- Archaeological testing/excavation to fill gaps about prehistory in the Copper River Basin. No sites currently identified.
- Paleontological inventory for Talkeetna Mountains, Alaska Range, and Chugach Range. Need a revised paleontological review, could be cooperative effort between BLM and University of Alaska-Fairbanks (UAF).

(c) Soil, Water, Vegetation

- Continue assessment of riparian areas, using proper functioning condition assessment methodology. Priority areas would include Wild and Scenic River corridors, ACECs, and riparian areas within anticipated or ongoing mining areas.
- Water rights application for the Gulkana River has been submitted to the State of Alaska. Complete instream flow needs assessment documentation and obtain water rights for the Delta Wild and Scenic River. In addition (second priority) any streams, lakes, or other riparian areas found to support a quality of fish habitat, recreation, or extractive resources, should be considered as a candidate for an instream flow reservation.
- Continue to monitor water flows and develop web-accessed information for the Gulkana and Delta Wild and Scenic Rivers.

- Continue soil surveys, with first priority to unencumbered BLM lands within the Bering and Tielke planning regions. Second priority is other unencumbered BLM lands and those designated as “limited” for OHVs.
- Continue assessment of OHV trails, using satellite imagery. First priority is within areas designated as limited to OHV use.
- Develop water quality data base in priority fish habitats and important recreation use areas to establish baseline for monitoring. In heavy use recreation rivers, include fecal coliform monitoring. First priority is Gulkana and Delta Wild and Scenic River corridors.
- Conduct a baseline inventory for sensitive plant species.
- Conduct a baseline inventory for invasive species present on BLM-managed lands within the planning area.

(d) Wildlife

- Conduct detailed condition assessments of critical moose habitats, especially in areas of intensive motorized use and/or mining operations.
- Work cooperatively with ADF&G to research effects of winter and summer OHV use on moose in critical habitat areas.
- Identify critical Dall sheep and mountain goat ranges in areas of current or potential high-level recreational activities (helicopter or snowcat-supported skiing) and within areas with high potential for mineral development.
- Identify critical habitat for high-profile furbearer species (wolverines, Canada lynx).
- Identify critical habitat for harbor seals in Vitus Lake/Bering Glacier area and Malaspina Glacier area.
- Continue annual bald eagle monitoring in Gulkana River watershed; conduct thorough analysis of existing data.
- Monitor effects of human disturbances on breeding, nesting, brood-rearing behavior of adult and young trumpeter swans.
- Resume annual monitoring of dusky Canada geese within the Bering Glacier area.
- Document usage/habitat preferences of Tule white-fronted geese and Vancouver Canada geese within the Bering Glacier area.
- Identify and document red-throated loons usage in Bering Glacier/Vitus Lake area.
- Establish and monitor breeding bird survey transects. Develop and participate in research partnership efforts to gain better understanding of Threatened and Endangered bird occurrence and habitat in planning area. Monitor effects of fire (prescribed and natural) on breeding bird habitat and preference.

(2) Maintenance and Restoration

The following maintenance and restoration projects would be common to all action alternatives (Alternatives B, C, and D).

(a) Cultural Resources

- Coordinate with recreation on placement of educational/interpretive materials regarding cultural resources in the following areas. Levels of trailhead and wayside development vary by alternative: 1) Denali Highway (cultural values in TLAD); 2) Richardson Highway, Tielkel planning region (Valdez Trail, WAMCATS trail); 3) 17(b) easements; 4) cultural/traditional areas as identified by Native villages and corporations.
- Assist recreation/trails management with re-location of trails to protect cultural resources. Priorities for this activity are TLAD and the Tielkel planning region.
- Identify opportunities for historic cabin restoration, maintenance on lands to be retained by BLM.

(b) Fisheries

- Cooperate with ADF&G on increasing the population of steelhead and rainbow trout in the Gulkana River by habitat manipulation and other enhancement techniques.
- Provide educational information through Gulkana website regarding waterflow levels and potential rafting and boating impacts to spawning beds.
- Cooperate with other BLM programs in identifying need for re-location, closure, or maintenance of OHV trails to avoid crucial habitat features.

(3) Land Use Requirements

All permitted activities would operate under guidelines and stipulations provided in *Appendix C: Required Operating Procedures*. These procedures were developed through the EIS process and are based on knowledge of the resources in the planning area and current permitting procedures. All oil and gas leases would be subject to the *Oil and Gas Leasing Stipulations* also listed in *Appendix C*.

(4) Wild and Scenic River Eligibility and Suitability

The Wild and Scenic Rivers Act mandates that land management agencies evaluate rivers for possible inclusion into the National Wild and Scenic Rivers System (NWSRS). As part of the land use planning process and based on thorough evaluation and assessment conducted in 1989 and on public comment received on the Draft RMP/EIS, 15 rivers in the planning area were determined to be eligible for inclusion and were classified using criteria in the Wild and Scenic Rivers Act and the BLM's 8351 Manual (BLM 1993) (see discussion in *Chapter III, Issue 3: Natural and Cultural Resources*;

Wild and Scenic Rivers). Eligibility simply means the segments are free-flowing and, with their adjacent land area, possess at least one outstandingly remarkable value. Based on strong public comment received during the comment period on the Draft RMP/EIS, it was determined that suitability assessment will be conducted once ANCSA and State entitlements are met and land status has been stabilized. This determination was based on public comment and the fact that the suitability analysis presented in the Draft used land status as its strongest criteria. Appendix I of this Proposed RMP/Final EIS contains a list of the eligible rivers, classification of those rivers, a description of the outstandingly remarkable values, and interim protective measures.

(5) *Gulkana Wild and Scenic River*

Concurrent to the development of this RMP, the River Management Plan for the Gulkana is being revised. Under all alternatives, management of the Gulkana Wild and Scenic River corridor would be consistent with the revised plan. ANILCA-designated mineral withdrawals would remain in place on all segments of the river. New roads would generally not be permitted within or across the wild river corridor unless a determination was made that the road would be compatible with the purposes for which the river's was designated and that there is no economically feasible and prudent alternative route or location.

(6) *Public Water Supplies*

In order to comply with the Safe Drinking Water Act and protect the quality and quantity of drinking water, the 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. Public water supply systems are defined as systems that provide water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serve an average of at least 25 people for at least 60 days a year. 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.

c) *Alternative A*

This alternative continues current management. Guidance for protection of specific resource values or concerns is provided in the 1980 Southcentral MFP. Direction in this document is very general. Most protective measures for specific resource concerns (such as caribou calving or waterfowl habitat) were tied to the adoption of ACECs, which were never designated. Therefore, specific measures for protection of these values were never described or adopted.

Currently, proposed permitted or authorized uses are analyzed in appropriate NEPA documents. Based on NEPA analysis, mitigation is developed to minimize impacts from

proposed activities. The resulting stipulations are included in the permit that authorizes the activity. Casual uses such as OHV use are generally not managed.

d) Alternative B

This alternative emphasizes resource development. Measures for resource protection would be applied on a site-specific basis for permitted activities based on guidelines provided in *Appendix C: Required Operating Procedures*. Protective measures would not be applied over general areas such as ACECs or the proposed Bering Glacier RNA. In general, within Alternative B, most ANCSA (d)(1) withdrawals would be revoked to allow for the greatest potential for mineral exploration and development.

The following measures described below are from *Appendix C: Required Operating Procedures*.

(1) Delta Bison Calving Area

Within defined calving areas, the following uses would not be permitted from May 1 to June 15: a) surface disturbing activities, b) FLPMA leases or permits that exceed 14 days of activity, or c) mining exploration. Aircraft associated with permitted activities would maintain an altitude of at least 1,000 feet. No oil and gas exploration or development activities may occur from May 1 to June 15.

(2) Nelchina Caribou Calving Area

Within defined calving areas, the following uses would not be permitted from May 1 to June 15: a) surface disturbing activities, b) FLPMA leases or permits that exceed 14 days of activity, or c) mining exploration. Aircraft associated with permitted activities would maintain an altitude of at least 1,000 feet. No oil and gas exploration or development activities may occur from May 1 to June 15.

(3) Moose Winter Range

Within defined moose winter range, the following use would not be permitted from October 15 to March 31: a) surface disturbing activities, or b) FLPMA leases or permits that exceed 14 days of activity. Aircraft associated with permitted activities would maintain an altitude of 1,000 feet. For oil and gas activities, these areas would be closed to drilling, pipeline construction, road construction, or construction of permanent facilities from October 15 to March 31. Exceptions may be granted for mining activities where no feasible alternative exists and for other activities based on actual occupancy of the area by wintering moose. Exception, waiver, and modification conditions for oil and gas stipulations are described under the *Oil and Gas Leasing Stipulations* in *Appendix C*.

(4) Raptor Nests

Within one-fourth mile of bald eagle nests, the following uses would not be permitted from April 1 to August 31: a) surface disturbing activities, or b) FLPMA leases or permits. Aircraft associated with permitted activities would maintain an altitude of 1,000 feet within one-half mile of documented eagle nests. Appropriate buffers around other raptor nests would be determined based on site-specific analysis. For oil and gas activities, areas within one-fourth mile of bald eagle nests would be closed to drilling, pipeline construction, road construction, or construction of permanent facilities from April 1 to August 31.

(5) Sensitive Status Species

Procedures outlined in *Required Operating Procedures in Appendix C* would be followed for species with special statuses (i.e., threatened, endangered, or Sensitive Status Species).

(6) Mountain Goats and Dall Sheep

In critical mountain goat and Dall sheep, helicopters used in support of permitted activities would maintain one-half mile horizontal and 1,500 foot vertical distance from goats or sheep. Heli-ski landings or skiing is not permitted in mountain goat or Dall sheep critical ranges, as identified based on ADF&G maps and refined by monitoring. For oil and gas activities, no surface disturbance would occur on slopes greater than 25 percent.

(7) Trumpeter Swans

Within one-fourth mile of the shores of waterbodies that contain trumpeter swan nests, the following uses would not be permitted from May 1 to August 31: a) ground disturbance or surface use exceeding 14 days, b) FLPMA leases, c) FLPMA permits where surface use exceeds 14 days, or d) overland access to permitted activities. Exceptions may be granted for mining operations on a site-specific basis where no feasible alternative exists and where mitigation measures can be identified to minimize impacts. The same areas would be closed to oil and gas drilling, pipeline construction, road construction, or construction of permanent facilities.

(8) Fish and Fish Habitat

Measures identified in *Appendix C: Required Operating Procedures* would be used based on site-specific analysis. They include the following: a) no exploratory oil and gas drilling, oil and gas roads, well pads, and other permanent facilities within 500 feet of fish-bearing rivers and lakes; and b) general guidelines for road or trail crossings. For casual use, such as use of OHVs, anadromous stream crossings would be permitted by Alaska Department of Natural Resources.

(9) Riparian Areas and Water Quality

Measures identified in *Appendix C: Required Operating Procedures* would be used, dependent on site-specific analysis. These measures include guidelines to maintain proper functioning condition of riparian areas and specific measures for mining, mineral material development, and oil and gas activities.

(10) Wetlands

The following measures are identified: a) Utilize winter access whenever possible and avoid road or trail construction in wetlands; b) in snow-free months, if wetlands cannot be avoided, low ground pressure vehicles would be used wherever possible; and c) all activities would comply with Federal and State permit requirements for alteration of wetlands.

(11) Soils and Vegetation

Protective measures for permitted activities are described in *Appendix C: Required Operating Procedures* and include guidelines for mining, revegetation, oil and gas exploration and development, vegetation treatment, road construction, and other permitted activities. Casual use of OHVs is only limited within the Delta and Gulkana Wild and Scenic River corridors and TLAD.

(12) Cultural Resources

Within TLAD, trails are designated to avoid cultural sites and mitigation is identified for other projects. Outside of TLAD, compliance with Section 106 of the National Historic Preservation Act is also required for project proposals. When a proposed, discretionary land use has the potential for affecting the characteristics that qualify as cultural property for the National Register of Historic Places, mitigation would be considered.

(13) Bering Glacier Area

This area would be open for locatable and leasable mineral development, but under seasonal restrictions to protect identified resource values. Site-specific restrictions are to be determined based on the nature and duration of the specific activity. *Appendix C: Required Operating Procedures* would be applied to all permitted activities, and the *Oil and Gas Leasing Stipulations* also found in *Appendix C* would apply to oil and gas leases in the area.

(14) Visual Resources

Visual Resource Management (VRM) classes would be established as shown on Map 15, page 107. VRM Classes were established using the process described in *Chapter III, Issue 3: Natural and Cultural Resources, Visual Resources*. VRM classes would be Class II for the Delta and Gulkana Wild and Scenic River corridors to protect the

viewshed while still allowing for some management activities. The Denali Highway viewshed, the Bering Glacier, and the viewshed from the Richardson Highway where resource development is possible but some protection of the visual resources is important would all be designated as Class III. All other areas would be designated as Class IV.

(15) Invasive Plant Species

As identified in *Appendix C: Required Operating Procedures*: a) burn plans for prescribed burning would address invasive species (any known occurrences, post-burn monitoring, or treatment); and b) equipment used for timber sales would be inspected prior to use on the sale, especially if contractor is from outside the Copper River Basin.

(16) Delta WSR Corridor Area

Existing ANCSA (d)(1) withdrawals in the scenic and recreational portions of the river corridor would be revoked to allow for mineral exploration and development. New roads would be permitted within the scenic and recreational portions of the river corridor, with locations and construction techniques selected to minimize adverse effects on the values for which the river was established.

e) Alternative C

This alternative emphasizes resource conservation. In addition to the measures in *Appendix C: Required Operating Procedures* described under Alternative B, the following are proposed by each resource category identified:

(1) Delta Bison Calving Area

See Map 10 on page 101. The bison calving range would be established as an ACEC to include 19,000 acres, all of which is unencumbered BLM lands. In addition to the measures described in *Appendix C: Required Operating Procedures*, measures identified within the ACEC to protect calving bison or bison habitat would include the following: 1) OHVs would be limited to designated trails from April 15 to October 15; 2) the area would be closed to mineral leasing through extension of existing withdrawal; 3) the area would be recommended for withdrawal from locatable mineral entry; 4) the area would not be available for FLPMA leases or FLPMA 302 permits; 5) no military permits would be issued; 6) no new roads or airstrips would be constructed; 7) ROWs would be avoided; and 8) no new mineral material sites would be permitted.

(2) Nelchina Caribou Calving Area

See Map 11 on page 102. The Nelchina caribou calving range would be established as an ACEC to include 389,000 acres, the majority of which are State-selected lands. In

addition to the measures described in *Appendix C: Required Operating Procedures*, management identified within the ACEC to protect calving caribou or caribou habitat would include the following: 1) OHVs would be limited to designated trails; 2) no new roads or airstrips would be constructed; 3) the area would be closed to all mineral entry by maintaining existing withdrawals; 4) no new mineral material sites would be permitted; 5) no FLPMA leases or FLPMA 302 permits would be allowed; 6) the area would be a ROW avoidance area; 7) no military permits would be issued; and 8) no prescribed fire would be permitted from May 1 to June 15.

(3) Moose Winter Range

In addition to measures described in *Appendix C: Required Operating Procedures*, management identified to protect moose winter range would include: 1) defined moose winter range open to mineral leasing would be subject to No Surface Occupancy (no placement of permanent oil and gas facilities); 2) within the Alphabet Hills/West Fork Gulkana area, this alternative would recommend maintenance of PLO 6329, which did not open approximately 700,000 acres to locatable mineral entry; and 3) only prescribed and wildland fire would be utilized to accomplish moose winter range habitat improvement, not forestry practices.

(4) Raptor Nests

In addition to measures described in *Appendix C: Required Operating Procedures*, management identified to protect raptor nests would include: 1) mineral leases would stipulate No Surface Occupancy within one-fourth mile of historically active bald eagle nest sites; and 2) areas within one-fourth mile of bald eagle nests would be unsuitable for surface mining of coal.

(5) Sensitive Status Species

Same as for Alternative B.

(6) Mountain Goats and Dall Sheep

Same as for Alternative B.

(7) Trumpeter Swans

See Map 12 on page 103. The West Fork ACEC would be designated, including 490,000 acres of predominantly State-selected lands. In addition to measures described in *Appendix C: Required Operating Procedures*, management identified within the ACEC to protect trumpeter swan habitat would include the following: 1) the area would be closed to mineral leasing or locatable mineral entry; 2) no new roads or airstrips would be constructed; 3) OHVs would be limited to designated trails, which would avoid swan habitat; 4) FLPMA leases and FLPMA 302 permits would not be

permitted; 5) ROWs would be avoided; and 6) permits for military activities would not be allowed.

For all other lands outside the West Fork ACEC, all primary trumpeter swan breeding habitat, displayed on Map 14, would have a No Surface Occupancy stipulation for oil and gas leasing, and the areas would be unsuitable for surface mining of coal.

(8) Fish and Fish Habitat

In addition to measures identified in *Appendix C: Required Operating Procedures*, Alternative C identifies several areas as limited to OHVs (see *Issue 1: Travel Management* on page 44). Designated trails within these areas would be selected to minimize vegetation, soil, and water impacts, particularly on stream and river approaches, to minimize sedimentation into streams and rivers. In addition, withdrawals against mineral leasing or locatable mineral entry would be maintained in the Nelchina and West Fork ACECs, the Tiekel, Gulkana, and Delta SRMAs, and the entire Bering Glacier RNA.

(9) Riparian Areas and Water Quality

Same as for Alternative B for specific measures, but more areas would remain withdrawn from mineral leasing and locatable mineral entry. In addition, most areas would be “limited” to OHVs, with trails designated to minimize sedimentation into riparian areas.

(10) Wetlands

Same as for Alternative B for specific measures. Alternative C also adopts the West Fork ACEC and the Bering Glacier RNA, both of which maintain mineral withdrawals in wetlands.

(11) Soils and Vegetation

This alternative limits OHV use on most BLM-managed lands to designated trails. The goal of trail designation in OHV limited areas is to minimize rutting, braiding, thermal erosion, and vegetation impacts associated with braided trails. This would be accomplished through the relocation of some segments of trails, hardening, vehicle class restrictions, and water drainage installation. In addition, Alternative C identifies more areas through ACEC and RNA designation where mineral development would be prohibited.

(12) Cultural Resources

Same as for Alternative B, but development activities that might potentially affect cultural resources would be more limited under this alternative.

(13) Bering Glacier Area

See Map 13 on page 104. This alternative would designate the Bering Glacier and surrounding area, consisting of 940,000 acres of unencumbered BLM and State-selected land, as an RNA. Management objectives for the area would be as follows:

- Protect habitats associated with the glacial environment and the retreating glacier in order to continue to provide opportunities for research.
- Protect wetlands that provide important habitat for migrating birds.
- Manage to continue to provide a primitive recreation experience.
- Conduct research activities in a manner that is least obtrusive to the area.
- Manage to protect anadromous fisheries habitat to support continued, long term subsistence use.

Measures to protect unique ecological values associated with glacier and glacier forelands include: 1) OHVs limited to designated trails to protect nesting waterfowl and nunataks; 2) no new road or airstrip construction; 3) withdrawal against mineral leasing or locatable mineral entry maintained; 4) no FLPMA leases or 302 permits unless associated with research activities; and 5) visitor use limits developed for Special Recreation Permits in the area, and no heli-recreation activities would be permitted.

(14) Visual Resources

VRM classes would be established as shown on Map 16, page 109. VRM classes would be Class I for the Gulkana and Delta Wild and Scenic River corridors, the Bering Glacier, and the Denali Highway viewshed to protect the natural landscape setting in these areas. Class II would be assigned to all foreground and middleground viewsheds from the Richardson and Glenn Highways, the TLAD, the Gulkana and Delta Wild and Scenic River corridors, and the West Fork ACEC to protect the viewshed but still allow for enhancement projects along the roads where development activities would occur. Class III would be assigned to the area between the Richardson, the Edgerton Highways, and the Copper River. Class IV would be assigned to all other areas.

(15) Invasive Plant Species

Same as for Alternative B. In addition, OHV limitations would minimize the potential spread of invasive species.

(16) Delta WSR Corridor Area

All existing withdrawals within the corridor would be maintained and 16,000 acres in the scenic portion that are currently open to locatable mineral entry would be recommended for withdrawal. No new road construction would be permitted.

f) Alternative D – Proposed RMP

Under this alternative, constraints to protect resources would be implemented, but would be less restrictive than under Alternative C.

(1) *Delta Bison Calving Area*

See Map 10 on page 101. This alternative would not designate this area as an ACEC, but a cooperative Habitat Management Plan would be developed with ADF&G for the area identified under Alternative C. In addition to those measures described in *Appendix C: Required Operating Procedures*, the following would apply to this area: 1) OHVs would be limited to designated trails from May 1 to June 15; 2) road construction would be permitted for resource development, but activity would be restricted from May 1 to June 15; and 4) maintain existing withdrawals against mineral leasing and locatable mineral entry (a portion of the area is currently open to locatable entry and would remain open).

(2) *Nelchina Caribou Calving Area*

No ACEC would be designated for this area. This area is predominantly State-selected. OHVs in this area would be limited to existing trails; otherwise, specific measures are the same as described under Alternative B.

(3) *Moose Winter Range*

Same as for Alternative B. In addition, moose winter range would be considered unsuitable for surface mining of coal.

(4) *Raptor Nests*

Same as for Alternative B.

(5) *Sensitive Status Species*

Same as for Alternative B.

(6) *Mountain Goats and Dall Sheep*

Same as for Alternative B for specific measures. However, some areas are identified as not available to helicopter-supported commercial activities (Delta Range Area and Bering Glacier Area).

(7) Trumpeter Swans

No ACEC would be designated for the area described in Alternative C. Interim management includes measures that would be the same as described in Alternative B. In addition, OHVs would be limited to existing trails.

For lands retained in long-term Federal ownership within the West Fork area, the measures listed in *Appendix C: Required Operating Procedures* would apply as well as the following: 1) OHVs would be limited to designated trails, which would be located to avoid trumpeter swan disturbance; 2) road construction would be permitted if necessary for resource development, subject to seasonal restrictions; temporary and winter roads would be utilized whenever possible; 3) the area would be open to mineral leasing, with seasonal stipulations as described in *Oil and Gas Stipulations* in *Appendix C*; 4) the area would be unacceptable for surface mining of coal; 5) there would be no mineral material development; and 6) the area would be a ROW avoidance area, overhead powerlines would be avoided in general, but not allowed in primary trumpeter swan breeding habitat.

(8) Fish and Fish Habitat

Alternative D designates most areas as “limited” to OHVs (see *Issue 1: Travel Management* narrative on page 49 or Table 3. Designated trails within these areas are chosen to minimize vegetation, soil, and water impacts, particularly on stream and river approaches to minimize sedimentation into streams and rivers. In addition, Alternative D maintains withdrawals against mineral leasing and locatable entry in the Wild and Scenic River corridors and in the western two-thirds of the Bering RNA, all containing important habitat for fish. Otherwise, specific measures for permitted activities are as described in Alternative B for *Required Operating Procedures*.

(9) Riparian Areas and Water Quality

Same as for Alternative B, but, in addition, withdrawals against mineral leasing or locatable mineral entry are maintained in the Wild and Scenic River corridors and the western two-thirds of the Bering RNA. OHV trails designated under Alternative D are located to minimize impacts to riparian areas and water quality.

(10) Wetlands

Same as for Alternative B. Designation of the Bering Glacier RNA protects some wetlands and waterfowl habitat associated with the area.

(11) Soils and Vegetation

Alternative D designates most BLM-managed lands as “limited” to OHVs. In areas with designated trails, designation is aimed at minimizing impacts to soil and vegetation through rerouting, hardening, size limitations, or seasonal restrictions. In other areas,

OHVs are limited to existing trails to prevent unmanaged proliferation of trails and associated impacts to soils and vegetation. Alternative D adopts measures for protection of soils and vegetation described in *Appendix C: Required Operating Procedures* and in *Oil and Gas Leasing Stipulations*.

(12) Cultural Resources

Same as for Alternative B.

(13) Bering Glacier Area

See Map 13 on page 104. This alternative would designate only unencumbered BLM lands in the Bering Glacier area (827,000 acres) as an RNA, with measures and objectives as described under Alternative C on page 93, except road or airstrip construction would be permitted if consistent with protection of values identified, and the western two-thirds of the area would remain withdrawn from mineral leasing or locatable mineral entry. The Bering Glacier RNA will not preclude use by ADF&G for facilities for wildlife or fisheries management purposes.

(14) Visual Resources

VRM classes would be assigned as shown on Map 17 on page 111. Map 17 represents the current VRM Class Inventory for lands within the planning area. Class I would be assigned to the Delta and Gulkana Wild and Scenic River corridors to protect the natural landscape setting. Class II would occur along the Richardson Highway through the Alaska Range, along the Denali Highway viewshed, the viewsheds of the Gulkana and Delta Wild and Scenic Rivers, and in the Bering Glacier area to protect the viewshed but still allow for projects along the roads where development activities might occur. Class III would be assigned along the Tielke corridor, other viewsheds from the Richardson and Glenn Highways, and in the West Fork area where resource development is possible but some protection of visual resources is important. Class IV would cover all other areas.

(15) Invasive Plant Species

Same as for Alternative C.

(16) Delta Wild and Scenic River

Current withdrawals against leasable mineral entry would be maintained in the scenic and recreational portions of the river corridor (existing under PLO 5150), and a withdrawal from locatable mineral location would be recommended for the scenic and recreational portions. Access to existing mining operations would be permitted in a manner that minimizes disturbance to the river and scenic resources. Consistent with section 1110 of ANILCA, new road construction in the scenic and recreational portions of the river corridor may be authorized if it is determined that there are no economically

feasible and prudent alternative routes and a determination is made that construction would be compatible with values for which the river was established.

Table 5 summarizes the preceding information.

Table 5. Natural and Cultural Resources – Alternative Summary

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Special Areas Considered	No ACECs or RNAs currently designated.	<p>No ACECs or RNAs proposed.</p> <p>Some measures identified to protect resource values within areas proposed under Alternatives C and D. See detailed alternative tables in Appendix B</p>	<p>Proposed ACECs: 898,000 acres (13%)</p> <p>Proposed RNA: 940,000 acres (13%)</p> <p>Total proposed: 1,838,000 acres (26%)</p> <p>The following would be designated:</p> <ol style="list-style-type: none"> Delta Bison Calving ACEC (19,000 acres) Unencumbered BLM land north of Summit Lake. Objectives: Protection of bison calving area and restoration or maintenance of habitat. Nelchina Caribou Calving ACEC (389,000 acres) Mostly State-selected lands south of Susitna River. Objectives: Protection of caribou calving area. West Fork ACEC (490,000 acres) Mostly State-selected lands adjacent to West Fork Gulkana. Objectives: Protection of trumpeter swan and waterfowl habitat and wetlands. Bering Glacier RNA (939,000 acres) Unencumbered BLM lands and adjacent selected lands around Bering Glacier. Objectives: Protect unique ecological values associated with glacier and glacier forelands; continue research opportunities in the least obtrusive manner; protect wetlands; maintain primitive recreation experience; protect anadromous fisheries habitat 	<p>Proposed RNA: 827,000 acres (12%)</p> <p>The following would be designated:</p> <ol style="list-style-type: none"> Bering Glacier RNA (827,000 acres) Unencumbered BLM lands. Objectives: Same as for Alternative C. <p>Some measures identified to protect resource values within other areas proposed under Alternative C. See narrative description or alternative tables in Appendix B for detail.</p> <p>If retained in long-term Federal ownership, some areas described under alternative C for West Fork and Nelchina Caribou Calving ACECs would be considered for ACEC designation.</p>

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Required Operating Procedures and Oil and Gas Stipulations	<p><i>Required Operation Procedures</i> described in <i>Appendix C</i> are common to all action alternatives. These procedures apply to all permitted activities on BLM-managed lands within the planning area.</p> <p><i>Oil and Gas Leasing Stipulations</i> described in <i>Appendix C</i> are common to all action alternatives. They apply to all oil and gas leasing that would occur on BLM-managed lands within the planning area.</p>			
Withdrawals	<p>ANCSA (d)(1) withdrawals are maintained in some alternatives in order to provide strong resource protection. These withdrawals (as applied to protection of special values) are described in the narrative above for each alternative. In addition, a summary of withdrawal recommendations is presented under <i>Issue 4: Lands and Realty, Withdrawal Review</i> on page 116.</p>			

Map 10. Delta Bison Calving ACEC - Alternative C

File size: 99 KB

File name: 10_deltaacec.pdf

Map size: 8.5x11

Map 11. Nelchina Caribou Calving ACEC - Alternative C

File size: 86 KB

File name: 11_nelchinaacec.pdf

Map size: 8.5x11

Map 12. West Fork ACEC - Alternative C

File size: 83 KB

File name: 12_westforkacec.pdf

Map size: 8.5x11

Map 13. Bering Glacier RNA - Alternatives C and D

File size: 102 KB

File name: 13_beingrna.pdf

Map size: 8.5x11

Map 14. Primary Trumpeter Swan Breeding Habitat

File size: 183 KB

File name: 14_ptsbh.pdf

Map size: 11x17

Map 15. VRM Classes - Alternative B

File size: 188 KB

File name: 15_vrmb.pdf

Map size: 11x17

Map 16. Visual Resource Management Classes - Alternative C

File size: 191 KB

File name: 16_vrmc.pdf

Map size: 11x17

Map 17. Visual Resource Management Classes - Alternative D

File size: 193 KB

File name: 17vrmd.pdf

Map size: 11x17

4. Issue 4: Lands and Realty

Issue Statement: Determine the appropriate mix of lands and realty actions needed to provide a balance between land use and resource protection. Establish conditions that would apply if the Slana settlement area is made available for disposal, considering the effects of disposal on the social and environmental conditions of the area.

a) Goals

- Support the BLM-Alaska State Office in the Alaska Conveyances which involve the survey and conveyance of lands to the State of Alaska, Native Corporations, Native Allottees, and other inholders.
- Provide a balance between land use (rights-of-way, land use permits, leases and sales) and resource protection that best serves the public at large.
- Provide support to other BLM programs to protect and enhance resources.

b) Management Common to All Action Alternatives

(1) Land Disposals

(a) Entitlement and Settlement

Provide support in the implementation and conveyance of lands pursuant to legislative mandates. These mandates include the Alaska Statehood Act, Alaska Native Claims Settlement Act, and the 1906 Native Allotment Act.

(b) Federal Land Policy and Management Act (FLPMA) Sec. 203

Public lands meeting one or more of the following criteria could be disposed of through FLPMA Section 203:

1. A tract that was acquired for a specific purpose and is no longer required for that or any other Federal purpose.
2. A tract whose disposal would serve important public objectives, including but not limited to, expansion of communities and economic development that cannot be achieved prudently or feasibly on other than public lands and that outweigh other public objectives and values, including but not limited to, recreation and scenic values, which would be maintaining such a tract in Federal ownership.
3. Such tract, because of its location or other characteristics is difficult and uneconomic to manage as part of the public lands and is not suitable for management by another Federal department or agency.

(c) Lands not to be disposed of

1. Lands withdrawn from the public land laws or segregated by State or Native selection.
2. Lands with mining claims of record under section 314 of FLPMA unless BLM policy is changed in the future to allow for their disposal.
3. Lands within the Delta and Gulkana Wild and Scenic River corridors.

(2) Other Disposals

(a) Recreation and Public Purposes (R&PP) Act

1. Lands identified for disposal under this authority that are selected by either the State or Native corporations would have to be fully adjudicated before the BLM would entertain a sale.
2. In most instances, the 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.
3. 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.
4. Existing leases shall be converted to patents if the lands are used for sanitary landfills.

(b) Act of August 1, 1956 Public Land Order (PLO 1613 Sales)

The BLM would continue to convey PLO 1613 lots to qualified applicants. PLO 1613 lots only exist along the Glenn, Richardson, and Tok Cut-off Highways.

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

Process airport conveyances as requested by the Federal Aviation Administration (FAA). Each conveyance shall contain appropriate covenants and reservation requested by the FAA. As a condition to each conveyance, the property interest conveyed shall 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.

(3) Exchanges

The BLM would strive to process mutually benefiting public interest land exchanges. Exchanges are authorized in Alaska by FLPMA, ANCSA, and ANILCA. When considering public interest, full consideration shall be given to efficient management of public lands and to secure important objectives including: protection of fish and wildlife, cultural resource, wilderness and aesthetic values, enhancement of recreational

opportunities, consolidation of mineral and timber holdings for more logical and efficient management expansion of communities, promotion of multiple use values, and fulfillment of public needs. Exchanges would not be actively sought out until State and Native entitlements are fulfilled.

(4) Acquisitions

Acquire private lands through purchase or exchange with willing owners within areas identified for long-term Federal management and retention and to further the programs of the Secretary, including access. When feasible, the BLM would acquire less than fee title to property if management goals could be achieved.

(5) Land Use Authorizations

(a) FLPMA Leases

All FLPMA leases would be at fair market value. No lease would be issued for the Wild and Scenic River corridors, unless for a purpose to maintain or enhance the outstandingly remarkable values. Cabins or permanent structures used for private recreation cannot be authorized under this authority. FLPMA lease proposals on selected lands would require the views from the Native Corporation to be considered on Native selected land and concurrence from the State on State selected lands. Proposals for leases for cabins for uses such as guiding or trapping would be subject to the following criteria:

- Proximity to other private property or existing authorized structures,
- Proximity to existing transportation routes or systems, and
- Documentation of customary lifestyle and need.

(b) R&PP Leases

Recreation and Public Purposes (R&PP) leases would not be issued for sanitary landfill purposes. Existing leases for sanitary landfill purposes may be converted to patents without a reverter clause. No lease would be issued for the Wild and Scenic River corridors. R&PP lease proposals on selected lands would require the views from the Native Corporation to be considered on Native selected land and concurrence from the State on State selected lands.

(c) Permits

Permits cover occupancy, use, or development of a site. Specific exclusion areas are described in the narrative below. In general:

- Cabin or permanent structure permits cannot be issued for private recreation purposes, and
- Trapping shelters would be authorized by short-term (three years maximum) Section 302 permits renewable at the discretion of BLM and tied to the applicant's customary lifestyle and need. Guide shelters would only be

authorized in conjunction with Special Recreation Permits issued under FLPMA authority. Criteria for consideration of issuance of such permits is the same as described above for cabin leases.

Regarding permits, selected lands would be treated as follows:

Native-selected: Prior to the issuance of 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.

State-selected: In accordance with 906(k) of ANILCA, the BLM must receive a letter of concurrence prior to issuance of any use authorization. The BLM may then incorporate comments in the terms and conditions of the use authorization if in compliance with Federal laws and regulations. If the State objects, the BLM would not issue the use authorization. If the proposal is on land that has been top-filed by the State, pursuant to 906(e) of ANILCA, a letter of concurrence is not required.

(d) Unauthorized Use

Trespass 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 on trespass cabins include:

1. Removal of the structure,
2. Relinquishment to the U.S. Government for management purposes, and
3. Authorization by lease or permit for legitimate uses if consistent with identified area objectives.

Under numbers 2 and 3 above, the criteria listed above for cabins under lease and permits would be used. Criteria for prioritizing unauthorized cases are as follows:

- Situations involving new trespass, 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, and
- Other selected lands.

(6) *Withdrawal Review*

Table 6 displays some of the withdrawals in the planning area, their segregative effect, and the recommendation under Alternatives B, C, and D. Under Alternative A, no withdrawal review would be conducted, thus all withdrawals would be maintained. A discussion of these withdrawals is also included in *Chapter III, Issue 4: Lands and Realty, Withdrawals*.

ANCSA (d)(1) withdrawals are a series of public land orders 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 was to limit appropriation of the lands in order to complete inventories of resources and assessment of values which would then allow for an orderly development of BLM's management objectives for present and future public needs. In the 1980's, studies and assessments were completed and opening orders were issued on some lands covered by ANCSA (d)(1) Withdrawals. No further actions have been done since that time and this land use planning process is now the means to assess resource values and make recommendations on opening lands withdrawn by the ANCSA (d)(1) orders. Table 7 displays the recommendations, by Alternative, for ANCSA (d)(1) Withdrawal maintenance or revocation.

c) 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 Alaska State Office in Alaska conveyances. No specific lands would be identified for disposal (including Slana). The program focus for Slana would be resolution of unauthorized use through trespass, and facilitation of right-of-way requests in the area for access to homesites and other infrastructure associated with settlement. No lands would specifically be identified for 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 be the case with other unauthorized uses, such as trespass cabins. Withdrawal review would not occur for ANCSA (d)(1) withdrawals or other smaller administrative withdrawals. Some uses would continue to be constrained by such withdrawals.

d) Alternative B

(1) *Land Disposals*

Slana: Lands in the Slana area (approximately 10,000 acres) would be available for disposal to the public at large by competitive or modified bidding procedures.

Other disposals: Isolated, unmanageable tracts resulting from highway realignment along the Richardson and Glenn Highways would be made available for disposal.

Exchanges: No exchanges would take place until all Native and State entitlements are met. Afterwards, exchanges would be considered in the Chistochina-Slana, Tiekel, and Denali planning regions.

(2) *Acquisitions*

No areas are identified for acquisition.

Table 6. Summary of Withdrawals and Recommendations under Alternatives B, C, and D

Withdrawal Type	Acres Withdrawn	Department	Segregative Effect	Recommendation
Lighthouse Reserves	3,286	US Coast Guard	Closed to settlement, location, sale, entry, or other disposition.	Maintain until administration can be transferred to another agency.
Air Navigation Sites	1,402	BLM & FAA	Closed to settlement, location, sale, entry or other disposition, including State selection.	Maintain until FAA deems them no longer necessary.
Administrative Site	48	BLM	Closed to public land laws including State selection, the mining laws and mineral entry	Maintain.
Recreational Withdrawals	4,413	BLM	Closed to all forms of appropriation under the public land laws, including mining, but not the mineral leasing laws.	Maintain withdrawals.
Recreational Withdrawal	15	DOD	Withdrawn from all forms of appropriation under the public land laws, mining, but not the mineral leasing laws nor disposal of materials under the act of July 31, 1947.	Maintain withdrawals.
Military Withdrawal (Black Rapids Training Sites)	2,795	DOD	Withdrawn from all forms of appropriation under the public land laws, mining, but not the mineral leasing laws nor disposal of materials under the act of July 31, 1947.	Maintain.
AK Railroad Withdrawals	5,006	AKRR	Closed to public land laws including State selection, the mining laws and mineral leasing laws.	Maintain.
Power Site Classifications (PSC)	105,225	BLM	Closed to public land laws, including State selection but not ANCSA entitlement; open to mineral location (subject to regulations in 43 CFR 3731); and open to mineral leasing.	Maintain.
Power Projects	42,112	AEA & FERC	Power Project W/D are Closed to public land laws, including State selection and open to mineral location (subject to regulation in 43 CFR 3731), in the application State. Upon issuance of a preliminary permit or license by FERC they are closed to mineral location. It is open to mineral leasing throughout.	Maintain.

Note: The recommendations in Table 6 only apply to the action alternatives (Alternatives B, C, and D). Alternative A would not have a withdrawal review; therefore, all existing withdrawals would be maintained.

(3) Rights-of-Way

No areas would be identified for ROW avoidance or exclusion. Granting of ROWs would be subject to the *Required Operating Procedures* in Appendix C.

(4) FLPMA and R&PP Leases

No areas would be identified for lease avoidance or exclusion.

(5) FLPMA Sec. 302 Permits

No areas would be identified for permit avoidance or exclusion; permits would be subject to the measures identified in *Appendix C: Required Operating Procedures*.

(6) Withdrawals

ANCSA (d)(1) Withdrawals: With the exception of the ANILCA-designated wild portions of the Delta and Gulkana Wild and Scenic Rivers, all ANCSA (d)(1) withdrawals would be revoked.

Transportation and Utility Corridor Withdrawals: PLO 5150 would be revoked, allowing for the conveyance of the transportation and utility corridor to the State of Alaska. Map 44 in Chapter III in the *Issue 4: Lands and Realty, Transportation and Utility Corridor* section shows the location of the transportation and utility corridor. This action is considered to respond to a request by the Governor. Based on comments submitted to this planning process, the State feels that state ownership of the corridor is appropriate. They feel that federal retention of the corridor is no longer necessary and that it makes for inefficient management of scattered land tracts.

e) Alternative C

(1) Land Disposals

Slana: No disposals would occur other than resolution of failed claims in the existing settlement area.

Other disposals: No other areas or tracts of land would be identified for disposal.

Exchanges: No exchanges would be considered until all State and Native entitlements are met. No exchanges would be considered that would result in a net loss of Federal land.

(2) Acquisitions

The following would be considered emphasis areas for acquisitions: 1) West Fork Gulkana ACEC; 2) Delta River SRMA; 3) Denali Highway SRMA; 4) Gulkana River SRMA; 5) Tielke SRMA; and 6) Bering Glacier RNA.

(3) Rights-of-Way

For the protection of specific resource values, no ROWs would be permitted in the following areas: 1) Delta River SRMA; 2) Denali Highway SRMA; 3) Gulkana River SRMA; 4) Tielke SRMA (except within the transportation and utility corridor); and 5) the Bering Glacier RNA. The following would be ROW avoidance areas: 1) Delta Bison Calving ACEC; 2) Nelchina Caribou Calving ACEC; and 3) West Fork ACEC.

(4) FLPMA and R&PP Leases

No leases would be considered in the following areas: 1) Delta Bison Calving ACEC; 2) Nelchina Caribou Calving ACEC; 3) West Fork ACEC; 4) Denali Highway SRMA; 5) Gulkana River SRMA; 6) Tielke SRMA; and 7) Bering Glacier RNA.

(5) FLPMA Sec. 302 Permits

No permits would be issued for the following areas: 1) Delta Bison Calving ACEC; 2) Nelchina Caribou Calving ACEC; 3) Delta River SRMA; 4) Denali Highway SRMA; 5) Gulkana River SRMA; and 6) Tielke SRMA. In the Bering Glacier RNA, permits associated with research activities would be allowed. In the West Fork ACEC, no new occupancy permits (cabins) would be issued. Other (non-occupancy) permits would be considered, consistent with protection of values identified for the area.

(6) Withdrawals

ANCSA (d)(1) Withdrawals: The following areas and associated withdrawals would be maintained: 1) scenic and recreational portions of the Delta Wild and Scenic River corridor (PLOs 5180 and 5150); 2) the Bering Glacier RNA (PLO 5179); 3) wild portions of the ANILCA-designated Delta and Gulkana Wild and Scenic River corridors; 4) inner and outer transportation and utility corridor (PLO 5150); 5) PLO 5179 that provides the “outer corridor” on the Gulkana Wild and Scenic River; and 6) the Nelchina Caribou Calving ACEC (PLO 5174). In addition, the following areas would be recommended for withdrawal: 1) Recommend closure of 16,000 acres within the scenic portion of the Delta Wild and Scenic River corridor to prohibit mineral entry under the mining laws; and 2) recommend closing the Denali SRMA from locatable mineral entry.

This alternative would maintain withdrawals against leasable and locatable minerals on approximately 2,888,000 acres.

Transportation and Utility Corridor Withdrawals: Recommend closure of the outer corridor to locatable mineral entry. Map 44 in Chapter III in the *Issue 4: Lands and Realty, Transportation and Utility Corridor* section shows the location of the transportation and utility corridor.

f) **Alternative D – Proposed RMP**

(1) Land Disposals

Slana: All lands within the Slana settlement area (approximately 10,000 acres) would be available for FLPMA Sec. 203 disposal, under the following priority:

1. Lands would be sold non-competitively to the claimant where the lands contain improvements that are still owned, occupied, or used by the claimant.
2. Lands may be sold with a preference right to a failed claimant where improvements exist that are owned but no longer used by the failed claimant.
3. The remaining lands may be disposed of at the discretion of the Glennallen Field Office, in close consultation with the community of Slana and Ahtna, Inc.. Further disposals would be used to consolidate land patterns or provide lands for community infrastructure. Disposal to the general public at large by competitive or modified competitive bid will not be considered.

Steps one and two are targeted at resolving unauthorized use on failed claims.

Other disposals: Isolated, unmanageable tracts resulting from highway realignment along the Richardson and Glenn Highways would be made available for disposal.

Exchanges: No exchanges would take place until all Native and State entitlements are met. Afterwards, exchanges would be considered in the Chistochina/Slana, Tiekkel, and Denali planning regions. Exchanges would be considered to consolidate scattered parcels to facilitate Federal subsistence management.

(2) Acquisitions

The following would be identified as emphasis areas for acquisitions: 1) Delta River SRMA; 2) Gulkana River SRMA; 3) Bering Glacier RNA; and 4) Denali Highway, if lands in the area are retained in long-term Federal ownership.

(3) Rights-of-Way

The following areas would be identified as ROW avoidance areas: 1) West Fork area, no overhead powerlines permitted in primary trumpeter swan habitat; 2) Delta River SRMA; 3) Gulkana River SRMA; and 4) Bering Glacier RNA. ROWs would be permitted within the Delta bison calving area and Nelchina caribou calving area, subject to seasonal constraints. ROWs permitted within the Denali Highway area would give

special consideration to minimizing impacts to the viewshed. Within the Delta River SRMA and the Gulkana River SRMA, applications for transportation and utility systems would be evaluated consistent with Title XI of ANILCA.

The Slana settlement area has been identified as an area where the need for future rights-of-way will be necessary, to access homesites and to provide for community infrastructure.

(4) FLPMA and R&PP Leases

No leases would be permitted within the Gulkana or Delta Wild and Scenic River corridors. Within the following areas, leases would be permitted only if consistent with protection of values identified for the area: 1) Nelchina caribou calving area; 2) West Fork area; 3) Denali Highway area; and 4) Bering Glacier RNA.

(5) FLPMA Sec. 302 Permits

Within the Delta bison calving area, the Nelchina caribou calving area, West Fork area, Delta River SRMA, Denali Highway area, Gulkana River SRMA, Tiekel SRMA, and Bering Glacier RNA, occupancy type permits, such as commercial use cabins, would be authorized only under the following conditions:

- No new permanent structures would be built within the area.
- Existing structures would be authorized only if they can clearly be tied to a commercial enterprise such as guiding or trapping.

Other (non-occupancy) permits would be authorized in these areas if consistent with protection of the values or objectives identified for the area.

(6) Withdrawals

ANCSA (d)(1) Withdrawals: The following withdrawals would be maintained: 1) Scenic and recreational portions of the Delta Wild and Scenic river corridor (portions of PLOs 5180 and 5150); 2) the western two-thirds of the Bering Glacier RNA; 3) ANILCA withdrawals within wild portions of the Delta and Gulkana Wild and Scenic Rivers; 4) PLO 5150 for the inner and outer transportation and utility corridor, except for that portion north of Paxson through which the pipeline does not run; and 5) existing withdrawals in the Slana settlement area.

In addition, the following withdrawal would be recommended: Recommend a closure on 16,000 acres within the scenic portion of the Delta Wild and Scenic River corridor to prohibit mineral entry under the mining laws. Alternative D would also recommend modification of ANCSA (d)(1) withdrawals to allow for locatable mineral entry in approximately 700,000 acres in the area around the Alphabet Hills.

Alternative D would maintain withdrawals on approximately 1,110,000 acres.

Transportation and Utility Corridor Withdrawals: This alternative would maintain most the existing withdrawals on the transportation and utility corridor. However, PLO 5150 would be modified to allow for 83,000 acres to be conveyed to the State. These lands include the Gunn Creek segment which is northeast of Paxson, and approximately 59,000 acres north of Paxson and west of the Delta river (see Map 18). This modification would allow for conveyance of approximately 18 percent of the Transportation and Utility corridor lands currently managed by BLM in this planning area. No inner corridor lands would be made available for conveyance under this alternative. Conveyance of these lands to the State would remove them from lands available for federal subsistence hunting. See Chapter 4 for an analysis of the effects of this action.

Table 7 summarizes the preceding information.

Table 7. Lands and Realty – Alternative Summary

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Slana disposal	No disposals would occur other than resolution of failed claims.	Lands would be available for disposal to public at large by competitive or modified bidding procedures.	Same as A.	All lands within the Slana settlement would be available for FLPMA Sec 203 disposal, under the following scenarios: <ol style="list-style-type: none"> 1. May be sold non-competitively to the claimant where the lands contain improvements which are still owned, occupied or used by the claimant. 2. Lands may be sold with a preference right to a failed claimant where improvements exist which are owned but no longer used by the failed claimant. 3. Remaining lands can be disposed on at the discretion of the Glennallen Field Office in close consultation with the affected communities with goals to provide infrastructure and consolidate land management. Disposal to the public at large by competitive bid will not be considered.
Acquisition	Wild and Scenic River corridors currently emphasized for acquisition opportunities.	BLM would not pursue any acquisitions.	The following would be emphasis areas for acquisition: 1) WSR corridors; 2) West Fork ACEC; 3) Denali Highway SRMA; 4) Tielke SRMA; and 5) Bering RNA.	With landowner's cooperation, acquire private inholdings within the following areas: <ol style="list-style-type: none"> 1. WSR corridors 2. Bering Glacier RNA. 3. Denali Highway, if lands are retained in long-term Federal ownership.

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Other FLPMA disposals	No lands currently identified for disposal.	Same as D.	No lands would be made available for disposal.	Specific tracts identified based on criteria outlined in <i>Management Guidance Common to all Alternatives</i> . Include isolated, unmanageable tracts resulting from highway re-alignment.
WITHDRAWALS				
ANCSA (d)(1) Withdrawals	All ANCSA (d)(1) withdrawals are in place, as modified by the subsequent PLOs.	Revoke all ANCSA (d)(1) withdrawals, except within the wild segments of the Delta and Gulkana WSR corridors.	In addition to those identified in Alternative D, the following ANCSA (d)(1) withdrawals would be maintained against mineral leasing and locatable mineral entry: <ol style="list-style-type: none"> 1. PLO 5179 which provides the "outer corridor" on the Gulkana W&SR; 2. ANCSA (d)(1) withdrawal within the Nelchina ACEC. In addition, the following would be recommended: <ol style="list-style-type: none"> 1. Recommend withdrawal of Denali SRMA to leasable minerals and mineral entry. 	Recommend maintenance of the following ANCSA (d)(1) withdrawals: <ol style="list-style-type: none"> 1. Scenic and recreational portions of the Delta WSR corridor (PLOs 5180 and 5150); 2. PLO 5179 in western 2/3 of Bering RNA. 3. ANILCA withdrawals within Wild portions of the Delta and Gulkana would be maintained. 4. Eighty-two percent of PLO 5150 for the inner and outer transportation and utility corridor. All other ANCSA (d)(1) withdrawals applicable to BLM-managed lands within the planning area would be recommended for revocation. In addition, the following withdrawal would be recommended: 16,000 acres within the scenic portion of the Delta WSR corridor to prohibit mineral entry under the mining laws. The following recommendation would occur: Allow locatable mineral entry in 700,000 acres in the Alphabet Hills area.

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
PLO 5150 (transportation and utility corridor)	PLO 5150 currently maintained for use as transportation and utility corridor. This unencumbered BLM land provides the majority of the Federal subsistence hunting area.	Revoke PLO 5150 to allow for mineral entry (leasing and locatable) and to allow for State conveyance.	Modify PLO 5150 to exclude metalliferous metals.	Recommend maintenance of most of PLO 5150 (as amended to include 5151), with one exception: modify to allow disposal of scattered, unmanageable parcels created by re-alignment of Richardson Highway, subject to site-specific analysis. In addition, the PLO would be modified to allow State conveyance of 83,000 acres north of Paxson.

Map 18. Revocations of Portions of PLO 5150 – Alternative D

File size: 108 KB

File name: 18_plo51550.pdf

Map size: 8.5x11

5. *Issue 5: Vegetation Management*

Issue Statement: Manage vegetation to provide for forest health, personal and commercial wood products, and fish and wildlife habitat. Determine what role fire will play in vegetation management.

a) **Goals**

Wildlife habitat and forestry:

- Maintain and restore the health, productivity, and biological diversity of forest and woodland ecosystems.
- Consistent with other resource values, provide personal use wood products for local consumption and opportunities for commercial harvests.
- Manage wildlife habitat to ensure wildlife productivity, consistent with State of Alaska wildlife management objectives.
- Maintain and restore big game and upland game habitat to sustain or increase wildlife populations.

Fire management:

- Protect human life and property.
- Use wildland fire and fuel treatments to meet land use and 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.

b) **Management Common to All Alternatives**

(1) *Inventory and Monitoring*

These monitoring/assessment projects would be common to all action alternatives (Alternatives B, C, and D).

- **Wildlife:** Conduct detailed condition assessments of crucial caribou habitats. Monitor fire (prescribed and wildland) in caribou habitat with focus on effects to lichen and overall quality of caribou habitat.
- **Wildlife:** In cooperation with ADF&G, evaluate current condition of bison calving range on Delta River. Collect information regarding desired conditions within critical habitats.
- **Forestry:** Forest inventory would be conducted (coordinate with State of Alaska to prevent duplication of efforts) to determine location and volume of commercial forest products. Priority for inventory efforts would be those areas identified under *Management Areas* in Table 8. Vegetation Management - Alternative

Summary. Old growth forest stands would be identified as a part of any inventory effort.

(2) Fire and Fuels Management

Management of the wildland fire and fuels program would focus on maintaining the key ecosystem components of vegetation composition and structure intact and functioning within their historical range. Fire management choices recognize fire is an essential ecological process and natural change agent of Alaskan ecosystems and provide for the protection of human life and site-specific values. Wildland fire and prescribed fire would be used to achieve habitat improvement objectives or desired conditions as described in alternative narrative descriptions below. Fire suppression classes are assessed on an annual basis by an interagency team and changes are made based on resource objectives or other factors. “Indicators” for changes in suppression classes are described in alternative narratives below. All actions proposed are consistent with guidance set forth in the Final Land Use Plan Amendment and EA for Wildland Fire and Fuels Management for Alaska which was signed in July 2005 (BLM 2005c).

(3) Grazing

Any livestock grazing within the project area is subject to permitting processes conforming with special recreation use permits and is subject to practices described in *Required Operating Procedures*.

(4) Land Use Requirements

All vegetation management practices would be conducted consistent with guidelines described in *Required Operating Procedures*.

(5) Desired Conditions

- **Timber stands managed for commercial production of white spruce:** These stands occur on floodplains and alluvial terraces on well-drained soils. These stands would be managed to maintain white spruce as the dominant tree species, which may require thinning to minimize early seral competition from other species. Bark beetle-kill trees within these stands would be salvaged where possible as firewood or house logs.
- **Timber stands managed for improvement of wildlife habitat:** In mixed white spruce-aspen/poplar/birch stands where wildlife habitat improvement is the primary objective, desired condition would be maintenance of white spruce with a component of aspen, balsam poplar, or paper birch. These stands would have shrub-dominated early seral stages after harvest, a wildland or prescribed fire, or mechanical treatment of mature or bark beetle-kill white spruce.
- **Moose habitat:** Desired condition is a mosaic pattern of upland spruce woodland cover types interspersed with a lower seral expression dominated by

alder and willow. Upland woodland cover types are mixed with stream terraces and flood plains dominated by sedge and mixed age classes of alder and willow.

- **Caribou habitat:** Summer range would be similar to the description for moose habitat. For caribou winter range, desired condition is uplands spruce woodland cover type where lichen and various herbs dominate the ground layer.
- **Bison calving area:** Delta floodplain, grass-dominated plant communities interspersed with scattered pockets of cottonwood, white spruce, and balsam poplar.
- **Dall sheep and mountain goat habitat:** Open high elevation grass and forb-dominated plant communities with a minor shrub or tree component.

c) Alternative A

Guidance for vegetation management is provided in the Southcentral MFP but is very general in nature. It calls for management to enhance critical moose habitat and custodial forestry management until economic conditions are more favorable for harvest. The Glennallen Field Office has identified a large prescribed burn unit in the Alphabet Hills with the primary objective of moose habitat improvement. In 2004, the BLM, in cooperation with State DNR and ADF&G, conducted a prescribed burn in the area that covered approximately 40,000 acres, all within the prescribed unit. Portions of the unit that were not burned would be targeted in future years. A wildland fire may also be used to meet this objective. Some commercial timber sales have occurred, most focused on salvage of bark beetle-kill white spruce. The Glennallen Field Office averages approximately 40 acres per year in commercial sales. Permits are issued for personal and commercial firewood.

d) Alternative B

(1) Forestry Products

This alternative would take an aggressive approach at salvage of bark beetle-kill spruce on approximately 360,000 acres on BLM-managed lands within the Tielke planning region. For the purposes of this analysis, this alternative assumes timber harvest at a rate of 100 - 200 acres per year. Where necessary, timber sale contracts would authorize construction of temporary roads to access timber sales. Where compatible with other resource objectives, retention of temporary roads would be considered. Personal use and commercial firewood permits would continue to be issued. In addition, the BLM would work with Native corporations or village corporations to identify specific areas on Native- or dual-selected lands where public-use firewood areas could be designated. These areas would be located to reduce hazardous fuels. Wildland or prescribed fire may also be used to improve forest health.

(2) *Wildlife Habitat*

Emphasis is on improvement of critical moose winter range to achieve desired conditions as described above. The preferred method of treatment to achieve stated objectives would be timber harvest and utilization of forest products. However, prescribed or wildland fires may also be used to meet this objective. Some road construction would be necessary to access treatment areas.

e) *Alternative C*

(1) *Forestry Products*

Commercial timber sales would only be utilized to achieve other resource objectives, such as wildlife habitat improvement or fuels reduction. This alternative anticipates a harvest level of 10 - 20 acres per year. To minimize construction of roads, only winter harvest would be permitted. Commercial sales would not be permitted in areas designated as ACECs or RNAs. The BLM would focus forestry efforts on designation of public firewood or house log gathering areas, emphasizing minimal and temporary road construction (working with DOT to construct gravel access “ramps” off the main highways). No personal firewood gathering would be permitted in the Wild and Scenic River corridors.

(2) *Wildlife Habitat*

Habitat objectives would be accomplished through wildland or prescribed fire. Commercial timber sales would only be used where the primary objective is improvement of wildlife habitat or fuels reduction.

(3) *Fuels Reduction*

Fuels reduction would be accomplished through personal or commercial firewood permits, not commercial timber or salvage sales. In areas away from urban interface, wildland or prescribed fire instead of commercial timber sales would be used for fuels reduction.

f) *Alternative D – Proposed RMP*

(1) *Forestry Products*

Commercial timber sales would be considered in the Tiekel planning region, and would include BLM public lands associated with the transportation and utility corridor but would also be adjacent to State- and Native-selected lands and lands in the Tonsina Bluffs

area. This area constitutes approximately 144,000 acres of commercial timber, most of which has a high bark beetle-kill component. However, due to access limitations and a limited market in the area, this analysis assumes an annual harvest level of 40 - 100 acres per year. Forestry objectives in these areas are:

- Increase access for personal and commercial wood products.
- Improve forest health through salvage of bark beetle-kill spruce.
- Consider potential for commercial harvest.
- Benefit wildlife habitat.
- Manage for desired conditions described above.
- Reduce hazardous fuels.

Within all harvest areas, the use of temporary roads or winter sales would be emphasized.

Commercial harvest would be considered in other areas to accomplish other resource objectives such as fuels reduction or wildlife habitat improvement.

Forestry practices are allowed within the Bering Glacier RNA, but the primary objective of any forestry practice would be enhancement or protection of values identified for the area. Forestry practices would be allowed within SRMAs. Emphasis would be on temporary roads or winter sales, but consideration would be given to retaining roads where areas are managed for roaded natural experiences. Cutting units would be designed to meet VRM objectives. Commercial harvest would not be permitted within the Gulkana or Delta Wild and Scenic River corridors.

The BLM would continue to issue permits for personal use and commercial firewood. In the transportation and utility corridor within the Tiekkel planning region, consideration would be given to designating specific areas for public firewood gathering and providing access to these areas. Access may consist of gravel access ramps off the highway and low-grade temporary two-track where site conditions allow. In addition, the BLM would work with Native corporations or village corporations to identify specific areas on Native- or dual-selected lands where public-use firewood areas could be designated. These areas would be located to reduce hazardous fuels. Personal use firewood permits would be allowed in the Gulkana and Delta Wild and Scenic River corridors, consistent with the current river plans. However, this practice would be monitored closely to ensure that it does not cause impact the viewshed.

(2) *Wildlife Habitat*

(a) Bison

Wildland fire and prescribed burning would be used to improve Delta bison calving range on over 15,000 acres (see Map 10 on page 101). Objectives would be to increase forage productivity and maintain grass dominated vegetation communities. See also *Desired Conditions* on page 129 under *Management Common to All Alternatives*.

(b) Caribou

Wildland and prescribed fire would be utilized within portions of the Nelchina caribou summer range to create a mosaic of burned and unburned areas. To maintain mixed age classes of lichen on Nelchina caribou traditional winter range, less than 10 percent of the range would be burned every decade. If large wildfires occur on or adjacent to winter range, changing the suppression class to full or modified would be considered. See also *Desired Conditions* on page 129 under *Management Common to All Alternatives*.

(c) Dall Sheep

Based on inventory, areas for maintenance or enhancement of Dall sheep range would be identified. Fuels treatment projects and wildland fire would be used to achieve objectives. See also *Desired Conditions* on page 129 under *Management Common to All Alternatives*.

(d) Moose

The BLM would use wildland fire and pursue vegetation treatment such as prescribed burning, mechanical treatment, or logging to improve moose habitat and achieve desired condition described above. The first priority for such projects is critical winter range (see Map 37 in Chapter III in the *Issue 3: Natural and Cultural Resources, Wildlife* section) on BLM public lands (unencumbered). The second priority is critical winter range on State- or Native-selected lands. Combined, there are an estimated 1,450,000 acres of moose winter range on BLM-managed lands in the planning area. Wherever possible, wildlife objectives would be combined with fuels reduction or forestry objectives.

(3) Fuels Reduction

Opportunities would be explored to combine forestry and wildlife objectives and achieve fuels reduction. Highest priority areas would be State- and Native-selected lands near rural communities and villages.

Table 8 summarizes the preceding forestry information and Table 9 summarizes the preceding wildlife information.

Table 8. Vegetation Management, Forestry – Alternative Summary

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Forestry Areas				
Tiegel	No specific area designated.	Same as Alternative D but include all BLM-managed lands within the Tiegel region.	Should only include unencumbered BLM lands. No commercial sales, only personal use firewood gathering should be permitted.	This area includes unencumbered BLM lands as well as adjacent State- and Native-selected lands in the Tiegel region. Forestry objectives in this area are: <ol style="list-style-type: none"> 1. Increase access for personal and commercial wood products and biomass material; 2. salvage bark beetle-kill spruce; 3. consider potential for commercial harvest; 4. benefit wildlife habitat; 5. manage for white spruce/deciduous timber stands as described in general objectives. 6. Reduce hazardous fuels.
Scattered firewood/house log areas	No specific area designated.	Coordinate with Native or village corporations to identify public-use firewood areas in areas to reduce hazardous fuels.	Designate public-use firewood or house log gathering areas, emphasizing minimal or temporary road construction.	This area would be based on inventory but includes BLM-managed lands in vicinity of towns or villages. Forestry objectives are: <ol style="list-style-type: none"> 1. In cooperation with State and Natives, identify areas for personal firewood and house log gathering; 2. Clearly mark access to areas and boundaries to prevent unintentional trespass; 3. Provide for secondary objectives such as fuels reduction and habitat improvement.

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Kenny Lake area (Tonsina bluffs)	No specific area designated.	Same as Alternative D.	Allow only personal use firewood permits in this area.	This area consists of BLM-managed lands around Kenny Lake/Tonsina bluffs. Forestry objectives are the same as described for the Tiekel forestry emphasis area.
Constraints				
Wild and Scenic River corridors	Some personal use firewood gathering currently allowed under permit.	Same as Alternative A.	Do not allow personal use firewood cutting or commercial sales in WSR corridors.	Personal use firewood gathering allowed consistent with river management plans. Would meet VRM Class I objectives.
Areas of Critical Environmental Concern or Research Natural Areas.	No current timber sales in any of the proposed ACEC areas. Some personal use firewood gathering currently permitted.	Consider commercial sales, mitigate impacts through measures identified in <i>Required Operating Procedures</i> .	No commercial sales allowed. Personal use firewood gathering permitted, consistent with measures identified in ACEC.	Forestry practices allowed, but primary objective of any forestry practice would be enhancement or protection of values identified within ACEC. Personal use firewood gathering permitted, consistent with measures identified in ACEC.
Special Recreation Management Areas	Some commercial sales have occurred but none currently in place.	Consider commercial sales, mitigate impacts through measures identified in <i>Required Operating Procedures</i> .	Permit only for personal use firewood or where primary objective is wildlife habitat improvement.	Forestry practices allowed. Emphasis would be on temporary roads, with consideration to retain roads where roaded-natural is objective (within highway corridors). Design cutting units to meet VRM objectives.
Timber sale contracts and personal use firewood or house log permits would adhere to general measures described in <i>Required Operating Procedures</i> Appendix C. Specific stipulations based on these mitigation measures may be developed on a project-by-project bases, to address specific resource concerns.				

Table 9. Vegetation Management, Wildlife – Alternative Summary

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Improvement and Enhancement				
Moose	Alphabet Hills prescribed burn would continue to be implemented with primary objective of improving moose habitat. Wildland fire may be used to improve habitat.	Utilize commercial timber sales where possible to accomplish objectives. Identifies 1.4 million acres potential prescribed burning.	Utilize only prescribed and wildland fire to accomplish objectives.	Use wildland fire and pursue vegetation treatment such as prescribed burning, mechanical treatment, or logging with emphasis on improving moose habitat, with objectives as described under wildlife objectives in alternative narrative. First priority for such projects is winter range (see Map 37, 1,450,000 acres). Second priority is general distribution areas.
Bison	Nothing proposed.	Nothing proposed.	Use only prescribed and wildland fire to accomplish objectives.	Pursue vegetation treatment opportunities such as prescribed burning to improve Delta bison calving range over 15,000 acres. Objectives are to increase forage productivity and maintain grass dominated vegetation communities.
Caribou	Alphabet Hills prescribed burn is within the Nelchina caribou range.	Nothing proposed.	Same as D Alternative.	Within portions of the Nelchina caribou summer range, utilize wildland and prescribed fire to create a mosaic of burned/unburned areas. On Nelchina caribou winter range, manage for less than 10% of range to be burned every decade, to maintain mixed age classes of lichen. If large wildfires occur, consider changing suppression class to full or modified.
Dall Sheep	Currently, limited inventory work is being done to refine Dall sheep ranges.	Nothing proposed.	Use only prescribed and wildland fire to accomplish objectives.	Based on inventory, identify areas for maintenance or enhancement of Dall sheep range. Use fuels treatment projects and wildland fire to achieve objectives.

6. Issue 6: Leasable and Locatable Minerals

Issue Statement: Determine which areas should be made available for mineral exploration and development.

a) Goals

- Maintain or enhance opportunities for mineral exploration and development while maintaining other resource values.

b) Management Common to All Alternatives

(1) Management Areas

Lands currently under selection by the State and Native corporations are segregated from locatable mineral entry or from mineral leasing to avoid potential encumbrances on selected lands prior to conveyance. These lands comprise approximately 5.5 million acres out of the 7.1 million acres currently managed by 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 lands are retained long-term in Federal ownership (i.e., not conveyed to the State or Native corporations).

(2) Inventory and Monitoring

The Glennallen Field Office would continue to work with the BLM’s Division of Energy and Solid Minerals to provide detailed mineral assessments for specific areas (ANILCA sec. 1010).

(3) Solid Leasable Minerals (Other Than Coal)

Solid leasable minerals include chlorides, sulfates, carbonates, borates, silicates or nitrates of potassium or sodium and related products; sulphur on all acquired lands; phosphate, including associated and related minerals; oil shale, and gilsonite (including all vein-type solid hydrocarbons). Deposits of these minerals are unlikely to occur on BLM-managed lands in the planning area (see Chapter III). If deposits were discovered, subsequent leasing, exploration, and development would be considered on a case-by-case basis.

(4) Renewable Energy

As described in Chapter III, some potential does exist within the planning area for development of solar, wind, or biomass renewable energy facilities. No permits or leases for these activities are currently issued within the planning and to date no interest has been expressed. The Glennallen Field Office would consider applications for permit or lease to conduct such leases, subject to the constraints for leasing and permitting as described under *Issue 4: Lands and Realty, Management Common to All Action Alternatives, Land Use Authorizations* on page 115.

(5) Coal

All BLM-administered lands within the planning area subject to leasing under 43 CFR 3400.2 are open to coal exploration and study. The coal screening process (as identified by 43 CFR 3420.1-4) has not been conducted in this planning area. 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 development and for leasing under 43 CFR 3425. The East Alaska RMP would be amended as necessary.

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).

(6) Leasable Minerals (Including Oil, Natural Gas, Coalbed Methane and Geothermal Steam)

Leasing would be subject to *Standard Lease Terms* and those applicable as outlined under *Oil and Gas Lease Stipulations* and *Required Operating Procedures* in Appendix C.

All areas open to mineral leasing would be open to geophysical exploration except those lands containing No Surface Occupancy restrictions, which would only be available for geophysical exploration in winter conditions, subject to stipulations and through Casual Use as described under 43 CFR 3150.05(b) during non-winter conditions.

All areas closed to mineral leasing would be closed to geophysical exploration.

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.

Coalbed methane development is authorized by the same process as oil and gas.

As described in BLM Manual 1624, Federal oil and gas resources (including coalbed methane) fall into one of four categories that become increasingly restrictive:

1. *Open Subject to Standard Lease Terms and Conditions:* 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.
2. *Open Subject to Seasonal or Other Minor Constraints:* These are areas where it has been determined that moderately restrictive lease stipulations may be required to mitigate impacts to other land uses or resource values. Category 2 leases frequently involve timing limitations such as restricting construction activities in designated big game crucial habitats, or controlled surface use stipulations such as creating a buffer zone around a critical resource.
3. *Open Subject to NSO or Other Major Constraints:* These are areas where it has been determined through the planning process that highly restrictive lease stipulations are necessary to protect resources. Category 3 leases may prohibit the construction of well production and support facilities. These areas can be subject to directional drilling, if technologically and economically feasible.
4. *Closed to Leasing:* These are areas where it has been determined that other land uses or resource values cannot be adequately protected, and appropriate protection can be ensured only by closing the land to leasing through either statutory or administrative requirements.

(7) Locatable Minerals

Mining of locatable minerals would be subject to the surface management regulations found in 43 CFR 3809. Surface occupancy under the mining laws would be limited to uses incident to the mining operation. Bonding would 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 Required Operating Procedures in Appendix C.

All operations must file a Plan of Operations with the BLM. The Plan 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.

c) Alternative A

(1) Leasable Minerals

Currently there are no mineral leases on BLM-managed lands within the planning area. Most BLM-managed lands are closed to leasing because of State or Native selections or underlying ANCSA (d)(1) withdrawals. Under Alternative A, no withdrawal review would occur and all ANCSA (d)(1) withdrawals would remain in place, pending some legislation or unrelated management direction. Map 19 shows areas open for mineral leasing, pending State or Native selections. For the purposes of this analysis, it is assumed that under Alternative A no leasing would occur.

1. Areas open to leasing subject to the terms and conditions of the standard lease form: 2,731,000 acres, of which 2,563,000 acres are State- or Native-selected.
2. Areas closed to leasing: 4,325,000 acres, which includes the Wild and Scenic River corridors and those areas closed by ANCSA (d)(1) withdrawals.

(2) Locatable Minerals

As with leasable minerals, most BLM-managed lands are currently closed to locatable mineral entry because of State or Native selections or underlying ANCSA (d)(1) withdrawals. Approximately 3 percent of existing BLM-managed lands are open, either through valid existing claims, exclusion from ANCSA (d)(1) withdrawals, or they are not selected. There are currently two active mining operations that submit Plans of Operations. Both are small operations, with disturbance less than 5 acres. Under Alternative A, no withdrawal review would occur and all ANCSA (d)(1) withdrawals would remain in place. Glennallen Field Office would continue to administer active claims through Plans of Operations but potential for future exploration and development on BLM-managed lands would be limited. Map 20 shows areas open for locatable mineral entry, pending State or Native selections.

1. Areas open to mineral entry: 2,149,000 acres, of which 1,903,000 acres are State- or Native-selected.
2. Areas closed to mineral entry: 4,907,000 acres including wild portions of Wild and Scenic River corridors and areas closed by ANCSA (d)(1) withdrawals.

(3) Mineral Materials

Mineral material sales are considered on a case-by-case basis, with specific operating stipulations developed through the NEPA process.

d) Alternative B

(1) *Leasable Minerals (Oil and Gas)*

1. Areas open to leasing subject to the terms and conditions of the standard lease form: 5,195,000 acres, of which approximately 4.7 million acres are State- or Native-selected.
2. Areas open to leasing, subject to minor constraints such as seasonal restrictions: 1,724,000 acres, 898,000 acres of which are State- or Native-selected lands. These areas include important bison or caribou calving areas, eagle nest buffers, moose winter range, and trumpeter swan seasonal constraints.
3. Areas open to leasing, subject to major constraints such as No Surface Occupancy: 0 acres.
4. Areas closed to leasing: 137,000 acres, which includes the wild portions of the Delta and Gulkana Wild and Scenic Rivers.

Map 21 shows areas that would be open for oil and gas leasing and to locatable mineral entry, pending State and Native selections. Because an area is open for leasing does not mean that leasing or development will occur. Actual development is dependent on several factors, including: a) land status (State and Native selected lands have a segregation against mineral leasing); b) mineral potential; and c) access and marketability. For the purposes of this analysis, development under this alternative is assumed to be twice that described in Chapter IV under Resource Assumptions for Issue 6: Leasable and Locatable Minerals.

(2) *Locatable Minerals*

1. Areas open to the operation of the mining laws: 6,919,000 acres, of which approximately 5.5 million acres are currently State- or Native-selected.
2. Areas closed to the operation of the mining laws: 137,000 acres, which includes the wild portions of the Delta and Gulkana Wild and Scenic Rivers.

Map 21 shows areas that would be open for oil and gas leasing and to locatable mineral entry, pending State and Native selections.

(3) *Mineral Materials*

Where mineral material sales occur, practices described in *Required Operating Procedures* (Appendix C) would be followed. Under Alternative B, only the Gulkana Wild and Scenic River corridor and the wild segment of the Delta Wild and Scenic River corridor would be excluded from mineral material sale.

e) Alternative C

(1) Leasable Minerals (Oil and Gas)

1. Areas open to leasing subject to the terms and conditions of the standard lease form: 1,819,000 acres, all of which are State- or Native-selected land.
2. Areas open to leasing, subject to minor constraints such as seasonal restrictions: 0 acres.
3. Areas open to leasing, subject to major constraints such as No Surface Occupancy: 2,322,000 acres, most of which is State- or Native-selected land. These lands include: a) all Class II VRM areas; b) moose winter range; c) trumpeter swan breeding and nesting habitat; d) areas within 200 feet of anadromous streams and rivers; and e) areas within one-fourth mile of eagle nests.
4. Areas closed to leasing: 2,915,000 acres, 1.5 million acres of which are State- or Native-selected. These lands include: a) all segments within the Delta and Gulkana Wild and Scenic River corridors; b) all lands within the Bering Glacier RNA; c) lands within the transportation and utility corridor; d) lands within the Nelchina Caribou Calving ACEC; e) lands within the Tiekkel SRMA; and f) lands within the West Fork ACEC.

Map 22 shows areas that would be open to oil and gas leasing, pending State and Native selections. Note that 2.3 million acres of those shown would be subject to No Surface Occupancy stipulations as described above. This leaves 1.8 million acres open to leasing subject to the terms and conditions of the standard lease form. However, all of these 1.8 million acres are State- or Native-selected. For the purposes of this analysis, it is assumed that little to no actual oil and gas development would occur under this alternative.

(2) Locatable Minerals

1. Lands open to the operation of the mining laws: 3,319,000 acres, 3.2 million acres of which are State- or Native-selected.
2. Lands closed to the operation of the mining laws: 3,737,000 acres, 2.5 million acres of which are State- or Native-selected. These lands include: a) all segments of the Delta and Gulkana Wild and Scenic River corridors; b) Slana settlement area; c) inner corridor of the transportation and utility corridor; d) the Bering Glacier RNA; e) Denali Highway SRMA; f) Nelchina Caribou Calving ACEC; g) Delta River viewshed; h) Tiekkel SRMA; and i) PLO 6329 in the Alphabet Hills.

Map 23 shows areas that would be open to locatable mineral entry under this alternative, pending State and Native selections.

(3) Mineral Materials

Where mineral material sales occur, practices described in *Required Operating Procedures* (Appendix C) would be followed. The following areas would be excluded from mineral material sale or development: a) Delta Bison Calving ACEC; b) Nelchina Caribou Calving ACEC; c) West Fork ACEC; d) all of the Delta River SRMA; e) Denali Highway SRMA; f) Gulkana River SRMA; g) Tiekkel SRMA; and h) Bering Glacier RNA.

f) Alternative D – Proposed RMP

(1) Leasable Minerals (Oil and Gas)

1. Areas open to leasing subject to the terms and conditions of the standard lease form: 3,863,000 acres, 3.8 million acres of which are State- or Native-selected.
2. Areas open to leasing, subject to minor constraints such as seasonal restrictions: 1,730,000 acres, 1.7 million acres of which are State- or Native-selected. These lands include a) moose winter range; b) caribou and bison calving areas; c) areas within one-fourth mile of bald eagle nests; d) swan nesting habitat; and e) areas greater than 25 percent slope. Specific stipulations related to these areas or resource concerns are described in *Oil and Gas Leasing Stipulations* in Appendix C.
3. Areas open to leasing, subject to major constraints such as No Surface Occupancy: 0 (none).
4. Areas closed to leasing: 1,463,000 acres, all of which are BLM public lands (unencumbered). These lands include: a) all segments of the Wild and Scenic Rivers; b) the western two-thirds of the Bering Glacier RNA; and c) lands within the transportation and utility corridor.

Map 24 displays areas that would be open to oil and gas leasing, pending State and Native selections. Because an area is open for leasing does not mean that leasing or development will occur. Actual development is dependent on several factors, including: a) land status (State and Native selected lands have a segregation against mineral leasing); b) mineral potential; and c) access and marketability. For the purposes of this analysis, development under this alternative is assumed to be at the level described in Chapter IV under Resource Assumptions; Issue 6: Leasable and Locatable Minerals.

(2) Locatable Minerals

1. Lands open to the operation of the mining laws: 5,988,000 acres, 5.5 million of which is State- or Native-selected. These lands include 700,000 acres of State-selected land in the Alphabet Hills areas which would be opened through a modification of PLO 6329.
2. Lands closed to the operation of the mining laws: 1,068,000 acres, all of which are BLM public lands (unencumbered). These include the following: a) all portions of the Delta and Gulkana Wild and Scenic River (this would require recommended

withdrawal of 16,000 acres in the scenic portion of the Delta); b) Slana settlement area; c) inner corridor of the transportation and utility corridor; and d) the western two-thirds of the Bering Research Natural Area.

Map 25 displays areas that would be open to locatable mineral entry, pending State and Native selections.

(3) Mineral Materials

Where mineral material sales occur, practices described in *Required Operating Procedures* (Appendix C) would be followed. The bison calving area, Nelchina caribou calving area, and West Fork area would be open subject to seasonal stipulations. The Delta Wild and Scenic River corridor would be open in the recreational portion, closed in the scenic and wild portions. The Gulkana Wild and Scenic River corridor would be closed. The Denali Highway viewshed would be an avoidance area. If necessary, mineral material development could occur with mitigation for visual resource impacts. Mineral material development would be permitted within the Tiekel SRMA, subject to mitigation for visual impacts. No mineral material development would be permitted in the Bering Glacier RNA. Rationale

Table 10 summarizes the preceding leasable minerals oil and gas information. Table 11 summarizes the preceding locatable minerals information.

Table 10. Leasable Minerals, Oil and Gas – Alternative Summary

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Closed to Leasing	Currently, most BLM-managed lands would be closed to mineral leasing because of State or Native selections or underlying ANCSA (d)(1) withdrawals.	137,000 acres (2%) closed to oil and gas leasing. Revoke all ANCSA (d)(1) withdrawals. Only wild portions of WSR corridors would be closed to leasing.	2,915,000 acres (41%) closed to oil and gas leasing. In addition to those lands identified in Alternative D, the following would be closed to mineral leasing if retained in Federal ownership: <ol style="list-style-type: none"> 1. Lands within the Nelchina Caribou Calving ACEC; 2. Lands within the Tiekel SRMA; 3. Lands within the West Fork ACEC. 	1,463,000 acres (21%) closed to oil and gas leasing. BLM would recommend revocation of most ANCSA (d) (1) withdrawals to allow for mineral leasing on lands retained in Federal ownership. The following areas would be closed to mineral leasing: <ol style="list-style-type: none"> 1. All segments within WSR corridors, including scenic and recreational portions of the Delta; 2. Western two-thirds of the Bering Glacier RNA; 3. Lands within the transportation and utility corridor (PLO 5150).
Open to Leasing with No Surface Occupancy (NSO) Stipulations	No Federal leases currently occur on BLM-managed lands within the planning area.	0 acres (0%)	2,322,000 acres (33%), most of which is State- or Native-selected. All Class I and II VRM areas not already closed to leasing; <ol style="list-style-type: none"> 1. Areas identified below under alternative D for moose winter range, caribou calving, trumpeter swan breeding and nesting, and raptor nests would be NSO. 	0 acres (0%)

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
			2. Areas within 200 feet of anadromous streams and rivers.	
Open with Seasonal and Minor Constraints	0 acres (0%) No Federal leases currently occur on BLM-managed lands within the planning area.	1,724,000 acres (24%), 898,000 of which are State- or Native-selected. Specific areas and constraints are described in the next 5 rows of this table.	0 acres (0%). These acres categorized under No Surface Occupancy in this alternative.	1,730,000 acres (24%), 1.7 million of which are State- or Native-selected.
Big Game Seasonal Constraints	No Federal leases currently occur on BLM-managed lands within the planning area.	Same as Alternative D.	See NSO category above.	To protect big game and big game habitat, oil and gas exploration and development activities would be: <ol style="list-style-type: none"> limited on moose winter range between October 15 and March 31; would be prohibited on caribou calving areas between May 1 and June 15. See <i>Oil and Gas Leasing Stipulations</i> for specific stipulations and exceptions.
Raptor Nests	No Federal leases currently occur on BLM-managed lands within the planning area.	Same as Alternative D.	See NSO category above.	To protect bald eagle nest sites, no oil and gas exploration and development activities would be permitted within one-fourth mile of historically active nest sites from April 1 to August 31. Other raptor nests would be considered on a case-by-case basis. See <i>Oil and Gas Leasing Stipulations</i> for specifics.

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Trumpeter Swans	No Federal leases currently occur on BLM-managed lands within the planning area.	Same as Alternative D.	See NSO category above.	To protect trumpeter swan nesting habitat, no oil and gas exploration or development activities would be permitted within one-fourth mile of documented active swan nests from May 1 to August 31. See <i>Oil and Gas Leasing Stipulations</i> for specific stipulations and exceptions.
Threatened and Endangered Species	No Federal leases currently occur on BLM-managed lands within the planning area.	Same as Alternative D.	See NSO category above.	To protect threatened or endangered species, no surface use, disturbance or occupancy would be permitted on areas known or suspected to be essential habitat. See <i>Oil and Gas Leasing Stipulations</i> for specifics.
Slope and Mountain Goat/Dall Sheep Critical Habitat	No Federal leases currently occur on BLM-managed lands within the planning area.	Same as Alternative D.	See NSO category above.	To prevent erosion and disturbance to critical mountain goat and dall sheep habitat, no surface disturbance on slopes greater than 25%. See <i>Oil and Gas Leasing Stipulations</i> for specifics.
Open Subject to Standard Lease Stipulations	No Federal leases currently occur on BLM-managed lands within the planning area.	5,195,000 acres (74%), 4.7 million of which are State- or Native-selected.	1,819,000 acres (26%), all of which is State- or Native-selected.	3,863,000 acres (55%), 3.8 million of which are State- or Native-selected.

Table 11. Locatable Minerals – Alternative Summary

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Closed Areas	<p>Most BLM-managed lands are currently withdrawn from mineral entry because of ANCSA (d)(1) withdrawals or State and Native selections. This RMP would not affect segregations against mineral entry due to State and Native selection. Mining activities are currently taking place on some BLM-managed lands because valid existing rights or because certain areas were excluded from ANCSA (d)(1) withdrawals or State and Native selections.</p>	<p>137,000 (2%) acres</p> <p>Revoke all ANCSA (d)(1) withdrawals. Open all areas other than wild portions of WSR corridors, subject to reasonable 3809 surface regulations.</p>	<p>3,737,000 acres (53%), 2.5 million of which are State- or Native-selected.</p> <p>Add the following to the list in D:</p> <ol style="list-style-type: none"> 1. Recommend withdrawing lands within the Denali Highway SRMA from mineral entry; 2. Maintain ANCSA (d)(1) withdrawals within the Nelchina Caribou Calving ACEC; 3. recommend withdrawing unencumbered BLM lands within distance Class 1 (foreground and middle ground) of the Delta River viewshed from mineral entry; 4. recommend withdrawing BLM-managed lands within the Tiekel SRMA from mineral entry. 5. Maintain the current PLO 6329 withdrawal against mineral entry in the Alphabet Hills. <p>Items 1, 3, and 4 would</p>	<p>1,068,000 acres (15%)</p> <p>The following areas would be closed to locatable mineral entry:</p> <ol style="list-style-type: none"> 1. All portions of the WSR corridors, including scenic and recreational segments of the Delta; 2. Slana settlement area; 3. inner corridor of the transportation and utility corridor (PLO 5150); 4. Western one-third of Bering Glacier RNA. <p>All ANCSA (d)(1) withdrawals outside these areas that exclude mineral entry would be modified or revoked to allow locatable entry.</p> <p>In addition, PLO 6329 would be modified to allow for mineral entry in 700,000 acres in the Alphabet Hills area. This area is currently State-selected so this modification would only take effect if lands were retained in long-term Federal ownership.</p>

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
			require congressional approval.	
Open Areas	2,149,000 acres (30%) 1.9 of which are State- or Native-selected.	6,919,000 acres (98%), 5.5 of which are State- or Native-selected.	3,319,000 acres (47%), 3.2 million of which are State- or Native-selected.	5,988,000 acres (85%), 5.5 million of which are State- or Native-selected.

Map 19. Areas open to Oil and Gas Leasing - Alternative A

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Map size: 11x17

Map 20. Areas open to Mineral Entry- Alternative A

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Map size: 11x17

**Map 21. Areas open to Oil and Gas Leasing and Mineral Entry-
Alternative B**

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File name: 21_locleasb.pdf

Map size: 11x17

Map 22. Areas open to Oil and Gas Leasing - Alternative C

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Map size: 11x17

Map 23. Areas open to Mineral Entry - Alternative C

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File name: 23_locc.pdf

Map size: 11x17

Map 24. Areas open to Oil and Gas Leasing- Alternative D

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File name: 24_leasd.pdf

Map size: 11x17

Map 25. Areas open to Mineral Entry- Alternative D

File size: 254 KB

File name: 25_locd.pdf

Map size: 11x17

**Map 26. Areas Open to Mineral Entry and Oil and Gas Leasing –
Alternative D – Bering Glacier RNA**

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File name: 26_beringmin.pdf

Map size: 8.5x11

7. Issue 7: Subsistence/Social and Economic Conditions

Issue Statement: Maintain and protect subsistence opportunities. Determine how the management actions, guidelines, and allowable uses prescribed in response to the other issues will affect both subsistence opportunities and resources and the social and economic environment.

a) Goals

- Conserve healthy populations through management and protection of habitat and subsistence harvest permitting and regulations.
- Provide reasonable access to subsistence resources.

b) Management Guidance Common to All Alternatives

Decisions made within this RMP will not affect the BLM's role in administration of subsistence on Federal public lands. Under all alternatives, the BLM will continue to carry out or participate in the following administrative functions:

1. **Involve Subsistence Users in Issues Identification:** Ten Regional Advisory Councils 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. BLM field staff members, along with those of other agencies, meet twice each year with the Regional Councils to identify emerging issues in conservation, allocation, and appropriate regulation of subsistence harvests.
2. **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.
3. **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.
4. **Develop Interagency Subsistence Management Regulations and Policies:** With heavy reliance on Regional Council input and interagency coordination, the development of subsistence regulations is a multi-step process.
5. **Manage Subsistence Harvests:** Although regulatory authority for subsistence management rests with the Federal Subsistence Board, implementation of Federal subsistence hunting and fishing opportunities rests largely on local Federal agency

field staff. Tasks include distribution of Federal regulation booklets, responding to questions, issuing Federal subsistence permits, contacting hunters in the field, and assisting in tallying permit and harvest reports.

c) Alternative A

Alternative A continues current management of all resources. The current levels, methods, and mix of multiple use management (as described for each issue above) would continue, and resource values (including subsistence resources) would receive attention at present levels. In general, most activities would be analyzed on a case-by-case basis and few uses would be limited or excluded as long as they were consistent with State and Federal laws. This alternative provides few constraints on activities that could potentially negatively impact subsistence resources. Access to subsistence resources would only be constrained by changing land status as entitlements are met.

d) Alternative B

This alternative provides very few area-wide constraints on development activities. Most areas would be opened for mineral exploration and development and very few areas would have management restrictions on OHVs. Access to subsistence resources would only be constrained by changing land status as entitlements are met.

This is the only alternative that proposes complete revocation of PLO 5150 (the transportation and utility corridor). This would allow conveyance of this area to the State of Alaska and would constitute a loss of 453,514 acres of Federal subsistence hunting area, in an area that currently provides 80 percent of the Federal subsistence caribou and moose harvest.

e) Alternative C

This alternative would provide the highest level of protection for resource values (including subsistence resources) through establishment of special management areas with area-wide constraints. This alternative also provides the highest level of OHV management and restrictions.

f) Alternative D – Proposed RMP

This alternative has some area-wide constraints, but relies more on the *Required Operating Procedures* for site-specific protection of resources. OHV management attempts to halt unmanaged proliferation of trails, with emphasis on correcting adverse resource impacts from OHV use.

Under Alternative D, PLO 5150 would be modified to allow for 83,000 acres to be conveyed to the State. These lands include the Gunn Creek segment which is northeast of Paxson, and approximately 59,000 acres north of Paxson and west of the Delta river (see Map18). These areas represent approximately sixteen percent of the BLM-managed lands on which the Federal subsistence priority applies. The effects of this action on subsistence is described in Chapter 4 and in the ANILCA section 810 analysis found in Appendix E.

Table 12 summarizes the preceding information with regards to impacts to Subsistence.

Table 12. Alternative Comparison – Subsistence

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Travel Management	No change: Long term negative effect on habitat/populations but increased access.	Same as Alternative A.	Limits OHV use and road construction. Some areas closed to motorized use. Long term positive effect on habitat/populations but decreased access.	Limits OHV use and road construction in some areas. Long term positive effect on habitat/populations, maintains access.
Cultural/Natural Resources	No change: Impacts to subsistence and habitat/populations considered on case-by-case basis. Does not provide protection of resources proposed by C or D.	Protects resources on a site-specific basis but encourages increased resource development. Does not provide protection of subsistence resources proposed by C or D.	Identifies ACECs and the Bering RNA that would provide strong resource protection, area wide, to subsistence resources. Provides strongest subsistence resource protection.	Identifies the Bering RNA and provides resource protection in other areas through application of area-wide standards and Required Operating Procedures.
Lands and Realty	No change. Would not modify PLO 5150 to allow for conveyance of transportation and utility corridor to the State. Would retain federal subsistence hunting areas.	Would modify PLO 5150 to allow for conveyance of the transportation and utility corridor to the State. Would significantly impact current federal subsistence hunting area.	Would retain BLM management of the transportation and utility corridor. No change to federal subsistence hunting area.	Would retain BLM management of most of the transportation and utility corridor. Areas of heaviest annual harvest (adjacent to Richardson Highway) would be retained.
Vegetation Management	No change. Provides minimal habitat improvement to improve habitat/populations for subsistence species.	Identifies the most acres for habitat improvement through commercial harvest or prescribed burning. Trade-off would be increased road construction with timber harvest.	Identifies fewest acres for habitat improvement through timber harvest or prescribed burning. Relies on wildland fire.	Identifies 1.5 million acres for habitat improvement through prescribed or wildland fire and forestry practices. Long term habitat benefit for subsistence species.

Issue	Alternative			
	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP
Minerals	No change. Very little mineral exploration or development would occur. No mineral leasing would occur. No impact on subsistence resources.	Opens most area for locatable mineral entry and mineral leasing. Applies stipulations to minimize resource impacts but overall has most potential for negative impacts to habitat/populations.	Area-wide constraints allow for very little potential mineral entry or mineral leasing. Few impacts on subsistence resources.	Opens some areas for locatable mineral entry and mineral leasing and provides stipulations to minimize resource impacts. Less potential than B for negative impacts to subsistence resources.

D. Effects Comparison by Issue and Alternative

Table 13 summarizes the direct and indirect effects under each alternative for all resources, where effects were found (a more detailed description is provided in Chapter IV). Cumulative effects are described in detail in Chapter IV.

This comparison table focuses on environmental effects and does not display alternative proposals, such as for Locatable and Leasable minerals, Lands and Realty, ACECs, or Wild and Scenic Rivers. These management proposals and allowable uses are displayed in the summary tables in Chapter II, by Issue, and explained in Chapter II narrative. Effects of the proposals on resources, subsistence, and socioeconomics are compared in the following table and discussed in detail in Chapter IV.

Table 13. Effects Comparison by Issue and Alternative

Effects on	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP	Cumulative Effects
Off-Highway Vehicles	Existing OHV designations would remain in place in TLAD and trails in the Delta and Gulkana Wild and Scenic River corridors. No new travel restrictions would be implemented under Alternative A. Once on public lands, there would be very few limits to OHV access.	Same as Alternative A.	Would limit OHV travel (not including snowmachines) to existing or designated trails on 96 percent of BLM-managed lands, and close 4 percent to OHV use. While access to public lands would still be provided, unlimited motorized access on public lands would no longer be available. This alternative is the most restrictive on motorized user's ability to access public lands using motorized means.	Would limit OHV travel (not including snowmachines) to existing or designated trails on 99 percent of all BLM-managed lands, and close 1 percent to OHV use. Closure of some specific trails to motorized use would be considered in implementation-level planning. This alternative is slightly less restrictive on motorized user's ability to access all public lands using motorized means than Alternative C, and more restrictive than alternatives A or B.	Within the planning area, OHV users would be presented with a mix of opportunities, varying degrees of trail maintenance, and varying off-road regulations. OHV management within the 13 million acres of Wrangell-St. Elias National Park and Preserve would continue as limited to OHVs, with travel limited to designated trails. Native lands would be restricted in most areas, with general public use limited to easements. As Native Corporation entitlements are met, this could mean a net loss of trails that are currently available on Native-selected lands. For the most part, State lands would remain open to OHVs, subject to 11 AAC 96.025 "Conditions for Generally Allowed Uses". Exceptions would be State lands within TLAD and other small areas where OHV use may be regulated by Special Use Land Designations. Other State lands may be subject to Controlled Use Area regulations, where OHV use may be limited to accomplish game management objectives or to provide a particular type of hunting experience. In general within the planning area, OHV use is expected to become more restricted over the planning period, regardless of the alternative selected by BLM.

Effects on	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP	Cumulative Effects
Recreation	Resource development would be minimal under this alternative due to existing constraints from withdrawals. Most effects to recreation would be from increasing user trends and from unmanaged OHV use. In areas accessible to these activities, some primitive and most semi-primitive recreation experiences would trend towards semi-primitive motorized or roaded-natural experiences. Lack of facility development in high use areas like the Denali Highway would decrease quality of experience over time.	This alternative would result in existing recreation experiences trending into at least the next class of development along the ROS. For example, many semi-primitive experiences currently available near existing roadways would trend towards semi-primitive motorized or roaded natural experience. No attempts would be made to maintain primitive experiences, and, given currently increasing user trends, most would trend towards semi-primitive or semi-primitive motorized. Without visitor use limits for commercial and general users in certain areas (developed in implementation planning), recreational experiences and natural resources would be degraded and user conflicts would develop.	This alternative would be the most effective at maintaining a diversity of recreational experiences over time based on stringent measures to regulate OHV use. Designation of five SRMAs would allow for intensive management of identified high value recreation resources. The establishment of visitor use limits (in implementation-level planning) in specific areas would help ensure the quality of recreation experiences for commercial and non-commercial users. Lack of facility development in this alternative could negatively effect recreation experiences in certain high-use areas.	This alternative would be the second most effective at maintaining a diversity of recreational experiences, in part due to measures to regulate OHV use. Four SRMAs would be designated and would allow for the preservation of high value recreation resources while managing recreation experiences and visual resource impacts. Development of additional facilities under this alternative would redirect recreational use to specific areas, alleviating unmanaged use of other areas while meeting public demand. Establishment of visitor use limits in specific areas (in implementation-level planning) would help ensure positive recreation experiences.	The planning area currently provides a tremendous diversity of recreation experiences, conditions that are expected to continue over the planning period regardless of the alternative selected for BLM-managed lands. The largest influence on recreation experience within the planning area is use of OHVs. Without management and some limitations on OHV use, the general trend, in OHV-accessible topography, is for primitive and semi-primitive recreation experiences to trend towards semi-primitive motorized and roaded natural experiences. However, much of the planning area is dominated by steep topography, wetlands, or dense vegetation that is inaccessible to most OHVs; these areas would be maintained to provide for primitive and generally inaccessible recreation experiences, regardless of the BLM's selected alternative. Helicopter-supported commercial recreation ventures and winter snowmachine use have the potential to access and potentially alter experiences in some of these areas.
Soils	Under this alternative, unmanaged proliferation of OHV trails would continue, with associated impacts to soils, particularly in high-use areas and areas of permafrost and wet soils. Low levels of timber harvest could cause localized adverse effects on soils from vegetation clearing and soil compaction. This alternative anticipates no mineral leasing and only a slight increase in mining activities, so less impacts to soils would occur from mining than under Alternatives B or D.	A larger acreage of soils could be disturbed compared to Alternative A due to the increase in lands available for mineral exploration and development. Effects on soils from mineral development activity could include oil spills, soil compaction, and loss of surrounding vegetation. Effects from OHV management would be the same as under Alternative A. An increase in anticipated timber harvest (to 100-200 acres per year) could cause more localized adverse effects to soils than any other alternatives.	A smaller acreage of soils would be disturbed compared to the other alternatives. Management actions proposed, including limitations on OHVs and designation of ACECs and area-wide protective measures, would limit resource development and associated soil disturbance potential.	A smaller acreage of soils would be disturbed compared to Alternative B due to limitations on OHVs and some area-wide restrictions to protect sensitive or unique areas. Anticipated timber harvest (40–100 acres per year) would cause localized adverse effects from vegetation clearing and soil compaction.	There would be a slight increase in activities that potentially cause soil disturbance or erosion on State, Native, and private lands within the planning area. Such activities would include an increase in the number and miles of OHV trails on State lands, as well as increased mineral exploration and development and forestry activities on State and Native lands. These activities would occur regardless of the alternative selected by the BLM. These impacts would have direct and indirect effects on soils but very little cumulative impact on site potential and soil productivity when combined with any actions proposed on BLM lands under any alternative. This conclusion is based on the small footprint of most development activities relative to the total planning area and the application of standards and guidelines described in State DNR Area Plans.

Effects on	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP	Cumulative Effects
Water Resources	Under this alternative, unmanaged proliferation of OHV trails would continue, with associated impacts to water quality at some stream crossings. This alternative anticipates no mineral leasing and only a slight increase in mining activities, so less impacts to water quality would occur from mining than under Alternatives B or D.	A larger acreage of soils could be disturbed compared to Alternative A due to the increase in lands available for mineral exploration and development. Effects on water resources from mineral development activity could include increased erosion and sedimentation, temporary impoundments or diversions, water temperature increases, or other changes in water quality. Effects from OHV management would be the same as under Alternative A. An increase in anticipated timber harvest (to 100-200 acres per year) could cause more localized adverse effects to water resources than any other alternatives, although these effects would be mitigated through application of ROPs.	Effects to water resources from actions proposed under Alternative C would be localized and limited in scale. Effects would occur over a smaller acreage than Alternatives A, B or C due to limitations on OHVs and designation of ACECs and area-wide protective measures, which would limit resource development and associated soil disturbance potential.	Effects would occur over a smaller acreage than Alternatives A or B due to restrictions on mineral development placed on certain sensitive or unique areas, application of ROPs and stips, and limitations on OHV use to existing trails, although there are fewer restrictions than under Alternative C. Opening additional lands to mineral entry through withdrawal revocation could increase potential adverse effects to water resources, however the overall potential is low.	Under Alternatives C and D, water quality should improve over the long-term through management actions proposed in the alternatives, adoption of ROPs and Stips, and as a result of participating in cooperative planning efforts on a watershed basis with other land management agencies. Actions on adjacent lands under other ownerships that produce sedimentation or nutrient loading into streams that then flow through BLM-managed lands, or inappropriate storage containers, small dumps or other potential sources of contamination from activities on non-BLM-managed lands could impact water quality in certain instances. Increased powerboat use in unregulated State waters could adversely impact water quality for short periods during peak use. Short-term cumulative impacts could occur as the result of drought. Changes in any flow regime across BLM-managed lands could result from actions taken on other jurisdictions.
Fisheries	Continued unmanaged proliferation of OHVs under this alternative could result in localized adverse impacts through degradation of water quality and increased sedimentation at unauthorized crossings. This alternative anticipates no mineral leasing and limited mining on BLM-managed lands. Current timber harvest is limited (40 acres/year) and mostly occurs under frozen conditions.	A larger acreage of fish habitat could be disturbed compared to Alternative A due to the increase in lands available for mineral exploration and development. Effects on fish and fish habitat from mineral development activity could include increased mortality and degradation of water quality and fish habitat. Effects from OHV use would be the same as described under alternative A. Anticipated timber harvest would increase to 100 – 200 acres per year with some roads constructed. This alternative has more likelihood for adverse impacts from resource development than A, C, or D. However, effects would be mitigated by application of ROPs and Stips.	Effects could occur over a smaller acreage than Alternatives A, B, or D due to restrictions on mineral development through designation of ACECs and limitations to OHV use. Management actions proposed could restrict land use activities in certain areas, thereby reducing adverse effects on fish and fish habitat relative to current conditions. ROPs and stipulations would offer additional protections to fish and fish habitat. The likelihood of adverse effects on fish and fish habitat would be less than other alternatives.	Fish and fish habitat could have a greater potential for adverse effects under this alternative compared to Alternatives A or C, but less than Alternative B due to restrictions on mineral development and OHV use. The proposed Bering RNA and area-wide restrictions for other specific resource values could restrict land use activities in certain areas, thereby reducing adverse effects on fish and fish habitat. OHV use would be limited to existing or designated trails. Timber harvest at approximately 40–100 acres per year could cause localized adverse effects but would be minimized by application of ROPs and use of temporary roads.	A continuation of current water and land use practices, by private, State, and other Federal agencies would continue to affect fish habitat within the planning area. Higher intensity OHV use, timber harvest, and mineral development or exploration on lands upstream from BLM-managed lands within a watershed could continue to be a concern due to sediment and water quality issues that influence the quality of fish habitat downstream from the source. Habitat improvement gains through more intensive management of recreation activities as proposed under Alternatives C and D could be offset or enhanced by regulatory sport-fishing changes made by ADF&G. Coordination would continue to be essential.

Effects on	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP	Cumulative Effects
<p>Wildlife</p>	<p>Continued unmanaged proliferation of OHVs under this alternative could result in localized adverse impacts through loss of wildlife refugia and habitat degradation. This alternative anticipates no mineral leasing and limited mining on BLM-managed lands. Current timber harvest is limited (40 acres/year) and mostly occurs under frozen conditions utilizing temporary roads. Overall, effects would be localized and would not occur at the population level.</p>	<p>Effects would occur over more of the planning area compared to Alternative A due to the increase in lands available for mineral exploration and development. Effects on fish and fish habitat from mineral development activity could include habitat degradation and displacement. Effects from OHV use would be the same as described under Alternative A. Anticipated timber harvest would increase to 100–200 acres per year with some roads constructed. This alternative has more likelihood for adverse impacts from resource development than Alternatives A, C, or D. However, effects would be mitigated by application of ROPs and Stips and overall, effects would be localized and would not occur at the population level.</p>	<p>Effects could occur over a smaller acreage than Alternatives A, B, or D due to restrictions on mineral development through designation of ACECs and limitations to OHV use. Management actions proposed, including seasonal protection against wildlife displacement in specific areas and application of ROPs and stipulations, would restrict land use activities in certain areas, thereby reducing adverse effects on wildlife and wildlife habitat relative to current conditions. The likelihood of effects on wildlife would be less compared to other alternatives. Overall, effects would be localized and would not occur at the population level.</p>	<p>Wildlife and wildlife habitat could have a greater potential for adverse effects under this alternative compared to Alternatives A or C, but less than Alternative B due to restrictions on mineral development and OHV use. The proposed Bering RNA and area-wide restrictions for other specific resource values could restrict land use activities in certain areas, thereby reducing adverse effects on wildlife and wildlife habitat. OHV use would be limited to existing or designated trails. Timber harvest at approximately 40–100 acres per year could cause localized adverse effects but would be minimized by application of ROPs and use of temporary roads, and in some cases will be designed to enhance wildlife habitat. Overall, effects would be localized and would not occur at the population level. This alternative proposes the greatest amount of habitat improvement through prescribed burning or wildland fire use.</p>	<p>Over the planning period, OHV management is expected to remain constrained within Wrangell-St. Elias National Park and Preserve and on private lands (including Native Corporation lands). State lands are expected to remain relatively open for OHV uses, where there would continue to be unmanaged proliferation of OHV trails. Over the planning period, habitat loss resulting from varying degrees of OHV use and regulation would be minor to insignificant, based on the amount of actual physical disturbance versus acres of available habitat. However, motorized access limited only by physical barriers would eventually lead to heavy hunting pressure and a subsequent drop in bull/cow ratios for moose and caribou, loss of security or refugia areas, and possible depletion of herd health during critical winter months. If these effects played out on State lands accessible to OHVs, lands with more regulated OHV management (such as lands managed by the National Park Service, Native Corporations, or the BLM under Alternatives C and D), may, over time, serve as wildlife refugia.</p> <p>Fire management in the planning area occurs under cooperative interagency planning. Therefore, fire impacts (positive or negative) occur across land status. Fire suppression classes can be adjusted on an annual basis to meet resource objectives (such as habitat improvement for moose balanced with maintenance of desired winter range for caribou).</p> <p>Maximum forest management activities outlined in Alternative B, combined with increased forestry practices and associated road construction on State and Native lands, could lead to a short-term reduction in big game security areas, fragmentation of specific habitats, increase in road density, and short-term loss of late-seral habitat in specific areas. Under this scenario, proposed forestry practices on BLM-managed lands would need to be adjusted to account for short-term negative impacts on other lands from large-scale forest practices.</p> <p>Minerals exploration and development at the levels described in Alternative B, combined with increased activity on State and Native lands, could lead to habitat loss and wildlife displacement, particularly if activities were to occur in critical habitat areas such as calving areas or wetlands that provide critical waterfowl habitat (such as the West Fork Gulkana area). If permanent road construction is necessary to facilitate development, habitat loss and wildlife displacement could occur even with seasonal constraints.</p>

Effects on	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP	Cumulative Effects
Vegetation	Continued unmanaged proliferation of OHVs under this alternative could result in localized adverse impacts through removal of vegetation or vegetation crushing. This alternative anticipates no mineral leasing and limited mining on BLM-managed lands. Current timber harvest is limited and results in short term removal of vegetation but long-term vegetation benefits.	Effects could occur over more of the planning area compared to Alternative A, and a larger number of acres could be potentially disturbed due to the increase in lands available for mineral exploration and development. Impacts associated with mineral development include loss of vegetation and creation of disturbance conditions that would favor spread of noxious weeds. Effects from OHV management are the same as Alternative A. Timber harvest is anticipated at 100–200 acres per year, which would result in short term loss of vegetation but long term improvement in vegetation age class. Application of ROPs and Stips would offer additional protection to vegetation.	Effects would occur over a smaller acreage than Alternatives A, B, or D due to restrictions on mineral development through designation of ACECs and limitations to OHV use. Management actions proposed could restrict land use activities in certain areas, thereby reducing adverse effects on vegetation relative to current conditions. ROPs and Stips would offer additional protections to fish and fish habitat. The likelihood of adverse effects on vegetation would be less than other alternatives. However, opportunities for forest management through timber sales would be minimal under this alternative.	There is a greater potential for effects under this alternative compared to Alternatives A or C, but less than Alternative B due to restrictions on mineral development and OHV use. The proposed Bering RNA and area-wide restrictions for other specific resource values could restrict land use activities in certain areas, thereby reducing adverse effects on vegetation. OHV use would be limited to existing or designated trails. Timber harvest at approximately 40–100 acres per year would cause short term loss of vegetation but long term improvement in vegetation age class and diversity. Application of ROPs and Stips would offer additional protection to vegetation.	Within the planning area, forestry practices are expected to increase, particularly on Native lands, with a slight increase on State lands. This increase, combined with the selection of any of the alternatives, would have only a minor impact when expressed in terms of change to vegetation cover types throughout the planning area. Even at a maximum activity level, these increases would change less than 4 percent of the total cover classes within the planning area. Short-term effects are mostly positive for wildlife habitat improvement, with a temporary increase in shrub-dominated cover types. Long-term effect would be an increase in age and cover type diversity within the planning area. Wildland fire and prescribed fire have more potential than any other activity in the planning area to make landscape-level changes to vegetation composition. Alternatives B and D propose prescribed burning of up to 1.5 million acres. A large portion of this burning would occur on State-selected and State lands and would be conducted with interagency cooperation. At this scale and combined with an expected increase in wildland fire in the area, significant changes could occur in vegetation composition in woodland cover types over the planning area. Late-seral black and white spruce cover types would be interspersed with a mosaic of early seral shrub-dominated cover types.
Wetlands / Riparian Habitat	Under this alternative, unmanaged proliferation of OHV trails would continue, with associated impacts to wetlands through degradation and alteration of drainage patterns. This alternative anticipates no mineral leasing and only a slight increase in mining activities, so less impacts to wetlands would occur from mining than under alternatives B or D. Current timber sale activities occur at a rate of about 40 acres per year. Impacts to wetlands are minimal due to use of temporary roads and operations primarily in winter.	A larger acreage of wetlands could be disturbed compared to Alternative A due to the increase in lands available for mineral exploration and development. Effects on water resources from mineral development activity could include increased erosion and sedimentation, degradation, and alternation of drainage patterns. Effects from OHV management would be the same as under Alternative A. An increase in anticipated timber harvest (to 100-200 acres per year) could cause more localized adverse effects to water resources than any other alternatives, although these effects would be mitigated through application of ROPs.	Effects to wetlands from actions proposed under Alternative C would be localized and limited in scale. Effects would occur over a smaller acreage than Alternatives A, B or D due to limitations on OHVs and designation of ACECs and area-wide protective measures, which would limit resource development and associated wetland disturbance potential.	Effects would occur over a smaller acreage than Alternatives A or B due to restrictions on mineral development placed on certain sensitive or unique areas, application of ROPs and Stips, and limitations on OHV use to existing trails, although there are fewer restrictions than under alternative C. Opening additional lands to mineral entry through withdrawal revocation could increase potential adverse effects to wetlands. Application of ROPs and Stips would minimize impacts. Timber sales are anticipated at 40–100 acres per year. Impacts would be minimized from use of temporary roads, application of ROPs, and operations in frozen conditions.	Adoption of Alternative A or B, combined with increased resource development, settlement, and OHV activities on other lands within the planning area, could put some riparian and wetland areas into functioning at risk or non-functional categories. Most impacts to riparian areas and wetlands are local and development footprints are fairly small. However, mineral exploration and development or large-scale forestry activities without standards or stipulations to protect riparian and wetland areas could result in impacts to riparian and wetland vegetation and functionality.

Effects on	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP	Cumulative Effects
Visual Resources	Continued unmanaged proliferation of OHVs under this alternative could result in localized adverse impacts through the alteration of the existing visual landscape. This alternative anticipates no mineral leasing and limited mining on BLM-managed lands. Current timber harvest is limited but can have impacts on visual resources, particularly in the short term.	Effects could occur over more of the planning area compared to Alternative A, and a larger number of acres could be potentially disturbed due to the increase in lands available for mineral exploration and development. Impacts associated with mineral development include alteration of the existing visual landscape. Effects from OHV management are the same as Alternative A. Timber harvest is anticipated at 100–200 acres per year. Application of ROPs and Stips would offer additional restrictions that could mitigate effects to visual resources. However the planning area would be designated primarily as VRM Classes III and IV, which allow for major landscape modifications.	Effects would occur over a smaller acreage than Alternatives A, B, or D due to more restrictive VRM classifications in several areas, restrictions on mineral development through designation of ACECs, and limitations to OHV use. Management actions proposed could restrict land use activities in certain areas, thereby reducing adverse effects on visual resources relative to current conditions. ROPs and stipulations would offer additional protections to visual resources. The likelihood of adverse effects on vegetation would be less than other alternatives. This alternative classifies areas mostly as VRM Classes I, II, and III.	There is a greater potential for effects under this alternative compared to Alternatives A or C, but less than Alternative B due to restrictions on mineral development and OHV use. The proposed Bering RNA and area-wide restrictions for other specific resource values could restrict land use activities in certain areas, thereby reducing adverse effects on visual resources. OHV use would be limited to existing or designated trails. Timber harvest at approximately 40–100 acres per year would cause short term impacts to visual resources but long term improvement in vegetation age class and diversity. Application of ROPs and Stips would offer additional protection to visual resources. This alternative classifies areas as a mix of VRM classes I–IV.	Increased timber harvest and mineral development on State, Native Corporation, or private lands and the occurrence of wild and prescribed fires on adjacent lands would continue to affect the visual features of form, line, color, and texture at the landscape level. These changes would influence the design of similar projects on adjacent BLM-managed lands where repeating these basic elements is an objective of the visual resource management class where the project is implemented.
Cultural Resources	Surveys for cultural resources would be conducted prior to all ground-disturbing activities which require advance authorization. Continued unmanaged proliferation of OHVs under this alternative could result in localized adverse impacts through the damage of surface features. This alternative anticipates no mineral leasing and limited mining on BLM-managed lands. Current timber harvest is limited and sale areas receive pre-sale survey and clearance.	Effects could occur over more of the planning area compared to Alternative A, and a larger number of acres could be potentially disturbed due to the increase in lands available for mineral exploration and development. Effects from OHV management are the same as Alternative A. Timber harvest is anticipated at 100–200 acres per year, but sale areas would receive cultural clearance. Application of ROPs and Stips would offer additional restrictions that could mitigate effects to cultural resources. Surveys for cultural resources would also be conducted prior to all ground-disturbing activities which require advance authorization.	Effects would occur over a smaller acreage than Alternatives A, B, or D due to restrictions on mineral development through designation of ACECs, and limitations to OHV use. Limiting OHVs to designated or existing trails would reduce cross-country travel and damage of surface features. Management actions proposed could restrict land use activities in certain areas, thereby reducing adverse effects on cultural resources relative to current conditions. ROPs and Stips would offer additional protections to cultural resources. The likelihood of adverse effects on cultural resources would be less than other alternatives. Surveys for cultural resources would also be conducted prior to all ground-disturbing activities which require advance authorization.	There is a greater potential for effects under this alternative compared to Alternatives A or C, but less than Alternative B due to restrictions on mineral development and OHV use. The proposed Bering RNA and area-wide restrictions for other specific resource values could restrict land use activities in certain areas, thereby reducing adverse effects on cultural resources. OHV use would be limited to existing or designated trails, which would reduce damage to surface features. Timber harvest is estimated at 40–100 acres per year but sale areas would receive cultural clearance pre-sale. Application of ROPs and Stips would offer additional protection to cultural resources. Surveys for cultural resources would be conducted prior to all permitted ground-disturbing activities.	Cumulative impacts to cultural resources could occur through incremental degradation of the resource base from a variety of sources that reduce the information and interpretive potential of historic and prehistoric properties, or that affect traditional cultural values important to Native Alaskans. Other regional resource, land use, and economic development planning efforts could affect the types and intensity of uses on private, State, or other Federal lands within the planning area and could therefore potentially affect the regional cultural resource data base. Development of lands that are not protected by Federal or State cultural resource statutes and regulatory protections could decrease the regional resource base and potentially limit management options within the planning area. Restrictions on recreational activities in other areas, regional population growth, and increases in current levels of resource extraction and development may increase the use intensity within the planning area, potentially affecting cultural resources.

Effects on	A: No Action	B: Resource Development	C: Resource Conservation	D: Proposed RMP	Cumulative Effects
Social and Economic Conditions	Timber sales would continue at a rate of 40 acres per year. No mineral leasing would occur and current small placer mining would be maintained. Recreation-related activities have the most potential to benefit the area economically. This alternative places no constraints on these activities, including use of OHVs.	Revocation of PLO 5150 and loss of the majority of the federal subsistence hunting unit could have immediate adverse effects, given the economic significance of subsistence hunting. Timber harvest and associated road construction anticipated under this alternative and increased opportunity for mineral exploration and development could create some jobs and have a positive economic effect. Effects from recreation management would be the same as described in Alternative A.	This alternative places the most area-wide constraints on resource development and consequently has the least potential for positive economic benefits.	There is a greater potential for adverse economic effects under this alternative compared to Alternatives A or C, but less than Alternative B due to the increase in lands available for mineral exploration and development. This alternative would also retain PLO 5150 and maintain the federal subsistence hunting area, an important economic consideration in the area.	Cumulatively, the potential economic benefits (in terms of employment opportunities and jobs created) could easily double dependent on resource development levels, particularly on State lands. Construction of a natural gas pipeline within the existing transportation and utility corridor (or alternate routes) on State and Federal lands could provide job opportunities and economic benefits over and above what is described for each alternative. Anticipated mining on State land north of the Denali Highway could provide local economic benefits through jobs and support services. The Copper River Basin has qualified as a potential borough, and formation of a borough in the area is being pushed by some State legislators (even though it is resisted locally). Formation of a borough could increase interest in resource development on BLM-managed lands as a source of revenue.
Subsistence	The Federal subsistence unit would be managed as is and PLO 5150 would be retained. This alternative anticipates low levels of resource development, with low levels of impacts on subsistence resources. Unmanaged proliferation of OHV trails could negatively effect subsistence resources and result in displacement of some subsistence users.	Revocation of PLO 5150 and loss of the majority of the federal subsistence hunting unit would have a significant impact on the availability of subsistence resources. Timber harvest and associated road construction anticipated under this alternative and increased opportunity for mineral exploration and development could have some localized negative impacts on subsistence resources. Negative impacts associated with unmanaged proliferation of OHV trails would be the same as Alternative A.	This alternative retains PLO 5150 and the federal subsistence hunting unit. In addition, this alternative places the most area-wide constraints on resource development and consequently would see the least amount of potential impacts to subsistence resources. Limiting OHV use to designated or existing trails would minimize habitat damage. Some access restrictions could occur under this alternative.	The Federal subsistence unit would be managed as is and most of PLO 5150 would be retained, thus continuing to provide a federal subsistence hunting unit. This alternative does allow for modification of PLO 5150 to allow conveyance of 83,000 acres to the State. While this comprises 16% of the total area currently available for federal subsistence harvest, it produces less than five percent of the annual harvest for caribou. This alternative allows for an increased level of resource development, but mitigates impacts through application of ROPs and stipulations and some area-wide constraints. OHV management attempts to strike a balance between minimizing off-road impacts to subsistence resources and continuing to provide for access to subsistence opportunities.	Assuming increased resource development and settlement on State, Native Corporation, and private lands in the planning area, adopting management described under Alternatives A or B could result in significant impacts to subsistence resources. Alternatives A and B make no attempt (except for in limited areas) to manage OHV use. Continued unmanaged proliferation of OHV trails would lead to increased competition for subsistence resources, additional disturbance to areas that serve as refugia for caribou and moose, and continued habitat degradation. This combined with a moderate increase in resource development with associated roads and infrastructure could cause critical habitat loss or displacement of some animals from traditional migration routes. Increased access to subsistence resources would be offset by increased competition with recreationists and sport-hunters.



Chapter III: Affected Environment

Chapter III: Affected Environment

A.	How to Read this Chapter	183
B.	Issue 1: Travel Management.....	184
1.	Transportation and Facilities.....	184
a)	Roads	184
b)	Trails	185
c)	State-recognized R.S. 2477 Routes.....	187
d)	ANCSA 17(b) Easements	187
e)	[REDACTED]	188
f)	Airstrips.....	188
g)	Boat Ramps	191
h)	Communication Sites	191
2.	Off-highway Vehicle (OHV) Management and Trails	191
a)	Subsistence Use of OHVs.....	195
b)	OHVs and Resource Concerns.....	195
C.	Issue 2: Recreation.....	199
1.	General Recreation.....	199
2.	Special Recreation Permits.....	200
3.	Recreation Opportunity Spectrum.....	201
4.	Areas of Concentrated Recreation Opportunities	203
a)	Delta WSR Corridor Area.....	203
b)	Gulkana WSR Corridor Area.....	204
c)	Denali Highway Area	207
d)	Tiekel Area.....	207
e)	Delta Range Area	208
f)	[REDACTED]	208
g)	[REDACTED]	208
h)	[REDACTED]	209
D.	Issue 3: Natural and Cultural Resources	210
1.	Soils	210
a)	Soils Inventory	211
2.	Water Quality	215
a)	Mineral Development.....	215
b)	Recreation.....	216
c)	Fire Management.....	216
d)	Forest Products.....	216
3.	Air Quality	218
a)	Smoke Management.....	218
4.	Vegetation (Including Sensitive Status Plant Species)	220
a)	Alaska Earth Cover Classification	220
b)	Upland and Riparian Vegetation	224
c)	Noxious Weeds and Invasive Plants.....	225
d)	Sensitive Status Plant Species	226
5.	Wildlife (including Sensitive Status Wildlife Species).....	232
a)	Big Game Species	233
b)	Furbearers	251

c)	Raptors	253
d)	Waterfowl and Other Water Birds	254
e)	Migratory Birds (Passerines)	257
f)	Upland Game Birds	257
g)	Amphibians	258
h)	Sensitive Status Wildlife Species	258
6.	Fish (Including Sensitive Status Fish Species)	273
a)	Monitoring Projects	277
b)	Factors Affecting Fish Populations and Habitats	277
c)	Subsistence Fisheries	278
d)	Sport Fishing	280
e)	Sensitive Status Fish Species	281
7.	Cultural Resources	282
a)	Bering Glacier-Icy Bay Region	285
b)	Chistochina-Slana Region	287
c)	Denali Region	288
d)	Gulkana-Delta Region	290
e)	Nelchina Region	295
f)	Tiekel Region	296
8.	Paleontological Resources	300
a)	Bering Glacier-Icy Bay Region	300
b)	Denali Region	301
c)	Gulkana-Delta Region	301
d)	Nelchina Region	302
9.	Visual Resources	303
a)	Visual Resource Management Inventory	304
10.	Areas of Critical Environmental Concern (ACEC)	305
a)	Background	305
b)	Nominated Areas	305
c)	Potential ACECs	306
d)	Potential Research Natural Area	307
11.	Wild and Scenic Rivers	309
a)	Delta National Wild and Scenic River	310
b)	Gulkana National Wild River	311
c)	Eligibility and Suitability Review	312
12.	Climate Change	315
E.	Issue 4: Lands and Realty	316
1.	Lands and Realty Programs and Administration	316
a)	Land Use Authorizations	316
b)	Disposal Actions	318
c)	Acquisitions	321
d)	Exchanges	321
3)	Withdrawals	321
2.	Utility and Communication Corridors	322
a)	Transportation and Utility Corridor	322
b)	Trans-Alaska Pipeline System (TAPS)	326

- F. Issue 5: Vegetation Management..... 328
 - 1. Fire Management..... 328
 - a) Historical Fire Role..... 328
 - b) Fire Occurrence 329
 - c) Current Fire Policy 330
 - d) Prescribed Burning 336
 - e) Fuel Conditions and Fire Behavior..... 336
 - f) Role of Fire on Wildlife Habitat..... 339
 - 2. Forest Products 341
 - a) Demand for Forest Products 342
- G. Issue 6: Leasable and Locatable Minerals 347
 - 1. Geology 347
 - a) Physiographic Regions 347
 - b) Structural Geology and Tectonics 353
 - c) Mineral Terranes..... 354
 - 2. Minerals Occurrence, Potential, and Administration 357
 - a) Leasable Minerals..... 357
 - b) Locatable Minerals..... 367
 - c) Salable Minerals (Mineral Materials)..... 371
 - d) Renewable Energy..... 371
- H. Issue 7: Subsistence/Social and Economic Conditions 373
 - 1. Subsistence 373
 - a) Subsistence Use Patterns and Harvest Levels 373
 - b) Traditional Use Areas 375
 - c) Socio-cultural Factors 376
 - d) History of Subsistence Administration..... 377
 - e) Current Program Administration..... 378
 - 2. Social and Economic Conditions 379
 - a) Regional Overview..... 379
 - b) Demographics..... 380
 - c) Employment and Labor Force..... 383
 - d) Income 385
 - e) BLM Spending 386
 - 3. Environmental Justice..... 386
- I. Other Program Areas 389
 - 1. Hazardous Materials..... 389
 - a) Management Concerns..... 390

CHAPTER III: AFFECTED ENVIRONMENT

A. How to Read this Chapter

This chapter contains background information about the resources, resource uses, and programs that exist or occur on the BLM lands managed by the Glennallen Field Office. The chapter is organized by the seven issues presented in Chapters I and II:

1. **Travel Management:** Includes discussion of off-highway vehicle (OHV) use, trails, roads, and access.
2. **Recreation:** Includes discussion of general recreation, areas with a concentration of recreational use, and backcountry byways.
3. **Natural and Cultural Resources:** Includes discussion of air quality, fisheries, soil, water, vegetation, paleontology, cultural resources, visual resources, Sensitive Status Species, Wild and Scenic Rivers, and wildlife. Some of the wildlife discussion related to habitat also applies to vegetation management.
4. **Lands and Realty:** Includes discussion of land use authorizations, withdrawals, rights of way, disposal areas, Slana, permits, and leases.
5. **Vegetation Management:** Includes discussion of forestry and fire.
6. **Leasable and Locatable Minerals:** Includes discussion of geology, minerals management and potential, and renewable energy.
7. **Subsistence and Social and Economic Conditions:** Includes discussion of social and economic conditions, subsistence, and environmental justice.

In Appendix G, the laws, regulations, and policies are listed to provide an overview of the directives that influence management; they are not meant to be all inclusive.

The order of the issues does not reflect their level of importance. Subsistence is discussed last to consider potential impacts to subsistence that could result from proposed management actions or allowable uses described under the previous six issues.

B. Issue 1: Travel Management

1. Transportation and Facilities

a) Roads

The Alaska Department of Transportation (DOT) maintains most roads located within the Glennallen Field Office boundaries. These roads consist of both gravel and paved surfaces and are integral parts of the statewide transportation system. The State's major road system includes the Denali, Edgerton, Glenn, Richardson, and Parks Highways, and the Tok Cut-off. Other roads in the planning area are secondary roads to access private property or communication sites. Roads that access the Trans-Alaska Pipeline are for maintenance purposes and are maintained by the Alyeska Pipeline Service Company. Roads listed in Table 14 are a description of existing roads within the planning area. These roads do not necessarily cross BLM-managed lands and are not maintained by BLM.

Table 14. Existing Roads within the Planning Area

Type of Road	Miles of Road	Examples of Roads
Paved	590	Richardson Highway, Glenn Highway, Parks Highway, Denali Highway
Major Gravel	289	Lake Louise Road, Denali Highway, Old Edgerton Road, Copper River Highway, Nabesna Road, McCarthy Road
Minor Gravel	425	Coal Mine Road, Valdez Creek Road, TAPS Access Roads

The Glennallen Field Office is responsible for the maintenance of six campground and wayside access roads totaling approximately 7 miles. These gravel access roads require annual maintenance, with larger scale road improvements contracted out when necessary. The Lands and Realty division considers proposals for road construction submitted through right-of-way applications; these applications are rare and are usually associated with access to private lands, particularly in the Slana area. Roads in support of forestry practices are either low-grade and temporary, or forestry activities are conducted in the winter under frozen conditions.

b) Trails

The ease of access from developed highway systems has allowed for the development of a user-created system of OHV trails within the planning area. Current inventories do not accurately represent all trails that are known to exist on the ground. Trail inventories that do exist are focused on Wild and Scenic River corridors and unencumbered BLM lands. These are also the areas where trail maintenance activities have been focused.

Dispersed trails can be found across a large portion of the planning area. Most information on the status of these trails is based on local knowledge, overflight observations, and knowledge of historical routes. It is estimated that 1,300 miles of trails exist in the planning area, approximately 1,002 miles of which have been inventoried through the use of Global Positioning System (GPS) technology. Given the mixed ownership patterns, almost every trail within the planning area crosses multiple jurisdictions. Due to the lack of regulations limiting cross-country travel, increases in technology, and increases in populations users are extending the length of trails, using them to access more remote places every year (BLM 2001).

Inventoried trails are assigned one of five maintenance levels to identify minimum maintenance standards. Past funding has not allowed the Glennallen Field Office to meet the maintenance provisions of the assigned level. The BLM trail maintenance levels are described in detail in the following table. The Glennallen Field Office does not have any trails at maintenance levels 1 or 5.

Table 15. BLM Trail Maintenance Levels

Maintenance Level	Assignment Criteria	Minimum Maintenance Standard
1	These trails are closed to motorized and non-motorized use. This level is the minimum maintenance required to protect adjacent lands and resource values. The objectives may be to remove these trails from the trail system.	Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Brushing and removal of hazards is not performed unless trail drainage is being adversely affected, causing erosion. Closure devices are maintained.
2	Low use trail with little or no contact between parties. Little or no visitor use management. Visitors may encounter obstructions like brush and deadfall.	Trails require condition surveys once every year. Repairs will be done at the beginning of the season to prevent environmental damage and maintain access. Emphasis is given to maintaining drainage and mitigating hazards. The trail may be signed "Not Regularly Maintained." Major repair may not be done for several years.

Maintenance Level	Assignment Criteria	Minimum Maintenance Standard
3	Moderate use trail with visitor use on a seasonal and/or peak use period with frequent contact between parties. Trail management is conducted with occasional visitor use patrols. Visitors are not likely to encounter obstructions.	The trail shall receive a minimum of one condition survey 1-2 times per season. Major repairs shall be completed annually. Maintenance shall be scheduled 2-3 time per season, if required, to repair the trail for environmental damage and to maintain access. Trail is kept in good condition.
4	High use trail used during specific times of the year with high frequencies of contact between parties. Regularly scheduled visitor use patrol and management.	Scheduled maintenance shall occur frequently during the use season (3-4 times per season). Trail condition and accessibility for persons with disabilities is a major concern. Significant repairs shall be completed within 10 work days.
5	A special high use trail with routine visitor use patrols and management.	Has a scheduled maintenance program. Trail condition and accessibility for person with disabilities is a major concern. Significant repairs shall be completed within 2-3 work days.

Maintenance Level 2 trails in the planning area include the Copper River, Hungry Hollow, and June Lake Trails. These trails only receive sporadic use, and are not high priorities for maintenance. 54-Mile, Dickey Lake, and Fish Creek Trails are examples of Level 3 trails. They receive a high level of use at varying peak seasons (specific hunting seasons or holidays such as the Fourth of July) and are more heavily impacted from visitor use than are Level 2 trails. Level 4 trails include Swede Lake Trail, Coal Mine Road, and the Middle Fork Trail. These trails receive the most consistent use throughout the year, with peaks during hunting season. These routes also comprise the main transportation corridors accessing some of the most sought-after recreational and hunting opportunities in the planning area. The following table illustrates the distribution of maintenance level trails on BLM-managed lands.

Table 16. Inventoried Trails in the Glennallen Field Office

Maintenance Level	Miles of Trail	Percentage of All Trails
2	317	32
3	513	51
4	172	17
Totals	1002	100

c) State-recognized R.S. 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 the Federal Land Management and Policy Act, 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. Within the planning area, these routes are based on historical or traditional trails. Because of lack of regular maintenance or use, many of the State-recognized R.S. 2477 routes may no longer exist on the ground. The United States Federal Government does not recognize the validity of the State's claimed R.S. 2477 routes on Federal public land as the State's claims have not been proven valid in a Court of Law. Until proven valid, users of Federal public land are required to follow Federal rules.

d) ANCSA 17(b) Easements

Section 17(b) of the Alaska Native Claims Settlement Act (ANCSA) provided for the reservation to the United States of easements necessary for accessing publicly owned lands across lands conveyed to Native Corporations. Section 17(b) easements may also be reserved for other reasons such as access between communities and for non-public uses such as utility lines and governmental purposes. Some 17(b) easements in the planning area overlap routes claimed by the State of Alaska as potential R.S. 2477 routes.

17(b) easements play a vital role in providing access across Native corporation lands. The BLM reserves 17(b) easements to allow the public to access Federal and State lands for the purposes of recreation, hunting, and other similar public uses on publicly owned lands. There are currently 427 17(b) trail and site easements managed by the Glennallen Field Office.

Currently 17(b) easements that access State lands or BLM-managed public lands are administered by the BLM. Those easements accessing National Park Service or National Forest Service lands are managed by the respective agencies.

The majority of the 17(b) easements managed by the Glennallen Field Office access lands conveyed to the State of Alaska. It is BLM's position that 17(b) easements accessing lands conveyed to the State should be managed by the State. Management responsibilities may be transferred to the State upon their agreeing to accept management and after consultation with the Native landowner. Management of 17(b) easements may be transferred to another federal agency when the easement access lands managed by them or is reserved for their benefit such as a FAA communications site.

BLM is committed to working with the land owner, state and other federal agencies and the public as coordination between Native corporations, State, and other federal agencies and the public is key to solving issues regarding 17(b) easements.

BLM's legal responsibilities for 17(b) easements are limited to record keeping, identification and reservation, and termination of easements. Easement management (including locating and marking) is discretionary and subject to availability of funds, personnel and approval. BLM is committed to locating, marking and monitoring priority easements and helping educate easements users to understand the rights reserved to the U.S. and the rights of the private land owner.

Map 27 shows the inventoried trails, digitized 17(b) easements, and State-recognized R.S. 2477 routes.

e) Waterways

Alaska's rivers, lakes, and streams provide an important means of transportation and access to public lands. Under the "Equal Footing Doctrine" and the Submerged Lands Act of 1953, which was expressly applied to Alaska in the Alaska Statehood Act of 1958, the State owns the unreserved beds of navigable waters in Alaska. Therefore, lands underlying navigable waters are not federal lands. Instead, they are vested in the State on the date of statehood (1959). As a result, the BLM is required to exclude the beds of all unreserved navigable waters from land conveyances. Navigability determination is a complex and ongoing process. This Resource Management Plan does not make or affect navigability determinations.

f) Airstrips

Most active airstrips or helipads within the planning area are privately owned, operated, and maintained. The Glennallen Field Office currently authorizes one airstrip under lease to Paxson Lodge, Inc. The airstrip is located within T. 22 S., R. 12 E., Fairbanks Meridian, and is 86 acres in size. There are at least two known airstrips in trespass.

Map 27. GPSed Trails, ANCSA 17(b) Easements, and State-recognized R.S. 2477 Routes

File size: 190 KB

File name: 27_trails.pdf

Map Size: 11x17

g) Boat Ramps

Four developed boat ramps, as described in the following table, are located on unencumbered BLM lands within the planning area. Three of the four are located within developed campgrounds. All ramps are constructed of poured, 8-foot concrete slabs, and can accommodate small powerboats, inflatable rafts, and canoes. Conditions vary based on installation date and incurred damages.

Table 17. Boat Ramp Facilities

Location	Width	Areas Accessed
Sourdough Campground	16 feet (double)	Gulkana River, Gulkana WSR Corridor
Paxson Campground	16 feet (double)	Paxson Lake, Gulkana WSR Corridor
Tangle Lakes Campground	16 feet (double)	Lower Tangle Lakes, Delta WSR Corridor
Delta Wayside	8 feet (single)	Upper Tangle Lakes, Delta WSR Corridor, Middle Fork of the Gulkana WSR

The area by Mile 212 of the Richardson Highway is the take out for the Delta WSR. This unimproved launch/takeout site can be used by powerboats, inflatable rafts, and canoes. The materials are the native material surface comprised of gravel and glacial deposits. This launch area is dynamic because of the changing river patterns and has no improvements other than signage.

h) Communication Sites

The Glennallen Field Office manages, maintains, and utilizes four repeater sites located on Keg, Nadine, Sugarloaf, and Paxson mountains. These sites consist of a repeater antenna that sits at a high point within the district creating a web of channels for radio communication. The repeaters are powered with a combination of solar and batteries; they were last serviced and upgraded in 2002.

2. Off-highway Vehicle (OHV) Management and Trails

OHV use is a major, nationally recognized recreational activity on BLM public lands. 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.

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 Tangle Lakes Archaeological District (TLAD) was designated as “limited” to OHVs in 1980. This archaeological district is comprised of approximately 196,000 acres of mostly State-selected land containing important cultural and historical resources. During snow-free months (between May 16 and October 15), all OHV usage is limited to four signed trails (approximately 40 miles of trail). All other lands within the TLAD are closed to OHV use during these times. OHV use is unrestricted from October 16 to May 15 when adequate snow cover is present (Federal Register 1980).

The Gulkana and Delta Wild and Scenic River Corridors carry a “limited to existing trails” designation based on management prescribed in the 1983 river management plans for each river (BLM 1983a; 1983b). This limitation limits cross-country travel, but “existing” trails have never been defined. There are 13 trails that cross the designated wild and scenic river corridors; approximately 50 miles of trail are located within the wild and scenic river boundaries.

The remainder of the BLM-managed lands within the planning area are currently undesignated. Use is generally focused at jumping off points from the highway corridors (Richardson, Glenn, Denali, and Tok Cut-off), with the greatest amount of use focused along the Denali Highway and subsistence hunting areas (BLM 2004h). GPS technology, satellite imagery, and aerial photos reveal an expansive network of trails in this area as a direct result of the unregulated use inherent in the “open” designation.

Summer use of OHVs is centered around personal recreation, and usually occurs from early May until September. After September, use shifts from recreation-based to use in support of hunting. The beginning of the subsistence hunting season brings a drastic increase in the use and size of OHVs that utilize BLM-managed lands. In the Glennallen Field Office, OHV use has averaged over 17,000 visitor days over the past five years (BLM, RMIS 2003). OHVs used in the planning area take many forms, from the “standard” 4-wheeler with a Gross Vehicle Weight (GVW) of 750 pounds, to tracked vehicles, snowcats, and weasels with GVWs up to 30,000 pounds. Argos, specialized dozers/skidlers, surplus military vehicles, and specialized “monster trucks” or mud buggers are also used.

The current State policy on casual (non-permitted) OHV use on State owned 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

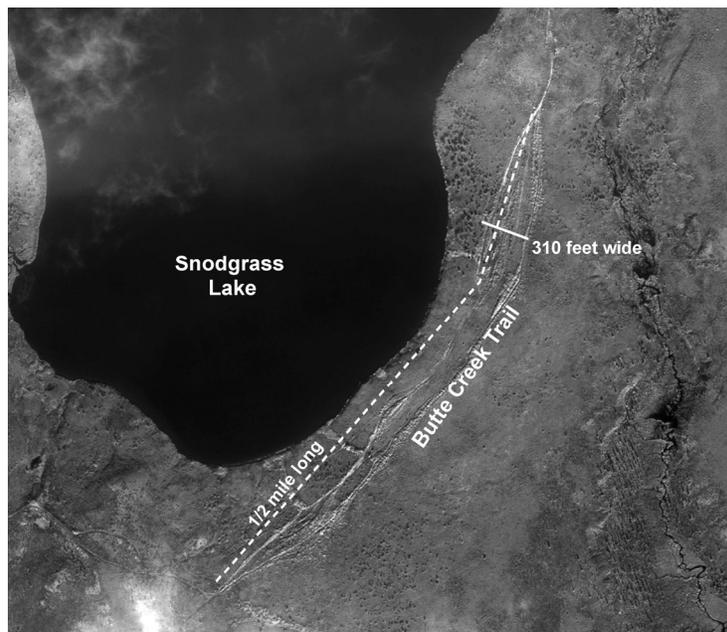
Allowed Uses.” Use of highway vehicles with a curb weight up to 10,000 lbs. or recreational-type vehicles (OHVs) with a curb weight of less than 1,500 lbs. is allowed on or off an established road easement if use off the road easement does not cause or contribute to water quality degradation, alteration 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).

Winter snowmachining within the planning area offers mainly backcountry and hill climbing experiences, with packed trails limited to major travel routes and associated highways. Most winter activity is recreational, though subsistence hunting and trapping activities are also supported by snowmachine. Snowmachine registration through the State has increased from 14,000 registrations in 1996 to over 40,000 registrations in 2002 (State of Alaska DMV 2002). Organized events that center on snowmachining are gaining popularity. This overall increase in use has made quiet winter recreational experiences harder to locate throughout the district. In addition, snowmachines, as are OHVs in the summer, are pushing deeper into the backcountry.

OHV use within the planning area and throughout the State of Alaska has increased substantially in the last few years. Every year vehicle counts at trailheads are increasing, especially during subsistence hunting seasons (BLM 2004a). This increased use has led to more user conflicts on the trails. It is increasing difficult to find a primitive experience and the search for such an experience drives users farther into the backcountry. Based on public comments received during public scoping for this resource management plan, conflicts between motorized and non-motorized users are also emerging as OHVs expand their range.

Many trails within the planning area are experiencing some level of resource damage (ICRC 2001; ICRC 2002). Motorized opportunities are heavily favored towards highly technical and specialized OHV use in a wet environment, dominated by tundra and muskeg vegetation. Most trails have sections of muddy bogs that become greater obstacles as thermal erosion from vegetation stripping and continued use occurs. This results in users creating detours around the mudholes, creating a braided trail pattern that can range in width from 10 to 100 feet, see Figure 1. These widened trails not only leave a visual scar on the landscape, they also contribute to vegetation and soil damage (Meyer 2002).

Figure 1. Trail Braiding within the Planning Area



With increased use comes the development of new trails. Many miles of unplanned, user-created trails have been pioneered throughout the planning area resulting in trail densities reaching up to an average of 1.6 miles of trail per square mile. Studies done in the Lower 48 have found trail densities ranging from one-half mile in undeveloped areas to 4 miles of trail per square mile in areas heavily impacted by logging roads and population centers (BLM, FS 2001). Along the Denali Highway multiple trailheads and trails eventually tie in together and access the same point creating a crisscrossed network of trails. This spreading out not only affects a larger area of vegetation, soils, and wildlife but also widens the footprint of motorized sound impacts. Table 18 displays the average trail densities found in areas of high, moderate, and low motorized use. Figure 2 shows a spider web of trails found within a Wild and Scenic River Corridor.

Table 18. Average Trail Densities

Level of Trail Density	Average Miles of Trail/Sqaure Mile
High	1.6
Moderate	.8
Low	.5

Figure 2. Trail Networks within the Planning Area

a) Subsistence Use of OHVs

Section 811 of ANILCA states that the BLM must provide “reasonable access to subsistence resources on public lands.” This allows for the use of OHVs (snowmachines, motorboats, and other forms of surface transportation) on public lands for traditional/subsistence activities, as well as travel to and from villages and homesites, subject to reasonable regulation. Local residents not only depend on these trails for recreational pursuits, they are also an important facet of everyday life. Subsistence activities play a major part in the management of OHV trails, allowing access for the harvest of fish, game, firewood, and numerous other natural bounties.

b) OHVs and Resource Concerns

Each of the Game Management Units (GMU), shown on Map 28, within the Glennallen Field Office boundary have experienced varying levels of increased OHV use and the corresponding wildlife population and habitat degradation problems since the 1960s; however, the scope of OHV use in some areas is of less concern to Alaska Department of Fish and Game (ADF&G) because OHVs are severely limited by steep terrain. Of particular concern for ADF&G managers is Unit 13, which comprises the bulk of the lands managed by the Glennallen Field Office. The unit is large and the State road system provides access to much of the unit from most major population centers of the state. A well developed system of OHV trails across relatively easily-traveled terrain

currently exists and is utilized by large numbers of OHVs for recreation and hunting purposes. There are vast amounts of public land (both State and Federal) in the unit; however, use of OHVs is so intensive and covers such extensive portions of Unit 13 that the current OHV policy on public land does not adequately address the situation (ADF&G 1996).

Snowmachine use in Unit 13A (from Glennallen west to the Talkeetna Mountains, from the Glenn Highway to the West Fork of the Gulkana River to the north) is particularly heavy in the Eureka area. In Unit 13B (Susitna River east to Gakona River, north to Alaska Range and south to the West Fork of the Gulkana River), snowmachine use has increased overall with a significant increase in use around Summit Lake; caribou wintering around the eastern Denali Highway area are particularly prone to snowmachine disturbance from both hunters and recreationists. Unit 13C (Gakona River east to the Mentasta Mountains) is an important moose wintering area and the potential for adverse impacts from snowmobiles is great due to accessibility and relatively easy terrain (ADFG 1996).

The Alaska Board of Game has established four controlled use areas within the planning area to regulate OHV use for hunting and transporting game. These areas are Sourdough, Clearwater Creek, Tonsina, and Delta. These areas are closed to the use of OHVs for hunting (not to recreational OHV use).

Off Highway Vehicles have caused documented impacts to archaeological sites on BLM-managed lands within the planning area. During 1976, the BLM contracted with the Western Interstate Commission for Higher Education to conduct archaeological surveys in and around OHV trails in the Tangle Lakes area. These limited surveys located three archaeological sites along the Landmark Gap North and Glacier Gap trails which were being eroded and damaged by OHV traffic (Zinck and Zinck 1976). These results led to a formal Memorandum of Agreement with the State Historic Preservation Officer and the Advisory Council on Historic Preservation in 1980, which describes a process for opening designated trails in the Tangle Lakes Archaeological District (TLAD).

Specific designations for OHV trails in TLAD were accomplished by Federal Register notices in 1980 and 1984, which opened trails as cultural resource work was completed (Federal Register 1980).

Map 28. State Game Management Units

File size: 179 KB

File name: 28_gmu.pdf

Map Size: 11x17

C. Issue 2: Recreation

1. General Recreation

Recreation occurs within the planning area throughout the year and at varying levels of use, providing diverse opportunities for all user groups. The recreational resources and activities managed by the Glennallen Field Office include rivers (including 2 components of the National Wild and Scenic River system with 138 dispersed campsites), 4 campgrounds, 2 major waysides, and 24 developed trailheads. The following table provides a more detailed description of amenities offered at recreation sites. The location of the Glennallen Field Office, situated between the state’s major population centers and intersected by the State highway system, supports a broad spectrum of dispersed recreation opportunities such as sport fishing, motorized and non-motorized boating, OHV use, snowmachining, camping, hunting, hiking, skiing, sightseeing, driving for pleasure, and wildlife viewing. There are numerous commercial recreation activities (e.g., guides and outfitters, heli-skiing) and competitive recreation activities. Due to the diversity of available opportunities, a recreation user typically participates in multiple activities per visit, such as combining camping and fishing, biking and birdwatching, or hunting and berry picking (BLM 2004g).

Table 19. Recreation Facilities

Facility	Description
Sourdough Campground	Boat launch on Gulkana River, parking, education/interpretation panels, observation pavilion, overflow parking, picnic area, 42 campsites with picnic tables and fire rings, potable drinking water, universally-accessible toilets, boater dump station, universally-accessible trails through campground to parking area.
Paxson Campground	Boat launch on Paxson Lake, parking area, toilet facilities throughout campground, education/interpretation panels, RV dump station, potable drinking water, 20 RV sites, 20 tent sites, 10 walk-in sites, picnic tables and fire rings at all campsites, boardwalk to Paxson Lake.
Tangle Lakes Campground	Boat launch on Lower Tangle Lake accessing the Delta River, parking, education/interpretation panels, 25 campsites, picnic tables and fire rings (sporadic), potable drinking water, universally-accessible toilets.
Brushkana Creek Campground	18 campsites with picnic tables and fire rings, toilets, potable water, day use picnic shelter, education/interpretation panels.
Delta Wayside	Day use area, picnic tables, toilets, boat launch, and education/interpretation panels on Upper Tangle Lakes.
Clearwater Wayside	Day use area, universally-accessible toilets, picnic tables.

Because of the general accessibility and minimal regulatory limitations on public lands, local dependence on these lands has strong ties to utilization of the region's hunting and fishing resources and pursuit of OHV recreation opportunities. In addition to the resident population, regional urban populations depend upon the planning area to

pursue recreational activities. The priorities of the recreation program are public health and safety, resource protection, visitor services, and requests for information and use authorizations (BLM 2004g).

In 1986 a study conducted by the President's Commission on Americans' Outdoors determined that 43 percent of Americans adults identified driving for pleasure as a favorite leisure pursuit. In response, the BLM established a Back Country Byway program in 1989 to complement the National Scenic Byways program and promote pleasure driving as a recreational activity. The program was designed to be highly visible and to foster partnerships with local and State governments and organizations. There are no designated back country byways on lands managed by the Glennallen Field Office.

With tourism as a leading industry in the planning area (Copper Valley Economic Council 2003), demand for recreational opportunities and providers for those opportunities will continue to grow. Demand for additional infrastructure and facilities (including interpretation) and commercial recreation opportunities will be a direct result, increasing the need for active management of the recreation resource. Use numbers over the past five years on the Gulkana and Delta Rivers have risen from 736 and 5,979 visitors, respectively, in 1999, to 1,271 and 7,506 visitors, respectively, in 2004 (BLM 2004b).

An increase in accessibility and a growing trend in visitation and recreation activities in areas that were previously remote and inaccessible has the potential to cause adverse impacts to recreation and other resources unless proactive management decisions and practices are implemented. Without active management, the tendency on BLM-managed lands is for those areas inventoried as Primitive opportunity to trend towards Semi-Primitive Motorized opportunity.

Identified resource damage appears to be linked to ease of access and proximity to harvestable resources like fish and game. Damage is characterized by bare ground, proliferation of dispersed campsites and trails, and increased presence of human waste and trash. Quiet, non-motorized recreation opportunities are becoming increasingly more difficult to locate.

2. Special Recreation Permits

The Glennallen Field Office currently administers special recreation permits for commercial use recreation activities occurring on BLM-managed lands. Approximately 60 special recreation permits were issued in 2003, a slight increase in the number of permits issued in the last 10 years. These permits are mostly for uses within the Delta and Gulkana National Wild and Scenic River areas. Commercial use on the Gulkana River is mainly focused on fishing; use on the Delta River is mainly focused on

wilderness camping and paddling. Other permits are issued for heli-ski operations, hunting guides, and competitive events.

3. Recreation Opportunity Spectrum

In preparation for this land use planning effort, the Glennallen Field Office conducted an inventory of the existing recreation opportunities available across the district using Recreation Opportunity Spectrum classes. The Recreation Opportunity Spectrum (ROS) is a framework for classifying and defining different classes or types of outdoor recreation environments, activities, and experience opportunities, as described in Table 20 (Dilts 2004). The inventory conducted for the Field Office describes the recreational opportunities that currently exist on BLM-managed lands across the landscape. A major trails inventory was conducted the summer of 2005. The results of this inventory had an effect on the ROS classes resulting in the minor modification of class boundaries, particularly along the Denali Highway (Gunn, 2005). The distribution of these classes throughout the planning area is displayed in Map 29.

Table 20. Recreation Opportunity Spectrum Classes

Class (acres / % of planning area)	Description
Primitive 4,782,000 (68%)	Area is characterized by essentially unmodified natural environment of fairly large size. Concentration of users is very low and evidence of other users is minimal. No summer motorized trails exist although seasonal motorized use occurs (snowmachines) at a low density. Sights and sounds of the road system 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 346,000 (5%)	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. The area is more accessible than an area in a primitive class, but is free of motorized trails and roads. Sights and sounds of the road system are more prevalent than in the primitive class, but less prevalent than in the roaded natural or backcountry roaded classes. Vegetation and soils are predominantly natural but some impacts exist.
Semi-Primitive Motorized 1,487,000 (21%)	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.

Class (acres / % of planning area)	Description
Remote Developed Lakeside 17,000 (0.2%)	Area is characterized by a predominantly unmodified natural environment, but concentrated use occurs around areas of high recreational value, such as lakeshores. The surrounding environment is generally in a very natural state and is largely unmodified by humans. Facilities such as docks, cabins, and private homes may exist, but they tend to be concentrated. Access is generally via floatplane, boat, or snowmachine. Natural sights and sounds predominate most of the time, but human sights and sounds are not uncommon, especially during times of heavy use. The area is generally not within sight or sound of a major highway or road. Vegetation and soils are predominately natural, especially outside the developed nodes, but areas of heavy localized modification exist. Concentration of users is variable across seasons, but generally is higher than in the semi-primitive or primitive classes, and lower than the backcountry roaded or roaded natural classes.
Backcountry Roaded 47,000 (0.7%)	Area is characterized by a generally natural environment with moderate evidence of the sights and sounds of humans. Resource modification and utilization practices are evident, but harmonize with the natural environment. Access is generally via four-wheel drive vehicles, and concentration of users is much higher than in the semi-primitive or primitive classes but much lower than in the roaded natural class. In some areas, such as near the Trans-Alaska Pipeline, access may be restricted. Users may be concentrated in areas of high recreational value, such as boat launches, fishing holes, and trailheads. Sights and sounds of the highway system may or may not be evident. Vegetation and soils are predominantly natural but localized areas exist, especially near points of heavy use, where soils and vegetation are modified.
Roaded Natural 136,000 (2%)	Area is characterized by a generally natural environment with moderate evidence of the 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 36,000 (0.5%)	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 homes, businesses, and other structures are common. Traffic levels are fairly constant since these areas are populated. Large areas of extensively modified soil and vegetation exist.
Urban 0 (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. The BLM does not manage any lands in this class within the Glennallen District.
Special 93,000 (1%)	Area where existing ROS classes existed prior to this land use plan-related assessment. Areas in this class have their own scale separate from the scale presented in this document. The only area within this class is that covered by the Gulkana river management plan.

(Dilts 2004)

4. Areas of Concentrated Recreation Opportunities

The following areas have been identified because of their concentration of resource values, the significant amounts of recreational activities that occur, or are areas of elevated public concern.

a) Delta WSR Corridor Area

The Delta River is part of the National Wild and Scenic River System. It has sections classified as “scenic,” “wild,” and “recreational” thus providing a diversity of recreational experiences which are road accessible.

The Delta River offers users a unique wilderness float experience: the river is accessible by road and can be traveled in a relatively short amount of time (two to three days). The variety of recreational activities supported by the Delta National Wild and Scenic River makes it truly unique. The Scenic portion of the river includes the Upper and Lower Tangle Lakes and provides for day canoe, kayak, and motorboat trips. The Wild portion of the river affords a float trip for canoe or small raft with a portage around two waterfalls. This stretch of river changes from a clearwater river to a glacial river at Eureka Creek, allowing users to observe the change in landscape as glaciers are introduced. The lower, Recreational portion the Delta River is entirely glacial and contains Class III and IV whitewater in long stretches where Black Rapids Glacier runoff meets the Delta River. It is a rare float for recreational users to take and requires skill in whitewater river-running. Take out points are undeveloped (BLM 1983a).

Over the past five years the Delta River has seen an average of 7,017 visits per year (BLM 2003a). River travelers are the majority of the users, though OHV trails, Top of the World Trail and Rainy Creek Mining Trail, do access the river corridor. While powerboat use is considerably less than on the Gulkana River, it has been increasing due to a change in Federal subsistence hunting regulations that allowed residents of Delta Junction to participate in the Federal subsistence hunt, and feature stories in local publications (Anchorage Daily News 2001).

Other recreational activities that take place within the Delta WSR corridor include fishing, hunting, trapping, berry picking, wildlife viewing, wildlife and scenery photography, hiking, camping, snow machining, and OHV travel. For a description of the other outstandingly remarkable values for which the Delta River was designated, see page 310.

b) Gulkana WSR Corridor Area

The Gulkana National Wild River supports an array of recreational activities. With the establishment of Sourdough and Paxson Campgrounds, the area provides opportunities for car, RV, and tent camping. Both areas also have a boat launch that provides access to the Gulkana WSR corridor. These two campgrounds are the launch and takeout points for most boating and floating activity on the river system.

To get from Paxson to Sourdough on the main stem of the river takes about four days. The trip can be completed with a raft, canoe, or kayak. There is a 2-3 mile reach of Class II and III rapids on the Middle Fork, a 2-3 mile reach of Class II rapids on the West Fork, two reaches of Class II rapids on the Main Stem (3 miles and 8 miles), and a one-quarter mile reach of Class III-IV rapids in the canyon on the main stem. At low water, almost all of these reaches become difficult to run because oars or paddles hit bottom or boats run aground. Visitors are also able to access the river by means of motorboat. The water level determine how far up or down the river motorized boats can go in any given year (BLM 1983b).

During a float or trip on the Gulkana River, visitors have the opportunity for berry picking, wildlife viewing, hunting, fishing, camping, and hiking. The area can also be accessed by OHV on the Middle Fork, Swede Lake, Fish Lake, and Haggard Creek Trails. During the winter months, snowmachines use the area for recreation and accessing trapping lines and subsistence resources.

The Gulkana River considered a prized king salmon fishery. In recent years the river has seen an influx of motorized use due to poor salmon returns on other traditional Alaskan salmon rivers, including the Kenai and Kasilof. The Gulkana also serves as an important recreational fishery for residents of Delta Junction and Fairbanks. Over the past five years the Gulkana has seen an average of 8,410 visits per year (BLM 2003a) with the majority of these visits associated with both king and red salmon fishing seasons.

The Middle Fork and the West Fork of the Gulkana WSR are more remote and offer a fly in or primitive experience. The Middle Fork can also be accessed from the Swede Lake trail with OHV. For a description of the other outstandingly remarkable values for which the Gulkana River was designated, see page 311.

Map 29. Recreation Opportunity Spectrum Classes

File size: 193 KB

File name: 29_ros.pdf

Map size: 11x17

c) Denali Highway Area

The 135-mile Denali Highway was the original travel route from the Richardson Highway to Denali National Park. It connects Paxson Lodge on the Richardson Highway to Cantwell Junction on the Parks Highway. Only 21 miles on the western end of the road and 3 miles on the eastern end are paved; the remaining miles are gravel surface. The highway is maintained by the Alaska DOT from mid-May through mid-October.

According to BLM guidelines, the Denali Highway qualifies as a Type I Back Country Byway with High Scenic Value because it is paved or has an all-weather surface, and adjacent scenery is classified as a Class II Visual Resource Class. This primitive highway provides a glimpse into the way that all of Alaska used to be – remote. The road winds through wide, glacial river valleys and onto mountain passes with vistas of the snow-capped mountains of the Alaska Range, including Mt. McKinley. Visitors have the opportunity to see many kinds of wildlife from moose to porcupine, along with many bird and fish species that occupy the lakes and streams along the highway. Historical and cultural attractions include the Valdez Creek Mining District and the Tangle Lakes Archaeological District.

In addition to providing a scenic driving experience, the Denali Highway also provides access to subsistence resources, remote trail experiences (both motorized and non-motorized), and camping. Two BLM-administered campgrounds and two waysides are located along the highway, and interpretative panels describing the landscape are located at prominent overlooks.

The beauty of the Denali Highway used to be a secret kept by Alaskans. In recent years, however, more and more people have driven, bicycled, or experienced a part or all of what this primitive highway has to offer. This trend of increasing use is expected to continue as the tourism industry grows in Alaska and the Princess Cruise Line continues to utilize the highway as a scenic travel route between Denali National Park and Preserve and Wrangell-St. Elias National Park and Preserve.

d) Tiekel Area

Located between Glennallen and Valdez, this area includes 848,000 acres of BLM-managed lands straddling the Richardson Highway. The transportation and utility corridor is the core of this area and provides a segment of unencumbered BLM lands adjacent to the Richardson Highway. The area is dominated by the Chugach Mountains. The clustered lower peaks of this range cover the area except where bisected by rivers such as the Tiekel and Tonsina. At 7,217 feet, Mount Billy Mitchell is a prominent peak in the area.

The area provides outstanding opportunities for a wide diversity of recreation experiences, from primitive and inaccessible to roaded-natural adjacent to the highway. Several trails take off from the highway and access State, Native, and State-selected lands. These trails provide an excellent opportunity for motorized and non-motorized experiences, loop trails, and extraordinary scenic vistas, all within relatively close distance to the highway. Helicopter-supported skiing and snowboarding are permitted on BLM and State lands within the area. Other Special Recreation Permits are authorized, mostly for outfitter and guiding activities. The BLM currently maintains three trailheads in the area.

e) Delta Range Area

Scenic values in the Delta Range area are high. The recreational segment of the Delta Wild and Scenic River corridor is located in the area, and the Richardson Highway crosses the Alaska Range, providing views of mountains and glaciers. The Trans-Alaska Pipeline also runs north-south through the area roughly paralleling the highway. There are no developed BLM facilities in the area, but numerous dispersed opportunities exist. A pipeline access road at Jarvis Creek provides access to several small lakes stocked by the Alaska Department of Fish and Game. Numerous dispersed campsites have been established in this area and several trails can be accessed from the road. The Delta Range area is popular winter use area for residents of Delta Junction and Fairbanks. Several glaciers in the area (including Canwell, Augustana, and Fels) and a portion of the Alaska Range have been traditionally used by backcountry climbers, skiers, and mountaineers seeking a challenging primitive backcountry experience. McCallum Creek drainage receives greater snowfall than the higher elevations or steeper slopes and is favored by backcountry skiers.

The annual Arctic Man Ski and Sno-Go Classic is held in the southern end of the area. This competitive snowmachine/ski race draws up to 10,000 spectators, and has led to increases in the amount of dispersed snowmachine use in the area. The event takes place on both State and BLM lands.

5. Recreation Area Designations

a) Special Recreation Management Area (SRMA)

A Special Recreation Management Area (SRMA) designation intensifies management of areas where outdoor recreation is a high priority. It helps direct recreation program priorities toward areas with high resource values, elevated public concern, or significant amounts of recreational activity. Areas with a SRMA designation can be expected to see investments in recreation facilities and visitor services aimed at reducing resource

damage and mitigating user conflicts (BLM 1990). Implementation-level plans are completed for each SRMA to fully describe management actions and objectives (BLM 2005b).

There are currently no designated SRMAs within the planning area.

b) Extensive Recreation Management Area (ERMA)

An Extensive Recreation Management Areas (ERMA) is an area that emphasizes the traditional dispersed recreation use of Public lands (BLM 1990). ERMAs have an undeveloped character that allows visitors to escape crowds, rely on their own skills and equipment for recreation pursuits, and freedom from stricter regulations (BLM 1990). All lands that are not within a designated SRMA revert to the ERMA category. BLM actions in ERMAs is limited to custodial actions and therefore do not require an implementation-level plan (BLM 2005b).

All land within the planning area, with the exception of the Delta and Gulkana Wild and Scenic River Corridors, is currently managed as ERMAs although not formally designated as such.

D. Issue 3: Natural and Cultural Resources

1. Soils

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.

The soils resource may be affected by natural forces such as wind and water erosion and by unnatural causes such as road building, mining, or OHV use. A primary function of the Soil Resources Program is to evaluate proposed actions on Federal lands according to the National Environmental Policy Act. For all authorized activities in the area, stipulations mitigate potential sources of soil degradation, to the extent possible.

Soil supports vegetation important to wildlife, stream bank stabilization, and commercial resources such as timber. Subsistence, commercial, sport, and recreational uses of lands and resources are all related directly or indirectly to the use of soil. Permitted activities, such as timber harvest or mining, include stipulations that minimize surface disturbing impacts.

The major programs that can lead to soil degradation (e.g., compaction and erosion) are mineral development, recreation, OHV use, forest management, and fire.

OHV use for hunting and recreational activities is continuing to grow, and concerns about potential watershed degradation will increase under current management. All of the planning area with the exception of the Tangle Lakes Archeological District and the Delta and Gulkana Wild and Scenic River Corridors are open to unrestricted use of OHVs.

OHVs can indiscriminately cross alpine areas, wetlands, steep slopes, and areas underlain by permafrost. Continual crossings expose the soil by compacting and removing vegetation, thereby increasing the availability of material to erosion (Meyer 2002). Trail condition surveys conducted on most of the major trails on lands managed by the Glennallen Field Office indicate trails are in critical need of management, with many areas showing high potential for watershed degradation (ICRC 2001, ICRC 2002).

a) Soils Inventory

Soils in the planning area have been surveyed on a very broad scale through the Exploratory Survey of Alaska completed in 1979. This survey is best used for general land use planning. Map units are very large and lacking in detail. The State of Alaska has been divided into 15 major land resource areas; of these 15, 5 make up most of the land within the planning area: Southcentral Alaska Mountains, Southeastern Alaska, Copper River Plateau, Alaska Range, and the Interior Alaska Lowlands. These areas are dominated by broad basin rolling to hilly moraines and glacial lacustrine sediment interspersed with many lakes, and mountains capped by large icefields, and many glaciers with moraines, outwash plains, and other glacial features.

Intensive soil surveys have been done on limited areas, most notably on the Gulkana Wild and Scenic River, in Copper River area, and along the Trans-Alaska Pipeline corridor. The completion of a survey of the Delta WSR Corridor is expected in March 2005. A brief summary of the major soil associations in the planning area is listed in Table 21, and is displayed in Map 30 (USDA 1979).

Table 21. Major Soil Associations

Soil Association	Description
RM 1 (AK218) Rough Mountainous Land	This soil association is made up of steep rocky slopes, icefields, and glaciers. Some slopes in the mountains support sparse shrubby vegetation, but most are barren. These areas are unsuitable for agriculture, forestry, or building construction.
IQ 1 (AK063) Histic Pergelic Cryaquepts (clayey)	This association occupies the site of a large glacial lake that existed during the last ice age. Most soils in this association are formed of clayey nonacid glaciolacustrine sediments and are underlain with shallow permafrost. These soils are interspersed by areas of gravelly morainal deposits and ancient beaches made up of silty sandy deposits. Vegetation is composed primarily of black spruce forest, interspaced with large areas of brushy tundra and scattered areas of sedges, mosses, and low shrubs. The climate and soil conditions preclude most crops and commercial timber production. These soils also impose severe limitations for roads and buildings due to unstable conditions caused by permafrost.
IQ2 (AK064) Histic Pergelic Cryaquepts (loamy)	This association occupies extensive tracts of nearly level to rolling ground moraines, outwash plains, and long mountain foot slopes. The soils are poorly drained with a shallow permafrost table, and are formed from loamy colluvium or loess, and scattered gravel glacial deposits over gravelly and stony glacial drift. Vegetation is mostly made up of black spruce forests and tundra dominated by sedges, mosses, and low shrubs. These soils are not suitable for common agriculture crops or commercial forestry. Due to extensive permafrost, these areas are subject to severe limitations for development.

Soil Association	Description
IU3 (AK201) Pergelic Cryumbrepts (very gravelly)	<p>These areas are made up largely of hilly alpine plateaus, rocky peaks, sharp ridges, steep mountain valleys, and foot slopes. The dominant soils are formed in very stony and gravelly colluvial material over bedrock. While soils are below freezing in temperature, the texture is so coarse that little ice rich permafrost is present. Vegetation is predominantly low shrubs, mosses, lichens, grasses, and forbs.</p> <p>Soils of this association are not suitable for cultivation or forestry, and, due to rugged terrain, have severe limitations for construction purposes.</p>
IR11 (AK178) Typic Cryochrepts (very gravelly)	<p>These soils are formed in thick deposits of very gravelly till and colluvium. The soils are well drained without permafrost and are covered with stands of white spruce and aspen in many locations.</p> <p>Portions of these soils are suitable for forest development.</p>
SO10 (AK247) Humic Cryorthods (very gravelly)	<p>The dominant soils formed in very gravelly drift or colluvium capped with a mantle of silty loess or a mixture of loess and ash. The soils are well drained and acidic. Vegetation is dominated by white spruce and aspen in the valleys and subalpine species on the slopes.</p> <p>These soils are not suitable for cultivation, and upland slopes are not generally suitable for construction projects. The soils do allow for forest development.</p>
SO15 (AK259) Pergelic Cryorthods – Histic Pergelic Cryaquepts (very gravelly)	<p>These soils are formed on rolling gravel glacial drift commonly capped with a thin mantle of silty loess or volcanic ash. These associations are a mixture of well and poorly drained soils that contain some ice rich permafrost. Vegetation is tundra with scattered groups of black spruce and aspen.</p> <p>The association is not suited for agriculture or forestry.</p>
SO16 (AK263) Pergelic Cryorthods (very gravelly), Histic Pergelic Cryaquepts	<p>These soils occupy the choppy morainal hills and broad valleys of the Copper River Plateau. The dominant soils formed in glacial till of loamy colluvial sediments. This association is composed of a mixture of gravelly well drained and loamy poorly drained soils. Permafrost is present throughout the association, although clear ice is not commonly found in the well drained portions. Vegetation is comprised of dwarf birch, willows, sedges, mosses, and low shrubs.</p> <p>In general these soils are not potentially suitable for cultivation or commercial forestry and contain severe limitations for development.</p>
SO17 (AK264) Pergelic Cryorthods	<p>This association occupies alpine areas adjoining steep mountains in the Alaska Range. High sharp ridges and peaks of bare rock or rubble, steep mountainsides, and deep glacial valleys dominate the landscape. The soils are mostly well drained and shallow. They are frozen but contain little clear ice.</p> <p>These soils are not suitable for agriculture or commercial forestry and have severe limitations for engineering uses.</p>

Map 30. Major Soil Associations

File size: 192 KB

File name: 30_soils.pdf

Map size: 11x17

2. Water Quality

The planning area contains many hydrologic features that contribute to the area's diverse water resources. Glaciers and their sediment-laden runoff, clearwater streams, wetland areas, lakes, and intricate major river watersheds combine to support wildlife, plants, and a multitude of human activities. Subsistence, commercial, sport, and recreational uses are all related in some way to water use. Generally, it is believed that the surface water is of good quality (Sondergaard 2003d). There are no water bodies listed as impaired on the State's list of impaired water bodies (303d list) on BLM managed lands in the East RMP planning area.

Two waterbodies within the Field Office boundaries are being monitored for instream flow: the Delta and Gulkana Rivers. These rivers are included in the National Wild and Scenic Rivers System and are afforded special management by the BLM. Flow regimes on these two rivers are being documented in order to quantify the amount of water necessary to support the values for which these areas were designated. It is BLM's policy to apply for a State Certificate of Reservation from the Alaska Department of Natural Resources to protect and maintain these instream flows. Applications were filed to reserve water on the Gulkana in 1996 and flow data is continually collected to support the filings and provide additional information regarding management of the river. It is expected that filing for a reservation of instream flow on the Delta will occur in 2006.

There is minimal water quality information available on other waterbodies in the area. Most preliminary water quality samples were gathered in conjunction with fisheries studies. For all authorized activities in the area, enforcement of State water quality standards is a required stipulation to the authorization. In addition, the State's Nonpoint Source Pollution Program has been outlined in Alaska's Nonpoint Source Pollution Strategy. This strategy identifies potential sources of pollution in Alaska and suggests measures to manage those sources of pollution. The development of this strategy was required by EPA in order for Alaska to receive continued grant funding under Clean Water Act Section 319.

Water resources will continue to have a significant role in the social and cultural aspects of rural Alaskans. 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

All placer and hardrock mining activities currently taking place within the planning area are operating under 43 CFR 3809 regulations which require compliance with all

pertinent Federal and State laws pertaining to water quality. There are no active coal or oil and gas leases within the planning area.

b) Recreation

The primary types of regulated recreational activities on lands managed by the Glennallen Field Office are guided hunting, guided sport fishing, guided float trips, and use of BLM campgrounds and waysides. All of these activities have the potential to impact water resources; however, none of these recreational activities has been determined to be causing a problem with water quality to date.

Recreation within the planning area covers a wide range of activities including OHV use, camping, raft and canoe float trips, and sightseeing. The recreation staff has observed, and must deal with, OHV use that has caused bank erosion and sedimentation at stream crossings and riparian areas, causing diminished water quality (BLM 2004i).

c) Fire Management

Fire management in the planning area is currently being conducted under the cooperative Alaska Interagency Fire Management Plan (Alaska Interagency Fire Management Council 1984). In addition, the fire and fuels management direction in the BLM-Alaska Land Use Plan Amendment for Wildland Fire and Fuels Management (2005) and the BLM-Alaska Fire Management Plan (2005) are applicable to BLM-managed lands statewide. Although a large portion of the area generally lacks the fuels required to carry 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 sensitivity of the landscape to eroding forces and to reduced land stability. This is manifested primarily as increased overland water flow and greater sedimentation of rivers and streams.

While wildland fires 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 (Sondergaard 2003d).

d) Forest Products

The number of acres disturbed by forest product harvesting within the planning area are minimal; however, due to the location of marketable timber resources, the possibility for

impacts from commercial timber development to high quality streams is ever present. To date, the impacts from commercial operations have been minimized by the liberal application of operating stipulations. The stipulation with the biggest positive impact to the area's water resources has been the requirement that all activities associated with commercial timber harvest that require the use of heavy equipment must be done when the ground is frozen and covered with snow. This stipulation will continue to be implemented on all future commercial forest product sales unless site conditions are conducive to dry, warm weather harvest. Non-commercial timber product usage, while of a larger magnitude in the planning area, is causing no known problems. Non-commercial harvesting is limited to personal use for firewood or house logs and is widely dispersed throughout the planning area. This type of harvesting is also conducted under a set of stipulations designed to prevent unnecessary environmental damage.

3. Air Quality

Air quality throughout the planning area is pristine or nearly so, except during periods in the summer when wildfires may increase the airborne particulates. On rare occasions and for short periods of time (such as during the 2004 fire season), wildland fires result in air quality standards being exceeded. Wildland fire occurrence and impacts from those fires vary widely from year to year. State air quality regulations distinguish between impacts associated with wildland fire and those of prescribed fires. Wildland fire emissions are not regulated under current EPA or State policy. There are no large industries which add significantly to the particulates in the air; however, Pump Stations 10 and 12 and heating and power generation stations in local communities may cause local increases in particulates during periods of still air. These increases have not presented any significant problems at any locations on lands managed by the Glennallen Field Office (Sondergaard 2003a).

At present, the only activities in the planning area that could be envisioned as contributing to the diminishing of air quality would be facilities associated with the Trans-Alaska Pipeline (such as the pump stations), gravel highways, wildland fires, prescribed burns, mining operations, and major construction projects such as highway realignment. The State of Alaska Department of Environmental Conservation monitors these activities for air quality violations and enforces dust control programs, a major source of air quality reductions around construction projects. With the exception of the pipeline facilities and one mining operation, all of these activities are seasonal in nature and usually short in duration; only fire is known to cause any significant decrease in the quality of the air resources in the planning area (Sondergaard 2003a).

The lack of major human impacts to air quality across a total area of 33 million acres has precluded the need for a BLM air quality monitoring program. Conclusions described above are based on specialist observations rather than specific monitoring data.

a) Smoke Management

The Alaska Department of Environmental Conservation (ADEC) is responsible for declaring air episodes and 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 (MAC), 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).

4. Vegetation (Including Sensitive Status Plant Species)

This section describes the occurrence and current condition of vegetation within the planning area. For information regarding the management of vegetation, fire and forestry practices, see section (III)(F) *Issue 5: Vegetation Management*.

Within the Glennallen Field Office boundaries lie extremely complex geology, varied climate and periodic disturbances of the habitats. Diverse floras range from the coastal shorelines of Prince William Sound to wetlands of the temperate rain forest to the tundra of South-central Alaska, as well as the ice-clad peaks of the Alaska and Chugach ranges. Most of the plant species in the planning area are widely distributed and common. However, some of the taxa are of limited distribution and numbers, several of which might be locally or globally rare.

a) Alaska Earth Cover Classification

Vegetation on most BLM lands within the Glennallen Field Office have been mapped on a broad scale using satellite imagery. This mapping is best served for general land use planning and as a guide to areas for a specific purpose. More intensive vegetation mapping has been done on limited areas, most notably on the Gulkana Wild and Scenic River through the Soil/Vegetation Survey. The Delta River Soil/Vegetation Survey will be completed in March 2005. Since the Earth Cover Classification covers most of the BLM lands addressed in this plan, those classifications will be used to define the vegetation within the planning area boundaries. A brief summary of the land cover classifications scheme for the Glennallen Field Office follows:

The classification scheme consists of 10 major categories and 27 subcategories. The following describes the 10 major categories as portrayed on Map 31.

1.0: Forest; Needleleaf and Deciduous Trees. The needleleaf species generally found are white spruce (*Picea glauca*) and black spruce (*Picea mariana*). White spruce tends to occur on warmer sites with better drainage, while black spruce dominates poorly drained sites, and thus is more common in the interior of Alaska where permafrost occurs. The needleleaf classes include both white and black spruce. Mature stands of black spruce with an understory component of lichen provide critical winter range for caribou.

The deciduous tree species generally found are paper birch (*Betula papyfera*), aspen (*Populus tremuloides*), and cottonwood (*Populus balsamifera* and *Populus trichocarpa*). Black cottonwoods (*trichocarpa*) are generally found only in river valleys and on alluvial flats. Under some conditions, willow and alder form a significant part of the tree canopy. Deciduous stands are found in major river valleys, on alluvial flats, surrounding lakes,

Map 31. Alaska Earthcover Classifications

File size: 295 KB

File name: 31_earthcvr.pdf

Map size: 11x17

or, most commonly, on the steep slopes of small hills. Mixed deciduous/coniferous stands are present in the same areas as extensive, deciduous and mixed deciduous/coniferous stands and are generally limited in size. The only exception to this rule is near major rivers where relatively extensive stands of pure deciduous trees occur on floodplains and in ancient oxbows.

Sub-categories within this category are: Closed Needleleaf (1.1), Open Needleleaf (1.2), Open Needleleaf Lichen (1.21), Woodland Needleleaf (1.3), Woodland Needleleaf Lichen (1.31), Closed Deciduous (1.4), Closed Birch (1.41), Closed Aspen (1.42), Closed Poplar (1.43), Open Deciduous (1.5), Open Birch (1.51), Open Aspen (1.52), Open Cottonwood (1.53), Closed Mixed Needleleaf/Deciduous (1.6), and Open Mixed Needleleaf/Deciduous (1.7).

2.0: Shrub. The tall and low shrub classes are dominated by willow species (*Salix* spp.), dwarf birch (*Betula nana* and *Betula glandulosa*) and *Vaccinium* species, with alder (*Alnus* spp.) being somewhat less common. However, the proportions of willow to birch and the relative heights of the shrub species vary widely, which can create difficulties in determining whether a site is made up of tall or low shrub. As a result, the height of the shrub species making up the largest proportion of the site dictates whether the site is called a low or tall shrub. The shrub heights will only be averaged within a genus, as in the case of a site with both tall and low willow shrubs. Dwarf shrub is usually composed of dwarf ericaceous shrubs and *Dryas* species, but often includes a variety of forbs and graminoids. The species composition of this class varies widely from site to site and may include rare plant species. It is nearly always found on hill tops or mountain plateaus, and may include some rock.

Sub-categories within the Shrub category are Tall Shrub (2.1), Willow/Alder Low Shrub (2.21), Other Low Shrub/Tussock Tundra (2.22), Other Low Shrub/Lichen (2.23), Other Low Shrub (2.24), Dwarf Shrub/Lichen (2.31) and Other Dwarf Shrub (2.31).

3.0: Herbaceous. The classes in this category include bryoids, forbs, and graminoids. Bryoids and forbs are present as a component of most of the other classes but rarely appear in pure stands. Graminoids such as *Carex* spp., *Eriophorum* spp., or Bluejoint Grass can dominate a community.

Sub-categories within the herbaceous category include Lichen (3.11), Moss (3.12), Wet Graminoid (3.21), Tussock Tundra (3.31), Tussock Tundra/Lichen (3.311), Mesic/Dry Graminoid (3.34), and Mesic/Dry Forb (3.35).

4.0: Aquatic Vegetation. The aquatic vegetation is divided into Aquatic Bed (4.1) and Emergent (4.2) classes. The aquatic bed class is dominated by plants with leaves that float on the water surface, generally pond lilies (*Nuphar polysepalum*). The Emergent Vegetation class is composed of species that are partially submerged in the water and may include freshwater herbs such as horsetails (*Equisetum* spp.), maretail (*Hippuris* spp.), and buckbean.

5.0: Water. Two subclasses, Clear Water (5.1) and Turbid Water (5.2).

6.0: Barren. This class includes sparsely vegetated sites, such as abandoned gravel pits or riparian gravel bars, along with non-vegetated sites, such as barren mountaintops or glacial till. Subclasses include Sparse Vegetation (6.1), Rock/Gravel (6.2), and Non-vegetated Soil (6.3).

7.0: Urban. This class was not found in the study area.

8.0: Agricultural. This class was not found in the study area.

9.0: Cloud/Shadow. At least 50 percent of the cover is cloud or shadow.

10.0: Other. Sites that do not fall into any other category are assigned to Other.

b) Upland and Riparian Vegetation

Throughout the planning area, fire as well as insects and disease are the most common natural disturbances that effect vegetation. Prior to the mid-1950s, periodic wildland fires were common, sometimes burning hundreds of thousands of acres. Fire suppression in combination with frequent interspersed wetlands and riparian areas has decreased the frequency and magnitude of wildland fire occurrence.

In general, within the Forest needleleaf cover types, lack of fire has lead to a late-seral expression dominated by mature black or white spruce. As the forest canopy develops and the understory species disappear, a site becomes progressively less productive. Relatively few animal species find the requirements necessary for their survival in the mature spruce forest that will eventually develop in the absence of fire. However, because lichen cover increases in these more mature stages of black spruce stands, these areas are valuable for lichen foraging animals such as caribou. Within the shrub types, lack of periodic fire can lead to lack of resprouting, over-mature shrubs, and dying crowns.

Lack of periodic fire and an increase in average temperatures in the area has contributed to the infestation of spruce bark beetle (*Dendroctonus rufipennis*) in white spruce stands. Over the past 10 years, the infestation has resulted in 80-90 percent mortality in many white spruce stands. Because of the occurrence of white spruce, the infestation is particularly prevalent in the Tielke planning sub-region. Recent mapping shows 144,000 acres of affected white spruce stands. Poor access into areas of infestation has prevented salvage, fuels reduction, or prescribed fire activities.

Human-caused disturbances to vegetation are relatively rare within the planning area. Most permitted activities are of a temporary nature and require some mitigation to minimize disturbance to vegetation. OHV users impact vegetation by removing obstructing vegetation to create trails; continuous use of trails leads to removal of

ground cover vegetation and exposure of bare ground. This type of activity in soils underlain by permafrost will lead to thermal erosion, mud, and bog-holes. Mud-holes tend to create trail braiding, where users find higher or dryer ground, thus widening the trail and associated impacts to vegetation, see Figure 1 on page 194. Some OHV trails in the planning area are at least 200 yards wide in braided areas. At current trail densities, these impacts to vegetation are relatively insignificant. With an estimated 900 miles of trail on BLM-managed lands in the planning area, at an average width of 15 feet, there are 1,636 acres of vegetation disturbance tied to OHV trails. Some impacts, however, can be significant locally (such as vegetation removal on a trail resulting in sedimentation into a stream).

With rare exception, riparian/wetland vegetation within the planning condition is in good condition. Riparian condition surveys done along the Gulkana River found riparian vegetation to have:

- Diverse age-class distribution and composition,
- Species present that indicated maintenance of riparian/wetland soil moisture characteristics;
- Deep-rooted riparian species;
- Vigorous riparian vegetation;
- Adequate vegetative cover to protect streambanks and dissipate energy during high flows;
- Plant communities with an adequate source of coarse and/or large woody material. (Sondergaard and Guyer 2002)

The rare inclusions that did not exhibit these characteristics were attributed to recreational activities (dispersed camping) and OHV trails accessing the river.

c) Noxious Weeds and Invasive Plants

Alaska has a known total of 1,373 native and introduced plants. It is unknown at this time how many species of noxious or invasive plants occur in the planning area because of a lack of surveys.

Noxious and invasive species are expected to be more prevalent in urbanized areas where vehicles transport seeds from outside of Alaska. There have been minimal formal weed surveys in the planning area. Weed control efforts have been primarily concentrated on increasing public awareness and prevention.

The Strategic Planning Committee for Noxious and Invasive Plant Management (CNIPM) has initiated efforts for a statewide Memorandum of Understanding between the BLM and other agencies to create an Invasive Plants Management Plan. The Committee held an Alaska Interagency Noxious and Invasive Plant Workshop in 2001. In December of 2001 the CNIPM came out with the *Strategic Plan for Noxious and*

Invasive Plants Management in Alaska (CNIPM 2001). A statewide list of noxious and invasive plant species is in the process of being developed.

Public concern about the harmful effects of uncontrolled weeds continues to increase. Unacceptable levels of weeds could adversely affect crop and forage production, wilderness, wildlife habitat, visual quality, recreation opportunities, and land value. Noxious and invasive weeds may be more prevalent near settled areas, but their populations are suspected to be increasing in remote areas as well. OHV use (especially summer and fall use), electronic sites, right-of-way development, guided hiking and climbing, helicopter landings in the summer, trail construction, non-motorized recreational activities, and utility systems or other development activities could result in increased infestations of noxious or invasive plant species (CNIPM 2001).

The goal is to keep noxious weed populations low enough to prevent unacceptable spread, damage, or annoyance, and to encourage desirable vegetation to permanently replace the weeds. If the alterations in the quality or quantity of the original habitat are severe enough, plant and animal populations may be substantially altered, resulting in displacement or even elimination of species. Changes in quality can be more subtle, yet the effects can be just as real and disruptive.

d) Sensitive Status Plant Species

(1) *Threatened and Endangered Plant Species*

At this time there are no threatened or endangered plant species known to occur on BLM-administered lands in the planning area. There is only one listed species in Alaska, the Aleutian shield fern, and it only occurs in the Aleutian chain on Adak Island.

(2) *Sensitive Status Plant Species*

Conserving rare species and unique natural plant communities is a necessary step toward maintaining species diversity in the planning area. The BLM's national and state goals and objectives for rare and sensitive plant species are to consider the overall welfare of these species when undertaking actions on public lands, and to not contribute to the need to list the species under the provisions of the Endangered Species Act. There are 31 rare/sensitive species on the Alaska Botanical Threatened and Endangered and Sensitive Status Species list as shown in Table 22. Since little to no specific baseline plant inventory data exists for the planning area, extrapolations of rare plant occurrences based on adjacent Wrangell-St. Elias National Park and Preserve plant inventories have been used to assess which rare plant species may inhabit the East Alaska planning area (NPS 1986).

Table 22. Sensitive Status Plant Species Possibly Occurring within the Glennallen Field Office

Common Name	Scientific Name	Possibly Occurs in Planning Area
Aleutian wormwood	<i>Artemesia aleutica</i>	No
Purple wormwood	<i>Artemesia globularia</i> var. <i>lutea</i>	No
Yellow-ball wormwood	<i>Artemesia senjavinensis</i>	No
Alaskan glacier buttercup	<i>Beckwithia glacialis</i> spp. <i>alaskana</i>	No
Triangle-lobe moonwort	<i>Botrychium ascendens</i>	Yes
Ogilvie Mountains springbeauty	<i>Claytonia ogilviensis</i>	No
Sessile-leaved scurvy grass	<i>Cochlearia sessilifolia</i>	Yes
Shacklette's catseye	<i>Cryptantha shackletteana</i>	Yes
Bering dwarf primrose	<i>Douglasia beringensis</i>	No
Aleutian whitlow-grass	<i>Draba aleutica</i>	No
Tundra whitlow-grass	<i>Draba kananaskis</i>	Yes
Murray's whitlow-grass	<i>Draba murrayi</i>	No
Ogilvie Mountains whitlow-grass	<i>Draba ogilviensis</i>	No
Muir's fleabane	<i>Erigeron muirii</i>	No
Yukon wild buckwheat	<i>Eriogonum flavum</i> var. <i>aquilinum</i>	No
Narrow-leaved prairie rocket	<i>Erysimum asperum</i> var. <i>angustatum</i>	No
Calder's bladderpod	<i>Lesquerella caldera</i>	No
Calder's licorice-root	<i>Ligusticum caldera</i>	No
Drummond's bluebell	<i>Mertensia drummondii</i>	No
Arctic locoweed	<i>Oxytropis arctica</i> var. <i>barnedyana</i>	No
Kobuk locoweed	<i>Oxytropis kobukensis</i>	No
Alaska bluegrass	<i>Poa hartzii</i> ssp. <i>alaskana</i>	No
Yukon podistera	<i>Podistera yukonensis</i>	No
Hairy lousewort	<i>Pedicularis hirsuta</i>	No
Aleutian saxifrage	<i>Saxifraga aleutica</i>	No
Mountain avens	<i>Senecio moresbiensis</i>	No
Pear-shaped candytuft	<i>Smelowskia pyriformis</i>	No
Stipulated cinquefoil	<i>Potentilla stipularis</i>	No
Nodding semaphoregrass	<i>Pleuropogon sabinei</i>	No
Pygmy aster	<i>Aster pygmaeus</i>	No
Willow	<i>Salix reticulate</i> spp. <i>glabellcarpa</i>	No

Table 23. Plant Species with Potential Future Listing as Sensitive Status Plant Species by BLM-Alaska*

Common Name	Scientific Name	Possibly Occurs in Planning Area
Cody's rockcress	<i>Arabis codyi</i>	Yes
Tunux's moonwort	<i>Botrychium tunux</i>	Yes
Yaaxudakeit's moonwort	<i>Botrychium yaaxudakeit</i>	Yes
Narrow-leaf grape fern	<i>Botrychium lineare</i>	Yes
Mountain moonwort	<i>Botrychium montanum</i>	Yes
Alaska moonwort	<i>Botrychium alaskense</i>	Yes

* As identified by the Alaska Natural Heritage Program (2004), rare plant species not currently on BLM's Sensitive Status Species list. *B. tunux* is being considered for possible inclusion to the Candidate list by U.S. Fish and Wildlife Service.

Most of the rare plants that could occur in the planning area are typically found in hard to access habitats such as solifluction slopes, seeps, heaths, snowbeds, recently deglaciated areas, rocky outcrops, cliffs, and scree slopes in subalpine and alpine areas. Therefore we would expect that few human demands exist for these environments and consequently would not jeopardize these particular rare plant species.

OHV use (especially summer and fall use), use authorizations, mining, right-of-way development, guided hiking and climbing, helicopter landings in the summer, trail construction, non-motorized recreational activities, utility systems or other development activities could subject rare/sensitive plant populations to additional impacts and cause localized decreases in some populations where they may occur, especially if near human settlements.

Habitat degradation and destruction is the most serious threat to rare and sensitive species. Rare communities are particularly vulnerable to destruction and degradation because either there are so few of them or their total acreage is very limited. These communities are threatened by hydrologic changes, water pollution, and development. Maintaining rare plants and their habitats enhance the diversity of living resources. The identification of habitat needs for these rare and endangered species and communities has not been pursued for the planning area, due to budgetary constraints, limiting management's ability to foster improved conditions for the perpetuation of these resources. Any management action must be reviewed for occurrences of rare and sensitive species, and special areas needing extra protection must be identified and set aside.

(a) Sessile-leaved Scurvy Grass

Cochlearia sessilifolia is known regionally from collections at Valdez, Seward, Kodiak, and Kenai Fjords. It should be considered as a possible occurrence within the planning area in intertidal zone areas (Rogers 2004b).

The typical habitat of sessile-leaved scurvy grass is gravel bars in the intertidal zone, where submersion at high tide would occur (Murray and Lipkin 1987). *C. sessilifolia* is very close morphologically to *Cochlearia officinalis*, but differs because *C. sessilifolia* is an annual plant, lacking a distinct basal rosette and having larger fruits and a different seed morphology (Rogers 2005a).

(b) Shacklette's Catseye

Cryptantha shackletteana has been documented regionally along Totschunda Creek within the Mentasta Mountains in Wrangell-St. Elias National Park and Preserve in proximity to BLM-managed lands (Cook and Roland 2002). As described by Cook and Roland,

“This Alaska endemic plant is known from only three localities worldwide, is rare in Alaska (G1Q S1) and is a United States Fish and Wildlife Species of Concern. We have previously reported this notable find (Roland and Cook 1998). This species is closely related to *C. spiculifera* (Piper) Payson which is common throughout the Great Basin states (Higgins 1969, Cronquist et al. 1984). A specimen from Chuktoka, assigned to *C. spiculifera* by Tolmachev and Yurtsev (1980), has been examined and determined to be neither *C. shackletteana* or *C. spiculifera*. The collections from the Mentasta Mountains are 280 km south of the collections at Eagle and Calico Bluffs on the Yukon River” (2002).

Given the aforementioned documented locations on adjacent National Park Service-managed land, Shacklette's catseye may possibly be found on very steep, xeric, south-facing scree and rubble slopes above Tetlin River within the Mentasta Mountains on BLM-managed lands (Rogers 2004b).

In general, Shacklette's catseye habitat in east Alaska is characterized as dry gravels on open, calcareous slopes.

(c) Triangle-lobe Moonwort

This moonwort (*Botrychium ascendens*) has been documented regionally on Gold Hill in the Nutzotin Mountains within Wrangell-St. Elias National Park and Preserve south-facing scree slope adjacent to BLM-managed lands. As described by Cook and Roland,

“This North American species with a cordilleran distribution was known from two localities in Alaska and one in the Yukon Territory (Cody 1994). It is rare in

Alaska (G3 And S1) and Cody (1994) suggested that it be added to the list of rare species for the Yukon Territory (2002).”

In general, triangle-lobe moonwort habitat in east Alaska is characterized by open mountain slopes and steep screes, ranging in elevation from 4,500-5,300 feet.

(d) Tundra Whitlow-grass

Also known as longstalk whitlow-grass, tundra whitlow-grass (*Draba kananaskis*). Regional locations have been documented in the Chugach Mountains within Wrangell-St. Elias National Park and Preserve in proximity to BLM-managed lands (Cook and Roland 2002). As described by Cook and Roland, “[t]his North American cordilleran mustard was known only from the vicinity of Hope on the Kenai Peninsula.”

Emphasis on possible tundra whitlow-grass occurrences are focused where an alpine limestone environment is found in close proximity to adjacent Wrangell-St. Elias National Park and Preserve lands (Rogers 2004b).

In general, tundra whitlow-grass habitat in east Alaska is characterized as alpine communities, rocky alpine slopes, rocky ledges, bare shale, and limestone slopes with large blocky talus.

(3) *Plants of Concern*

(a) Alaska Moonwort

Although not officially listed as a BLM-Sensitive Status Species plant, Alaska moonwort (*Botrychium alaskense*) warrants special concern due to its rarity. The species has been documented immediately adjacent to Glennallen Field Office lands within Wrangell-St. Elias National Park and Preserve on the Cheshnina Plateau (Rogers 2004b).

In general, *Botrychium alaskense* habitat in east Alaska is characteristic of recently disturbed areas, revegetating sandbars, new oxbow lakes, infrequently mowed fields or lawns, ditches, and edges of roads.

(b) Cody’s Rockcress

Although not officially listed as a BLM-Sensitive Status Species plant, Cody’s rockcress (*Arabis codyi*) warrants special concern due to its rarity. The species is known from Iron Creek in the Chitina River area and only a few sites in the Yukon (Rogers 2004b). National Park Service botanists have documented this rare species in the Chugach Mountains on west-facing unstable limestone scree slopes (Cook and Roland 2002).

Arabis codyi habitat is characterized by unstable alpine slopes.

(c) Mountain Moonwort

Although not officially listed as a BLM-Sensitive Status Species plant, mountain moonwort (*Botrychium montanum*) warrants special concern due to its rarity. This moonwort has been documented within Wrangell-St. Elias National Park and Preserve (Rogers 2004b).

Botrychium montanum habitat is characterized by alpine forb herbaceous scree slopes, wet fens, and cedar forests.

(d) Narrow-leaf Grape Fern

Although not officially listed as a BLM-Sensitive Status Species plant yet, narrow-leaf grape (*Botrychium lineare*) warrants special concern due to its rarity. The species is known from the Chisana airstrip within Wrangell-St. Elias National Park and Preserve and is considered likely to occur on adjacent BLM lands of similar environmental composition (Rogers 2004b).

Open silty areas, disturbed roadsides, and meadows usually of high elevation in mountainous country are typical habitats of *Botrychium lineare*.

(e) Tunux's Moonwort and Yaaxudakeit's Moonwort

Although not officially listed as a BLM-Sensitive Status Species plants, Tunux's moonwort (*Botrychium tunux*) and Yaaxudakeit's moonwort (*B. yaaxudakeit*) warrant special concern due to their rarity. Both are known from the Yakutat Forelands and are considered very likely to occur on beaches to the west on BLM lands. In addition, *B. tunux* has been documented within the White River Valley of Alaska and along the Chisana River. *B. yaaxudakeit* has been documented within the White River Valley of Alaska (Rogers 2004b).

Characteristic habitat for *Botrychium tunux* is within alpine forb herbaceous scree slopes and in open sand dunes and upper beaches along the coast. The typical habitat of *Botrychium yaaxudakeit* is silty slopes.

5. Wildlife (including Sensitive Status Wildlife Species)

The overall objective of wildlife habitat management on public lands is the conservation and rehabilitation of fish, wildlife, and plant resources consistent with multiple use management principles. On Glennallen Field Office lands, however, management is typically limited to conservation efforts rather than rehabilitation because few if any district resources are impacted enough to justify rehabilitation work. In collaboration with the State of Alaska's identified wildlife population management objectives, the Glennallen Field Office emphasizes wildlife habitat improvement to support wildlife populations compatible with what ecosystems can sustain naturally.

The use of wildlife resources within the planning area by humans is either consumptive (hunting and trapping) or non-consumptive (viewing and photography). 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 sport or commercial uses. The Federal Subsistence Board manages the fish and wildlife harvest on Federal Reserved waters for fish and Federal lands for wildlife through harvest regulations. The State may comment on these regulations and close coordination of State and Federal regulations is sought by both entities.

Given the physiographical extent of the Glennallen Field Office, ranging from glaciated, mountainous terrain to broad, sedimentary interior valleys and lowland coastlines, habitats are quite varied and support a diversity of wildlife species. Wildlife resources in Alaska are constrained due to climatic conditions that are extreme in interior regions but more moderate in the coastal environments. Table 24 shows the habitat types that occupy the planning area.

Table 24. General Habitat Types within the Glennallen Field Office

Habitat Type	Acres	Percent of District
Ice/snow/rock	1,755,600	5
Water	1,393,700	4
Tundra	6,591,200	17
Shrub	12,012,000	31
Spruce/poplar	16,747,500	43
Total	38,500,000	100

The Alaska Department of Fish & Game's annual *Species Management Report* is the authoritative source of current wildlife populations' status throughout the state. This report is relied upon heavily to present information per species and associated habitat by Game Management Unit (GMU) within the BLM's Glennallen Field Office boundaries.

The units and subunits that encompass the Glennallen Field Office are Unit 5B, Unit 6A, Unit 6D, a portion of Unit 11, a portion of Unit 12, all subunits within Unit 13, Unit 14B, Unit 20A, and Unit 20D. Map 28 on page 197 displays the location of each unit within the Glennallen Field Office.

The following information is provided as an overview of existing wildlife populations and associated habitat within the Glennallen Field Office. However, because wildlife populations and their associated habitats do not recognize political boundaries, this information also applies more broadly to other adjacent public lands.

A wide variety of wildlife species (mammals, birds, and amphibians) are found in Southcentral Alaska. Complete species lists can be found in *Appendix D*. Only those species of wildlife considered important as a subsistence resource, economically important to Southcentral Alaska, or otherwise a high profile species, will be covered in this chapter.

a) Big Game Species

All maps displaying the habitat of big game species are at the end of the *Big Game Species* section beginning on page 239 of this chapter.

(1) Bear

Grizzly bears (*Ursus arctos*) and black bears (*Ursus americanus*) are widely distributed on lands managed by the Glennallen Field Office and huntable populations are found within each Game Management Unit (GMU) within the Field Office boundaries. See Map 32 on page 239 for the current distribution of bears within the Glennallen Field Office. Biological pressures dictate what areas of their home range are preferred at different times of the year. For example, grizzlies are only active for half of the year, denning within their home ranges for the period of October to April (or longer in the case of females with cubs), thus occupying a very well-defined and restricted habitat during this period. However, during the remaining six months in which they forage, grizzlies occupy all available habitat within their home range and consume whatever they may find (BLM 1989b).

Grizzly bears occur throughout Alaska except on remote isolated islands surrounded by saltwater environments. As stated in the Wildlife Notebook Series published by ADF&G,

“Formerly, taxonomists listed brown and grizzly bears as separate species. Technically, brown and grizzly bears are classified as the same species . . . the term “brown bear” is commonly used to refer to the members of this species found in coastal areas where salmon is the primary food source. Brown bears found inland and in northern habitats are often called “grizzlies” . . . inland bears are usually smaller than coastal bears, probably

because they do not have a readily available supply of protein-rich food, such as salmon, in their diet” (ADF&G 1994).

Grizzly populations vary depending on the productivity of the environment, but because they range over large scale areas with no affinity to a particular habitat, they should be considered creatures of landscapes rather than of a specific habitat type.

Field Office-wide, the current condition of grizzly and black bear habitat is considered moderate to good. Localized threats to the continued quality of bear habitat include extensive logging of old growth forests along the Southcentral coastline, human development/encroachment, and wildland fire suppression that prevents establishment of early seral vegetative communities across the landscape.

(2) Bison

Thousands of years ago, bison (*Bison bison*) were the most common large terrestrial mammal in Alaska; however the Alaskan bison of a millennia ago has gone extinct. The bison found in interior Alaska now are an introduced species that originated in 1928 from transplants from Montana to the Delta Junction area. Since that time, natural emigration and further transplants have resulted in an additional bison herd on BLM-managed lands in the Copper River area. Other herds have also been established in Alaska, such as the Farewell herd and the Chitina River herd. Map 33 on page 241 illustrates the current distribution of bison on lands managed by the Glennallen Field Office.

An assessment of the current condition of bison habitat has not been conducted, but ADF&G indicates there is evidence of heavy use and reduced forage production in those areas preferred by bison (such as swamps, sedge openings, grassy bluffs, and river bars) (Tobey 2002).

The Copper River bison herd in Unit 11 is occasionally found on BLM-managed lands west of the Copper River in the Kenny Lake area; these lands are selected for eventual conveyance to either the State of Alaska or the Ahtna Native Corporation. The Copper River bison herd size has fluctuated considerably since the 1950s, with a low of 64 animals in 1995 and a high of 119 in 1970. In 2001, ADF&G’s bison count resulted in 108 animals total. ADF&G’s management objective for this herd is a minimum of 60 animals. A complete habitat condition assessment of the Copper River bison range has not been conducted, but generally they are known to inhabit black spruce forests, frequent swamps, sedge openings, grass bluffs, and river bars. Field observations by ADF&G biologists at preferred feeding locations indicates heavy use of the sites and reduced forage production as a result of overgrazing (ADF&G 2002a).

The Delta River bison herd in Unit 20D is frequently found on BLM-managed lands in the Black Rapids and Donnelly Dome area of the Delta River during calving season. A portion of these lands used by the Delta bison herd during calving have been selected by the State of Alaska for conveyance; however, the core Delta River riparian

zone/corridor will be managed indefinitely by the BLM. Recent annual herd counts before the scheduled fall hunting season indicate this herd is stable (434 animals in 1999; 453 animals in 2000; and 471 animals in 2001) and benefits from an active ADF&G bison range management program. ADF&G's management objective for this herd is to maintain approximately 360 animals at the pre-calving count (ADF&G 2002a). No specific information is provided on this herd's diet when on unmanipulated public lands range, but it is assumed their grazing and browsing preferences would be the same as those of the Copper River bison herd. ADF&G actively manages this herd to maintain and/or increase their time spent on public lands rather than on privately-owned agricultural lands where conflicts are known to occur regularly with farming and livestock interests.

(3) Caribou

Caribou (*Rangifer tarandus*) live in the arctic tundra, mountain tundra, and northern forests of North America, Russia, and Scandinavia. Worldwide there are approximately 5 million caribou, with about 950,000 of those found in Alaska.

Annual caribou movements are affected by a myriad of physiological and environmental factors. After insect numbers have declined in August, the caribou scatter across the countryside and feed heavily on willow leaves, forbs, sedges, and mushrooms to gain weight in preparation for the upcoming stresses and physical demands of mating season and cold weather. By mid to late September, both the rutting season and fall migration have begun and the caribou diet switches to lichens, dried sedges, and shrubs. To find adequate supplies of available food, caribou herds generally migrate long distances (up to 400 miles) between summer and winter ranges. However, they tend to calve in the same general area each year (ADF&G 2001b). No matter where they are located in Alaska, caribou are an important subsistence species. See Map 34 on page 243 for the current distribution of caribou within the Glennallen Field Office.

The current condition of caribou habitat, specifically the Nelchina herd range, within the Glennallen Field Office area is one of declining quality. Analysis of ADF&G-established range exclosures since 1955 indicates that lichen biomass and production has been exceeded by the number of caribou. An assessment of caribou body condition and herd productivity during the 1990s also concluded that the Nelchina animals were in poorer body condition and more nutritionally-stressed than other interior herds due to overstocking of their range for a number of years (Tobey 2001).

The Mentasta and Chisana caribou herds occupy lands within the northern half of Wrangell-St. Elias National Park and Preserve (and beyond) inside GMU 11. Though no work has been done to determine if overlap of ranges occurs between these two small herds, personal observations indicate that they are physically separate (the Chisana herd's range extends west only as far as the Nabesna River and Glacier) and genetically distinct herds. A portion of Glennallen Field Office lands are within the extreme northern end of GMU 11 (15, 997 acres); however BLM lands in this area are not now, nor were they historically, occupied by either the Mentasta or the Chisana

caribou herds. Neither of these herds is considered a huntable population due to recent drastic declines in their population numbers within the past two decades; the Mentasta herd had numbered approximately 3,500 during the mid- to late- 1980s, but a recent population count (2003) found only 273 animals remain. Among other factors leading to these declines is predation by bears and wolves on newborn calves (Rogers, 2003).

Unit 13's Nelchina caribou herd is the most abundant large mammal in the interior region of Southcentral Alaska. Calving occurs in the eastern Talkeetna Mountains. Historic winter range is the Tangle Lakes area; however, the majority of the Nelchina caribou herd now winters outside of Unit 13 in Units 12 and 20 (Joly et al. 2002). Population numbers are quite variable from year to year due to hunting pressure, changes in habitat quality and weather patterns, carrying capacity relationships, and influence of predators. Currently, the Nelchina caribou herd numbers approximately 37,000 and is considered in recovery from a recent low of 29,600 animals in 2000 (Tobey 2005). ADF&G has set a population objective of 35,000 to 40,000 for this herd (Tobey 2001). Habitat assessment for Unit 13 indicates that due to lack of wildland fires, summer range conditions currently limit the productivity of the Nelchina herd (ADF&G 2001b).

The Macomb caribou herd is a small herd of woodland caribou whose traditional range extends from the Robertson River westward to the Richardson Highway, along the northern side of the eastern Alaska Range within Unit 20D. Until 1972, the Macomb herd had been relatively unknown; population estimates at that time put the herd at 350-400 animals. Harvest by hunters had exceeded calf recruitment annually until harvest was severely restricted or eliminated from the 1970s through the 1990s; predation by bears and wolves were also key factors in poor calf survival and led to a localized wolf control effort during the winter of 1980-1981. ADF&G now manages for a fall population objective of 600-800 animals. The most recent census in 2000 resulted in approximately 650 Macomb herd caribou (Dubois 2001). A documented portion of the Macomb caribou herd's summer/fall range is within the Glennallen Field Office's land management jurisdiction and is considered sensitive habitat for this struggling herd (Dubois 2001).

Due to the high profile of caribou, especially the Nelchina herd, movement patterns across the landscape and areas of critical concern (such as calving) are well-documented. However, because of their less than 100 percent predictable annual movements, opportunities to collect more data regarding habitat preferences should be pursued.

(4) Dall Sheep and Mountain Goat

Within the planning area, Dall sheep (*Ovis dalli dalli*) are generally distributed over approximately 6.9 million acres during some time of the year. There are several distinct populations in the district that are associated with the mountain ranges in which they reside: Alaska Range, Talkeetna Mountains, Mentasta Mountains, and Chugach

Range. See Map 35 on page 245 for the current distribution of Dall sheep within the planning area.

Mountain goats (*Oreamnos americanus*) are the single North American representative of widespread worldwide goat-like animals. The range of Alaskan mountain goats extends from the southeastern panhandle north and west through coastal mountains as far as Cook Inlet. Southcentral Alaska mountain goats are found primarily in the Chugach and Wrangell Mountains, but also into the Talkeetna Mountains. Mountain goats in this area are apparently at the extreme extent of their range within the planning area, as none are found north of the Talkeetna, Chugach, or Wrangell Mountains. The majority of mountain goats in the planning area are found in the Chugach Mountains and particularly in coastal environments (BLM 1989b). See Map 36 on page 247 for the current distribution of mountain goats within the planning area.

The current condition of Dall sheep habitat (quantity and quality) in the various mountain ranges within the Glennallen Field Office boundaries is generally good to excellent (BLM 1989b).

Within the Glennallen Field Office boundaries, the current condition of mountain goat habitat is largely unknown but assumed to be good, taking into consideration that ADF&G believes mountain goats to be at the extreme northern end of their suitable range in Southcentral Alaska. However, high reproductive rates suggest that the goat populations are still below the carrying capacity of their habitat (BLM 1989b).

Specific information on seasonal distribution of mountain goats (particularly in winter) is lacking from the literature, but the data need is gaining in importance as high-impact recreational activities (i.e., heli-skiing operations) are established and expanding within the Chugach Mountains. Although both sheep and mountain goat habitats were heretofore inherently protected from the majority of adverse human influences associated with development and recreation, recent advances in recreational pursuits (i.e., heli-skiing, cat-skiing, and snowmobiling) now threaten the sanctity of these high elevation habitats (Macarthur et al. 1982; Cote et al. 1996; Goldstein et al. 2004).

(5) Moose

Moose (*Alces alces*) are the largest member of the deer family, and are considered an important subsistence species. They are widely distributed throughout the planning area generally below 4,000 feet elevation, but are not found in areas of extreme habitat such as glaciers, deep lakes, and marine environments. Moose are most abundant in recently burned areas that contain willow and birch shrubs, timberline plateaus, and along the major rivers of Southcentral and interior Alaska. In general, however, their distribution is determined by requirements for food and cover, and by seasonal snow depths. See Map 37 on page 249 for the current distribution of moose within the planning area.

The current condition of moose habitat within the planning area is poor to good, depending on location. While moose habitats in general are unaffected by human activities, those populations associated with human activities often suffer. Human activity during the majority of the year does not usually affect moose populations; however, those moose that inhabit areas where mechanized travel exists are frequently subject to vehicular collisions, poaching, and harassment.

An even more critical habitat need for moose is the return of fire on a large scale in order to provide an increased amount and diversity of early seral vegetative types across the landscape. Since 1980, several attempts to implement prescribed burns have been made with minimal success. In 2004, a year when wildland fire burned a record number of acres statewide, the BLM and the State of Alaska were able to cooperatively conduct a prescribed burn in the Alphabet Hills area that successfully burned 40,000 acres in a mosaic burn pattern.

The ADF&G indicates that moose numbers for the entire Unit 13 are currently trending downward due to severe winter conditions and increased predation on calves. The State management objective for moose in all of Unit 13 is 20,000-25,000 animals. Moose habitat assessment of Unit 13 by ADF&G indicates that there is much room for improvement overall if wildland fires were not actively suppressed or if mechanical treatment to encourage sprouting of deciduous shrub species were implemented (ADF&G 2002b).

Map 32. Black and Grizzly Bear Habitat

File size: 187 KB

File name: 32_bear.pdf

Map size: 11x17

Map 33. Bison Habitat

File size: 178 KB

File name: 33_bison.pdf

Map size: 11x17

Map 34. Caribou Habitat

File size: 186 KB

File name: 34_caribou.pdf

Map size: 11x17

Map 35. Dall Sheep Habitat

File size: 185 KB

File name: 35_dsheep.pdf

Map size: 11x17

Map 36. Mountain Goat Habitat

File size: 182 KB

File name: 36_goat.pdf

Map size: 11x17

Map 37. Moose Habitat

File size: 193 KB

File name: 37_moose.pdf

Map size: 11x17

b) Furbearers

Furbearers include those species of mammals that are routinely sought after by licensed trappers who place commercial value on the animals' pelts. Furbearers include Canada lynx, wolf, wolverine, coyote, red fox, pine marten, weasel (ermine), river otter, beaver, mink, muskrat, marmot, and squirrel, all of which are widely distributed throughout the planning area. Definitive species population and distribution information is not available, and consequently wildlife biologists rely upon annual trapper harvest reports and opinions and field observations by department personnel conducting track surveys to gauge furbearer status and trend information. The price paid for animal pelts is the greatest determining factor in trapper harvest effort, and subsequently, in the number of pelts sealed per species per year by ADF&G.

Of the furbearer species noted above, all but marmot and squirrel are routinely targeted for trapping in the planning area. Because of their economic value, Canada lynx, wolf, and wolverine are discussed in more detail in this document. River otter, beaver, pine marten, coyote, red fox, muskrat, and mink are briefly discussed because limited harvest information is available which provides some insight into their status and trend in the planning area.

In general, the condition of furbearer species habitat within the boundaries of the Glennallen Field Office is moderate to good. The terrestrial secondary consumer species of furbearers (wolf, coyote, red fox, wolverine, lynx, pine marten, and weasel) would indirectly benefit from the return of wildland fire to the landscape by the direct benefits of habitat improvement afforded their prey species under a more natural fire regime. Aquatic-based furbearer (river otter, mink, beaver, and muskrat) habitat is excellent across the district due to the large quantity of aquatic environments present and the associated wetland vegetation available.

(1) *Beaver*

The beaver (*Castor canadensis*) is the largest rodent found in North America and is found widely distributed throughout Alaska's forested regions. Water environments having greater than 2-3 feet of depth are necessary to sustain a beaver during the entire year. A continuous supply of nearby woody material and other vegetation is also necessary to sustain a beaver colony; once these food resources have been depleted, the beaver colony migrates to a new area and reestablishes itself in an area of food and water resource abundance (ADF&G 1994). Beavers are widely distributed within the planning area.

(2) *Coyote*

The Copper River Valley, the Matanuska-Susitna Valleys, and the Kenai Peninsula are host to the largest populations of coyote (*Canis latrans*) in Alaska. Coyotes are

relatively new to the state, having immigrated here shortly after the turn of the twentieth century. Because the coyote will consume carrion, snowshoe hares, mice, voles, marmots, ground squirrels, muskrats, fish, insects, birds, and even Dall sheep where possible, the coyote is considered an opportunistic forager (ADF&G 1994).

(3) Gray Wolf

The wolf (*Canis lupus*) occurs throughout mainland Alaska. Presently wolves are common over much of the state with densities ranging from about one wolf per 25 square miles in some of the southern and interior portions of the state, to one wolf per 150 square miles or less in the coastal portions of western and northern Alaska. In general, wolves are found throughout the planning area wherever adequate numbers of prey species are found. Wolves are carnivorous, and in most of mainland Alaska, moose and/or caribou are their primary food. During summer, small mammals including voles, lemmings, ground squirrels, snowshoe hares, beaver, and occasionally birds and fish supplement their diet (ADF&G 1994).

As in other areas of Alaska, management of the wolf population in Southcentral Alaska's Unit 13 has varied due to political mandates and State policy. Currently ADF&G's management objective for this unit is to achieve and maintain a post-hunting and trapping season of 135-165 animals distributed proportionally among each of the five subunits. The spring 2002 wolf population estimate was 230 wolves (5.4 wolves per square kilometer). ADF&G recommends substantial reductions in wolf numbers in Unit 13 to avoid severe declines in ungulate populations, particularly moose (Tobey 2002).

(4) Mink

Mink (*Mustela vison*) are found throughout Alaska except Kodiak Island, the Aleutian Islands, the offshore islands of the Bering Sea, and most of the Arctic Slope. Mink are aggressive carnivores and will consume virtually everything that they can capture of manageable size including insects, fish, birds, bird eggs, and small mammals. Suitable mink habitat consists of streams, ponds, beaches, or marshes (ADF&G 1994).

(5) Pine Marten

Pine marten (*Martes americana*) are found from southeastern Alaska, northward and westward in the state to where the last of the trees disappear and unsuitable arctic tundra habitat begins. In Alaska, the majority of pine marten are found in the stunted black spruce forests and bogs of the interior. Home ranges of marten vary in size due to changes in food availability and density levels. Unlike pine marten in the lower 48 states, squirrels are not a primary food source for Alaskan marten. Alaska's pine martens are opportunistic feeders and will readily consume carrion where available. Red-backed voles, meadow voles, and mice compose the majority of their diet; to a lesser extent, they are dependent upon berries, especially blueberries, for food. Of

even less importance to the pine marten diet are small birds, eggs, and vegetation (ADF&G 1994).

(6) Red Fox

Alaska's red fox (*Vulpes vulpes*) ranges widely throughout the state except for some southeast islands, the western Aleutians, and Prince William Sound. Red foxes prefer broken country, extensive lowland marshes, hills, and draws-type habitat. The red fox lives in both forested and tundra environments, but is most abundant in non-tundra settings. The red fox has an omnivorous diet composed of small mammals, birds, eggs, insects, vegetation, and carrion, but voles are its preference (ADF&G 1994).

(7) River Otter

The river otter (*Lutra canadensis*) ranges over most of North America to the north of Mexico. In Alaska, the river otter is widely distributed except for the Aleutian Islands, offshore islands in the Bering Sea, and an area adjacent to the arctic coast east of Point Lay. River otters will hunt both on land and in water, and are inextricably tied to riparian zone habitat throughout their lives. Their diet consists of snails, mussels, clams, insects, frogs, a variety of fish, and occasionally birds, mammals, and vegetable matter (ADF&G 1994). River otters are widely distributed within the planning area.

(8) Wolverine

Wolverines (*Gulo gulo*) are distributed in small numbers across their remaining range (chiefly Alaska) and require large expanses of wilderness. Like bears, wolverines are opportunistic feeders and will consume whatever is available, including carrion and small prey animals (e.g., snowshoe hares, ptarmigan, grouse, ground squirrels). Rarely and given the right circumstances, they are capable of killing young moose (calves or yearlings), caribou, mountain goats, and Dall sheep. Unlike bear diets though, wolverines consume very little vegetation and only when other preferred food sources have become scarce (ADF&G 1994). Wolverine, being capable of subsisting on a varied diet of carrion and prey, are generally found throughout the planning area, but fare best at mid- to high-elevations.

c) Raptors

There are 18 species of raptor known to inhabit lands within the planning area at least seasonally: bald eagles, golden eagles, osprey, gyrfalcon, northern harrier, American kestrel, merlin, red-tailed hawk, sharp-shinned hawk, Swainson's hawk, northern goshawk, rough-legged hawk, great horned owl, great gray owl, snowy owl, northern hawk owl, short-eared owl, and boreal owl. Only the bald eagle will be discussed in detail, as most information specific to the Glennallen Field Office pertains to this species.

(1) Bald Eagle

Bald eagles (*Haliaeetus leucocephalus*) are Alaska's largest resident bird of prey and are more abundant here than anywhere else in the United States. Eagles are often found along Alaska's coast, offshore islands, and interior lakes and rivers. Most bald eagles winter in southern Alaska, but some migrate even further south to warmer climates. Fish are the main diet of the bald eagle. Interior populations of bald eagles, such as the Gulkana River population, prey heavily on spawning salmon. When fish are in short supply, Alaska's interior bald eagles will consume waterfowl, small mammals, and carrion (ADF&G 1994).

Bald eagles are widely distributed throughout the planning area seasonally where suitable habitat and food resources can be found. See Map 38 on page 255 for the current seasonal distribution of bald eagles within the area. Nesting habitat is typically white spruce, cottonwood, or large aspen. Most nest sites are within 100 feet of water (either a lake, stream, or river) (BLM 1989b).

Bald eagle nesting surveys have been conducted in the Gulkana River watershed and portions of the Delta River watershed for over 20 years. Through these surveys, the BLM has determined that nearly 100 nesting territories exist within the Gulkana River drainage; actual nest occupancy rates vary from year to year depending on various climatic conditions and biological situations (BLM 2004I).

The planning area hosts bald eagles in other areas during breeding and nesting season, such as the lower Copper River and Tiekel River; however, very little is known of these seasonal populations.

d) Waterfowl and Other Water Birds

Within the planning area, there are large populations of waterfowl and other water birds (including ducks, geese, swans, loons, grebes, cormorants, and the great blue heron) that utilize the extensive wetlands available. Detailed information is provided only for those birds identified as sensitive species by BLM-Alaska and are known or suspected of occupying habitat within the Glennallen Field Office. This information is located in section *Sensitive Status Wildlife Species* section on page 258.

The current condition of waterfowl and other wading bird habitat is excellent across the district due to the enormous quantity of aquatic environments and associated wetland vegetation available which are primarily unimpacted by humans.

Map 38. Bald Eagle Breeding and Nesting Habitat

File size: 180 KB

File name: 38_eagle.pdf

Map size: 11x17

e) Migratory Birds (Passerines)

The birds that return each spring to Alaska are quite varied and number up to 131 species of breeding birds. Little is known about the population trends of Alaskan landbirds, but Alaskan habitats are still relatively pristine and unaltered, and no large-scale threat to their summer habitat has warranted long-term studies to date. Given that Alaska's summers are of short duration and generally warm and mild, the success of breeding birds depends greatly on their ability to locate suitable nesting habitat in a timely fashion, endure infrequent adverse weather conditions, evade predators, and avoid disruption of their normal routine. Suitable nesting habitat is especially critical to the success of breeding birds, as there they are able to meet the specific needs of rearing young (providing food, water, and shelter) while expending as little energy as possible in the process.

Because of the variety of habitats preferred by the varying species of birds that migrate to Alaska each year, migratory birds are known to occupy every available space of natural habitat within the planning area including wetlands, forests, scrub, and tundra.

Detailed information is provided only for those species of passerines that have been identified by BLM-Alaska as being sensitive species and are known or suspected of occupying habitat within the Glennallen Field Office. This information is located in section *Sensitive Status Wildlife Species* section on page 258.

f) Upland Game Birds

(1) Ptarmigan

Ptarmigan are close relatives of forest and prairie grouse, but live in alplands and arctic tundras throughout the Northern Hemisphere. The ptarmigan group is divided into three species and all are residents of Alaska. Willow ptarmigan (*Lagopus lagopus*) occupy nearly all of Alaska's high, treeless country, rock ptarmigan (*Lagopus mutus*) occupy all major treeless areas except the flat tundras of western and northern coasts of Alaska, and white-tailed ptarmigan (*Lagopus leucurus*) occupy rugged upland habitat from the Alaska Range and central Yukon southward. All three species therefore can be found within the planning area.

In general, ptarmigan begin nesting as soon as snow has melted within their range and will typically lay six to ten eggs which hatch in late June to early July. Young are precocial.

Ptarmigan routinely form and disband into large flocks often during the fall, with their movements becoming more predictable as cold weather sets in. The extent of these fall

movements is variable, but migrations of 100 to 150 miles one way would represent a maximum migration distance for ptarmigan. Ptarmigan move about erratically in winter (November to March) in search of available food. However, by spring (April and early May) large flocks of ptarmigan (up to several thousand) are known to move en masse back towards their breeding grounds.

The diet of all three species consists of plant materials (buds, twigs, and catkins of willow, alder, and birch) during the months of winter and early spring. Their diet during the remaining snow-free months of the year consists of a blend of insects, dried berries, new leaves, and flowers.

Ptarmigan are known for wide fluctuations in their abundance over relatively short periods of time (within a few years). The cause behind these rapid changes in population remains a mystery (ADF&G, Wildlife Notebook Series, 1989).

g) Amphibians

(1) Western Toad

The western toad (*Bufo boreas*) is the only toad species found in Alaska; however, its range is limited to southeast Alaska as far north as Prince William Sound. Considering this, the western toad may potentially inhabit suitable lands in the vicinity of Bering Glacier.

(2) Wood Frog

There are two species of frogs that occupy habitat within the State of Alaska, but only one species occupies land within the planning area: the wood frog (*Rana sylvatica*). The wood frog is capable of inhabiting diverse habitats (grasslands, forest, muskeg, and tundra) and is commonly found a considerable distance from fresh water.

h) Sensitive Status Wildlife Species

As of spring 2005, there are no wildlife species that occupy habitat on Glennallen Field Office lands or are found in adjacent marine waters that are Federally-listed as threatened, endangered, or candidates for listing. Informal, Endangered Species Act of 1973, as amended, Section 7(a)(2) consultations with both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service were conducted as part of the development of this resource management plan. This informal consultation with both agencies resulted in determinations of no threatened or endangered species occurring within the vicinity of the Glennallen Field Office, and no critical habitat for any of these species found in the vicinity of Field Office lands.

BLM-Alaska does give special consideration to certain species that are considered sensitive as defined by one or more of the following criteria:

1. their situation is under status review by the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service, or
2. their numbers are declining so rapidly that Federal listing may become necessary, or
3. they exist in typically small and widely dispersed populations, or
4. they inhabit ecological refugia or other specialized or unique habitats (BLM Manual 6840 Revision 1-19-2001) (BLM 1988a).

The BLM-Alaska Sensitive Status Species list was last updated in April 2004. The majority of species on this list have been considered based on either criteria three or four. The Alaska Natural Heritage Program provided the basis for the potential occurrence of these species on BLM administered lands.

The BLM’s objective regarding sensitive species is to ensure that actions authorized on BLM-administered lands do not contribute to the need to list the species under the Endangered Species Act.

Table 25 lists the BLM-Alaska bird and mammal sensitive species. Twenty-five species of birds are considered sensitive species in Alaska; of those, 12 species are suspected of or known to occupy habitat within the Glennallen Field Office boundaries, based on birding checklists compiled by local natural resource management agencies (Alaska Natural History Association 1993, BLM 1989a, FWS n.d.). Two species of mammals are considered sensitive species in Alaska; both of these species are known occupants of habitat within or immediately adjacent to the Glennallen Field Office.

Table 25. BLM-Alaska Sensitive Status Wildlife Species List

Common Name	Scientific Name	Known or Suspected Occupant on BLM-managed Lands
Canada lynx	<i>Lynx canadensis</i>	X
Harbor seal	<i>Phoca vitulina</i>	X
Trumpeter swan	<i>Cygnus buccinator</i>	X
Dusky Canada goose	<i>Branta canadensis occidentalis</i>	X
Tule white-fronted goose	<i>Anser albifrons gambelli</i>	X
Harlequin duck	<i>Histrionicus histrionicus</i>	X
Red-throated loon	<i>Gavia stellata</i>	X
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>	X
Red knot	<i>Calidris canutus</i>	X
Blackpoll warbler	<i>Dendroica striata</i>	X
Gray-cheeked thrush	<i>Catharus minimus</i>	X
Olive-sided flycatcher	<i>Contopus borealis</i>	X
Townsend’s warbler	<i>Dendroica townsendi</i>	X
American peregrine falcon	<i>Falco peregrinus anatum</i>	X
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	
Bristle-thighed curlew	<i>Numenius tahitiensis</i>	
Kittlitz’s murrelet	<i>Brachyramphus brevirostris</i>	

Common Name	Scientific Name	Known or Suspected Occupant on BLM-managed Lands
King eider	<i>Somateria spectabilis</i>	
Old squaw	<i>Clangula hyemalis</i>	
Black scoter	<i>Melanitta nigra</i>	
Black guillemot	<i>Cephus grille</i>	
Dovekie	<i>Alle alle</i>	
Black brant	<i>Branta bernicla</i>	
Black-tailed godwit	<i>Limosa limosa</i>	
Surf scoter	<i>Melanitta perspicillata</i>	
McKay's bunting	<i>Plectrophenax hyperboreus</i>	
Marbled godwit	<i>Limosa fedoa</i>	

(1) Blackpoll Warbler

Blackpoll warblers (*Dendroica striata*) winter outside of the North American continent, primarily in the northwestern portion of South America. Blackpoll warblers depart from their wintering grounds as late as the end of April and arrive on their Alaska breeding grounds in late May.

Blackpoll warblers prefer riparian shrub thickets and/or early successional forests of spruce in Alaska for their breeding habitat.

In general, blackpoll warblers seem to be more plentiful in Alaska than in any other region of the United States. Research indicates that Alaska is likely one of the major breeding areas for this species. Research indicates that blackpoll warblers would likely benefit from land management and forestry practices that increase the availability of early successional habitats, including logging and fire. These warblers are likely to be adversely affected by fire suppression, which tends to increase the amount of older forest habitats (Pogson et al. 1997).

(2) Buff-breasted Sandpiper

The buff-breasted sandpiper (*Tryngites subruficollis*), although uncommon, is one of several species of sandpipers that regularly migrate to and breed in Alaska each year. It is considered a sensitive species because of human disturbance effects to productivity, overhunting, pesticides and contaminants used in agriculture, and winter habitat degradation (Lanctot and Laredo 1994). Although official documentation does not exist to tie the buff-breasted sandpiper to Glennallen Field Office (GFO) lands, we suspect it may occupy suitable habitat somewhere within GFO boundaries based on suitable habitat availability. This small, diminutive shorebird prefers dry ground on tundra ridges during breeding season and the drier areas of tidal flats and other areas during migration (Armstrong 1995). Within Alaska, the Copper River Delta near Cordova and the Fox River flats near Homer are especially important to the buff-breasted sandpiper (as well as to millions of other birds) as highly productive seasonal staging areas. The buff-breasted sandpiper winters as far south as the southern tip of South America.

(3) Canada Lynx

Canada lynx (*Lynx canadensis*) are the only indigenous wild cat of Alaska. Once found throughout northern North America, lynx are now Federally listed as a threatened species in the northern Rocky Mountains of the lower 48 states due to overharvesting and the cat's inability to successfully compete with more opportunistic predators, such as coyotes and bobcats. As a result of their listing in the lower 48, the BLM considers the Canada lynx a sensitive species in Alaska. However, in Alaska, Canada lynx are still considered a legal furbearer and are actively sought by trappers. Lynx are found throughout the planning area where suitable forested habitat and snowshoe hare populations exist.

Canada lynx populations are inextricably dependent upon the availability of their primary prey, the snowshoe hare, and to a lesser extent by the availability of other small game populations. Lynx inhabit Alaska's forested regions including spruce and hardwood forests from sea level to subalpine zones, but they fare especially well in areas that have recently experienced wildfires. In the resulting mosaic habitat type of old black spruce forest and young resprouting vegetation, the prey species that lynx favor are more easily found foraging on the new, succulent growth (ADF&G 1994).

(4) Dusky Canada Goose

The dusky Canada goose (*Branta canadensis occidentalis*) is the darkest-colored Canada goose in Alaska. The Alaska population of dusky geese has always been small, with the shortest migration of all Canada geese in Alaska. They nest only in the coastal region of southeast Alaska on the Copper River Delta near Cordova southward to the Bering Glacier forelands. Most birds overwinter in the rich grassy fields of Oregon's Willamette Valley and along the Columbia River near Portland, but a few stay farther north in coastal areas of Washington and British Columbia. See Map 39 for the current seasonal distribution of dusky Canada goose within the planning area.

The great Alaska earthquake of 1964 produced an uplift and drying of dusky Canada goose nesting grounds that initially helped the geese to increase in number to over 25,500 by 1979. However, long-term habitat changes favoring predators (such as brown bears and coyotes) have reduced dusky goose production, and the population has hovered between 10,000 and 18,000 since the 1980s (ADF&G 1994). Since the 1964 earthquake, in which profound hydrologic changes dramatically affected availability of dusky Canada goose habitat along Alaska's southeast coastline, the dusky goose population has continued to decline steadily despite managerial efforts to improve their status (USGS 2000).

The dusky Canada goose is considered a BLM sensitive species and a Species of Concern by the Alaska Natural Heritage Program. The dusky goose is a regulated game species under Alaska Fish & Game regulations; however, in Unit 6 (which includes the Bering Glacier forelands), the open hunting season for waterfowl species is

Map 39. Dusky Canada Goose Habitat

File size: 95 KB

File name: 39_dgeese.pdf

Map size: 8.5x11

from September 28 to December 16, which allows for most dusky Canada geese to migrate out of the area before hunting season commences (Alaska Natural Heritage Program 2003).

(5) *Gray-cheeked Thrush*

Gray-cheeked thrushes (*Catharus minimus*) winter on the South American continent from northeastern Colombia to easternmost Panama. These thrushes arrive on their Alaskan breeding grounds by late May after having migrated north over 4,000 miles during the preceding month. Most have left Alaska by the end of August, although some stragglers remain until early September.

Research has shown that gray-cheeked thrushes avoid deciduous forests of all types when establishing their breeding territories in Alaska, and instead prefer habitat types where shrub is the main component or where open woodlands and dwarf forests are present (Pogson et al. 1997). Gray-cheeked thrushes are relatively abundant in Alaska when compared to other areas of the United States and Canada. However, no trend has been detected in an analysis of data from 24 breeding bird survey routes in Alaska. Research suggests that disturbance of riparian habitat might reduce numbers of this already rare species (Pogson et al. 1997).

(6) *Harbor Seal*

The harbor seal (*Phoca vitulina richardsi*) is a marine mammal species commonly found in both the north Atlantic and Pacific oceans. In Alaska, the harbor seal is found along the coast from British Columbia north to Kuskokwim Bay, and westward throughout the Aleutian Islands. See Map 40 on page 264 for the distribution of harbor seals within the planning area. Most commonly, harbor seals inhabit coastal waters, but occasional observations of seals up to 50 miles offshore have been made. Harbor seals do not make long annual migrations as other marine mammals do, but will make lengthy local movements of up to 120-150 miles.

Potential harbor seal terrestrial haul-out habitat exists along the western half of Vitus Lake on lands managed by the Glennallen Field Office, though no seals have been documented using this area. The shorelines in this area are mostly vegetated with tall alder and willow thickets and would not provide suitable haul-out sites with good visibility for early detection of predators.

Accurate harbor seal population numbers are difficult to determine because seals are only visible when hauled out; simultaneously, an unknown number of seals can be underwater and go completely undetected by survey biologists. Best estimates for harbor seal populations in Alaska range between 200,000 and 300,000 animals. The Marine Mammal Protection Act restricts harbor seal harvest to Alaska Natives only; annual harvest is about 2,500 to 4,000 animals. The number of harbor seals has

Map 40. Harbor Seal Habitat

File size: 196 KB

File name: 40_seal.pdf

Map size: 8.5x11

declined in several areas of the Gulf of Alaska and Prince William Sound since the mid 1970s; the reasons behind the decline have not been determined (ADF&G 1994). Harbor seals are known to haul out on Vitus Lake icebergs in the foreground of Bering Glacier. A two-year research study of Vitus Lake harbor seal behavioral ecology was begun in 2002. To date, research indicates that harbor seals using Vitus Lake as a haul-out site account for roughly 1 percent of the region's total harbor seal population. Seal numbers peak in Vitus Lake during the month of September coinciding with a local salmon run. Seals are apparently present throughout the year here, but in significantly lower numbers outside of the salmon run timeframe (Burns and Savarese 2003).

(7) Harlequin Duck

Harlequin ducks (*Histrionicus histrionicus*) are among the least studied ducks in North America, mainly due to their affinity for wild and remote terrain and their relatively short migrations between wintering and summering grounds. On coastal wintering grounds, harlequin ducks prefer choppy waters off rocky points and reefs. Preferred harlequin breeding habitat is typically an inland forested area with vigorous mountain streams.

Like all ducks, harlequins are renowned for their aerial maneuverability and are often observed skimming across the surface of twisting mountain streams and rivers while feeding either on surface invertebrates or diving underwater to retrieve their meal. They are also noted for their ability to navigate through the strong currents of rushing mountain streams. With the coming of fall in September, the female leads her young on their first migratory flight to wintering grounds along the coast.

Because of their range and habitat preferences for more remote and harsh environments, harlequin duck populations and their preferred habitat in Alaska have been relatively unaffected by human disturbances and encroaching developments (ADF&G 1994). Harlequin ducks have been observed on the Gulkana River during breeding season.

Harlequin ducks are considered a sensitive species because of early century overhunting, contaminants and toxins, fishing net entanglement, and habitat degradation (Robertson and Goudie 1999).

(8) Olive-sided Flycatcher

Olive-sided flycatchers (*Contopus borealis*) winter primarily in northern South America, and generally migrate north towards summer breeding grounds beginning the last week of March; conversely, they migrate south from their summer breeding grounds beginning late August or early September. In Alaska, they are gone from their summer range by mid to late September.

Generally flycatchers occur at low densities throughout Alaska on their breeding range. Based on breeding habitat studies, it is the opinion of BLM biologists that flycatchers prefer black spruce coniferous forests, mixed coniferous forests (both black and white

spruce), and mixed deciduous forests (aspen and birch) where temperatures tend to be cooler, and in the vicinity of water (Bent 1942).

Research on the relationship between this species and their habitat is conflicting and requires further study.

The olive-sided flycatcher is a known or probable breeder in central Alaska and is considered uncommon across this range, preferring coniferous forests for its nesting habitat.

(9) *Peregrine Falcon*

In general, peregrine falcon breeding range is characterized by habitats having a cliff component and large open expanses of airspace and landscape for foraging. Typically though, peregrine falcon density in any given area is limited by availability of suitable nest site locations and further by territorial spacing of pairs, which is itself a consequence of prey availability (White et al 2002). The American peregrine falcon (*falco peregrinus anatum*) is found from the crest of the Brooks Range south throughout mainland Alaska, and so would be expected to occupy suitable breeding habitat within the boundaries of the Glennallen Field Office but no documentation exists of any actual occupancy to date (Rogers 2005b).

The American peregrine falcon was de-listed in 1999. Consequently, it is a considered Sensitive Status Species by BLM as a constraint of the Endangered Species Act amendment (section 49 (g)(11)) requirement which specifies that de-listed species will be monitored for a minimum of 5 years post-delisting in cooperation with State agencies in order to maintain the non-threatened status of these species.

(10) *Red Knot*

The red knot (*Calidris canutus*) is a member of the sandpiper family (*Scolopacidae*). It is considered uncommon to rare in different parts of Alaska, and is consequently considered a sensitive species by BLM-Alaska. Although official documentation of habitat occupancy by the red knot has not been made, BLM-GFO suspects that it may inhabit seasonal breeding grounds within the Glennallen Field Office based on the availability of its preferred habitat. The red knot prefers gravelly ridges in alpine tundra during breeding season. Like other shorebirds migrating to and from Alaska, staging areas at the Copper River Delta and the Bering River are extremely important to the red knot.

(11) *Red-throated Loon*

Adult red-throated loons (*Gavia stellata*) migrate to their northern breeding grounds by late May to reestablish nesting territories with their life-long mates. Adult loons struggle to successfully raise young, as the eggs and chicks are easily preyed upon by gulls, jaegers, foxes, and other predators. Like other nesting birds, the adult loons are

susceptible to human-caused disturbances and will temporarily halt the incubation process, sometimes allowing the eggs to chill and die. It has been observed that on busy recreational lakes, loon chicks will sometimes drown in the wake of motorized watercraft (ADF&G 1994). Loons will congregate on large inland lakes before migration to coastal wintering areas.

The red-throated loon is considered a BLM sensitive species because of hunting pressure, oil spills associated with fossil fuel development, fishing net entanglements, and habitat degradation (Barr et al. 2000). Although official documentation does not exist, biologists have observed this species in the vicinity of the Bering Glacier and suspect that it may occupy seasonal breeding habitat there.

(12) Trumpeter Swan

The trumpeter swan (*Cygnus buccinator*) is a BLM sensitive species due to its Federal listing as endangered within the lower 48 states. However, because of the remote nature of their preferred habitat in Alaska, trumpeter swans have been relatively unaffected by human development in the state in stark contrast to the species' plight in the lower 48 states. A 1990 census found trumpeter swans to number over 13,000 statewide (FWS 1991).

Alaska's trumpeter swans generally winter near coastal waters from Cordova south to the Columbia River in Washington State. Trumpeters summer in Alaska's forested wetlands of the interior and along the coastal plain from Cook Inlet south to the Chilkat Valley (FWS 1996b). See Map 41 on page 269 for the current seasonal distribution of trumpeter swans within the planning area.

In the post-breeding period, when cygnets are able to fly, trumpeter swans congregate at staging areas in preparation for flying southward. These staging areas are usually large shallow lakes and represent important trumpeter swan habitat.

Trumpeter swan patterns of seasonal use in and around Vitus Lake, and more broadly in the Bering Glacier forelands, has remained mostly consistent during the past two U.S. Fish and Wildlife Service's swan censuses in 1995 and 2000 (FWS 1996; FWS 2000). Trumpeter swans utilize suitable nesting habitat along the southern shoreline of Vitus Lake and in outlying glacially-carved ponds and wetlands. In the immediate area of eastern Vitus Lake, three pairs of trumpeter swans and one single adult swan with a brood were observed during the 2000 census. The west-southwest corner of Vitus Lake was host to five pairs of adults and three flocks of swans during the same time period (FWS 2000).

The Gulkana River watershed is an area of seasonally concentrated trumpeter swan occupancy and use due to the abundance of thousands of remote, small, shallow freshwater ponds and lakes with a plentiful supply of aquatic vegetation for foraging swans to eat. A 1995 U.S. Fish and Wildlife Service trumpeter swan survey of the Gulkana Unit determined that 5,316 square miles of potential summer habitat are

available for nesting swans. During the census portion of this effort, 3,577 adult swans were observed (0.67 swans per square mile) (white adult swans may or may not have been accompanied by gray young-of-the-year swans). From these data, researchers made a “speculative assessment” that by the year 2050, 5,191 adult swans (0.98 swans per square mile) would potentially occupy the available habitat within the Gulkana Unit (FWS 1996).

Large numbers of trumpeter swans are also found during breeding and nesting season occupying suitable habitat in the Susitna River Valley (FWS 2000). Trumpeter swan habitat in the planning area and across the state is well-documented on a recurring basis due to the continuous efforts of the U.S. Fish and Wildlife Service. However, the effects of motorized vehicles on breeding, nesting, and cygnet-rearing swans are not well understood, and managers would benefit greatly by having this impact clearly defined.

(13) Townsend’s Warbler

Townsend’s warblers (*Dendroica townsendi*) winter in two distinct and separate areas. The Pacific coast wintering population is found from northwestern Washington south to southern California. The second wintering population of Townsend’s warblers is found in the highlands of northern Mexico and Central America to Costa Rica. Spring migration lands this species on central Alaskan breeding grounds by mid-May. Townsend’s warblers depart for their wintering grounds from interior Alaska by late August.

Alaskan Townsend’s warblers were found to exhibit distinct habitat preferences during the breeding season for mixed forested habitat types where mature white spruce is the dominant species (pure deciduous mix, pure conifer mix, and deciduous/coniferous mix). The breeding success of Townsend’s Warbler has been positively correlated to the size (a proxy for age) of the white spruce (Matsuoka, 1996). Researchers recognize that additional information is necessary to determine the specific habitat requirements of this species within Alaska (Pogson et al. 1997). Townsend’s warblers are considered a sensitive species because of winter habitat degradation (Wright et al. 1998).

(14) Tule White-fronted Goose

The tule white-fronted goose (*Anser albifrons gambelli*), a larger and darker subspecies of the three subspecies of white-fronted geese in Alaska, numbers only about 7,000 birds. This goose winters with Pacific birds in central California. Its Alaska breeding range has not yet been fully determined, but the west side of Cook Inlet is a known nesting area. White-fronted geese nesting in Alaska are part of the Mid-continent Population that breed throughout the western and central arctic of Canada. This population of over 300,000 birds migrates through the central United States and winters in Texas and Mexico (ADF&G 1994).

Map 41. Trumpeter Swan Nesting Sites

File size: 186 KB

File name: 41_swan.pdf

Map size: 11x17

Tule white-fronted geese are considered a BLM sensitive species and are known to occupy seasonal habitat in the Bering Glacier area. Recently, a USDA Forest Service survey crew documented the entire known Alaskan population of Tule white-fronted geese (from the Cook Inlet area) staging for fall migration along the western edge of Vitus Lake in the foreground of Bering Glacier. Until this discovery was made, researchers had no information on the migration route of this species once they had left their summer breeding grounds at Cook Inlet and headed south (Rogers 2003c). Further documentation of tule white-fronted goose staging habitat in the Bering Glacier area is needed to enable managers to provide adequate protection for this sensitive species.

(15) Collaboration with Other Agencies and Non-Governmental Organizations

It is the inherent responsibility of Federal agencies to cooperatively gather information regarding species of concern (threatened, endangered, or sensitive) in order to better manage, conserve, and aid in the prevention of their further decline. To that end, the following research and monitoring efforts have been or are currently being carried out within the purview of the Glennallen Field Office.

Research Efforts:

- A 2-year cooperative research study with the University of Alaska regarding Vitus Lake harbor seal ecology was begun in 2002. Among other findings, this research indicates that harbor seals using Vitus Lake (in the foreground of the Bering Glacier) as a haul-out site account for roughly 1 percent of the Gulf of Alaska region's total harbor seal population.
- In cooperation with the U.S. Geological Survey and Ducks Unlimited, the BLM has been studying the reduced capacity for dusky Canada goose production and a gradual long-term decline in this population in the Bering Glacier area following the 1964 earthquake in the Copper River Delta. Understanding the factors limiting goose productivity is of increasing importance as this population continues to decline and managers exhaust their options for reducing the harvest of this species in the lower 48.

Monitoring Efforts:

- In conjunction with the U.S. Geological Survey's Patuxent Wildlife Research Center, the Canadian Wildlife Service's National Wildlife Research Centre, the U.S. Fish and Wildlife Service's Boreal Partners in Flight, and numerous local volunteer birding enthusiasts, continue annual breeding bird surveys along 12 official Breeding Bird Survey (BBS) routes within the Glennallen Field Office boundaries are conducted to monitor the status and trends of North American bird populations. BBS routes were designed to provide a continent-wide perspective of population change over time among passerines and other birds.
- The Glennallen Field Office contains approximately 2,569 square miles of prime trumpeter swan breeding habitat that supports 32 percent of the total trumpeter

swan population in Alaska. The U.S. Fish and Wildlife Service's Migratory Bird Division conducts a statewide census of trumpeter swans every five years to track population trends and evaluate their breeding habitat. Among other benefits of this recurring census is the ability of resource managers to track population trends and detect any significant changes over time.

Other research and monitoring efforts are either underway or completed for other sensitive species listed above that may or are strongly suspected of occurring within lands managed by the Glennallen Field Office, including the tule white-fronted goose, the red-throated loon, the grey-cheeked thrush, the harlequin duck, and the olive-sided flycatcher. These particular research projects are not occurring within the Glennallen Field Office proper, but the resulting information will be extremely beneficial to management of these species.

6. Fish (Including Sensitive Status Fish Species)

The fisheries resources on the Glennallen Field Office offer a wide variety of species and opportunities. Anadromous species occurring within the planning area include all five species of Pacific salmon (Chinook, coho, chum, pink, and sockeye) and steelhead trout. Map 42 on page 275 displays the location of the anadromous stream and rivers within the planning area. Resident fish species found within planning area waters include kokanee salmon, stocked and land locked sockeye, lake trout, rainbow trout, cutthroat trout, Dolly Varden, Arctic grayling, burbot, round whitefish, lake whitefish, pygmy whitefish, longnose sucker, slimy sculpin, and Pacific lamprey. The fisheries habitats in the planning area range from tiny clearwater streams to large, glacial-fed rivers, and from high alpine, clear lakes to large, glacial lakes. Fish habitats vary considerably with each species displaying different requirements. General habitat requirements for the different resident fishes are identified in the Alaska Habitat Management Guide (ADF&G 1986) and in Scott and Crossman (1973).

There are two broad categories of streams and lakes within the planning area: glacial and clear. Because of conditions found within glacial streams, they are typically much less productive in terms of biomass production and numbers of fish than are clear lakes. There are approximately 23,000 miles of streams, more than 102,000 lakes between 2-38,000 acres, and more than 211,000 lakes less than 2 acres within the planning area. Total estimated number of lakes of all sizes is 313,000, with a total lake acreage of 2.35 million acres (6.1 percent of all Glennallen Field Office lands). This acreage includes all marsh areas associated with lakes. Total estimated lake perimeter distance is 98,572 miles (Ritter and Koeln 1989).

Major rivers within this region include the Copper River and its major tributaries (the Gulkana, Gakona, Chistochina, Slana, Tiekkel, Tonsina, Klutina, and Tazlina Rivers); the Bering River; the Tok and Little Tok Rivers; the Susitna River and its major tributaries (the Maclaren, Tyone, and Oshetna Rivers); the Nenana River; the Matanuska River; and the Delta River. Major lakes include the glacial Tazlina, Klutina, and Tonsina Lakes, and clearwater Susitna, Tyone, Louise, Crosswind, Ewan, Fish, Paxson, Summit, Mankomen, Mentasta, Suslota, Bering, Tangle, Upper Tangle, and Fielding Lakes. Altogether, these fishery resources support large commercial, recreational, and subsistence fisheries.

In the Bering Glacier area, the Seal, Tsiu, Kaliakh, Kulthieth, and Duktoth Rivers are all anadromous rivers that support strong runs of coho salmon.

The Copper River fisheries is a major economic contributor. According to Cordova District Fishermen United, the fishery averages about \$22 million a year directly to fishermen, and another \$18 million to cannery workers, tendermen, and shore side support. Estimates of value for the commercial sport guide industry, sport and

subsistence is placed at about \$5 million, making the fishery a \$45 million a year economic driver.

The Copper River supports extensive commercial, recreational, and subsistence fisheries for sockeye salmon. While the largest harvest occurs in the lower portions of the river, most sockeye spawning and rearing areas are located within the Copper River Basin. The upper east fork of the Gulkana River between Paxson and Summit Lakes is one of several areas that contribute significantly to total sockeye production in the Copper River. Between 1962 and 1972, the spawning population in the affected area declined from about 60,000 to 25,000 (Roberson, unpublished data), with habitat erosion (due to reconstruction of the Richardson highway) the primary cause of the decline. This and the abundance of warm water springs in the area led ADF&G to consideration and construction of a hatchery to supplement wild salmon runs in the Copper River.

Sockeye eggs are obtained from spawning salmon in adjacent spring areas and incubated in the hatchery. Salmon fry released from the Gulkana I hatchery site move downstream to rear to smolt in Paxson Lake. As hatchery releases approached the rearing capacity of Paxson Lake, Summit Lake was added as a fry release site. The first Summit Lake release was in 1980 with an initial release of 1.3 million fry. An additional release site, Crosswind Lake, was tested in 1985 and added as a regular release site in 1988 with a release of 2.5 million fry. The Gulkana I hatchery site has been supplemented by the Gulkana II site, downstream and adjacent to the Gulkana River just upstream from Paxson Lake. This site is on BLM land and BLM has issued a lease to Prince William Sound Aquaculture Corporation, which runs the hatchery under contract with the State of Alaska.

The goal of the Gulkana facility is to provide an annual average return of 300,000 adult sockeye salmon without jeopardizing delta and upriver wild stock escapements. Wild stock returns range from 500,000 to 4 million fish. In the time period from 1977 to 1999 the most frequent wild return was 1.7 million fish and the average return was 1.6 million fish. The desired average hatchery production (300,000) is 15 percent of an estimated total return of 2 million (Prince William Sound Aquaculture Corporation 2000).

As the Gulkana Hatchery program expanded there was growing concern about the department's ability to achieve wild stock escapement goals. The Gulkana Hatchery Policy Paper was produced by a group of ADF&G biologists in 1990 when the expected hatchery return was estimated to be between 250,000 and 300,000 adults. The report recommended projects that would enable the department to better achieve wild stock escapement goals for both the upriver and delta components of the Copper River sockeye return. These projects focused on escapement enumeration, AWL sampling, stock identification and data analysis. Some of these recommendations have been implemented. However, excellent survivals, both fresh water and marine, have increased the size of the adult hatchery return above the 250,000 to 300,000 adults expected at that time. These large hatchery returns continue to complicate harvest

Map 42. Anadromous Rivers and Streams

File size: 193 KB

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Map size: 11x17

management of the Copper River District even though wild sockeye returns have also had excellent survivals.

BLM's role in fisheries management is as a habitat manager. ADF&G is directly responsible for population management, including the operation and monitoring of the hatchery facility and its' effects on the wild salmon stocks of the Copper River. BLM's involvement is through the lease for the Gulkana II site.

a) Monitoring Projects

The BLM is responding to a growing concern voiced by subsistence users, commercial outfitters, and ADF&G about the potential for overharvest and depletion of Chinook and sockeye salmon fish stocks in the Gulkana River and its tributaries through a cooperative fish counting project on the Gulkana River. A long-term goal of this project is to establish a biological escapement goal for the Gulkana River. A biological escapement goal is the minimum number of spawning fish needed to sustain the run while at the same time meeting the harvest demands of different user groups. This information would provide a vital management tool to ensure the sustainable harvest of wild stocks.

Current management regulations for allowable harvest of Chinook and red salmon, coupled with imprecise in-season data of run strength, threatens the sustainability of the Gulkana River fisheries and forces ADF&G to manage conservatively (i.e., maintain a lower level of harvest). It is therefore essential that a more effective means of assessing spawning escapement be implemented as increasing demands are placed upon these fish stocks by the various fisheries. With increased precision of escapement data, ADF&G could more actively manage where necessary and accommodate increased fishing effort at current or increased harvest levels.

b) Factors Affecting Fish Populations and Habitats

The major fish species within the planning area are managed by ADF&G while their habitats on public lands are managed by the BLM. Activities such as fire, minerals development, and recreation are the major activities that the BLM manages that can affect fish and their habitat directly and indirectly. Alaska Statute 41.14.870 requires ADF&G to list waters that are important for spawning, rearing, or migration of anadromous fish. It also requires anyone wanting to use, divert, obstruct, pollute, change flow, construct in, or operate a vehicle in those waterbodies to obtain written approval from ADF&G prior to beginning construction.

Fish populations and habitat conditions in the planning area are good for both anadromous and resident species. Although Chinook and sockeye salmon stocks for

the Copper River are considered fully allocated, current levels of exploitation for both anadromous and resident fish are considered sustainable.

Currently, habitat quality is not a limiting factor in anadromous fish populations in the planning area. Fish habitats are subjected to relatively consistent environmental conditions, meaning that habitats change very little in a static system. Most limitations are imposed by human demand or pressure on the populations. However, in the past, extremes of environmental conditions have impacted all stocks of anadromous fish.

Severe winters which have little snow and extreme cold can dramatically reduce survival of eggs in spawning beds, as the insulating blanket provided by snow cover is important protection from the severe cold which occurs each year (ADF&G 1986). Conversely, too much lingering deep snow cover on the ice lakes will retard the opening of lakes and phytoplankton production sufficiently to affect growth and survival juvenile salmon. Extreme flow and temperature fluctuations also can account for significant mortalities. Other than humans, predators do not usually pose significant threats to any anadromous stocks, with perhaps the exception of the low population steelhead in the Gulkana River. Birds such as gulls and terns do exert a fairly high toll on fry at the time they emerge from the gravel and begin their downstream migration to rearing areas, but this is usually confined to short time periods. High, sudden flows in spawning streams have been known to scour out spawning areas, and silt associated with high flows will affect eggs in redds.

Limiting factors on resident fish and their habitats are similar to those for anadromous fish. However, as resident fish distribution is far more extensive than that for anadromous fish, and their life histories are measurably different, more factors will undoubtedly affect them. For example, in addition to those factors affecting anadromous fish, parasites often produce severe inroads on resident populations. Resident fish are not granted the opportunity to reside in marine environments during major portions of their lives; they must spend their winters in what can only be described as a hostile environment. Low temperatures and oxygen levels and the metabolic problems associated with them undoubtedly exert considerable influence over almost all populations which winter over in the freshwater lakes and streams of the planning area.

c) Subsistence Fisheries

Within the planning area there is a large local dependence on the fisheries resources for subsistence purposes, primarily the Copper River salmon species. Subsistence fishers in the upper Copper River for the last five years have harvested almost 209,000 salmon annually, 95 percent of which have been sockeye. At this time, all of the subsistence salmon fishing occurs on lands within the planning area that are managed by stewards other than the BLM (primarily the National Park Service and ADF&G). However, the waters contained on public lands provide a tremendous service in that they are the spawning and rearing areas for these fish stocks. It is also conceivable that at some time in the future there may be some pressure to harvest these resources on BLM-

managed lands. Other than the Copper River salmon, there is no known subsistence dependence for salmon within the planning area.

There is a long history of subsistence fishing in the upper Copper River. The first State subsistence law was passed in 1978, giving subsistence use of salmon the highest priority in allocation. In order to comply with ANILCA, the State modified the regulations in 1982 such that only “rural” residents qualified for subsistence priority. This in turn led to the creation of a personal use fishery that allowed dipnetting of salmon. In 1989 the State Supreme Court in the *McDowell Decision* determined that all State residents qualified for subsistence (*McDowell v. State of Alaska* 1989). The implementation of this decision resulted in having two subdistricts in the Upper Copper River District: the Glennallen Subdistrict and the Chitina Subdistrict.

The Glennallen Subdistrict was classified as a subsistence fishery open to all Alaska residents, and the Chitina Subdistrict was classified as a personal use fishery also open to all Alaska residents. Under State regulations, a user could fish one subdistrict or the other, but not both. In 1999 the State Board of Fisheries reclassified the Chitina personal use fishery as a subsistence fishery. In 2003 the State Board of Fisheries reversed that decision, and the Chitina Subdistrict is once again classified as a personal use fishery. Also in 1999, the Federal government assumed management of the subsistence fisheries on Federal waters only, which includes a significant portion of the Copper River. The Federal regulations mirrored the State regulations for the first two years, therefore no Federal permits were issued. However, beginning in 2002, Federal regulations were different than the State regulations, and rural users had a choice of a State or Federal permit.

At present there is a personal use fishery, a State subsistence fishery, and a Federal subsistence fishery for upper Copper River salmon. The personal use fishery and the State subsistence fishery are open to any state residence, while the Federal subsistence fishery is limited to rural residents with a customary and traditional use determination. The harvest goals authorized by the State Board of Fisheries and set by ADF&G are as follows: 60,000-75,000 for the Glennallen Subdistrict, and 100,000-150,000 for the Chitina Subdistrict. The number of fish actually harvested is listed in the Table 26.

Table 26 . Subsistence and Personal Use Fisheries Permits Issued and Harvested

	Subdistrict			
	Glennallen		Chitina	
	Permits Issued	Fish Harvested	Permits Issued	Fish Harvested
State Permits				
1998-2002 average	1,145	72,307	8,730	121,286
Federal Permits				
2002	200	20,000	143	> 1,000

The subsistence harvest has stabilized at around 200,000 Copper River salmon annually. Demand on subsistence resources is likely to remain stable or increase slightly within the next 5 to 10 years due to an increase in urban users. Commercial fishers in Prince William Sound and on the Copper River Flats take by far the greatest proportion of all salmon stocks taken in the planning area, followed by Copper River subsistence fishers and sport fishers. At present, salmon resources are fully allocated; in years when there is a biological concern, ADF&G would likely regulate the harvest through a series of emergency closures to ensure that escapement goals are met. Escapement is the portion of an anadromous fish population that escapes the commercial, subsistence, and recreational fisheries and reaches the spawning grounds.

Within the Copper River basin, very few subsistence permits are issued for freshwater species. ADF&G issues permits for 1-2 individuals per year for whitefish in the area (Rogers, 2005). Other taking of freshwater fish in the area for subsistence purposes is probably done through sport fishing permits. According to a recent publication by Simeone and Kari, whitefish and grayling traditionally made up the bulk of the freshwater fish harvest in the area. For the Ahtna people, Lake Louise and Ewan Lake were renowned for freshwater harvest. Post-1950's, after Ahtna families had settled into permanent communities along the highway, reliance and harvest of freshwater fish declined. Today, whitefish, rainbow trout, grayling, and burbot are the most frequently harvested freshwater fish, but in smaller amounts (Simeone and Kari, 2004).

Subsistence harvest in the Bering Glacier area is an important activity to Yakutat, Cape Yakataga, and Cordova residents. One of the most important subsistence activities of area residents is salmon fishing. Subsistence set netting has been done at the Duktoth, Kaliakh, Tsiu/Tsivat, Seal, Tashalich, and Kiklukh Rivers. Some residents also harvest eulachon during their run in February and March.

d) Sport Fishing

Resident fish in the planning area are some of the most heavily used in Alaska. This fact is influenced significantly by the relatively easy access to the population centers of the state. The waters in the planning area support the largest grayling, whitefish, burbot, and lake trout fisheries in the state (Walker et al. 2003). These "largest" fisheries generally do not consist of a single waterbody, but of all the waterbodies within the planning area.

Future demand on freshwater fish resources is anticipated to increase due to increases in population and the tourism industry. While there is currently a large population base of these fishes, on a single waterbody basis they are highly susceptible to the demand-associated stresses. As the primary manager of freshwater fish on public lands, ADF&G is quick to respond to demand-associated stresses, particularly overfishing, with regulatory changes that reverse these trends. Bag limits, seasons, and size limits are adjusted downward as increasing demand forces these populations into stress

situations. These regulatory changes stabilize the populations, and usually, as a side effect, regulate demand.

While all species are managed by ADF&G, only those species highly sought by fishers are actively monitored. These species include grayling, burbot, lake trout, and rainbow trout. Overall demand for these resources is stable after experiencing an increase in the early 1990s. Studies in the early 1990s by ADF&G indicated populations were reflecting smaller and fewer fish of younger age classes – classic signs of over harvesting. As a result, recent management changes have been implemented to attempt to turn these trends around.

e) Sensitive Status Fish Species

There are no threatened or endangered fish species in the planning area. Only one sensitive fish species, the Gulkana steelhead (*Oncorhynchus mykiss*), is found within the planning area. The steelhead trout is a migrating form of the rainbow trout. Unlike anadromous salmon species, steelhead do not typically die after they spawn. They often return to the sea after they spawn and return in subsequent years. Steelhead and rainbow trout are located in the mainstem Gulkana River and in the Middle Fork. Crucial spawning areas have been identified in the Middle Fork (Brink 1995; Stark 1999). The adult steelhead enter the Gulkana River in the early fall, overwinter in the mainstem, and spawn in the early spring.

Concerns related to the population of steelhead trout are maintaining the integrity of the spawning areas, the ability to maintain a sustainable population, maintenance of adequate corridors for young fish migration to the mainstem Gulkana, and adequate food base. It is suspected that a large portion of the young steelhead food base is composed of drifting salmon eggs and aquatic insect drift initiated by spawning salmon. The BLM is currently involved in cooperative population monitoring projects with ADF&G. In addition, ADF&G regulates steelhead fishing on the Gulkana through catch-and-release and bait restrictions.

7. Cultural Resources

The BLM is responsible for the management, inventory, documentation, and interpretation of the archaeological, historical, and paleontological resources within the district. The Cultural Program works in support of other programs as well to ensure that the Glennallen Field Office's projects, permits, and programs comply with a variety of legal mandates surrounding cultural resources.

Cultural resources within the planning area cover a large span of time from the end of the Pleistocene, around 10,000 years before present, to the Cold War era of the 1950s and later. Archaeological and historic remains within the Glennallen Field Office's boundaries include some of the State's oldest and densest prehistoric activity areas, camps, and villages; early 1898 gold rush camps and trails; one of the earliest highways and roadhouse systems in the country; and Cold War-era Ballistic Missile Early Warning System (BMEWS).

Only a small fraction of information regarding the number, distribution, and nature of these resources is known. The vast majority of heritage resources in the District have not been identified due to a number of interrelated factors, chief among them the cost and difficulty of accessing remote parts of the field office to conduct systematic archaeological or paleontological work. Other factors include the cryptic nature of the area's resources, which is abetted by dense vegetation and thick sedimentary deposits. Therefore, few systematic, area-wide archaeological surveys have been attempted within the district outside of work conducted for the Trans-Alaska Pipeline System, highway construction or realignment, and other large construction projects. The majority of this archaeological work has been what is termed "salvage archaeology," which has involved hurried excavations and research centering on sites at risk from construction projects.

The Glennallen Field Office must deal with the actual and potential damage inflicted on cultural resources from both the lawful recreational users of public lands and the criminal misconduct of vandals and looters. The first group, which largely incorporates OHV users, impacts several sites within the Field Office through ignorance of cultural resources. Basic solutions for these problems are public education, designation of appropriate uses for each trail, and a program of inventory along existing and designated trails. This inventory is required to provide a baseline for the management actions that will be taken by BLM and their compliance with the National Historic Preservation Act of 1966, as amended.

The following information is organized by planning regions delineated for purposes of both this cultural resources discussion and the paleontological resources discussion. Map 43 on page 283 illustrates the boundaries of these regions.

Map 43. EARMP Planning Regions

File size: 177 KB

File name: 43_planreg.pdf

Map size: 11x17

a) Bering Glacier-Icy Bay Region

(1) *Prehistory and History*

The planning area falls within the territory ascribed to the regional group of Eyaks often referred to as the Yakatags (de Laguna 1990), the Guth-le-uk-qwan or the Qwolth-yet-kwan. The Yakatags inhabited the coast line from about Cape Suckling south to Cape Yakataga (de Laguna 1990). The Eyak had several permanent villages along the shoreline of the Gulf of Alaska, including villages at the mouths of the Okalee, and Yakataga Rivers, as well as at Guyot Bay (de Laguna 1990). This group of Eyak was heavily influenced by the Tlingit since about 1850, when Eyak lore suggests increased trade with the Tlingit (de Laguna 1990). Excavations at Yakutat's Old Town indicate that the Eyak may have inhabited the coast for as long as 250 to 400 years B.P. (de Laguna et al. 1964).

The Eyak lived in sedentary villages, using a variety of boats to access resources along the coast (de Laguna 1990). Houses were rectangular and constructed with gabled roofs and vertical planks; houses or often portions of communities were surrounded by palisades for protection (de Laguna 1990). The Eyak yearly subsistence cycle began in February with the trapping of various fish beneath the ice and seal harpooning above the ice (de Laguna 1990). Various roots and other plant foods were gathered until spring and summer, when the Eyak shifted their focus to salmon, various waterfowl, and large and small land mammals, as well as a variety of berries and roots (de Laguna 1990). During the fall they gathered late berries, dried clams, and hunted fur-bearing mammals. Winter activities included hunting bears and ptarmigan as well as fishing for halibut, yet the majority of the winter activities took place in the villages and homes as indoor chores from December through February (de Laguna 1990).

Early Eyak contact with Europeans was volatile and marked by a number of conflicts. The Eyaks' first direct contact with Europeans began in 1792 when a group of Eyaks attacked Aleksandr Baranov's party in Prince William Sound (Baranov 1979). Later, Russians took a number of Eyak hostage from a village near the Kaliakh River in 1894 (Purtov and Kulikalov 1979). The Russians then established a fort and agricultural colony at Yakatat in 1796, from which the Russians hunted fur-bearing mammals with Aleut and Eskimo hunters (de Laguna 1990). The local Eyak wiped out and destroyed this fort in 1805, which the Russians never reestablished (de Laguna 1990). Later Russian attempts to explore the Copper River resulted in the employed Eyak killing their Russian masters (de Laguna 1990). Prior to contact with other Europeans, half the Eyak population along the coast was wiped out in the small pox epidemic of 1837-38 (de Laguna 1990).

American contact with the Eyak began during Abercrombie's 1884 expedition up the Copper River, where he used Eyak guides until reaching the first Ahtna village

(Abercrombie 1900). The Eyak were largely isolated until the 1880s when they were visited by a variety of Euro-American miners, missionaries, and traders (de Laguna 1990). The majority of the remaining Eyak in the early 1900s concentrated at Yakatat, where some were employed in the cannery from 1910 to about 1920 (de Laguna 1990). The remaining Eyak outside of Yakatat were forced to leave their homes around 1907 to 1910 due to increased mineral development in the area and the depletion of coastal herring and salmon resources (de Laguna 1990). Fewer than 20 people in Old Town, Cordova were the only remaining Eyak speakers along the coast by the 1920s (de Laguna 1990).

Human activity in the planning area was limited until the mid to late 1940s when the Federal Aviation Administration (FAA) constructed an airstrip and weather station just west of the old Eyak village at Cape Yakataga. The FAA constructed a road in the late 1940s to late 1950s from the airstrip to a VHF transceiver approximately 2.5 miles to the east. The bridge currently standing over the South Channel of the Yakataga River was built around 1957 to access this transceiver (Jackson 2001; FAA 1958).

Subsequently, the U.S. Air Force constructed a tropospheric communications station on Cape Yakataga in the late 1950s, which became operational as part of the White Alice Communications System's "A" route in 1960 (U.S. Army Corps of Engineers 1998). Portions of the FAA-held lands, including the bridge, were transferred to the U.S. Air Force in 1967 (Haskins 1986; Jackson 2001). The lands surrounding the road and the bridge were later transferred to the Chugach Natives, Inc. in 1984. However, an easement was retained by the U.S. Air Force for the airstrip, road, and all improvements. This road, bridge, and easement were relinquished by the Air Force through the Army Corps of Engineers, Department of the Army, in 1986 to the BLM.

(2) Current Status

This portion of the Glennallen Field Office requires very little time annually for cultural resource management. Several mining claims in the area require Section 106 review of their mining plans each year in compliance with the National Historic Preservation Act. However, none of these claims has been monitored by the Glennallen cultural staff, and potential impacts to cultural resources are presumed to be minimal. It has been recommended in Section 106 reviews of these claims, starting in Fiscal Year 2000, that the Glennallen archaeologist examine and monitor these claims for compliance. Weather conditions and the general remoteness of the area has precluded examinations up to this date.

b) Chistochina-Slana Region

(1) Prehistory and History

The areas surrounding the Chistochina–Slana region contain cultural resources that are both prehistoric and historic in nature. The Copper River drainage, in its entirety, was accessible for human habitation as early as 9,500 years B.P. when retreating glaciers and a draining pro-glacial lake may have exposed the basin (Ferrians et al. 1983; Buzzell and McMahan 1995). However, few prehistoric sites have been located and none of these has been extensively excavated within this region.

The area was occupied by the Ahtna, an Athapaskan language group, at the time of contact (de Laguna and McClellan 1981). Specifically, the Sanford River-Chistochina band occupied the Chistochina and Sanford River drainages, while the Mentasta band occupied the Slana River and north of the Suslota River as well as the area around Mentasta Lake (de Laguna and McClellan 1981). The most western portion of the planning area fell within the territories ascribed to the Gulkana-Gakona band along the Gakona River (de Laguna and McClellan 1981).

The first Euro-American exploration of the area occurred in June of 1885 when a small party of explorers under Lieutenant Henry Allen followed the Copper River north to the Slana River (Sherwood 1995:113). The party camped at Lake Suslota where they stocked up on spawning salmon before proceeding north through the pass to Tetling's on the Tetlin River in the Tanana Valley (Sherwood 1995).

The 1898 Valdez to Eagle trail as well as the winter Valdez to Fairbanks route along the Gakona River passed through the region. Prospectors pursuing gold in the Yukon in 1898 ventured along the northwestern bank of the Copper River, to continue north of the Alaska Range through Mentasta Pass (Powell 1997). Later prospectors followed the military trail, established in 1899, along the same route (Powell 1997). A branch of the trail toward Fairbanks became the dominant route for gold seekers when gold was discovered in the Tanana Valley in 1902 (Philips 1984). During the same year that gold was discovered in the Tanana Valley, the U.S. Army completed the Valdez to Eagle portion of the Washington Alaska Military Cable and Telegraph System (Quirk 1974). While the original Valdez to Fairbanks route had followed the Gakona River northward, the newly-formed Alaska Road Commission, the Board of Road Commissioners for Alaska, realigned the route with a new parallel segment of road along the Gulkana River (Bleakley 1996).

(2) Current Status

The native village of Chistochina and the Cheesh'na tribe have expressed their concerns about the current condition of a 17(b) easement and the historic, native Chistochina trail. The village has even produced a film entitled "I Am A Trail," which addresses the historic importance area natives have placed on the trail as well as

current uses and the trail's overall poor condition. A preliminary investigation indicates that the trail may qualify under National Register criteria for a place of religious and cultural importance under Section 101 (d) of the National Historic Preservation Act. This would require additional management responsibilities on behalf of the BLM to mitigate adverse effects on this resource. It is recommended that the BLM perform a National Register Eligibility Determination or that BLM agrees in accord with the Alaska State Historic Preservation Officer to treat the trail as eligible to the National Register. The result would be a programmatic agreement covering only the portion of trail that the BLM administers, while inclusion of the State of Alaska in the agreement would encourage communication and cooperation between the Village and the State.

c) Denali Region

(1) Prehistory and History

The Denali region contains cultural resources that are both prehistoric and historic in nature, but the best archaeological information from the area is from the Nenana River drainage. The Upper Nenana was accessible for human habitation at several times during the late Pleistocene; however, the earliest that the Upper Nenana drainage could retain evidence of human occupation is after the McKinley Park III stage around 11,800 years B.P. (Bowers and Mason 1992). Previous glacial episodes have remodeled the landscape within the drainage dramatically, leaving little possibility for in situ evidence for earlier human use of the area.

Several cultural traditions are represented in the Nenana drainage spanning from the Pleistocene to the late Holocene. The earliest evidence of human occupation of the drainage is from the Dry Creek Site located near Healy. Dry Creek is a terminal Pleistocene site, whose earliest component has been dated to about 11,120 years B.P. and is ascribed to the Nenana complex on the basis of its representative tool types (Hoffecker et al. 1996). The Denali Complex, dating around 10,690 years B.P., is also represented at Dry Creek (Hoffecker et al. 1996), as well as at the Carlo Creek Site. The Carlo Creek Site contains evidence of both a Denali Complex occupation, dated around 9,500 to 8,500 years B.P., and a technologically unidentifiable occupation, dated around 6,700 years B.P. (Bowers and Mason 1992). The drainage also contains sites of the late Athapaskan period, around 500 to 300 years B.P., in the vicinity of the Nenana River Gorge (Bowers and Mason 1992).

There is also good evidence that the nearby Susitna River drainage to the east was occupied as early as the middle of the Holocene. The Ratekin Site has been interpreted as a caribou kill and butchering site (Skarland and Keim 1958) with a Northern Archaic aged assemblage as its oldest component.

Historically, the Western Ahtna and Tanaina primarily used the Upper Nenana drainage, while the Lower Tanana used the lower Nenana drainage. Both the Ahtna and Tanaina

speak closely-related Athapaskan languages and share close cultural affinities between the Western Ahtna and Upper Cook Inlet Tanaina (de Laguna and McClellan 1981).

Both peoples used the area seasonally and had no known permanent camps until the twentieth century. The Tanaina had an established village at Stephan Lake southeast of the project area as well as a camp at Chulitna Creek to the south. However, the closest Ahtna camp was at Tyone Lake (de Laguna and McClellan 1981). The Tanaina used the region around the project area as part of their seasonal ground in late summer when they traveled to the mountains to hunt caribou and mountain sheep, which usually involved moving their families long distances from summer fish camps to temporary mountain camps (Townsend 1981). Families accompanying these mountain hunters usually snared ground squirrels while the men hunted larger game (Townsend 1981). The Western Ahtna were more dependent than other Ahtna groups on large game due to a lack of access to salmon streams (de Laguna and McClellan 1981). They relied on the area for hunting caribou and mountain sheep into the twentieth century.

The earliest recorded Euro-American exploration of the area occurred in 1898, when G.H. Eldridge and Robert Muldrow of the U.S. Geological Survey as well as Sergeant William Yanert of the U.S. Army, followed the Susitna and Chulitna Rivers north to the Yanert Fork immediately north of the project area. Gold was discovered on Valdez Creek in 1903, which resulted in a rush of gold seekers to the region as well as the development of a small mining community (Dessauer and Harvey 1980). This mining community, which was composed of both Euro-American and native miners, flourished until the 1920s, with corporate mining shutting down during World War II (Dessauer and Harvey 1980).

During construction of the Alaska Railroad, a small railroad construction community of Ahtna and Euro-Americans grew up at nearby Cantwell around 1916 (de Laguna and McClellan 1981, Dessauer and Harvey 1980). When the railroad was completed from Seward to Cantwell through the Chulitna and Nenana River valleys in 1919, it provided a railhead for supplying miners in Valdez Creek as well as the new community at Cantwell (Dessauer and Harvey 1980). Much of the Valdez Creek mining community was abandoned in the 1940s due to a decline in gold profits. Mining in this region has continued until the present. Unfortunately, much of the historic community was bulldozed in the late 1970s (Dessauer and Harvey 1980).

(2) Current Status

The BLM currently administers a number of commercial mining claims in the Valdez Creek drainage; however, little additional impact is expected from these small family-operated claims. These claims see few additional acres of impact per year in an area that has been impacted by mining since the early 1900s. Previous impacts have removed many of the historic structures and features associated with the early mining site in the area, leaving only the Denali Post Office in its original location and close to its original condition. Likewise, although the John Babel rock cabin has remained in its

original location, it is in poor condition and is in continual danger of collapsing or being removed by nearby mining activity since it is only 100 feet from active mining.

There are, however, additional historic remains within the Valdez Creek drainage, including a native miner's cabin and the remains of a reconstructed miner's cabin. The major threat to all these aforementioned resources are not related to mining but to vandalism, unauthorized reconstruction, and neglect. Several of the original structures associated with the Denali townsite and Valdez Creek mines have been bulldozed or burned by various individuals who feared the creation of a historic district, which they perceived would have limited the ability to mine in the area. Also two structures have been moved or reconstructed over the years. The native cabin was reconstructed by workers at Cambior Mining in the mid 1990s, and has continued to be reconstructed and modified by trespass users, including area hunters, since. The second miner's cabin was moved by Cambior, also in the mid-1990s, from its original location near the location of the central Denali townsite. It has since seen some reuse and reconstruction; generally the condition of this cabin is poor. Beyond the standing structures there are also numerous historic features including water ditches, freight sleds, and collapsed structures that require additional relocation, mapping, and documentation.

An additional impact to the area's historic resources is the illegal removal of artifacts from the native miners' townsite. This is the result of a lack of management presence in the area, as well as a lack of law enforcement presence.

d) Gulkana-Delta Region

(1) Prehistory and History

The Gulkana-Delta region encompasses some of the densest and best investigated clusters of archaeological sites within the Glennallen Field Office's management area. The region includes the Tangle Lakes Archaeological District, as well as some of the least investigated prehistoric remains for the entire region, namely within the Gulkana and Delta River corridors. North of the Copper River Basin in the Tangle Lakes Archaeological District there is ample evidence for early Holocene occupation of the area by hunter gatherers as early as 10,000 years B.P. (West 1996). Occupation in the Tangle Lakes spanned the entire Holocene, with a possible occupational hiatus between the Denali and Northern Archaic age occupations (West 1975). However, some of the most intriguing sites in the area follow an ancient, elevated strandline of a fossil, pro-glacial lake shore, which dates to around the end of the Pleistocene and the early Holocene (West 1996). The Tangle Lakes Archaeological District alone contains over 500 archaeological sites clustered near the headwaters of both the Gulkana and Delta Rivers (Bowers 1989).

The prehistory south of the Alphabet Hills and the Tangle Lakes Archaeological District is limited to knowledge gleaned from a handful of sites along some of the youngest landforms of the Gulkana and Copper Rivers. The Copper River Basin's prehistory is limited to the last thousand years from excavations at Dakah De'Nin's village (Shinkwin 1979), the Ringling Site (Workman 1976; Hanson 1999), and at Paxson Lake (Ketz 1983). One of these sites, the Ringling Site, appears on a low, relatively young river terrace that is approximately 200 feet lower in elevation than the surrounding Lake Ahtna sediments. Thus, no intact sites have been located or excavated south of the Alphabet Hills that are older than about 1,000 years B.P.

There is tantalizing evidence for much older occupations of the Copper River Basin. During construction of the Trans-Alaska Pipeline, Hogan Hill 1 (or GUL-078) was largely destroyed and left out of context by material removal from a nearby rock quarry. The site was believed to originate on the beach sands of the former pro-glacial lake level at about the 2,350 foot contour (Clark 1975). Artifacts consisted of waste flakes and a few formed artifacts, including a flat based dart sized, projectile point (Clark 1975). However, testing in the vicinity located no in situ materials (Clark 1975).

Clark also located Little Tonsina 21 on a large moraine/terrace west of the Little Tonsina River, which yielded a number of waste flakes and a single wedge shaped microblade core reminiscent of Denali cores (Clark 1975). This site was, however, largely a surface scatter with little subsurface potential (Clark 1975). Both of these sites indicate the likelihood that a much richer prehistory exists within the Copper River Basin than has previously been documented.

Most of the Gulkana-Delta region falls within the territories claimed ethnographically by the Gulkana-Gakona band of the Ahtna, an Athapaskan speaking group who occupied the majority of the Copper River Basin (de Laguna and McClellan 1981). This band occupied the Gulkana and Gakona River watersheds from below the confluence of the Gulkana River with the Copper River north to the southern end of the Alaska Range (de Laguna and McClellan 1981). Their lands bordered to the north within the Delta River valley, near the northern edge of the region, with the lands of the Tanana, who primarily used the Delta River Valley as a trade and exchange route with the Ahtna (McKenna 1981).

Ahtna subsistence patterns generally focused on runs of anadromous salmon, with a more limited focus on resident mammals, birds, and fish. Most resources were pursued from seasonal satellite camps. Salmon camps were occupied through the spring and summer, while dispersed hunting camps were occupied through the fall (de Laguna and McClellan 1981). Within the area of Paxson Lake, large numbers of caribou were driven into the lake and speared from skin boats (Reckord 1983a). During the winter, families congregated in large winter houses near the summer fish camps, dispersing in January and February to exploit other resources which included a larger proportion of fur bearing mammals after European contact (de Laguna and McClellan 1981).

Major Ahtna villages were generally located near the confluences of rivers. Two major winter villages of this band were located at the confluences of the Gulkana and Gakona Rivers with the Copper River (de Laguna and McClellan 1981). A large winter village located on the shores of Paxson Lake, also known as Spring Water Lake, was occupied by the Gulkana-Gakona band during the 1800s (Reckord 1983a). The large winter villages were comprised of less than nine multifamily houses, which were typically rectangular and semi-subterranean (de Laguna and McClellan 1981).

The Ahtna's first contact with Europeans came around 1796, when Tarkhanov traveled from Yakutat to the Copper River Delta; here Tarkhanov encountered Chief Kaltysh from the village of Takekat, who traveled annually down the Copper River to prepare yukola (Lethcoe and Lethcoe 2001). After Russian interests in Alaska passed to the U.S. in 1867, Lieutenant W. R. Abercrombie of the U.S. Army unsuccessfully attempted to enter the Copper River Basin in 1884. Subsequently, in 1885, Lt. Henry Allen led an expedition into the basin where he came into contact with the lower Copper River Ahtna, including Chief Nicolai of Taral (Sherwood 1995). Large scale Euro-American contact with the Gulkana-Gakona band of the Ahtna did not occur until after the discovery of gold on the Yukon River in 1896.

Gold seekers attempted to reach the Yukon gold fields via an all-American route reported by Lt. Abercrombie in 1885, resulting in a stampede of prospectors into the Port of Valdez and over the Valdez Glacier in 1898 (Lethcoe and Lethcoe 2001). These prospectors followed a variety of routes across the basin while prospecting and attempting to reach the Yukon (Lethcoe and Lethcoe 1996). A number of these routes used existing Ahtna trails, including a route along the Copper River past the mouth of the Gulkana River (Lethcoe and Lethcoe 2001).

The military trail between Eagle City and Valdez was established in 1899, largely following the Copper River north from Copper Center. A branch of the trail toward Fairbanks became the dominant route for gold seekers when gold was discovered in the Tanana Valley in 1902 (Philips 1984). During the same year that gold was discovered in the Tanana Valley, the U.S. Army completed the Valdez to Eagle portion of the Washington Alaska Military Cable and Telegraph System (Quirk 1974). The original Valdez to Fairbanks route had followed the Gakona River northward; later, the newly formed Alaska Road Commission, the Board of Road Commissioners for Alaska, realigned the route with a new parallel segment of road along the Gulkana River (Bleakley 1996).

Gold was discovered in 1903 far to the east of the Valdez to Fairbanks trail in an area called Valdez Creek near the Susitna River (Dessauer and Harvey 1980). Since the most viable access to the entire Copper River Basin was from the port of Valdez and the newly pioneered trail, several branch trails were traced westward, often following older native trails toward the gold fields (Dessauer and Harvey 1980). These trails included the Bear Creek Trail, the West Fork of the Gulkana Trail, the West Fork Trail via Clearwater Creek, the Middle Fork of the Gulkana Trail, a trail from Paxson's Roadhouse to the Maclaren crossing, and the Yost Trail (Dessauer and Harvey 1980).

Almost all of these trails later fell into disuse after the construction of the Alaska Railroad between Seward and Cantwell in 1919 and the blazing of a new overland route to Valdez Creek via Cantwell (Dessauer and Harvey 1980).

Long after the Valdez to Fairbanks section of the military trail was completed in 1906 as a packhorse trail and as a winter road by 1908, however, it remained in heavy use by travelers (Bleakley 1996). The route became passable for automobiles by 1913 and was re-designated as the Richardson Road in 1919 (Bleakley 1996). The Washington Alaska Military Cable and Telegraph System line eventually followed the same route as the Richardson Road, with a new line strung from Gulkana to Big Delta that was operational by 1907 (Phillips 1984). This section of telegraph line was in service until 1925 when it was decommissioned in favor of wireless radio communication (Phillips 1984).

Heavy use of the Valdez to Eagle and Valdez to Fairbanks routes by visitors and residents of the state created a demand for small entrepreneurs to provide food and lodging at various intervals on the trails. As early as 1898, Andrew Holman established a temporary roadhouse at Copper Center to serve as a shelter, store, and post office for the early miners entering the area (Phillips 1984). Since that time and up to and including recent years, roadhouses have appeared at various locations along the trail and road system. Various establishments have included Dry Creek Roadhouse, Gulkana Trading Post and Hotel, Gakona Roadhouse, Gillespie's Roadhouse, Roosevelt Roadhouse, Timberline Roadhouse, Poplar Grove Roadhouse, Sourdough Roadhouse and Trading Post, Our Home Roadhouse, Abbott's Roadhouse, Meier's Roadhouse, Paxson's Roadhouse, Yost's Roadhouse, Casey's Cache, Miller's Roadhouse, and Rapids Roadhouse (Phillips 1984). Since the heyday of the roadhouses from about 1898 to about 1923 (Phillips 1984), the Richardson Highway has continued in modern use and has been the primary route for development of the Copper River Basin.

One of the Cold War developments along the Richardson Highway within the planning area was the U.S. Air Force's Ballistic Missile Early Warning System (BMEWS)/Rearward Communication also known as the "White Alice System." The system was constructed as a link between Distant Early Warning (DEW-Line) radar systems monitoring the Soviet Union and the North American Air Defense (NORAD) headquarters in Colorado (Reynolds 1988). Several microwave facilities, known as TD-2 Stations, were constructed along the Richardson Highway as part of the "A" route, which connected Neklassen Lake to the south with Pedro Dome to the north (Reynolds 1988). The TD-2 facilities located within the planning area included Glennallen (GUL-126), Aurora (GUL-125), Paxson (GUL-127), McCallum (XMH-393), and Black Rapids (XMH-392), all of which were constructed in 1960 and operational by 1961 (Reynolds 1988).

(2) Current Status

Although the Gulkana-Delta region has received the most archaeological work, the area has a large number of inventory gaps. Neither the Delta nor the Gulkana Wild and Scenic River Corridors have received any systematic surveys despite having their headwaters in the dense early Holocene archaeology of the Tangle Lakes Archaeological District. Therefore, little is known about prehistoric subsistence patterns within the Copper River Basin as a whole, since only recent sites (e.g., 1,000 years old and newer) have been excavated south of the Tangle Lakes. Beginning in fiscal year 2003, the BLM initiated a systematic random sample and geoarchaeological investigation of the Gulkana River corridor, which has borne initial fruit by increasing knowledge about prehistoric resources and the distribution of more recent historic (and possibly proto-historic) aged sites (Keating and Jangala 2003). These surveys have increased baseline knowledge about the river corridor's archaeology and the potential effects of future management strategies on those resources. Additional and similar surveys are planned along the Delta River corridor starting in fiscal year 2007.

Beyond gaps in inventories and archaeological knowledge, there are currently three threats to cultural resources located within the boundaries of the Glennallen Field Office. Since the addition of the Tangle Lakes Archaeological District to the National Register of Historic Places in 1972, there has been an increase in both OHV use and trail impacts to archaeological sites in this area. These increases have removed some of the vital vegetative cover from the thin, fragile soils covering several recorded sites spanning virtually the entire Holocene. In response to this problem, the BLM has used experimental trail hardening materials in those areas with wet soils that are not able to withstand the weight and traffic to which they have been exposed. The trail hardening would also attempt to discourage the user-created braided trail patterns that have developed in these wet areas. The BLM has also increased signage along both designate and non-designated trails. This signage is continually replaced each year due to heavy attrition from non-compliant OHV enthusiasts. Increased law enforcement has also resulted in the issuance of a small number of fines to the minority of OHV users in the area who intentionally travel off designated trails. While these efforts have reduced overall impacts to sites and slowed the apparent creation of new trails, compliance with vehicle restrictions remains a problem within the Glennallen Field Office.

The second threat to heritage resources within this region is the natural decay and disturbance of sites. There are several cabins and cabin remains that have naturally decayed and collapsed, with virtually no possibility of reconstruction. However, there are a small number of historic cabins, including the Dawson Norwood Cabin on the Gulkana river, which are in immanent danger of collapse. There is the possibility that some of these may be suitable for future stabilization efforts and interpretive use. Other sites, including the Sourdough Gene site at Sourdough Campground, are eroding from a combination of human traffic and natural erosion from flooding.

The third threat to cultural resources in the region is deliberate vandalism and looting; however, only a few of these incidents have come to light within the planning area. There have been at least two looting incidents in the Tangle Lakes Archaeological District. The first documented case was of a looter in the Kenai National Wildlife Refuge who also had in his possession several artifacts looted from the Tangle Lakes and an unknown number of sites. The second incident relates to a looter's pit dug into a site above Tangle Lakes campground, located during fieldwork in fiscal year 2000 (Jangala 2001). A few historic cabins have also been vandalized along the Middle Fork of the Gulkana River canyon; timber from the structures had been removed to feed campfires.

The BLM is attempting to lessen the risk of this kind of looting and vandalism on at least two properties through periodic monitoring. The BLM has agreed to monitor two sites near the Paxson Lake Campground to ensure that no adverse effects impact the sites.

e) Nelchina Region

(1) *Prehistory and History*

At the time of European contact, the area was occupied primarily by the Ahtna Athapaskan Natives, although the area was also used by the Tanaina of the Knik Arm and Susitna River (de Laguna and McClellan 1981; Townsend 1981). The majority of trade and interaction between these people occurred to the north of the project area near the source of the Susitna River between the Upper Ahtna and Tanaina (de Laguna and McClellan 1981).

The Tyone-Mendeltna band of the Ahtna occupied the area around Tazlina and Susitna Lakes as well as the area around Lake Louise. Major villages in the area included lodges at the mouth of the Mendeltna River, Matanuska Village, Lake Louise, and Tyone Lake (de Laguna and McClellan 1981).

The first Euro-American exploration of the project area was accomplished under the orders of Captain Edwin Glenn in 1899, who directed Lieutenant J. C. Castner to cut a trail from Knik Arm to the Matanuska River (Cole 1992). Castner succeeded in continuing past the Matanuska's headwaters to Lake Louise, the Delta River, and eventually to the Tanana River (Cole 1992). The area, however, did not see much use until construction of the Glenn Highway during World War II. Monies were appropriated for the Alaska Road Commission in 1941 to construct the highway, which was completed in about four years.

(2) *Current Status*

The BLM oversees few activities in this area. Section 106 work for compliance with the National Historic Preservation Act is required in the area on a sporadic basis that leaves no ability to plan for projects. However, there is currently a paleontological inventory

need within the Talkeetna Mountains to assess additional potential for significant vertebrate remains. This is a project that is proposed for an undetermined time when the University of Alaska Fairbanks can work on this project jointly with the BLM, perhaps as a Cooperative Ecosystems Study Unit project.

f) Tiekel Region

(1) Prehistory and History

Although this region was largely inundated during most of the Pleistocene by the waters of Pro-Glacial Lake Ahtna, it was opened to human occupation around 9500 years B.P. after the lake's draining (Ferrians et al. 1983). The few excavations conducted in this area, namely Dakah De'Nin's village, have yielded relatively young remains (Shinkwin 1979) that fall within the nineteenth century. Conversely, there is only a vague hint of earlier archaeology in the area from deflated surface sites in the Tonsina drainage, notably Little Tonsina 21, which was discovered by Clark (1975). This small surface site contained several waste flakes and a single wedge shaped microblade core similar to those ascribed to the Denali Tradition (Clark 1975). Little else is known about this region's prehistory.

According to de Laguna and McClellan (1981), the project area lies on the border of territory claimed by the Lower Ahtna Athapaskan Natives and the Chugach Pacific Eskimo at the time of Euro-American contact. The Ahtna people occupied numerous primary residential sites along the Copper River including the vicinities of Copper Center, Lower Tonsina, and Chitina (otherwise known as Taral). These residences were occupied most of the year, primarily due to stored salmon caught during the summer (de Laguna and McClellan 1981). Short term hunting camps were once located close to seasonally available resources such as moose, caribou, and sheep (Buzzell and McMahan 1995). The Chugach primarily occupied the coast of Prince William Sound, hunting marine mammals and fishing for a variety of fish.

The Ahtna utilized numerous transportation networks. In general, local paths were used for subsistence activities while longer trails were used for trade and occasionally for raiding (Bleakley 1996). These routes usually followed natural corridors such as river valleys and traversed the more obvious mountain passes. Trade occurred among the different Alaska Native groups and both oral and documentary evidence suggests that the Ahtna regularly held intertribal trade fairs within the Richardson Highway corridor, including ones near Thompson Pass (Bleakley 1996). According to West and Workman, the "trade route used by the Ahtna to bring copper and other interior products to the sea up to the 1860s crossed the divide via the Tiekel River and followed the valley of the Lowe River to the Valdez Arm . . . This route parallels the Richardson Highway" (1970).

Russian explorers discovered the mouth of the Copper River in 1783. In 1819 Russian Ensign Klimovskii made the first successful ascent of the Copper River, reaching the mouth of the Chitina River (Bleakley 1996). Here he established a trading post which endured, off and on, for the next 40 years. The Spanish explorer Francisco de Eliza visited Prince William Sound in 1790; during this voyage, one of his captains, Salvador Fidalgo, named the Port of Valdez after the celebrated Spanish naval officer Antonio Valdez y Basa. The U.S. purchased the region in 1867; during the 1880s several American expeditions entered the area to explore and trade. The discovery of gold on the Klondike (1896-98) precipitated the first intensive movements of non-native explorers into the project area. Lured by local promoters, thousands of stampedeers were brought to Port Valdez in hopes of following an “all-American route” to the Klondike. Unfortunately, the prospectors found only one way across the Chugach Range: an exceptionally difficult and dangerous path over the Valdez and Klutina Glaciers (Bleakley 1996). These miners constructed cabins and other structures along the route, most notably along the shores of Klutina Lake at locations called Peninsula Camp and Klutina City (Benedict 1899).

In the spring of 1898 the army sent Captain William R. Abercrombie to Port Valdez to locate a safer path. The captain followed the remains of the Chugach Trail leading to the north toward Keystone Canyon and an Ahtna path leading up the western bank of the Copper River, both routes eventually utilized by the Valdez Trail (Bleakley 1996). Apparently similar paths existed elsewhere along the route. Specifically concerning the project area, “Lieutenant Walter C. Babcock related finding an ‘old Indian . . . foot trail’ along the Little Tonsina River. It had evidently been much used at one time, as there were numerous signs of brush cutting done many years ago, and the trail for long distances was worn down to a foot or more below the natural surface” (Babcock 1899).

In 1899 Abercrombie returned to the region and, utilizing hand tools, his soldiers built a 93-mile packhorse trail from Valdez to the Tonsina River. The construction continued and in 1901 the trail was completed to Eagle City. This trail has been called the Valdez-Fairbanks Trail, Military Trail, Government Trail, Eagle Trail, and Valdez Trail (Phillips 1984). The trail was originally created for pack and saddle horses, but was passable by wagon by 1910. By 1913 the first motorized vehicle traveled the entire length of the trail (Bleakley 1996).

By the fall of 1898 gold had been discovered in the Tonsina and Tiekkel areas. During the next three years discoveries were made on the Chistochina, Nabesna, and Nizina Rivers. Gold strikes in the vicinity of Fairbanks around 1902 helped established another branch of the trail. About 1906, the main trail was diverted at Gulkana and directed towards Fairbanks (Phillips 1984). Through the years road houses were built along the trail corridor to provided food and shelter. Approximately 56 roadhouses were reported to have been built along the corridor.

This route follows the Tsina River to the Tiekkel, which it traces to its headwaters. It next crosses a low divide leading to the top of the little Tonsina. Here two variations exist: a summer trail, bearing to the east, traverses Kimball Pass and descends Bernard Creek

to the Tonsina River, while a winter path, bearing further west, follows the Little Tonsina to the same destination (Bleakley 1996). The route then heads north to Copper Center and follows the west banks of the Copper River to the Gulkana River. Here the trail splits: one branch leads east to Eagle and the other continues up the Gulkana River, eventually ending in Fairbanks.

Overlying and closely paralleling the trails are the Richardson Highway and the Tok Cut-off. The Valdez-Fairbanks trail eventually became known as the Richardson Highway, named after General Wilds P. Richardson, who was president of the Alaska Road Commission from 1905-17 and played a prominent role in the highway's construction. Little evidence of the original trail exists today as changes and reroutes were made throughout the years. Major sections of the trail were obliterated by turning the trail first into a wagon road, then into a motor vehicle route, and finally into a modern highway (Phillips 1984).

One year after the military trail began, the Federal government authorized the building of the telegraph line to connect the various Army forts in the state. The communication link was called the Washington-Alaska Military Cable and Telegraph System. In 1901 the cable was installed from Valdez to Gulkana, and by 1902 the line was connected from Valdez to Eagle (Phillips 1984). The entire system connecting the Army forts with the central station at Fort St. Michael on Norton Sound was operational by 1903 (Quirk 1974). The telegraph line utilized the Valdez-Eagle trail as a transportation corridor – the line was installed adjacent to the trail. The telegraph line roughly follows the Richardson Highway to Gulkana, except in the Tonsina drainage where it follows the Valdez-Fairbanks “summer trail” through Kimball Pass (Phillips 1984). Between Valdez and Gulkana a total of six telegraph stations were installed between 1900-01: Keystone, Tsina River, Tiekkel, Tonsina, Copper Center, and Gulkana. In 1905 plans were made to replace the original telegraph stations with new log cabins. Through the years all stations along the line were replaced. In the 1920s the Signal Corps decided to phase out the telegraph system on the Richardson Highway. In 1925 the closing down of the system began. After 1936 the telegraph line was used as a telephone line.

(2) Current Status

The Tiekkel region is currently the site of several commercial helicopter-accessed recreational skiing operations, though few Section 106 investigations per the National Historic Preservation Act occur yearly. Additionally, since the area is predominantly used for recreation and hunting, there are few heavily impacting activities in the area. Recent BLM work has begun to focus on possible features and archaeological remains associated with the early Holocene shorelines of Lake Ahtna in the vicinity of the Little Tonsina's headwaters. Inventories have been conducted to inventory trails and associated historic remains of the 1898 to 1940s Valdez Trail as well as local historic mining and trapping related structures and camps (Jangala 2002; 2003). These inventories have pointed to serious historic resource problems in the area caused by impacts to sites from visitor use

These inventories have led to the discovery of two historic sites: a pre-1917 prospector camp associated with the Valdez Trail and a 1920s mining camp. Both sites are currently being impacted by recreational OHV traffic, with one of the sites exposed and its context degraded by passage of OHV traffic. Since this site may be eligible as a contributing property under the Valdez Trail Multiple Property Nomination, it is of special concern for management purposes. The other site is being impacted by OHV users scavenging wood from collapsed structures for fires.

Another impact noted during surveys is the discovery of recent evidence of looting within archaeological sites of National Register significance. The 1898 Peninsula Camp site was recently looted by an unknown party using a metal detector for remains. It has been noted that this looting of sites on public lands, lands managed by both the BLM and the State of Alaska, has occurred for a long period of time and over a broad area, evidenced by extensive collections of historic remains in the Copper Center Museum.

8. Paleontological Resources

Paleontological remains on Glennallen Field Office lands span from Late Triassic age pelecypods, to Cretaceous age hadrosaurs, to Pleistocene age mammal remains and early Holocene age plant remains. Paleontological research has been at a standstill, with only occasional and accidental discoveries by amateur paleontologists and mining operations adding additional information to the region's prehistory.

Currently no systematic inventory for paleontological resources occurs within the Glennallen Field Office. Because the Statewide Inventory of cultural resource sites maintained by the State of Alaska also includes known paleontological sites on BLM lands, that information is also reviewed whenever every Section 106 review is done for compliance with the National Historic Preservation Act. Occasional remains are located on an irregular and unpredictable basis. Paleontological research permits are issued on an as-needed basis by the BLM Alaska State Office as well as by the Glennallen Field Office to interested researchers. This permit requires that the researcher submit a report of the season's findings so that the BLM is better able to manage newly located remains.

During the past few years, independent paleontological research has been conducted in only two areas. The recession of the Bering Glacier has exposed a variety of botanical and invertebrate specimens from the last 10,000 years. These remains have been studied by several researchers from the University of Alaska Anchorage as part of an ongoing paleontological research project focused on past climate. Additional, incidental research has been conducted by researchers in the Talkeetna Mountains, where 90 million-year-old dinosaur and marine reptile remains have been located. The recent 2003 location of a set of marine reptile remains was found as part of a research effort in the vicinity of Cameron Pass by a University of Alaska Fairbanks paleontologist in his spare time. Future work is planned at both the Bering Glacier and in the Talkeetna Mountains to locate and collect a variety of paleontological remains. However, both projects are dependent upon university funding and the availability of the interested researchers.

The following information is organized by regions delineated for purposes of both this paleontological resources discussion and the previous cultural resources discussion. Map 43 on page 283 illustrates the boundaries of these regions.

a) Bering Glacier-Icy Bay Region

There are numerous paleontological sites located in the Bering Glacier region, with deposits ranging from the Pliocene to the Jurassic/Cretaceous as well as the Late Holocene, with the oldest sediments being farthest inland (Lindsey 1986). The oldest

fossils, poorly preserved brachiopods, pelecypods, gastropods and forams, are Jurassic or Cretaceous aged and located in the greywacke, argillite and slate of the Yakutat group; however only one locality has been noted on BLM lands (Lindsey 1986). The Kushtaka and Kulthieth Formations are Late Eocene and Early Oligocene age deposits of sandstones, siltstones, and thin coal beds, which contain both marine gastropods and pelecypods as well as terrestrial plants (Lindsey 1986, p. 13). Elsewhere, the Katalla and Poul Creek Formations, which range in age from the Oligocene to the Miocene and possibly the Pliocene, contain terrestrial plants, angiosperms, and pectins, as well as marine fauna, mostly pelecypods and gastropods (Lindsey 1986).

During an overflight of the Bering Glacier's terminus in 1998, a BLM wildlife biologist located the ancient remains of sheared off trees and other organic debris in a small drainage. In 1998 and 1999, biologists and paleontologists from the University of Alaska were contacted and subsequently conducted an investigation of the area. The site is estimated to be approximately 10-15 acres in size and is located at the bottom of a drainage. It contains standing and collapsed dead trees as well as a peat layer around the tree roots. The site contains numerous species of plants in the peat layer and a large percentage of the site area is fully exposed. Tree ring counts indicate the Bering specimens were between 160 and 250 years old when overrun by the glacier.

b) Denali Region

There are numerous paleontological remains within the Denali region and to the east, along a large portion of the Alaska Range. Fossils within the Healy quadrangle are from Late to Middle Devonian aged limestones (Lindsey 1986). These rocks contain coelenterates, bryozoans, brachiopods, corals, gastropods, and trilobites, which are poorly preserved but represent the oldest fossils found in this range (Lindsey 1986).

More recent quaternary fossils include two tusk fragments likely from a mammoth (*Mammuthus* sp.) as well as a caribou (*Rangifer*) antler fragment from deep gravels excavated by Cabior Mining Company in the Valdez Creek drainage (Gangloff 1995). These fossils represent some of the best evidence for Pleistocene megafauna south of the Alaska Range.

c) Gulkana-Delta Region

Numerous Pennsylvanian aged fossils of brachiopods, corals, ammonites, and trilobites have been reported in the vicinity of the Delta River and Phelan Creek in an area known as Rainbow Ridge (Lindsey 1986). However, the majority of the southern region (south of the end of the Delta River National Wild and Scenic River's wild and recreational portion designations) is poorly known paleontologically. Recently, a fossil specimen, apparently belonging to the order Dendroidia, was located in frost fractured argillite

cobbles along a remnant glacial feature east of the Tangle Lakes and north of Swede Lake in the Tangle Lakes Archaeological District (Jangala 2003).

Additionally, one important Quaternary age fossil locality is known to occur within the Tangle Lakes Archaeological District. This site has been dated by a series of nine radiocarbon dates to between 11,800 and 7,700 years B.P., and consists of a 14 meter-long, 3 meter-thick organic-rich exposure eroding out of a 20 meter-high bluff, which is associated with an early Holocene fossil lake shore strandline. This site has added significantly to our understanding of the area's late Pleistocene and early Holocene paleocology, and has a direct bearing on the location and dating of the region's early archaeology. The site has yielded perhaps the earliest direct date (7,700 B.P.) of post-glacial spruce macrofossils in Alaska (Bowers 1989), and has been described in preliminary reports by Schweger (1981) and West (1981).

d) Nelchina Region

There are a variety of paleontological remains eroding from the southern portion of the Talkeetna Mountains, including numerous invertebrates and the only truly fossilized remains discovered south of the Alaska Range. These were a set of Hadrosaur, or duckbilled dinosaur, remains located in shallow marine sediments in 1994 and exposed by a private gravel pit alongside the Glenn Highway. Recently a paleontologist from the University of Alaska Fairbanks reported finding a previously unrecorded example of possible plesiosaur remains near the Cameron Pass vicinity. Also located in this vicinity in 1990 was an Edmontonia skull from a Nodosaurid Ankylosaur in a creek bed in the western part of this range (Gangloff 1995).

9. Visual Resources

The BLM's Visual Resource Management (VRM) program attempts to balance the uses of public lands with the protection of areas containing a high scenic values. Scenic quality is an essential component of most recreation activities. Recent studies indicate Americans enjoy a wide variety of outdoor activities that depend on high quality visual resources.

The BLM is responsible for managing the negative impacts that surface-disturbing activities can have on the visual resources of all public lands. Visual Resource Management ensures that scenic values are maintained while allowing for multiple uses to occur on public lands. The VRM classes and their objectives are:

- **Class I.** Objective: To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
- **Class II.** Objective: To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
- **Class III.** Objective: To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
- **Class IV.** Objective: To provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

All mining operations within the planning area are required through their Plan of Operations to mitigate for impacts to visual resources. These measures can include revegetation of impacted areas with native seed, using natural barriers to disguise mining activities, seasonal restrictions on surface disturbing activities, and transport of mining equipment. Currently, there are no large scale mining activities within the planning area.

Timber sales within the Glennallen Field Office are generally small in size because of a lack of infrastructure and the unavailability of high value, marketable timber. A timber sale proposed for the Tonsina Bluffs area near Kenny Lake has used buffer distances from existing trails to address public concern about the visual and social impacts of a timber sale in that area (Calderwood 2003b). Forestry practices will address visual resources through the use of frozen ground and snow cover to mitigate surface disturbing activities and their associated scars on the land and vegetation, as well as the replanting of forested areas to sustain the resource.

The effect of fire on the visual resource is primarily beneficial but can be adverse in areas of high visual sensitivity. In general, areas of high visual sensitivity correspond to major travel corridors and population centers. Wildfire is an integral part of the ecological process that maintains or enhances natural visual diversity. In the short-

term, a small fire (up to 50,000 acres) may blacken an area, creating sharp visual contrast and possibly visual interest (Calderwood 2003a). Extremely large, severe fires (over 50,000 acres) with few unburned or less severely-burned inclusions, can create large expanses of blackened landscape which are monotonous and result in reduced visual impact on some users (viewers), although others will view the scene positively or make no value judgment. Even large burned areas may create a pleasing visual effect once vegetation regrowth has begun.

Fire suppression can cause highly adverse damage to visual resources. Short-term impacts are generally acceptable unless viewed from observation positions such as highways, high use areas, or scenic overlooks (Mclain 2004). Long-term impacts are unacceptable and are usually a result of bulldozed firelines. Bulldozers disturb the organic mat and expose mineral soil, creating distinct unnatural lines across the landscape and sharp color contrast that may take decades to disappear (Mclain 2004).

Increased OHV use throughout the Field Office has created a web of trail systems that change the characteristic of the land. In some areas, because of wet and muddy conditions, the trail braiding has reached a width of 100-300 feet (ICRC 2001; ICRC 2002). This is not only a resource damage issue but a visual resource issue as well. Through trail rerouting, revegetation of scarred landscape with native seed, and proper trail construction and maintenance these visual impacts are being mitigated. The response to trail proliferation and degradation is still in the reactive stage, focusing on the Wild and Scenic River corridors and unencumbered BLM lands within the Glennallen Field Office.

a) Visual Resource Management Inventory

In the summer of 2003 a VRM inventory of the planning area was conducted. Through the spatial analysis of overflight information using GIS software, on-the-ground observations, scenic quality ratings, distance classes, viewsheds, sensitivity classes, and specialist input, VRM inventory classes were developed for all lands within the Glennallen Field Office.

Twenty travel routes were used in this evaluation: Alaska Railroad, Parks Highway, Denali Highway, Valdez Creek Road, Delta River, Gulkana River, Richardson Highway, Coal Mine Road, Tok Cut-off, Nebesna Road, Mentasta Spur Road, Glenn Highway, Lake Louise Road, Klutina Road, Old Edgerton Highway, Edgerton Highway, McCarthy Road, Old Copper River Railroad, Copper River Highway, and Mineral Creek Road.

Map 17 on page 111 in Chapter II shows the **current** VRM inventory classes within the planning area.

10. **Areas of Critical Environmental Concern (ACEC)**

a) **Background**

The designation of an area as an Area of Critical Environmental Concern (ACEC) is a management designation unique to the 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.

b) **Nominated Areas**

Currently, there are no ACECs within the planning area. The 1980 Southcentral Management Framework Plan recommended ACEC designation for three different: the Nelchina caribou calving area, habitat for *Smelowkia borealis villosa* (at that time a threatened plant species), and the Tangle Lakes Archaeological District. None of these areas was ever designated. Since that time, the threatened plant species has been delisted.

During the scoping process for this resource management plan, the Glennallen Field Office actively solicited nominations and comments from the public on areas that should receive consideration as ACECs. A total of seven nominations were received from the public, some for the same areas. The nominations were as follows:

- Denali Highway ACEC – nominated by Copper County Alliance, supported by Alaska Center for the Environment.
- Bering Glacier ACEC – nominated by Alaska Coalition, Wilderness Society, Alaska Center for the Environment, supported by EcoTrust and Lynn Canal Conservation.

In addition, BLM specialists identified areas for ACEC consideration based on review of important resource values, State (DNR) planning documents, and past BLM planning documents (including a 1989 draft RMP for the area that was halted due to budget constraints and conveyance concerns).

c) Potential ACECs

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 EIS. The Denali Highway was found to meet the relevance and importance criteria, but is considered as a Special Recreation Management Area because of the recreational use that occurs there. For more specific information on specific measures proposed for these areas, see the detailed alternative comparison tables in Appendix B.

(1) *Delta Bison Calving Range*

The Delta River riparian zone between Black Rapids and Buffalo Dome (approximately) on BLM-managed land is a narrow river corridor and the southernmost extent of the traditional calving range for the Delta River bison herd. The majority of bison remain at higher elevations along the Delta River corridor throughout calving season (April through June) and into the summer months of July and August, before migrating to lower elevations as the season progresses. In addition, grizzly bears are known to concentrate in this same area during spring and prey upon newborn bison calves.

Since the 1950s, the Delta bison herd has become a source of conflict between private agricultural interests and ADF&G as more lands in the Delta Junction area have been developed for crop and livestock production. In response, the 1979 Alaska Legislature established the 90,000 acre Delta Junction State Bison Range for the purpose of perpetuating free-ranging bison by providing adequate winter range and altering seasonal movements of bison and thus reducing damage to agriculture (ADF&G Division of Wildlife Conservation 1998). This effort by ADF&G not only reduces the amount of crop and property damage incurred on private lands, but it also reduces the likelihood of disease exposure (brucellosis) between cattle and bison.

In the spirit of interagency cooperation, Alternative C recommends that the BLM designate and manage bison habitat in the Delta River corridor as an Area of Critical Environmental Concern. Protection, maintenance, and possibly even enhancement of bison calving habitat would aid ADF&G in their efforts to sustain/prolong bison seasonal occupancy of public lands as long as possible throughout the year, thereby further reducing conflicts with private interests. Map 10 on page 101 in Chapter II displays the location of the 19,000 acre recommended Delta River bison range ACEC. These lands are all unencumbered BLM lands.

(2) *Nelchina Caribou Calving Range*

The eastern Talkeetna Mountains and their foothills are recognized as the traditional calving area of the Nelchina caribou herd (ADF&G, Division of Wildlife Conservation 1973). Approximately the northern third of the total known Nelchina caribou herd calving area is on State-selected lands currently managed by the BLM.

Due to the extreme importance of the Nelchina caribou herd's integral part in a wholly complete and functioning ecosystem, and for their importance to local subsistence efforts in Southcentral Alaska, Alternative C recommends that all lands managed by the BLM that are occupied by the Nelchina caribou herd during calving season be designated an Area of Critical Environmental Concern (ACEC). Map 11 on page 102 in Chapter II displays the location of the 389,000 acre recommended Nelchina Caribou Calving ACEC.

(3) *West Fork of the Gulkana River Watershed*

The West Fork of the Gulkana River contains a large percentage of the world's known population of trumpeter swans (*Cygnus buccinator*), a BLM-Alaska designated Sensitive Status Species. The majority of these birds are breeders, utilizing the multitude of lakes in the West Fork watershed as breeding and rearing areas for their cygnets.

It is recommended in Alternative C that the entire West Fork of the Gulkana River, including both North and South branches, be designated an ACEC to provide protection for trumpeter swan habitat. Map 12 on page 103 in Chapter II displays the location of the recommended 490,000 acre West Fork ACEC. These lands are predominantly State-selected lands currently managed by the BLM.

In addition, this area is an important breeding area for large numbers of other waterfowl. These wetlands provide habitat for many nesting bald eagles and osprey which feed on both the waterfowl and the algae numbers of fish in the area. The south face of the Alphabet Hills provides important habitat for trophy class bull moose, a habitat area beginning to be impacted by OHVs. The West Fork Gulkana River and its tributaries provide extensive spawning areas for sockeye and king salmon stocks, which in turn provide significant numbers of fish for subsistence, sport, and commercial users.

d) Potential Research Natural Area

(1) *Background*

According to 43 CFR Subpart 8223, a research natural area is "an area that is established and maintained for the primary purpose of research and education." The land must have at least one of the following characteristics:

1. a typical representation of a common plant or animal association
2. an unusual plant or animal association
3. a threatened or endangered plant or animal species
4. a typical representation of common geologic, soil, or water features
5. outstanding or unusual geologic oil, or water features

The area must be of sufficient acreage and size to adequately provide for scientific study, research, and demonstration purposes. Currently, no land within the planning area is designated as a RNA.

There are currently no RNAs within the planning area.

(2) Bering Glacier and Surrounding Glacier-influenced Environment

The entire Bering Glacier icefield and the surrounding glacially-influenced environment is unique to BLM-managed lands across the nation for its dynamic landscape, pristine environment, and outstanding biodiversity. Its harsh conditions, physical isolation, and frequently dynamic landscape are thought to have encouraged the evolution of unique plants and animals. The Bering Glacier is the largest (5,200 sq km) and longest (190km) glacier in North America. It is bounded to the north by the St. Elias Mountain range and to the south by the Gulf of Alaska. In various places, this tidewater glacier has a thickness of over 800 meters. The extent of the combined Bagley Ice Field and Bering Glacier, including all tributaries, encompasses a multitude of variant natural communities including marine, post-glacial freshwater ponds and lakes, coastal lowlands, non-vegetated terminal moraines, mountainous highlands, nunataks (isolated hills or peaks that project through the surface of a glacier), and the glacier itself.

The Bering Glacier area is a seasonal home or migratory staging area for numerous species of birds, and a yearlong home to various species of mammals and fish. Among these are mountain goats, harbor seals, waterfowl (including trumpeter swans, dusky Canada geese, tule white-fronted geese, Vancouver Canada geese, and red-throated loons), moose, wolves, coyotes, fox, beavers, coastal brown bears, and black bears. Vitus Lake (in the foreground of Bering Glacier) and adjacent lowlands/riparian areas provide important parturient habitat for harbor seals, trumpeter swans, dusky Canada geese, and other species of waterfowl, shorebirds, and songbirds considered Sensitive Status Species by BLM-Alaska. The area's floristic elements include those from Beringia, the Aleutian/Asian connection, southeast coastal ranges, and the Cordilleran Range of the Interior.

In summary, the entire Bering Glacier system is considered a national treasure and unique natural laboratory by researchers and scientists, and is deserving of local, statewide, and national recognition as such. Therefore, it is recommended under Alternatives C and D that the entire portion of BLM-managed lands in the Bering Glacier area be designated a RNA to provide for protection of this unique natural environment and the unique assemblage of living creatures found there, and to encourage continued investigations focused on the many aspects of a glacially-influenced and dominated landscape. Map 13, on page 104 in Chapter II, displays the location of the 827,000 acre recommended Bering Glacier RNA.

11. *Wild and Scenic Rivers*

Through passage of the Wild and Scenic Rivers Act of 1968, Congress established the National Wild and Scenic River System (NWSRS) to preserve some of the nation's most precious waterways. To qualify for designation, a river or river segment must be in free-flowing condition and must be deemed to have one or more "outstandingly remarkable values" as defined by the Act. These values include scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. The act recognizes three designations of protected rivers: wild, scenic, and recreational. Wild rivers are "free flowing, essentially primitive, and unpolluted representing vestiges of primitive America." Scenic rivers are "largely undeveloped, but accessible in places by roads." Recreational river are "readily accessible" and "may have some development," including impoundments or diversions.

Every river in the NWSRS must be administered in such a way as to protect and enhance the values that made it eligible for designation, but not to limit those other uses that do not substantially interfere with public use and enjoyment of those values. The heart of river protection, and the essence of the act, is protection of free-flowing character. The existence, however, of low dams, diversion works, or other minor structures at the time any river is proposed for designation does not automatically bar it from consideration for inclusion.

There are two rivers within the planning area that are designated as part of the NWSRS: the Delta National Wild and Scenic River (designated as wild, scenic, and recreational) and the Gulkana National Wild River (designated as wild). The Delta Wild and Scenic River Corridor also includes the Upper Tangle Lakes. Together these two river corridors comprise some of the larger contiguous blocks of unencumbered BLM lands within the Glennallen Field Office.

Intensive management takes place on the Delta and Gulkana Rivers, as well as on the Upper Tangle Lakes, each summer season from mid-May through mid-September when the majority of the use within the river corridors occurs. Winter use consists of subsistence hunting and trapping and recreation by means of dog sleds and snowmachines.

Management of the Delta and Gulkana Rivers is carried out in a variety of ways. In a given year, BLM river crews generally take three to four river trips on the Delta, four to five trips on the Gulkana, and two trips on the Upper Tangle Lakes. These trips include general cleanup of litter and refuse, documentation of all camp encounters, monitoring of impacted sites, public contacts and user education, facility maintenance (e.g., outhouses, portages, signs), overflights (to observe and verify use levels), and site rehabilitation and monitoring.

A revision of the 1983 River Management Plan for the Gulkana National Wild River is near completion. The revised plan will set visitor use limits and identify measures to address other impacts on the river. Revision of the plan has been a cooperative effort between the BLM and the State of Alaska.

a) Delta National Wild and Scenic River

Section 603(47) of the Alaska National Interest Conservation Act (ANILCA) established the Delta River as part of the National Wild and Scenic Rivers System. The designated segment begins and includes all of the Tangle Lakes to a point one-half mile north of Black Rapids. The upper third of the segment is designated as recreational, the middle third as wild, and the lower third as scenic. ANILCA also directed the Secretary of the Interior to establish detailed boundaries, prepare a management and development plan, and present this information to Congress by December 2, 1983. In response to these directives, the River Management Plan for the Delta National Wild and Scenic River established the detailed boundaries and developed the management policies for the Delta National Wild and Scenic River.

The Delta River watershed is located in the Alaska Range. Access to the Delta River is along the Denali Highway about 21 miles west of Paxson. The watershed drains an area of about 150,000 acres and contains a network of 160 miles of streams and 21 lakes. The Tangle River flows through and connects several lakes in the Tangles Lakes system, then drains into the Delta River which is Clearwater until the confluence with Eureka Creek when it becomes a braided, glacial river. The Delta then flows north through the Alaska Range and joins the Tanana River, which flows into the Yukon River. The terrain around Tangle Lakes is predominantly tundra-covered rolling hills with glacial features such as moraines, eskers, and kettles. Gravel benches above Lower Tangle Lake indicate that the lake was at one time about 50 feet higher than the current level. The land adjacent to the upper Delta River includes steep alluvial slopes, rock cliffs, and spectacular geologic features. Elevations average 2,800 feet at the Tangle Lakes, after which the drainage falls 650 feet in 51 river miles. (BLM 1983a)

In addition to the diverse geological features of the Delta WSR, the Delta River area provides habitat for many fish species including grayling, round whitefish, lake trout, burbot, and longnose suckers. Users of the area primarily fish for grayling but good lake trout is available in late winter and early spring (BLM 1983a).

Wildlife and bird habitat are also an important aspect of the Delta WSR. Hunters in this area seek moose, caribou, bear, Dall sheep, and snowshoe hare. Trappers concentrate on taking beaver, fox, wolf, marten, lynx, wolverine, otter, muskrat, and mink. One hundred ten species of birds inhabit this area, most of which are only summer residents. Migratory birds, waterfowl, and raptors can be seen on the lakes and river throughout the summer season. Along with the hunting and trapping activities, these animals provide visitors with opportunities for wildlife viewing and photography (BLM 1983a).

All of the Tangles Lakes, the Tangle River, and the “wild” section of the Delta River are within the Tangle Lakes Archeological District which is listed on the National Register of Historic Places. Many known prehistoric archeological sites are located within the designated “scenic” and “wild” river areas. Cultural resources of the historic period include cabin sites and mining trails associated with the mineral activities just outside the Delta WSR corridor in the Rainy and Eureka Creek areas in the Alaska Range (BLM 1983a).

b) Gulkana National Wild River

Section 603(49) of the Alaska National Interest Conservation Act (ANILCA) established the upper portion of the Gulkana River, including the Middle Fork and West Fork, as a component of the National Wild and Scenic Rivers System. Subject to valid existing rights, ANILCA classified and designated approximately 181 miles of the Gulkana River system as a Wild river pursuant to the Wild and Scenic Rivers Act.

The three forks of the Gulkana flow through the rolling valleys and low ridges of an upland spruce-dominated forest. Lakes are abundant in the surrounding hills. For several short stretches of river, most notably at Canyon Rapids, the river cuts sharply through ridges, providing short gorge-like settings. Soils are poorly drained and often tussocky. Vegetation includes spruce forests and thick willow, alder, and berry underbrush. Vegetation usually grows along the river’s edge, although there are numerous gravel bars providing a more open river corridor. (BLM 1983b)

Fish, wildlife, and birds species are abundant and diverse throughout the Gulkana River system. Fish species include the King salmon, red salmon, rainbow trout, lake trout, grayling, whitefish, burbot, and suckers. Heaviest use of the river by fishermen occurs from mid-June through mid-July when salmon are ascending the river.

Wildlife along the Gulkana River is important for the recreation it provides hunters, trappers, photographers, and others who enjoy viewing wildlife. Hunters focus their taking on moose, caribou, black bear, and grizzly bear. Trappers utilize the wolf, marten, wolverine, otter, weasel mink, fox, coyote, lynx, beaver, and muskrat populations. (BLM 1983b)

Users of the river enjoy the viewing and photography of the many birds who inhabit the river including bald eagles, many species of duck, loons, trumpeter swans, geese and owls. These birds can be observed in their natural habitat with many eagle nests visible from the river. (BLM 1983b)

The first 10 miles of the Middle Fork Gulkana River, below Dickey Lake are within the Tangle Lakes Archeological District, which is listed on the national Register of Historic Places. Several known prehistoric archeological sites are located within the designated “wild” river area and other sites are expected to exist. Cultural resources of the historic period include several cabins, cabin sites, trails, and part of freighting sleds associated

with the time, around 1910, when the West Fork and Middle Forks were routes used to reach the Denali Mining District about 80 miles west of the area. (BLM 1983b)

c) Eligibility and Suitability Review

Section 1326(b) of ANILCA states, “[n]o further studies of Federal 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 shall be conducted unless authorized by this Act or further Act of Congress.” A conservation system unit as defined by Section 102(4) of ANILCA includes wild and scenic rivers.

Inventory and review, however, may be conducted as part of a comprehensive planning effort, such as the creation or revision of a resource management plan. The settlement agreement for the 1993 case of *American Rivers et al. vs. the Secretary of the Interior* states:

The Director, Bureau of Land Management (BLM) will rescind BLM Instruction Memorandum No. 91-127, which provides an exception for Alaska from the general BLM requirement to conduct wild and scenic river studies as part of the resource management plan (RMP) process, and instruct BLM, Alaska to follow the BLM guidelines, presently set out as part 8351 of the BLM Manual, for conducting such studies. It is understood that these guidelines may change with time and it is the mutual intent of the plaintiffs and the federal defendants that BLM, Alaska follow the same policies and procedures that are followed by BLM throughout the rest of the United States (U.S. District Court 1993).

Consistent with these directives, the East Alaska RMP planning team conducted an **eligibility** review for the planning area. Review was based largely on an earlier review conducted in 1989 as part of a draft RMP effort that was halted due to budget constraints and conveyance concerns. At that time, the team considered over 300 rivers in the area for eligibility based on criteria described in the Wild and Scenic Rivers Act and BLM’s 8351 Manual. After interdisciplinary review, the 1989 team came up with a list of 25 eligible rivers within the planning area. Rivers are considered eligible through a determination that they are free-flowing and, with their adjacent land area, possess at least one outstandingly remarkable value. The 1989 team then classified the eligible rivers as wild, scenic, or recreational. The 2004 team **reviewed the eligibility and classification** of these 25 segments and assessed the segments for suitability, based on criteria listed in BLM’s 8351 Manual. **The list of eligible rivers and the team’s suitability determinations were presented in the Draft RMP/EIS.**

Of the 25 rivers listed as eligible in the Draft RMP/EIS, only one was shown to be suitable for inclusion into the National Wild and Scenic Rivers system. Most river segments considered eligible run through uplands that are State or State-selected lands. In assessing suitability, this was a major consideration and in most cases the

primary reason for a finding of non-suitability. According to BLM Manual 8351 (Policy and Program Direction for Identification, Evaluation, and Management of Wild and Scenic Rivers):

“In situations where there is limited public lands (shoreline and adjacent lands) administered by the BLM within the identified river study area, it may be difficult to ensure those identified outstandingly remarkable values could be properly maintained and afforded adequate management protection over time. Accordingly...river segments may be determined suitable only if the entity with land use planning responsibility supports the finding and commits to assisting the BLM in protecting the identified river values.”

In their written comments throughout the planning process, the State of Alaska is opposed to any additions to the Wild and Scenic River system.

BLM received numerous comments on the Draft RMP/EIS on our eligibility and suitability determinations and on the lists presented in the Draft. Most comments supported protection of the identified eligible segments and opposed BLM’s finding of non-suitability. Several commenters asked BLM to defer suitability determinations until State entitlements are met and land status is determined in the planning area. BLM also received comments on proposed additions and deletions to the eligibility list. Based on public comments and on the fact that our primary consideration for suitability was land status (which is in a constant state of change until entitlements are met), the decision was made to defer suitability.

The planning team then re-considered the list of eligible rivers, based on public comment and on internal (BLM) comments received during the planning process. The edited list of eligible rivers is presented in Table 27. Appendix I presents a more detailed description of the outstandingly remarkable values for each river, maps, and interim protective measures. If State-selected uplands are conveyed to the State, these river segments will not be considered for suitability and interim protective measures will no longer apply. Interim protective measures will only apply until conveyance takes place or a suitability determination is made. Any remaining rivers eligible for suitability will have a suitability determination EIS completed by 2011, when all land conveyances are anticipated to be complete. For rivers that were included on the eligible list in the Draft RMP/EIS that were removed from the list, an explanation is provided in Appendix I.

Table 27. Rivers Eligible for Wild and Scenic River Designation

River	Segment	Class*	Description of Outstandingly Remarkable Value(s)
Brushkana Creek	Entire river, 12 miles	S, R	Historic, Scenic, Recreational
Clearwater Creek	Entire creek, 22 miles	W, R	Scenic, Recreational
Duktoth	Upper portion of drainage, 12 miles	W	Scenic, Cultural, Recreational
Hungry Hollow	Entire creek, 14 miles	S	Fisheries, Wildlife, Cultural

River	Segment	Class*	Description of Outstandingly Remarkable Value(s)
Kulthieth River	Middle portion of drainage, approximately 8 miles	W	Scenic, Cultural, Fisheries, Wildlife
Kosakuts River	Northern portion, 10 miles	W	Scenic, Fisheries, Wildlife
Liberty Creek	Entire creek, 14 miles	S	Scenic, Recreational
Maclaren River	Entire river, 50 miles	S	Scenic, Wildlife, Cultural, Recreational
Monsoon Creek	Entire creek, 13 miles	W	Fisheries, Recreation
Nenana River	Headwaters to Wells Creek, approximately 30 miles	R	Scenic, Recreational
Susitna River	Headwaters to Kosina Creek, approximately 150 miles	S	Recreational, Cultural
Tonsina River system	BLM-managed portions of Tonsina, Little Tonsina, and Greyling Creek, approximately 75 miles	W, R	Scenic, Recreational, Fisheries, Cultural
Twelve Mile Creek	Entire creek, 12 miles	S	Fisheries
Victor Creek	Entire creek, 20 miles	W	Wildlife, Fisheries
South Branch of West Fork of Gulkana	15 miles	W	Recreation, Scenic, Wildlife, Fisheries

* W = Wild; S = Scenic; R = Recreational

12. *Climate Change*

Based on current scientific research, there is growing concern about the potential effects of primary greenhouse gases on global climate. Through many complex interactions on a regional and global scale, the lower layers of the atmosphere experience a net warming effect. These trends could be caused by greenhouse warming or natural fluctuations in the climate. There is an ongoing scientific debate about the cause of these trends.

The assessment of the impacts of climate change is in its formative phase, and it is not yet possible to know with confidence the net impact of such change. The potential effects of global climate change could alter water supply, food security, sea-level fluctuations, increasing levels of ultraviolet radiation, and natural variances in the ecosystem (ACIA 2004). Global climate change may affect surface resources in the Planning Area.

The average temperature of the Arctic has risen at almost twice the rate as the rest of the world in the last few decades (ACIA 2004). From 1954 to 2003 the average annual atmospheric surface temperatures in the Alaska region has risen ranging from 2 to 3 degrees Celsius. This increase in temperature has had a direct effect on increased glacial melt which contributed about 0.15 to 0.30 mm/yr to the average rate of sea-level rise in the 1990s. Other factors observed within the Arctic regions include an increase in river discharge with the spring runoff occurring earlier and a decrease in snow-cover by 5-10% since 1972. All of these changes are attributed to an increase in overall global temperature. (ACIA 2005)

Anticipated effects of climate change specific to the planning area are discussed in Chapter IV under Cumulative Effects.

E. Issue 4: Lands and Realty

1. Lands and Realty Programs and Administration

Land actions constitute resource allocations, and, as such, are made through a variety of means but generally fall into five broad categories: use authorizations, disposal actions, acquisitions, exchanges, and withdrawals. Each proposal or application for a lands action is considered on a case-by-case basis and is either authorized or rejected.

The primary objective of the lands program in the Glennallen Field Office is to provide the public with the land it needs for rights-of-way, land use permits, leases, and sales. The secondary objective is to provide support to other programs to protect and enhance the resources. Overlaying these first two objectives is the need to support the Alaska State Office in the Alaska Land Transfer Program, which involves the survey and conveyance of lands to the State of Alaska, Native Corporations, Native Allottees, and other inholders. The final goal of all these objectives is a balance between land use and resource protection that best serves the public at large.

a) Land Use Authorizations

(1) Unauthorized Use/Trespass

It is the responsibility of the BLM to protect the public's best interest in regards to BLM-managed lands. Over the years, individuals have built structures for various purposes (e.g., occupancy, commercial uses, recreational uses) with no regard for who actually owned the land on which they built. The Glennallen Field Office is attempting to manage this problem through a program of detection, control, and abatement. While the size of the district has not allowed a complete inventory to be conducted, a large number of trespasses have already been identified. Once a trespass has been identified it is handled in one of three ways:

1. If the structure is used for permissible purposes as defined by Sec. 302 of FLPMA, and is compatible with other resource management objectives, the trespass can be controlled by authorizing it under a specific set of conditions.
2. If the structure is not permissible under FLPMA, but is compatible with other resource objectives, it could be transferred to Federal ownership and maintained as a public use cabin or for administrative purposes.
3. If the structure is impermissible under FLPMA and is either unsuitable for public use or is incompatible with other management objectives, it is removed.

Currently, 150 known trespass cases are scattered throughout the planning area.

(2) Use Authorizations

Use authorizations and patents issued prior to the passage of FLPMA in 1976 are controlled and regulated under the acts by which they were issued. For example, rights-of-way for communication sites and transmission lines were issued under the Act of March 4, 1911. However, this and many other laws and statutes were repealed by FLPMA. In general, all new disposal, lease, easement, and right-of-way actions on public lands are now regulated by FLPMA.

Use authorizations respond to public demand for specialized and more or less temporary uses of the public lands. Examples are right-of-way grants, airport leases, R&PP leases, and all FLPMA leases, permits, and easements. These do not cause the lands to leave the public domain, although they may restrict or benefit certain uses. They may be set for a period of time or may be open-ended. They tend to cover small, scattered areas and cannot be anticipated through the planning process.

(3) Airport Leases

The Act of May 24, 1928, as amended, authorizes the Secretary of the Interior to lease for use as a public airport any contiguous unreserved and unappropriated public lands not to exceed 2,560 acres in area. In accordance with the regulation, those lands leased for airport purposes will not be subject to appropriation under the public land laws, including the mining laws. The Glennallen Field Office currently authorizes one airport lease.

(4) R&PP Leases

The Act of June 14, 1926, as amended, commonly known as the Recreation and Public Purposes Act, authorizes the Secretary of the Interior to lease any public lands that are not (1) lands withdrawn or reserved for national forests, national parks and monuments, and national wildlife refuges, (2) Indian lands and lands set aside for the benefit of Indians, Aleuts, and Eskimos, and (3) lands which have been acquired for specific purposes under conditions set forth in 43 CFR 2740 and 2912. Under these regulations, lands leased for R&PP are segregated from entry under the public land laws, including the mining laws (43 CFR 2091.3-2). The Glennallen Field Office currently authorizes four R&PP leases. Two R&PP lease applications are pending.

(5) FLPMA Leases and Permits

The Southcentral Management Framework Plan resulted in the decision to open those public lands in the Tiekel Block and the Clearwater Block (previously known as the Denali Block), not otherwise segregated by Native corporation selections or other valid existing rights, to lease and permit proposals under FLPMA. Sec. 302 of FLPMA contemplates a wide variety of land uses for lease and permit including, but not limited

to, habituation, cultivation, and the development of small trade or manufacturing concerns. In general, leases are for long-term land uses while permits are used to authorize short-term land uses. This section of the Act is implemented by regulations in 43 CFR 2920 and BLM Manual 2920, which define these uses further to exclude private recreational habitation such as seasonal use cabins. All such proposals are to be reviewed under the criteria established by FLPMA on a case-by-case basis and require a site specific environmental assessment. The Glennallen Field Office issues approximately 20 FLPMA permits and 10 leases.

(6) *FLPMA Easements*

A FLPMA easement is an authorization for a non-possessory interest in lands that specifies the rights of the holder and the obligations of the BLM to use and manage the lands in a manner consistent with the terms of the easement. For example, easements may be used to assure that uses of public lands are compatible with non-Federal uses occurring on adjacent or nearby land. There are currently no FLPMA easements authorized by the Glennallen Field Office.

b) Disposal Actions

Disposal actions are usually initiated in response to public requests or applications. These actions result in a transfer of title, and the lands leave the public domain. Examples are State entitlements, Native settlement claims, private or State exchanges, airport conveyances, R&PP sales, and FLPMA sales. Disposal may depend upon the recipients meeting certain conditions, such as in an R&PP patent, or may be absolute, as in a sale. In addition to these existing disposal programs, there are a number of programs occurring within the planning area that, while the acts authorizing them have been repealed, there is still a residual of disposal actions taking place. These include the Native Allotment Act, trade and manufacturing sites, headquarter sites, and homesites. With the exception of State entitlements and Native settlement claims, these disposals tend to involve scattered, discrete parcels and cannot be anticipated through the planning process.

(1) *Airport Conveyance*

The Airport and Airway Improvement Act of September 3, 1982, and 43 CFR 2640 authorize and regulate the issuance of conveyance documents for lands under the jurisdiction of the Department of Interior to public agencies for use as airports and airways. Under the regulations those lands proposed for conveyance are segregated from appropriation under the public land laws, including the mining laws. Furthermore, airport patents contain provisions allowing for reversion of the lands to the United States under certain circumstances. There are currently no airport conveyance sales within the Glennallen Field Office.

(2) R&PP Sales

The Act of June 14, 1926, as amended, commonly known as the Recreation and Public Purposes (R&PP) Act, authorizes the Secretary of the Interior to convey those public lands that are not (1) lands withdrawn or reserved for national forests, national parks and monuments, and national wildlife refuges, (2) Indian lands and lands set aside for the benefit of Indians, Aleuts, and Eskimos, and (3) lands which have been acquired for specific purposes, under conditions set forth in 43 CFR 2740. Though minerals remain reserved to the United States, there is no provision for mineral entry or development on R&PP patents. R&PP patents contain provisions allowing for reversion of the lands to the United States under certain circumstances. The Glennallen Field Office has currently authorized 10 R&PP sales for such purposes as a cemetery, a church camp, and a Boy Scout camp.

(3) FLPMA Sales

Section 203 of FLPMA establishes criteria under which public lands may be considered for disposal. In general, all such proposals are to be reviewed under the criteria established by FLPMA on a case-by-case basis and will require a site specific environmental assessment. However, there are situations existing within the transportation and utility corridor where, due to highway realignments, small slivers of public land have been created between the new highway and what was once land owned by adjacent property owners. This land use planning process will determine specifically what areas may be available for disposal, including Slana, subject to the criteria listed in Chapter II.

(4) Native Allotments

The Act of May 17, 1906, as amended, authorizes the Secretary of the Interior to allot not to exceed 160 acres of vacant, unappropriated, and unreserved nonmineral land in Alaska, to any Indian, Aleut, or Eskimo. The purpose of this act was to enable individual natives of Alaska to acquire title to the lands they have historically used and occupied, and to protect these lands from the encroachment of others. If it is determined that the applicant has met the requirements, as contained in the law and 43 CFR 2561, administration of the land passes to the Bureau of Indian Affairs (BIA). Upon survey and conveyance these lands are then held in trust by the BIA for the applicant or their heirs. While this act was repealed in 1971 by ANCSA, there is still a large case load of pending applications. Most of these applications consist of several smaller parcels of land scattered throughout the Glennallen Field Office, making the distribution of the total number of private holdings too cumbersome to depict. There are currently 56 pending applications.

The Alaska Native Veterans Allotment Act of 1998 enables certain Alaska Native veterans who, because of their military service, were not able to apply for an allotment in the early 1970s under the Act of 1906, to do so now. In addition to meeting the

requirements of the original act of 1906, there are additional restrictions as to which lands are available for veteran selection.

(5) Settlement Claims (Slana)

FLPMA repealed the Alaska Settlement Laws effective October 21, 1986. The criteria for disposal under FLPMA was applied to two areas know as north and south Slana in the 1983 amendment to the Southcentral Management Framework Plan, and it was determined that these lands were suitable for disposal. On September 26, 1983, Public Land Order 6456, opened 10,250 acres of lands in the Slana area to settlement for trade and manufacturing sites under the Act of May 14, 1898, and for homesites or headquarters under the Act of March 3, 1927. These lands previously had been and currently remain closed to mining but open to mineral leasing.

The Act of May 14, 1898, as amended, authorized the sale of not-to-exceed 80 acre parcels of unappropriated and unreserved public land in Alaska for trade and manufacturing sites. These sites must be used for actual trading, manufacturing, or other productive industry.

The Act of March 3, 1927, as amended, authorized the sale of not-to-exceed 5 acre parcels of unappropriated and unreserved public lands in Alaska for homesites or headquarters sites. Homesites are for the purpose of actual residency; headquarters sites are not required to have actual trade or manufacturing taking place on them, but must be used in conjunction with some kind of business located in Alaska.

Under the Alaska Settlement Laws an applicant has a five year statutory time frame in which to prove up on a claim and file an application to purchase. This means that within five years of the repeal of the settlement laws on October 21, 1986, applicants will have submitted any claims that could go to patent for purchase and the remaining claims will have been closed as their individual statutory lives expire. However, due to the large number of claims filed, it will be some time before all of the remaining valid claims can be conveyed.

As more claims go to patent in the Slana settlement area, a pattern of isolated and unmanageable tracts of land is emerging. In some instances, failed claimants who do not have title to lands still occupy public land in trespass. In other cases, failed claimants have left the area and abandoned personal possessions (including buildings, old cars, and other junk) on public lands. Some limited sales within the highway/utility corridor may be possible to alleviate management problems and facilitate clean-up of abandoned material.

c) Acquisitions

The Federal Land Policy Management Act of 1976 authorizes the acquisition of real property where it is consistent with the mission of the department and departmental land use plans. This is particularly applicable to designated Conservation System Units (CSU). ANILCA created two CSUs within the Glennallen Field Office: The Delta National Wild and Scenic River and the Gulkana National Wild River. When these CSUs were created most existing or potential interests and private inholdings were cherry stemmed out of the corridor boundaries, creating a complicated and unmanageable boundary between the corridor and private property.

d) Exchanges

Title 43 CFR 2200 regulates the procedures for the exchange of public lands or interests for non-Federal lands and interests. There are currently no exchanges taking place within the Glennallen Field Office.

3) Withdrawals

A withdrawal is a formal action that sets aside, withholds, or reserves Federal lands by administrative order or statute for public purposes. The effect of a withdrawal is to accomplish one or more of the following:

- 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;
- dedicate Federal land for a specific public purpose.

Millions of acres underlying both BLM public land and BLM-managed State or Native selected lands are withdrawn by public lands orders issued pursuant to Section 17(d)(1) of ANCSA. The (d)(1) withdrawals are a series of public land orders 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 allow for an orderly development of the BLM’s management objectives for present and future public needs. In the 1980s studies and assessments were completed, and opening orders were issued on some lands covered by the (d)(1) clause. No further actions have been taken since that time. The current land use planning process is now the means to assess resource values and make recommendations on opening lands withdrawn by the ANCSA (d)(1) orders.

Table 28. Major Withdrawals within the Planning Area

Withdrawal	Acreeage*	Effect of Withdrawal
Original ANCSA (d)(1)		
PLO 5174	808,000	Withdrawn from mineral leasing and entry
PLO 5176	374,000	Withdrawn from mineral leasing and entry
PLO 5178	1,766,000	Withdrawn from mineral leasing and entry
PLO 5179	739,000	Withdrawn from mineral leasing and entry
PLO 5184	711,000	Withdrawn from mineral leasing and entry
Other Withdrawals		
PLO 5150 (transportation and utility corridor, inner corridor)	261,000	Withdrawn from mineral leasing and entry
PLO 5151 (transportation and utility corridor, outer corridor)	173,000	Withdrawn from mineral leasing but allows for entry for metalliferous metals
PLO 5180	2,171,000	Withdrawn from mineral leasing but allows entry for metalliferous metals

* Current acres of BLM-managed lands withdrawn as of 9/30/2004.

In addition, there are hundreds of acres of administrative, recreation, power site, military, and other withdrawals in place, many of which were created for a specific purpose that may now be obsolete. This planning process will evaluate the need for maintenance or revocation of these withdrawals. Table 6 describes these withdrawals and recommendations for maintenance or revocation can be found on page 118 in Chapter II.

2. Utility and Communication Corridors

a) Transportation and Utility Corridor

The Transportation and Utility Corridor, withdrawn by PLO 5150 in December of 1971, is primarily identified with the Trans-Alaska Oil Pipeline System (TAPS), but it is reserved as a utility and transportation corridor in aid of programs for the U.S. government as well as the State. In accordance with section 17(c) of ANCSA, the State and ANCSA corporations were not permitted to select lands from the withdrawal area. In the 1979 Utility Corridor Management Framework Plan (MFP), the BLM management decision was to retain all lands in Federal ownership. However, in response to continual pressure and formal requests by the State, two major amendments to PLO 5150 allowed approximately 1.1 million acres to be opened and conveyed to the State of Alaska. These BLM decisions to allow the disposal of lands within the Utility Corridor were made through the land use planning/NEPA process and included assessing if the

Map 44. Transportation and Utility Corridor

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Map size: 11x17

disposal of land would be in the national interest in compliance with Section 102(a) of FLPMA. The land use decisions to allow disposal of the lands to the State were made under the 1983 Utility Corridor MFP Amendment and the 1989 Utility Corridor RMP (BLM 1989I). Protests to both these BLM planning documents were filed, with the impact to subsistence use and needs being the basis raised in the majority of the protests that were filed. BLM denied the protests citing, in part, that subsistence uses would not be restricted and would be protected through the State of Alaska maintained subsistence preference of resources. Both these land use planning documents were developed during the time when the State managed subsistence resources throughout the entire state. After 1990, the Federal government was obliged to directly manage the ANILCA Title VIII rural subsistence priority on Federal public lands. The State continues to manage State-defined subsistence and other hunting and fishing activities, including on Federal public lands, except where these are closed to non-Federally qualified subsistence uses.

Approximately 453,000 acres within the planning area are currently withdrawn by PLO 5150. Contained in this area is 114 miles of the TAPS out of the total 372 miles that crosses Federal land. Within the planning area, lands withdrawn for the utility corridor make up 63 percent of the Federal subsistence hunting area within the Glennallen Field Office. Hiking, OHV use, rafting, and other recreational activities also take place within the transportation and utility corridor and two SRMAs (Tiegel and Delta Range) are included in this area as part of the Proposed RMP (see descriptions on page 208). In addition, the southern portion of the transportation and utility corridor (Tiegel) contains stands of white spruce that provide commercial and personal firewood, houselogs, and sawlogs to residents of the Copper Basin. It is one of the few areas accessible to the public for personal use firewood. Electrical and telecommunication companies also utilize the utility corridor. Future pipeline needs (such as a natural gas pipeline) could be accommodated along this existing route.

Map 44 shows the current withdrawal for the transportation and utility corridor.

Power transmission lines outside of the corridor are generally confined to the road net within the planning area. The Copper Valley Electric Association (CVEA) is the commercial producer and distributor of electric power for all of the Copper River Basin. CVEA has a powerline right-of-way that was issued in conjunction with the Solomon Gulch Power Project licensed by FERC. The powerline goes from Valdez to Glennallen along the Richardson Highway, 34 miles of which are on BLM public lands. From Glennallen, the power is distributed on lines run along the Glenn, Richardson, and Tok Cut-off highways.

Specific permitted communication sites are discussed under *Transportation and Facilities*. With a growing population in the planning area, it is expected there will be an increased demand for the use of these sites.

b) Trans-Alaska Pipeline System (TAPS)

The Trans-Alaska Pipeline System delivered the first oil from Prudoe Bay on the North Slope to Valdez Marine Terminal in Prince William Sound on July 28, 1977. This 800 mile pipeline, crosses 30 major rivers, 800 smaller stream, and three mountain ranges. Eleven pump stations were originally constructed along the pipeline for the purposes of moving the oil through the pipe and for pressure control. Currently seven are operating, Pump Stations 1,3,4,5,7,9, and 12. Other infrastructure associated with the TAPS include approximately 284 roads, 13 bridges, 71 communication sites, and such support services as fire management, earthquake monitoring, and oil spill emergency response. (BLM, 2002) The East Alaska Planning Area encompasses 114 miles of the TAPS on Federal lands including Pump Stations 11 and 12 and several hundred miles of access roads.

All impacts of TAPS are clearly outlined and analyzed within the Final Environmental Impact Statement for the Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way which was signed in November of 2002. (BLM, 2002)

TAPS is monitored and administered through the Joint Pipeline Office (JPO) which was established in 1990. JPO is comprised of many Federal and State Agencies each with clear and direct regulatory authority over various TAPS activities. Table 29 outlines the responsibilities of those agencies a part of the Joint Pipeline Office. Alyeska Pipeline Services Company is responsible for the daily operation of the pipeline.

Table 29. Members of the Joint Pipeline Office

Agency	Responsibilities
Federal Agencies	
U.S. Department of the Interior, Bureau of Land Management	Issues and administers rights-of-way and permits for land use and cultural survey activities, and material sales related to pipeline use on federal land.
U.S. Department of Transportation, Office of Pipeline Safety	Regulates the transportation by pipeline of hazardous liquids and gases, as well as drug testing related to pipeline safety, and conducts inspections of TAPS.
U.S. Environmental Protection Agency	Works in partnership with the Alaska Department of Environmental Conservation to administer regulatory programs such as the Clean Air Act, Clear Water Act, and Oil Pollution Act.
U.S. Coast Guard	Issues approvals of work associated with construction and maintenance of bridges at aerial pipeline crossings over navigable waters and other activities that may impact navigation; oversees vessel movement in and out of the Valdez Marine Terminal area; and Terminal safety issues.
U.S. Army Corps of Engineers	Issues approvals of structures or activities in navigable waters and approvals of placement of dredged or fill material in waters of the U.S. including wetlands.
U.S. Department of the Interior, Minerals Management Service	Manages the nation's natural gas, oil, and other mineral resources on the outer continental shelf.

Agency	Responsibilities
State Agencies	
Alaska Department of Natural Resources	Administers state-owned land, as well as rights granted in land-use leases, permits, material sales, water rights, and water use
Alaska Department of Environmental Conservation	Regulates and issues permits to operate facilities that may affect air quality, generate waste, hazardous material treatment storage and disposal, and oil spill contingency plan approval.
Alaska Department of Fish and Game	Regulates activities affecting fish passage, anadromous fish streams, and hazing of wildlife in connection to oil spills, issues permits for beaver takings, and comments on subsistence issues.
Department of Labor and Workplace Development	Reviews practices and procedures pertaining to occupational safety and health; mechanical, electrical and pressure systems; and wage and hour codes to protect employees of the pipeline company
Department of Public Safety, Division of Fire Prevention	Concentrates on fire and safety inspections, plan reviews, fire investigations, and public safety education.
Department of Transportation Public Facilities	Provides design, construction and maintenance of primary and secondary land and marine highways and airports.

(Joint Pipeline Office, 2005)

F. Issue 5: Vegetation Management

This section describes management of vegetation within the planning area. For information regarding the occurrence and current condition of vegetation, see *Issue 3: Natural and Cultural Resources, Vegetation (Including Sensitive Status Plant Species)* on page 220.

1. Fire Management

a) Historical Fire Role

Fire occurrence in the Copper River Basin follows the general pattern found throughout the boreal forest region of the northern hemisphere. Fire plays a dominant ecological role in the establishment and appearance of the expansive forests of this region. Indeed, the greatest testimonial to the past fire history of the Copper River Basin is in the forest itself, where a complex mosaic of forest types indicate where fires have previously burned. This broad mosaic can be seen from nearly any vantage point in the basin (Calderwood 2003a).

Some of the earliest records of Euro-American exploration contain evidence of the magnitude of fire occurrence during the exploration era of this region. The journals of Canadian explorer-authors W. H. Davies 1843 and A. P. Low 1896 contain references to numerous large fires (Sherwood, 1995). These writers attribute large areas of burned forest to the Native population, who were known to start fires to enhance hunting, kill insect pests, and kill timber for firewood. Carelessness with camp and cooking fires was also a leading cause of wildfire.

Almost all early Euro-American explorers reported encountering forest fires. William R. Abercrombie in his journal of the Copper River Exploring Expedition (Abercrombie, 1990) described large fires in the vicinity of Klutina Lake. He stated, “the entire valley seemed to be on fire, which made traveling through the timber very dangerous, as the falling trees were liable to injure man or beast if they did not stampede the entire pack train.”

On his journey to the Tanana River in 1898, E.F. Glenn traveled through the country north of the Tazlina River. He reported, “[w]e entered what we called the burned district which seemed to extend as far as the country is visible toward the Copper River and to the northward almost to the Alaska Range” (Sherwood 1995).

With the discovery of gold in the Klondike and copper in the Chitina Valley, new residents and visitors began to bring in their own brand of carelessness. The Copper River Valley was a principal route from the coast to the gold fields of the north.

Construction of the Copper River and Northwestern Railroad (CR&NWRR) and the Valdez to Eagle telegraph (the Washington Alaska Military Cable and Telegraph System built by the U.S. Army) further added the rapid spread of development. With this influx into the Copper River country, an increase in the incidence of human-caused fire was inevitable. There appeared to be a widespread belief that fires were “good for the land.” Intentionally-set fires became more common for reasons that included increased moose browse and grass production, mosquito abatement, and to make prospecting easier. Fires due to carelessness also increased. Railroad and construction fires, debris burning, campfires, and tobacco smoking were additional causes.

From 1939 until 1945, fire control in Alaska was the responsibility of the Alaska Fire Control Service of the U.S. General Land Office. In 1946 the BLM became the responsible fire control and record keeping agency.

Improved communication and equipment availability in the 1960s aided in more efficient initial attack, and most fires were suppressed when small in size. However, notable exceptions were the Ahtell Creek Fire in 1967 which burned 2,200 acres on both sides of the Tok Cut-off Highway and threatened the community of Slana, and the 1969 Kenny Lake Fire, which burned 1,830 acres and several buildings. Both fires were human-caused.

In 1979 the State of Alaska acquired fire protection responsibility from the BLM. In June of 1981, the Wilson Camp Lightning Fire burned 13,000 acres on the western slopes of Mt. Drum – 8,000 acres the first day – and threatened to jump the Copper River between Glennallen and Copper Center.

b) Fire Occurrence

Prior to 1950 and the era of well-organized fire suppression, large wildfires occurred in the planning area. Table 30 details several sizable fires that occurred within the Copper River Basin.

After 1950, large fires were less frequent. Map 45 on page 331 shows the fire history for the planning area from 1950-2002. Lack of large fire occurrence is due in part to fire suppression, but also to the abundance of wetlands and other natural breaks interspersed throughout the planning area.

Table 30. Large Fire History Within the Glennallen District, 1915-47

Year	Fire Name	Location	Cause	Acres Burned
1915	Sourdough Hill	From Chitina to the Kennecott River, and from the Chitina River to the mountains on the north.	Sparks from CR&NWRR	348,000
1915	Kennecott	Around Kennecott Mine	Intentionally set to kill timber to produce fuelwood for sale at Kennecott Mine	64,000
1927	Willow Creek	Copper River and Tonsina River, with Richardson Highway as western boundary	Construction crew activities	128,000
1947	Tazlina	From Tazlina Lake to the Glenn Highway	Unknown	125,000

c) Current Fire Policy

Within the planning area fire management has been conducted by agreements executed on an interagency, landscape-scale basis since the early 1980s. This effort standardized policies and procedures among land managing agencies in Alaska. As a result, four wildland fire suppression management options (Critical, Full, Modified, and Limited) are utilized statewide by all Federal, State, and Native land managers. Table 31 provides a definition of each suppression class and acres within the planning area for each class. Each management option is defined by objectives, management constraints, and values to be protected. The management option categorizations ensure that:

- Human life, property, and natural and cultural resources receive an appropriate level of protection given available firefighting resources,
- The ability to achieve land use and resource management objectives is optimized, and The cost of the suppression effort is commensurate with the values identified for protection.
- Options are assigned on a landscape scale across agency boundaries. Management option categorizations are designed to be ecologically and fiscally sound, operationally feasible, and sufficiently flexible to respond to changes in objectives, fire conditions, land use patterns, resource information, new technologies, and new scientific findings (BLM 2004c).

The designation of a management option pre-selects strategies (appropriate management response) assigned to accomplish established land use and resource objectives. Regardless of management option classification, firefighter and public safety is the highest priority for all fire activities. Map 46 on page 333 shows the current suppression classes within the planning area. Suppression classes can be changed based on RMP or other land use planning objectives.

Map 45. Fire History 1950 to 2002

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Map size: 11x17

Map 46. Wildland Fire Management Classes

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File name: 46_firemgmt.pdf

Map size: 11x17

An essential attribute of the interagency fire planning in Alaska is the flexibility to change the fire management option as warranted due to changes in land use, resource objectives, protection needs, laws, suppression concerns, mandates, or policies. As part of the annual management option review, if the appropriate management response for the designation is not followed for a fire, the area in which the fire occurred will be evaluated to determine if the management option designation is suitable and meeting current land use and resource objectives.

Table 31. Wildland Fire Management Options

Fire Suppression Class	Definition	Acres Within Planning Area*
Critical	Highest priority for allocation of initial attack suppression forces. The objective is to protect human life, populated areas, inhabited property, designated physical developments, and structural resources designated at National Historic Landmarks. Protection of human life has priority over property. The appropriate response to fires that occur in this option is aggressive and continuing actions to provide complete protection of specifically-identified sites from fire.	22,000
Full	Second priority, below Critical, for assignment of available initial attack suppression resources. Full is assigned to cultural and historical sites, uninhabited private property, natural resource high-value areas, and other high-value areas that do not involve the protection of human life and inhabited property. The appropriate response to fires occurring within or immediately threatening areas with this designation is aggressive initial attack dependent upon the availability of suppression resources to minimize resource damage and suppress fires at the smallest reasonably possible number of acres.	1,260,000
Modified	Third priority, below Full, for assignment of available initial attack suppression resources. The goal is to balance acres burned with suppression costs and, when appropriate, to use wildland fire to accomplish land and resource objectives. The option provides flexibility in the selection of suppression strategies. When risks are high, the response is analogous to Full; when risks are low, the appropriate response is analogous to Limited.	2,189,000
Limited	This option acknowledges fire as a vital component of Alaskan ecosystems. Wildland fire is used as a management tool to maintain, enhance, and improve ecological condition. Under this option, wildland fires will be allowed to burn under the influence of natural forces within predetermined areas, while human life and site-specific values continue to be protected. This option is also assigned to areas where the cost of suppression exceeds the value of the resources to be protected or the environmental impacts on the resources than the effects of fire. Generally, this designation receives the lowest priority for allocation of initial attack resources. The appropriate response is routing surveillance to observe fire activity and to determine if site-specific values or adjacent higher priority management option areas are compromised.	11,011,000

* Includes all lands within the planning area regardless of land ownership.

Extensive fire activity in a single year, or multi-year incidents within the same hydrologic unit also trigger the need to initiate an interagency review for that unit (BLM 2004c). Reviews on a collaborative, interagency level after extensive fire activity are encouraged to ensure management option designations are still meeting all land managers' land use and resource objectives. The effects noted by Native villagers residing adjacent to or within the area should be weighed in management option reviews.

d) Prescribed Burning

Prescribed burning efforts have been focused solely on the Alphabet Hills with the objective to improve moose winter range. Early efforts through the 1980s and 1990s failed to meet objectives, in part because of a very narrow burning window. In 2003, 5,000 acres were burned, and in 2004, 41,000 acres burned resulting in a mosaic pattern. Objectives were met in 2004, a year when wildfires burned more than 5 million acres in the state.

e) Fuel Conditions and Fire Behavior

The fuels in the Copper River Basin are similar to those in much of Alaska and contribute to similar fire behavior and problems. The majority of the fire-prone areas are typified by complexes of fine fuels, both living and dead, which react rapidly to changes in relative humidity. These fuels are capable of rapid drying, even after substantial rainfall. Fuel beds are often continuous, with few breaks. Deep organic mats allow fires to be carried beneath the surface, increasing the possibility of hold over fires and the difficulty of mop-up.

Black spruce and white spruce are often associated with these fuel complexes and contribute to additional fire behavior considerations. Spruce trees (especially black spruce) often have branches growing near the ground, and the trees retain a large number of dead branches. These dead fuels form a vertical ladder that easily carries a surface fire into the crowns. The problems associated with crown fires are increased when the spruce grow in dense stands with closed canopies, forming a continuous fuel bed above the ground. In addition to crowning, spotting ahead of the main fire is a common problem in spruce stands. The embers are lofted as crowns burn, and are carried by wind to points ahead of the main fire. (Calderwood 2003a)

Fuels under broadleaf stands and tall shrub communities do not create the same problems because they are not as dense, they usually do not burn as readily, and crown fires are rare. Fires occur in this fuel type after snowmelt but before green-up in spring, then again after leaf drop in the fall. However, the potential for suppression problems does exist after periods of extensive drying.

Map 47. Fuels Types

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Map size: 11x17

A third important fuel type in the planning area is tussock tundra. From a fuels and fire viewpoint, the tussock tundra is essentially a grassland. Virtually all of the burnable material is small diameter and loosely packed dead grass and sedges. This fuel wets and dries very rapidly, burns quickly, and, because there is typically a substantial amount of fuel, the fires can be remarkably intense when burning under dry, windy conditions. This situation presents a set of suppression problems unique to the fuel type. Line building may be questionable and is certainly time consuming because of the commonly deep layers of organic material. For the same reasons, mop-up is slow and tedious. Because the dead grass fronds are retained on the tussocks, this fuel type is ready to burn any time the area is snow free, and even beyond that under the right circumstances. (Calderwood 2003a)

Elevations above 3,000 feet form effective barriers to fire spread because they generally do not support enough vegetation to carry fire. Extensive high elevation areas in the Wrangell Mountains, Chugach Mountains, Talkeetna Mountains, and the Alaska Range are unvegetated and form natural firebreaks. Major, wide rivers such as the Copper, Susitna, and Chitina form natural, but not invincible, firebreaks as well. Map 47 on page 337 shows the distribution of fuel types in planning area.

f) Role of Fire on Wildlife Habitat

Fire is a natural occurrence within Alaska ecosystems. Generally, the effects of fire on habitat are much more significant than the effects on resident animals. Habitat changes determine the suitability of the environment for future generations of animals. Fires may have a short-term negative impact on resident animals by displacing them, disrupting critical reproductive activities, or, rarely, killing them. However, these animal populations recover quickly if suitable habitat is available. Generally, fire improves the habitat for a wide variety of species. The adverse effects that the immediate generation of wildlife may experience are usually offset by the benefits accrued for future generations (Calderwood 2003b).

Most of the planning area is covered with a mosaic of forest, bog, and tundra habitat types that have been collectively termed the northern boreal forest. Fire is the primary agent of change in the boreal forest and is responsible for maintaining habitat heterogeneity. Wildlife have evolved in the presence of fire and have adapted to its presence. Indeed, the continued well-being of most species of wildlife depends on periodic disturbance of the habitat by fire.

The grasses and herbaceous plants that quickly reestablish on burned areas provide an ideal environment for many species of small mammals and birds. A rapid increase in microtine population usually occurs following a fire. This abundance of small prey animals in turn makes the recently burned area an important foraging area for predatory animals and birds. However, the size of the fire and the subsequent proximity to cover and denning or nesting sites affects the degree of use by larger animals.

Fire severity and frequency greatly influence the length of time that the grass and herbaceous plant stage will persist. Severe burning delays the reestablishment of shrubs, a benefit to grazing animals and seed-eating birds. Frequent reburning of a site further retards generation of shrubs and seedlings and prolongs the grassland environment.

For some species of wildlife, such as bison, this perpetuation of a grassland environment is beneficial. Where bison are present, a management program that entails periodic burning to preclude invasion by shrubs and trees can supplement the rangeland that is naturally available along the braided river courses.

Browsers such as moose, ptarmigan, and hares can benefit from the fire as soon as shrubs and tree seedlings begin to reestablish. If a fire leaves most of the shrub root and rhizome systems intact, sprouting will occur very soon after burning. In the case of early season fires, some forage may be available by the end of the growing season and limited use by browsing animals may occur. Forage quality is much improved, with increased digestibility and protein and mineral content for some years after fire. As tall shrubs and tree saplings begin to dominate, the site provides shelter and forage for a greater variety of wildlife. Although the rate of regrowth varies among burned areas and is dependent on many factors, this productive stage can persist for as long as 30 years after fire.

The greatest diversity of wildlife will be found during the tall shrub-sapling stage. Many species, which up to that point have frequented the burned area only to hunt or forage, begin to find that it provides shelter and denning or nesting sites as well. This abundance and diversity of wildlife, in turn, makes these burned areas extremely important to people, whether it be to hunt and trap or to view and photograph.

On most sites the young trees outgrow the shrubs and begin to dominate the canopy after 25-30 years. At this point the shrub component thins out and changes as more shade-tolerant species replace the willows. Subsequently, use by browsing animals such as moose, hares, and ptarmigan declines. On mesic sites which are developing into black spruce forest, the lichen biomass becomes significant during this period and increases in abundance for 50-60 years.

As the forest canopy develops and the understory species disappear, a burned site becomes progressively less productive. Relatively few animal species find the requirements necessary for their survival in the mature spruce forest that will eventually develop in the absence of further fire.

Because lichen cover increases in these more mature stages of black spruce stands, these areas are valuable for lichen-foraging animals such as caribou. In older stands, lichens are slowly replaced by feather and sphagnum mosses. On valley bottoms where a muskeg-bog situation exists, lichen cover also develops, but, contrary to the upland sites, lichens may persist as succession advances.

Generally speaking, large, severe fires are not nearly as beneficial to wildlife as are more moderate fires (Calderwood 2003a). Less intense fires quickly benefit browsing animals and their predators by opening the canopy, recycling nutrients, and stimulating sprouting of shrubs. In addition, the mature trees that are killed but not consumed by the fire provide nesting sites for hole nesters such as woodpeckers, flickers, kestrels, and chickadees, as well as some cover for other animals. A severe fire that burns off the aboveground biomass and kills root systems slows the regeneration of the important browse species, which must then develop from seeds.

Some sites, however, have progressed so far toward a spruce forest community that very little shrub understory exists from which regeneration of the site may occur. Furthermore, many sites are so cold and poorly drained that black spruce have a competitive edge over the less tolerant shrub species. In these situations, a light fire simply results in more spruce. Severe fire or frequently recurring fires are necessary to kill the seeds in the spruce cones and prepare a suitable seedbed for other species, resulting in the greatest enhanced value of the site to the most species of wildlife.

2. Forest Products

The forests of interior Alaska have a very diverse mixture of tree species. There are several species that have the potential for commercial value depending on the market conditions and fiber availability. These tree species include: white spruce (*Picea glauca*), paper birch (*Betula papyrifera*), aspen (*Populus tremuloides*), and balsam poplar (*Populus balsamifera*). Pure stands of a single species are rare, whereas mixed stands of hardwood and conifers are common. Tree diameters vary widely through a stand, which makes maximum utilization difficult. In most stands well over 75 percent of the trees are not large enough to utilize as saw logs or house logs. In order to maximize the use of the fiber from these forests, an integrated mill with multiple processing capabilities would be necessary.

Within the Glennallen Field Office, the Tielke region represents the most productive timber stands. Map 48 on page 3434 shows the location of the most productive commercial stands within the planning area. The timber stands are composed primarily of white spruce and either balsam poplar and/or aspen. Most stands are situated on gently rolling topography with well-drained soils. Over the last 10-15 years the stands have suffered high rates of mortality due to an infestation of the spruce bark beetle (*Dendroctonus rufipennis*). Map 49 on page 345 shows the areas with bark beetle infestation. In some stands affected by the bark beetle, upwards to 80-90 percent of the mature white spruce has died. The lack of adequate access to this low value fiber has limited utilization.

The region exhibits potential for small commercial harvesting of standing timber stocks. Present inventory of the region indicates roughly 25 percent of the area is covered by forest. The USDA Forest Service has estimated that 287,000 acres of the timber crop is of commercial grade, with 303.8 million cubic feet of growing stock and a board-foot

volume of 1,159.6 million feet. Additionally, a non-commercial stratum was examined that had substantial standing volume but did not meet the growth criteria for commercial forest land. This stratum contained 152,800 acres with a volume of 157.9 million cubic feet. There are small timber sales in the planning area that are conducted by the Department of Natural Resources, the BLM, and the Ahtna Native Corporation. The timber harvested in these sales is used locally for house logs, saw timber, and firewood. Timber within Wrangell-St. Elias National Park and Preserve is also used for firewood and house logs. The mountain ranges surrounding the Copper River Valley rise abruptly from the plateau confining most timber stands, including non-commercial timber, to a 5- to 25-mile wide band along the larger rivers. The only exception is the Lake Louise area extending northwest to the Talkeetna Range and Alaska Range foothills. Within that area are many acres of the non-commercial, poorly drained, black spruce sites typical of much of interior Alaska.

Of the units inventoried both by area (76 percent) and volume (85 percent), white spruce is predominant. Aspen is next, followed by cottonwood, with no birch type, although scatterings of birch are found mixed with other types. The best and highest volume stands are found along the Klutina River; other good stands are on river-bottom terraces and levees adjacent to the Copper, Chitina, and Tazlina Rivers.

a) Demand for Forest Products

Annual demand for firewood in the Tielkel region over the last 10-15 years has averaged about 400 cords. House log demand in the same time period has averaged between 400-500 logs. It is also estimated that similar quantities are taken each year unlawfully (without permits) from the Tielkel area.

The forecast for firewood demand is that it will remain stable and potentially increase with any new population increases. With the large stands of bark beetle-killed timber, the fiber should be available. There is a potential for a commercial firewood operation to supply local demand. With the limited access to remote BLM lands, a significant portion of the firewood demand has come from State and Native lands.

Much of the national and international demand for softwood lumber, pulp, and paper products is supplied by the western states and Canada. Demand for these products in southcentral Alaska has diminished in the past several years (Calderwood 2003b).

At this time there is one commercial timber harvest operating in the Tielkel region. The sale will remove approximately 400 cords of spruce from 59 acres. There are approximately 40 free use firewood permits issued annually. Fiber utilization potential could increase with increased access to remote timber stands.

The Tielkel region consists of a large percentage of mature stands. In order to secure the long-term sustainability of these timber stands for commercial and public use, a reforestation program may have to be developed. With upwards of 80-90 percent of the

trees dead in some stands, natural regeneration will be extremely slow (Calderwood 2003b). Planting seedlings would ensure a diversity of both forest and habitat types are sustained.

Significantly more fiber could be utilized in the foreseeable future on a sustainable basis. The key to utilization is access. The vast majority of the Tielke region is currently not accessible by road. The lack of access not only prohibits the local community from utilizing the bark beetle-kill trees for personal firewood, but also increases the danger of a wildfire that could threaten private property. The public is increasingly aware of this danger and generally support a fuels reduction program.

Map 48. Productive Commercial Timber Stands

File size: 152 KB

File name: 48_comtimber.pdf

Map size: 8.5x11

Map 49. Areas Affected by Beetle-Kill

File size: 190 KB

File name: 49_beetle.pdf

Map size: 11x17

G. Issue 6: Leasable and Locatable Minerals

1. Geology

a) Physiographic Regions

The East Alaska planning area includes diverse terrain ranging from glaciated mountains to river deltas. Most of the mountainous portions of the planning area host glaciers and icefields; practically the entire region was covered in ice during periods of Pleistocene glaciation (Wahrhaftig 1965). The physiographic description of Alaska compiled by Wahrhaftig remains the definitive reference. Portions of the descriptions of physiographic subdivisions within the planning area are excerpted below; Map 50 on page 349 shows the boundaries of these subdivisions.

(1) Alaska Range (Central and Eastern Portion)

The eastern part of the Alaska Range consists of rugged glaciated ridges surmounted by extremely rugged snowcapped mountains more than 9,500 feet in altitude. Most of the range drains to the Tanana River; the south flank drains to the Copper River. Streams are swift and braided, and most rivers head in glaciers. The high mountains are sheathed in ice, and long valley glaciers extend from them. Short valley glaciers lie in north-facing valleys in the lower parts of the range. Rock glaciers are common. Permafrost is extensive and solifluction features are well developed.

The internal structure of the Alaska Range is a complex synclinorium having Cretaceous rocks in the center and Paleozoic and Precambrian rocks on the flanks. This synclinorium is cut by great longitudinal faults that trend approximately parallel to the length of the range and are marked by lines of valleys and low passes. The synclinorium was probably formed near the close of the Mesozoic Era. Many roughly oval granitic stocks and batholiths support groups of high mountains that have cliffs as high as 5,000 feet. Synclinal areas of Tertiary rocks underlie lowlands that trend parallel to the length of the range. Much of the major topography of the range was probably produced from mid-Tertiary structures by removal of easily eroded Tertiary rocks to form lowlands. Recently formed scarplets as high as 30 feet can be seen on several longitudinal faults. At least four periods of glaciation have been recognized; the earliest is indicated only by scattered giant granite erratics on uplands in the foothills to the north (Wahrhaftig 1965).

(2) Northern Foothills of the Alaska Range

The Northern Foothills are flat-topped east-trending ridges separated by rolling lowlands. The foothills are largely unglaciated, but some valleys were widened during the Pleistocene Epoch by glaciers from the Alaska Range. The major streams of the foothills flow north to N 20° W to the Tanana River. A few small lakes lie in the lowland passes. There are no local glaciers, although a few glaciers from the Alaska Range terminate in the area.

Crystalline schist and granitic intrusive rocks make up most of the ridges, which are anticlinal. Poorly consolidated Tertiary rocks underlie the lowlands; thick coarse conglomerate near the top of the Tertiary section forms cuestas and ridges where it dips 20°-60°, and broad dissected plateaus where it is flat lying. The topography reflects closely the structure of monoclines and short, broad flat-topped anticlines having steep north flanks. Flights of tilted terraces on north-flowing streams indicate Quaternary tilting and uplift of the Alaska Range. The Tertiary rocks contain thick beds of sub-bituminous coal (Wahrhaftig 1965).

(3) Broad Pass Depression

General topography. The Broad Pass Depression, 1,000-2,500 feet in altitude and 5 miles wide, is a trough having a glaciated floor opening to the east to a broad glaciated lowland. The eastern part of the depression drains to the headwaters of the Susitna River. Most streams head in glaciers in the surrounding mountains and are swift, turbid, and braided. Many long, narrow lakes lie in morainal depressions in the central part of the trough. Morainal and thaw lakes are common in the eastern part. There are no glaciers. Most of the depression is underlain by permafrost.

Patches of poorly consolidated Tertiary coal-bearing rocks, in fault contact with older rocks of the surrounding mountains, show that this depression marks a graben of Tertiary age. Most of the bedrock consists of highly deformed slightly metamorphosed Paleozoic and Mesozoic rocks that are also exposed in the surrounding mountains. Ground moraine mantles the lowland (Wahrhaftig 1965).

(4) Clearwater Mountains

The Clearwater Mountains consist of two or three steep, rugged east-trending ridges rising to altitudes of 5,500-6,500 feet, separated by U-shaped valleys 3,000-3,500 feet in altitude. They are intensely glaciated. The ridges are asymmetrical; long spurs on their north sides separate large compound cirques; their south sides are relatively smooth mountain walls grooved by short steep canyons. The entire section is tributary to the Susitna River. There are a few rock-basin lakes in cirques and passes. The largest lake is less than 1 mile long. The north slopes of the highest peaks have a few cirque-glaciers.

Map 50. Physiographic Regions

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Map size: 11x17

The Clearwater Mountains are underlain chiefly by Triassic greenstone and Mesozoic argillite and graywacke. The rocks are highly deformed, strike generally east, and dip steeply (Wahrhaftig 1965).

(5) Gulkana Upland

The Gulkana Upland consists of rounded east-trending ridges separated by lowland glacial deposits showing morainal and stagnant-ice topography and containing large esker systems. The southeastern and eastern part drains south to the Copper River; the western part drains southwest to the Susitna River; and the north-central part drains north via the Delta River to the Tanana and Yukon. Many long, narrow lakes occupy rock-cut basins in notches through the ridges. Irregular lakes abound in some areas of morainal topography. A few cirque glaciers lie on the north sides of the highest ridges. The termini of a few glaciers from the Alaska Range are in this section. The upland is underlain by permafrost and contains ice-wedges, pingos, and altiplanation terraces.

Bedrock is chiefly greenstone and of late Paleozoic and Mesozoic age; structure trends eastward. Areas of relatively low relief in the northern part are underlain by poorly consolidated Tertiary sedimentary rocks (Wahrhaftig 1965).

(6) Copper River Lowland

The eastern part of the Copper River Lowland is a relatively smooth plain trenched by the valleys of the Copper River and its tributaries. The Copper and Chitina valleys, eastward prongs of this lowland, contain longitudinal morainal and ice-scoured bedrock ridges that rise above axial outwash plains. The western part of the Copper River Lowland, the Lake Louise Plateau, is a rolling upland and has morainal and stagnant-ice topography; the broad valley of the Nelchina and Tazlina Rivers separates this upland from the Chugach Mountains. The eastern and southern parts of the Copper River Lowland are drained by the Copper River and its tributaries. The northwestern part is drained by the Susitna River. Low passes lead to the heads of the Delta, Tok, and Matanuska Rivers. Most rivers head in glaciers in surrounding mountains and have braided upper courses. Salty ground water has formed salt springs and mud volcanoes. Large lakes occupy deep basins in the mountain fronts. Thaw lakes are abundant in the eastern plain. Lakes occupy abandoned melt-water channels; those in morainal depressions in the western upland are as much as 6 miles across. Beaches and wave-cut cliffs border lakes more than 2 miles wide whereas irregular muskeg marshes encroach on smaller lakes. There are no glaciers. The entire lowland is underlain by permafrost. The permafrost table is within 5 feet of the surface and permafrost is at least 100 feet thick.

Bedrock beneath the southern part of the lowland is chiefly easily eroded sandstone and shale of Mesozoic age; bedrock beneath the northern part is chiefly resistant late Paleozoic and Mesozoic metamorphosed volcanic rocks. Tertiary gravels cap some hills. Ground and end moraine and stagnant ice deposits mantle much of the lowland.

The eastern plain is underlain by glaciolacustrine and glaciofluvial deposits at least 500 feet thick (Wahrhaftig 1965).

(7) *Wrangell Mountains*

The Wrangell Mountains are a group of great shield and composite volcanoes that rises above a low plain on the north and west and above heavily glaciated cliffed and castellated ridges on the south and east. Six volcanoes at altitudes higher than 12,000 feet make up the greater part of the mountains. Most of the section drains to the Copper River, which encircles the mountains on the west. The remainder drains to the Tanana River via the Nabesna and Chisana Rivers and to the Yukon River via the White River. There are a few rock-basin lakes in the extreme northern part. Several ice-marginal lakes lie in Skolai Pass at the east end of the mountains. A large icecap covers most of the high mountains and feeds large valley glaciers. Rock glaciers are common in the southeastern Wrangell Mountains. Permafrost is probably present in the glacier-free areas, but its extent is unknown.

The Wrangell Mountains are a great pile of Cenozoic volcanic rocks that rests on deformed Paleozoic and Mesozoic sedimentary and volcanic rocks, among which are cliff-forming units of limestone and greenstone. Some granitic masses intrude the Mesozoic rocks. An important belt of copper deposits, including the Kennicott Mine, lies on the south side of the Wrangell Mountains (Wahrhaftig 1965).

(8) *Kenai-Chugach Mountains*

The Kenai-Chugach Mountains form a rugged barrier along the north coast of the Gulf of Alaska. High segments of the mountains are dominated by extremely rugged east-trending ridges 7,000-13,000 feet in altitude. Low segments consist of discrete massive mountains 5-10 miles across and 3,000-6,000 feet in altitude, separated by a reticulate system of through valleys and passes one-half to one mile wide that are eroded along joints and cleavage. The entire range has been heavily glaciated, and the topography is characterized by horns, aretes, cirques, U-shaped valleys and passes, rock-basin lakes, and grooved and mammillated topography. The south coast is deeply indented by fiords and sounds, and ridges extend southward as chains of islands. The north front is an abrupt mountain wall. The drainage divide is along the highest ridges, and is commonly only a few miles from the Pacific Ocean. Streams are short and swift; most head in glaciers. The Copper River crosses the eastern part of the Chugach Mountains in a canyon 6,000-7,000 feet deep. Large lakes fill many ice-carved basins along the north margin of the Chugach Mountains and throughout the northern Kenai Mountains. All higher parts of the range are buried in great icefields, from which valley and piedmont glaciers radiate. Many of the glaciers on the south side of the mountains end in tidewater. The extent of permafrost is unknown.

The Kenai-Chugach Mountains are composed chiefly of dark-gray argillite and graywacke of Mesozoic age that are mildly metamorphosed and have a pronounced vertical cleavage that strikes parallel to the trend of the range. In the Prince William

Sound area large bodies of greenstone are associated with the argillite and graywacke. A belt of Paleozoic and Mesozoic schist, greenstone, chert, and limestone lies along the north edge of the Kenai and Chugach Mountains. All these rocks are cut by granitic intrusions.

(9) *St. Elias Mountains*

The St. Elias Mountains are massive isolated blocklike mountains rising from a myriad of narrow ridges and sharp peaks. The average altitude of icefields in the interconnected valley system is 3,000-7,000 feet. Local relief is extreme and jagged cliffs abound. Drainage is almost entirely by glaciers. There are no lakes. All parts of the range gentle enough to hold snow are sheathed in glacial ice. A continuous network of icefields and glaciers penetrates the range and feeds piedmont glaciers to the south. The extent of permafrost is unknown

The high mountains are probably underlain by crystalline schist and granitic intrusive masses. A belt of Permian and Triassic volcanic and sedimentary rocks extend along the north side of the range. Lower Cretaceous sedimentary rocks lie in down-faulted basins in the center of the range and probably underlie ice-filled valleys. The entire sequence is thrust southward against Cretaceous and Cenozoic rocks; thrusting may be active today. Cenozoic volcanoes are present in the northern part of the range; some of these may still be active (Wahrhaftig 1965).

b) Structural Geology and Tectonics

Geographically the East Alaska planning area extends from the Talkeetna Mountains in the west to the Wrangell and St. Elias Mountains in the east and southeast. The Chugach Mountain Range and the Gulf of Alaska form the southern border and the eastern extension of the Alaska Range forms the arching northern border.

The southcentral region of Alaska was created from a series of island arcs and their associated oceanic sedimentary basins being thrust onto North America by the geological subduction zone which rims the northern Pacific Ocean. By the late Paleozoic age the large Alexander, Wrangellia, and Peninsular terranes had been attached to Alaska (Nokleberg et al. 1998). The Chugach and Prince William terranes had followed by early Paleocene times completing the accretion of south-central Alaska. With the long history of subduction along the Alaskan coast, there is an equally long history of intense faulting and volcanism which forms the current geology of south-central Alaska.

The large scale faulting in the East RMP is associated with the subduction environment of its formation. The infamous Denali fault forms a southeast trending arc where it is the northern border of the Glennallen Field Office. The Totschurda, Border Ranges, Chugach-St. Elias and Contact faults are nearly parallel to the Denali fault's east-west

to southeast trend. Likewise many of the intrusive geologic features in the accreted terranes of the south-central Alaska have a similar geographic orientation (Beikman 1980). There are numerous, generally mafic, intrusive bodies scattered throughout the sedimentary geologic formations of the planning area. The coincidence of intrusives and volcanics with the predominant orientation of the structural trends is expressed in the mineral terranes of the area. Mineral terranes are where known mineral occurrences are extrapolated to adjacent areas of similar geology.

c) Mineral Terranes

The East Alaska planning area is underlain by five Mineral Terrane units whose geologic settings are considered highly favorable for the existence of metallic mineral resources (U.S. Bureau of Mines 1995). Specific commodities and mineral deposit types are more likely to exist within each terrane based on a terrane's particular geologic nature. Unmapped areas are generally evaluated as having poor to only moderate mineral potential. The mapped terranes include Granitic Intrusive, Mafic-Ultramafic Intrusive, Felsic Volcanic-Sedimentary, Mafic Volcanic-Sedimentary, and Continental Sedimentary dominated units. Map 51 on page 355 presents the mineral terranes and the locations of producing placer districts, significant commodities/mineral deposits, and the aerial extent of mineral terranes in the planning area.

The Granitic Intrusive Terrane includes mainly Jurassic to Tertiary age felsic and alkalic intrusive rocks of typically granite to granodiorite composition. This terrane is generally permissive to copper, gold, molybdenum, tin, tungsten, uranium, thorium, and rare earth element deposits. Specific deposit models likely to occur include disseminated intrusive gold, gold-copper skarn, polymetallic vein, copper-molybdenum-gold porphyries, tin greisens, and tungsten deposits.

Mafic-Ultramafic Intrusive Terrane in the area exists mainly along the Border Ranges Fault, and represents hot, deep-seated gabbroic to ultramafic bodies, intruded along major fault sutures as differentiated igneous complexes. There is high potential in these areas for copper, nickel, chromium, and platinum group element (PGE) deposits, with by-product cobalt. A number of large exploration projects are currently underway in 2004, actively exploring for Noril'sk-model and other magmatic sulfide types of mineralization in the Central Alaska Range.

The Felsic Volcanic-Sedimentary Terrane occurs in only a small portion of the northern planning area, northeast of Paxson. Among the commodities associated with this rhyolite-dominated rock suite are copper, lead, zinc, gold, silver, uranium, and thorium.

Mafic Volcanic-Sedimentary Terrane is the most extensive in the planning area and has a high potential for discovery of copper, zinc, and by-product gold and silver deposits. Kennicott (basaltic) copper and Besshi-type massive sulfide target models are the most applicable, with host lithologies ranging from shallow marine basaltic to tholeiitic flows, ophiolites, volcanoclastic sedimentary rocks, and local black shale and conglomerate.

Map 51. Mineral Terranes and Producing Placer Districts

File size: 233 KB

File name: 51_minter.pdf

Map size: 11x17

This terrane is seated mainly along the three major faults that transect the planning area.

The Continental Sedimentary Terrane potentially hosts significant gold, silver, lead, zinc, copper, and tin resources. Additionally, coal-bearing sandstone and shale are present. Metamorphic gold vein, plutonic-related gold vein, polymetallic massive sulfide, skarn, copper and gold deposits in greywacke, shale, and limestone are the prospective mineral deposit types to target.

2. Minerals Occurrence, Potential, and Administration

a) Leasable Minerals

(1) Coal

All or parts of four coal fields reside inside the planning area. Map 52 on page 359 shows the location of these fields. A coal field, as used here, is an area that has high resource potential and contains one or more known coal beds of mineable thickness and quality. This does not imply that coal within these fields is economical to mine. There are no existing coal lease in the planning area. However, one Federal coal lease was issued in 1984 at the Jarvis Creek Field.

Coal is classified by rank in accordance with standard specifications of the American Society for Testing and Materials. Most of the coal in the planning area is low to medium rank (lignite to subbituminous). The Bering River field, however, does contain bituminous, semi-anthracite and anthracite coal. It is unlikely that these coal resources will be developed within the next 15-20 years.

(a) Broad Pass Field

The Broad Pass Field, located about 160 miles south of Fairbanks along the Parks Highway, is considered a northeastern extension of the Cook Inlet/Susitna basin (Merritt, 1986a). The Tertiary coal-bearing sequence occupies a narrow graben about 36 square miles in area and contains lignite seams 5 to 10 feet thick that dip between 2 and 9 degrees. Identified resources are estimated at 50 million short tons (Merritt and Hawley 1986; McGee and O'Connor 1975a; Barnes 1967; Hopkins 1951).

(b) Bering River Field

The Bering River coal field, most of which is located within Chugach National Forest near the Gulf of Alaska, is about 20 miles long and 2 to 5 miles wide (Smith and

Rao, 1987). The coal-bearing rocks are exposed in a belt running northeast from the eastern shore of Bering Lake. The field is bordered by the Martin River Glacier on the northwest and by the Bering Glacier on the southwest. The Bering River field contains four formations of Tertiary age; the Tokun, Kushtaka, Stillwater, and Poul Creek Formations. The exact relationship of these formations to one another is not known due to the lack of contacts. The middle part of the Kushtaka Formation is the primary coal-bearing strata in the field (Smith and Rao 1987). It contains bituminous, semianthracite, and anthracite coal with a total resource potential of 59 million tons. Past production has been less than 100,000 tons (Merritt 1986a).

The structure of the coal field is characterized by complex folding including isoclinal recumbent and overturned folds as well as northwest trending major faults and minor faults that run northeast. This structural deformation has resulted in thickness variations within short distances (a few inches to 60 feet), however, drilling data shows that continuity exists from outcrop to their subsurface extensions (Smith and Rao 1987).

(c) Jarvis Creek Field

The Jarvis Creek field, an easternmost, isolated subfield of the Nenana coal province, is located about 30 miles south of Delta Junction in east-central Alaska. The coal field covers about 16 square miles and is underlain by lower Paleozoic schist and coal-bearing Tertiary age rocks. The coal-bearing formation at Jarvis Creek, tentatively correlated with the Healy Creek and Lignite Creek formations in the Nenana coal, is about 2,000 feet thick and contains at least 30 coal beds of subbituminous rank, most of which are thin (1 to 10 feet) and discontinuous. Estimates of inferred reserves are reported at 100 million tons (Wahrhaftig and Hickox 1955; Wahrhaftig et al. 1969; Belowich 1987).

(d) Copper River Field

According to Merritt and Hawley (1986) the coal-bearing Gakona Formation crops out at several locations within the Copper River Field. The Tertiary age Gakona Formation contains lignite coal beds of unknown thickness. Sparse coal also occurs in upper Cretaceous sandstone along the Nelchina River (Williams 1985).

Subsurface data gathered from exploratory oil wells and water wells drilled in the Copper River Basin show several thin lignitic coal beds in Tertiary age rocks unconformably overlying the Cretaceous Matanuska Formation. A 5 foot thick coal bed was recorded in a drill hole south of Lake Louise at depths ranging from 126 to 167 feet (Williams 1985). Merritt (1986a) reports that coals of the Copper River field occur in the Frederika Formation of Tertiary age. Numerous beds up to 18 feet thick are found in isolated fault blocks, prisms, and erosional remnants.

Map 52. Coal Fields

File size: 194 KB

File name: 52_coal.pdf

Map size: 11x17

(e) History and Development

One Federal coal lease was issued in the planning area in 1984 at the Jarvis Creek Field. The lease was issued as a result of a Preference Right Lease Application, which meant that a discovery of coal was made through a prospecting permit issued prior to August 4, 1976. This preference right lease terminated in 1994 due to lack of diligent development. The lease area has since been conveyed to the State of Alaska. In 1970, the Bureau of Mines estimated that a few hundred tons of coal had been mined from the Jarvis Creek Field in which the lease is located. The coal was mined by open pit methods and used locally for space heating.

(2) Geothermal

Geothermal energy consists of heat stored in rocks, and to a lesser extent in water or steam-filling pores and fractures. Water and steam transfer geothermal heat by convection to shallow depths within the earth's crust. This heat may then be tapped by drilling. Geothermal heat may also escape at the surface in geysers, thermal springs, mud volcanoes, and fumaroles (a vent, usually volcanic).

The distribution and extent of potential geothermal resources within southcentral Alaska is centered around the Mt. Wrangell volcanic pile, which contains over 11 million acres (ADGGS 1984). This massif, and the associated springs with temperatures ranging between 20 and 50 degrees Celcius, is located within the East Alaska planning area, mostly on National Park Service lands.

Geothermal leases are issued through competitive bidding for Federal lands within a Known Geothermal Resource Area (KGRA), or noncompetitively for Federal lands outside of a KGRA. KGRAs are areas where BLM determines that persons knowledgeable in geothermal development would spend money to develop geothermal resources. There are only three Known Geothermal Resource Areas (KGRAs) within Alaska. None of the KGRAs are in the East Alaska planning area.

(3) Coalbed Methane

Recent oil and gas exploration in the state has included a focus on coalbed methane (CBM) exploration, most notably in the Matanuska-Susitna Valley area located in the northeastern Cook Inlet basin, about 60 miles southwest of the planning area. Coalbed methane is a form of natural gas that occurs in large quantities in coal seams. The gas is typically contained within the internal surfaces of the coal and is held in place by hydrostatic pressure created by the presence of water. During production, this water is pumped to the ground surface which lowers the pressure in the coalbed reservoir and stimulates the release of gas from the coal. The gas itself, which is almost entirely methane, eventually flows through fractures in the coal to the well bore and is captured for use.

Until the 1980s, coal seams generally were not considered to be reservoir targets, even though producers often drilled through coal seams to reach deeper horizons. During the second half of the 1990s, CBM production increased dramatically nationwide to meet ever-growing energy demands.

The most accessible areas available for CBM exploration and development in the planning area are the Copper River Basin and identified coal resources near Summit Lake, about 10 miles north of Paxson. However, we know of no companies testing lignite coal for gas, and with present technology it is unlikely that industry will produce commercial amounts of gas from lignite coal within Alaska for the reasonably foreseeable future.

(4) Oil and Gas

There are no active Federal oil and gas leases within the planning area. Only one geophysical exploration oil and gas permit has been issued for Federal lands; this exploration permit was issued in 1984. BLM-administered lands within the planning area currently open for lease comprise about three million acres in the Denali, Tiekel, North Slana, and South Slana areas. Most of these areas are encumbered by State or Native selections.

(a) History and Development

1. Gulf of Alaska Onshore Basin

The petroleum potential of the onshore Gulf of Alaska Tertiary Basin was first recognized through the discovery of oil and gas seeps east of Katalla in 1896. Katalla is located on the Gulf of Alaska, approximately 15 miles west of the Bering Glacier. From 1901 to 1930, 44 shallow wells were drilled in the Katalla area; 28 wells at the Katalla field and 16 wells at nearby locations. Most wells had oil shows, some had gas shows, and 18 produced oil commercially (about 154,000 barrels) from fracture porosity in sandstone and siltstone of the Poul Creek Formation at depths ranging from 360 to 1,750 feet (Blasko 1976).

The Katalla field became the only commercially productive area in the Gulf of Alaska Tertiary Basin. Production within the first decade justified the expense of building a small refinery onsite. Between 1911 and 1933, refined products, including distillate, gasoline, diesel oil and kerosene were transported in 100-gallon steel drums and sold along the Alaska gulf coast to local canneries, mining companies and fisherman. Production abruptly ended when the refinery burned down in 1933 (Miller et al. 1959; Blasko 1976; Bruns and Plafker 1982). Although active natural gas seeps were known in this area, there are no records of gas production from this period.

East of Katalla in the coastal area of Cape Yakataga, located between the Bering Glacier and the Malaspina Glacier, oil and gas seeps are found on numerous rivers and creeks draining southward toward the ocean. The first

test well in this area, drilled between 1926 and 1927, had shows of oil and gas but was plugged and abandoned. After WW II, leasing activity on previously withdrawn lands resumed and in 1951 hundreds of individuals applied for non-competitive leases covering nearly one million acres in the coastal areas between the Copper River and Cape Fairweather (Miller et al. 1959). Most, if not all, of the leases were obtained as speculative investments. Exploration for onshore oil and gas deposits within the basin continued from 1954 to 1963 when an additional 23 wells and 4 core holes were drilled. Although all were abandoned, records indicate shows of oil and/or gas in nine of the wells (Plafker 1971). No commercial hydrocarbon field has been discovered east of the Katalla field.

2. Copper River Basin

Since the late 1950s, Copper River Basin petroleum exploration efforts have produced aeromagnetic and gravity survey data, seismic surveys and eleven exploration wells. Aledo Oil drilled the first well, Eureka No 1, in 1957, in the southwest corner of the basin. The last well, Alicia No 1, was drilled in 1983 by the Copper Valley Machine Works in the east-central part of the basin, about 12 miles west of Glennallen. None of these wells produced oil or gas and all were subsequently plugged and abandoned.

In October 2000, the State of Alaska awarded a 5-year exploration license to Forest Oil Corp/Anschutz Exploration on approximately 398,445 acres within the Copper River Basin. At this time, results of the exploration have not been made public.

(b) Occurrence Potential

Several geologic elements are necessary for oil and gas to accumulate in sufficient quantities. These elements include an organic-rich source rock to generate oil or gas, the combined effects of heat and time, a porous and permeable reservoir rock to store the petroleum in, and some sort of trap to prevent the oil and gas from reaching the surface. Traps generally exist in predictable places - such as at the tops of anticlines, next to faults, in the updip pinchouts of sandstone beds, or beneath unconformities. Map 53 shows the occurrence potential for oil and gas throughout the planning area. It does not imply these resources can be developed economically.

Ehm (1983) delineated two petroleum basins that fall either partially or entirely within the planning area. These basins are generally considered prospective for oil and gas resources and serve as the focus for further analysis using available exploration and drilling data and U.S. Geological Survey play descriptions.

Four conventional oil and gas plays have been identified in the planning area by the U.S. Geological Survey (See Map 53 on page 365). A play is a set of discovered or undiscovered oil and gas accumulations or prospects that exhibit nearly identical geological characteristics. A play is defined, therefore, by the geological properties

(such as trapping style, type of reservoir, nature of the seal) that are responsible for the accumulations or prospects. All four plays identified by the U.S. Geological Survey 1995 National Assessment that occur within the planning area are considered hypothetical. Hypothetical plays were identified and defined based on geologic information but for which no accumulations of the minimum size have, as yet, been discovered. As such, hypothetical plays characteristically carry a much broader degree of uncertainty than do confirmed plays.

(c) Development Potential

Actual development activity within the planning area will be determined by accessibility to resources, including the perceived impact of lease stipulations by the petroleum industry; exploration and development costs; the success rate of wells drilled in the future; commodity prices; and production rates required to provide an economically viable return on investment.

1. **Yakataga Fold Belt Play**

The Yakataga Fold Belt Play is classified as a lightly explored area (22 exploratory wells, excluding the Katalla Field) with High potential for the generation of oil and gas and Low development potential. The most favorable accessible structures have been tested by previous exploration efforts. Structural complexity is so extreme as to make trap potential unfavorable on many, if not most, of the exposed onshore structures. This structural complexity may increase with depth. Well depths are estimated to range from the surface and at least 13,000 feet, with potential reservoirs up to 30,000 feet immediately offshore. The primary objectives are most likely the Cenozoic rocks harboring hard-to-define traps and major thrust faults that cut the region.

2. **Yakutat Foreland/Lituya Bay Play**

The Yakutat Foreland/Lituya Play is classified as a moderately explored area (13 exploratory wells) with High potential for the generation of oil and gas, and Low development potential. Within the boundaries of the planning area, over 80 percent of the play lies beneath the ice of the Malaspina Glacier. Well depths are estimated to range between 1,500 feet and at least 13,000 feet, with potential reservoirs up to 30,000 feet immediately offshore. The primary objectives are the Cenozoic and Tertiary sedimentary rocks near inferred gentle structural closures in the Icy Bay area.

3. **Upper Cretaceous-Tertiary Biogenic Gas Play**

The Upper Cretaceous-Tertiary Biogenic Gas Play is classified as a lightly explored area (9 exploratory wells) with Medium potential for the generation of biogenic gas and Low development potential. Well depths would be less than 2,000 feet and the primary objectives are the Tertiary non marine sedimentary

Map 53. Oil and Gas Potential and Occurrence

File size: 185 KB

File name: 53_ogpot.pdf

Map size: 11x17

rocks consisting of conglomerate, sandstone, siltstone, and local thin beds of lignite coal. The Tertiary section penetrated in the Salmonberry Lake and Rainbow wells contained low-grade (lignite) coals at depths between 700 and 2,000 feet. These coals measured up to 60 feet thick and could be targets for coalbed methane gas wells. Spacing is typically 640 acres for a shallow gas well.

4. Mesozoic Oil Play

The Mesozoic Oil Play is also classified as a lightly explored area (11 exploratory wells) with Medium potential for the generation of oil and gas and Low development potential. Evidence is lacking that sufficient oil has been generated to fill existing structural and stratigraphic traps. No significant oil shows have been reported in outcrop or from any of the wells drilled to date. The primary objectives for this play are the Early to Late Cretaceous marine sedimentary rocks of the Matanuska Formation at depths between 2,000 and 6,000 feet.

b) Locatable Minerals

(1) History and Development

(a) Valdez Creek Area

Valdez Creek discharges into the Susitna River near the former town of Denali. The placer mines along Valdez Creek and its tributaries, were the largest mines in the East Alaska RMP. Gold was first mined at Valdez Creek (formerly named Galina Creek) by hand methods starting in 1903. Tammany Channel was mined by underground methods and it and Dry Creek cut were also mined by hydraulicking. Gold production through 1979 totaled approximately 35,000 ounces. Valdez Creek Mining Company was formed to mine the creek by large-scale, open-pit methods and from 1984 until temporary shutdown in October of 1989 produced 179,417 ounces of refined gold (Kurtak et al. 1992). Up to April 2000 the total production from Valdez Creek and its tributaries has been over 650,000 ounces of gold (Stevens, 2001:401) As of 1999 there was a large volume of sub-economic material upstream of the upper limit of mining which had been identified by Valdez Creek Mining Company's extensive drilling program (Stevens, 2001:401). Lucky Gulch, the next largest producer in the Valdez Creek Mining District, discharges into Valdez Creek itself, and had a total recorded production through 1925 of about 3,000 ounces. Since that date, cumulative production is probably about equal to that amount. (D. L. Stevens, personal observation, 1999). Lucky Gulch produced the coarsest placer gold in the district and the largest gold nugget which weighed 52 ounces.

(b) Nikolai Belt

Nickel and copper were discovered along the south flank of the Delta Range near Rainbow Mountain in the early 1950's. This mineralized area has become known as the Nikolai Belt, which is the name of the igneous formation that hosts the mineralized rocks. Several large companies have staked or optioned claims in the area and explored over the years, including Cominco, Falconbridge, and INCO. Smaller companies have also been active. Not until the 1990's, however, have platinum group elements (PGE) also been targeted along with the nickel and copper. Exploration over the years has included geologic mapping, geochemical sampling, airborne and ground geophysics, and diamond drilling.

Nevada Star Resources Corporation has put together a large land position in the area. Their MAN project is focused on locating nickel, copper, and PGE resources in prospective terrain north of the Denali Highway, approximately between the Richardson Highway on the east and the Maclaren River on the west. Several factors make this area particularly attractive for mineral exploration: The infrastructure of highways in the area makes it particularly accessible. There is a large known extent of Nikolai Belt afic-ultramafic rocks in the area, which are the potential hosts of Ni-Cu-PGE resources. The large extent makes the discovery of a large deposit possible. Prices for nickel, copper, and platinum are currently elevated. PGE exploration began fairly recently, making the area relatively under-explored. Finally, the United States has only one other mine that currently produces PGE (the Stillwater Mine in Montana).

(c) Upper Chistochina River area:

Gold was discovered in the upper Chistochina River area in 1898 (Mendenhall, 1905). The upper Chistochina district included several creeks, Slate Creek, Miller Gulch, the Big Four claims, the lower Chisna River, Ruby Creek, and Lime (or Limestone) Creek. Miller Gulch was the most profitable of the placer mines in the area. Intermittent production from the district has occurred to the present, but the greatest production came between 1901 and 1906 (Foley and Summers, 1990). Moffit (1912) reports that by 1910, more than \$1,500,000 of gold production had occurred from the Chistochina district. Moffit later reports (1944) that according to USGS records, the Chistochina district produced about \$3,000,000 worth of gold from 1900 to 1941, with \$1,280,000 of gold produced prior to 1907. Significant production reportedly occurred until about 1926, and between 1979 and 1985 (Foley and Summers, 1990). In the later years, most production came from the operations of Ranchers Exploration and Development Corp. Foley and Summer (1990) report total production from the upper Chistochina area through 1988 at 178,926 ounces gold, and 17,344 ounces silver, with a value assigned at \$17,171,527.

(d) Golden Zone Mine Area

The Golden Zone Mine is located about 25 miles southwest of the town of Cantwell, at the headwaters of Bryn Mawr Creek, a tributary of the West Fork Chulitna River. The mine produced 1,580 ounces of gold, 8,616 ounces of silver, and 20.9 short tons of copper between 1941 and 1942 (Hawley and Clark 1974: B34). As of April 7, 2000, the Golden Zone and other nearby properties such as Banner, Lupin, Bunkhouse, and Mayflower were considered to be active (Stevens, 2001: 88, 76, 78, 80, 82). All of the properties in the immediate area are lode deposits except for a small placer immediately downstream of the Golden Zone, the Bryn Mawr Creek placer prospect, which produced a small amount of gold in 1909.

The Golden Zone mine has been the center of extensive exploration activity especially between 1936 and 1996 which included 54,326 feet of drilling in 137 drill holes. There have also been numerous trenches and geochemistry samples taken. The underground workings include 1,900 feet of development on three levels. Geophysical work on the property includes close space helicopter aeromagnetic, and EM along with ground based IP (Stevens, 2001, p.88). The other properties in the vicinity have also been examined, although not nearly as well as the Golden Zone. As a result of this work it has been estimated that the Golden Zone and nearby properties have proven and probable reserves of 8 million tons of ore averaging 0.1 ounce of gold per ton (at a cutoff of 0.02 ounce of gold per ton), or about 800,000 ounces of gold (Stevens, 2001:89).

(e) Eastern Talkeetna Mountains Area

There are several inactive gold placer mines in the area, one of which (Yacko Creek) has produced an estimated 1,000 ounces of gold. The presence of coarse gold was noted in 1918 by Chapin. Placer and stream sediment samples taken on a number of streams such as Yacko Creek, Red Fox Creek, Tyone Creek, and Busch Creek indicate anomalous levels of gold and PGE in the gravels. There are large volumes of stream and bench gravel deposits which have the potential for development (Kurtak et al. 1992).

(f) Port Valdez Area

South of Port Valdez, on the west side of Solomon Gulch, 1.3 miles south of Solomon Lake, is the Midas Mine. Production from the Jumbo lode of the Midas Mine totaled more than 3,000,000 pounds of copper (Rose 1965, p.7). Most production occurred from 1911 to 1919 from the four underground mine levels. The Midas Mine is estimated to have reserves of 60,000 tons of mineralized rock with an average grade of 1.6 percent copper (Jansons et al. 1984, p. 92).

North of Port of Valdez, in the Mineral Creek watershed, are several mines with past production. All of these mines are listed as Inactive or Probably Inactive in the ARDF database and one, the Hercules, is listed as having inferred reserves. The Little Giant

has a reported production of 367 ounces of gold and 152 ounces of silver (Jansons et al. 1984, p.89). The Big Four mine had a reported production of 846 ounces of gold and 371 ounces of silver (Jansons et al. 1984, p.91). The Cash mine had an unknown production level. Small scale placer mining has occurred at various places along Mineral Creek. The Hercules mine had a reported production of 269 ounces of gold and 44 ounces of silver and has inferred reserves for this area of 450 tons of mineralized rock averaging 22.5 ppm gold and 9.1 ppm silver (Jansons et al. 1984, p.91).

(2) Resource Allocation

Locatable minerals are allocated through 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 claim.

By law, all public lands are open to mineral entry (mining claim location) unless specifically segregated or withdrawn. Map 20, on page 153 in Chapter II, shows those areas that are currently open to mineral entry.

Segregations occur on State and Native-selected lands. The purpose of a segregation from mineral entry would be to prevent new mining claim locations from clouding title to the lands which are selected. A mining claim carries an inherent right to carry a surface patent. If a new claim were located and a surface patent ensued, it would encumber the selection. Currently, 5.5 million out of 7.1 million acres of BLM-managed lands within the planning area are State or Native selected. Therefore, no mineral entry will occur on these lands until conveyance occurs or the selection is relinquished back to the BLM.

Withdrawals (as discussed on page 321 under *Issue 4: Lands and Realty*) also currently constrain mineral development on many lands within the planning area. Revocation of withdrawals that occur on State or Native selected lands would only allow subsequent mineral entry once conveyance occurs.

(3) Mining Claims and BLM Management

There are approximately 1,100 unpatented mining claims within the Glennallen Field Office, although claims are continuously being located or abandoned. Because mining claimants have the right to prospect, under the 1872 Mining Law, for locatable minerals, and locate mining claims without governmental approval, BLM's management is minimal until such time as the claimant wished to do some activity that will disturb the surface, at which time various laws and regulations must be followed before such disturbance can occur. Mining claim recordation and adjudication are handled at the BLM Alaska State Office (ASO) level. ASO handles Notices of Intent to perform annual assessments. District personnel use an interdisciplinary approach to approving a Plan of Operation under 43 CFR 3809 regulations for any activity that requires access across a wild and/or scenic river corridor or has planned operations that will disturb greater than five acres or has a cumulative disturbance greater than five acres. There are currently five plans of operations processed under these regulations. These plans must

be approved prior to any mining by the applicant. Operations currently being conducted on BLM-managed lands are small-scale placer mining operations, with annual disturbance less than five acres.

BLM compliance officers conduct inspections of placer mining operations on Federal claims. Currently, all operations are inspected at least twice each year, and most are inspected at least once during the mining phase of the operation and once at the end of the season after site reclamation has been completed. 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.

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 planning area, include but are not limited to, sand and gravel aggregate, silica sand (abrasives), dimension and decorative stone, and common or bentonite clay. During the construction of the Trans-Alaska Pipeline, 1.7 million cubic yards of gravel were sold from the many established material sites along the Denali Highway. Production value of mineral materials sales were about \$500,000 for FY 2001 statewide and the trend indicate increased sales yearly.

Many of the sites in the planning area are roadside materials sites owned by municipalities or the State. There are 41 documented occurrences of salable minerals in the planning area, 12 of which are currently active.

d) 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. To date there has been no demand for development of renewable energy projects on BLM-managed lands within the planning area. In

cooperation with the National Renewable Energy Laboratory (NREL), BLM assessed renewable energy resources on public lands in the western United States (BLM et al. 2003). The assessment reviewed the potential for concentrated solar power, photovoltaics, wind, biomass and geothermal on BLM, BIA and Forest Service lands in the west. Unfortunately, Alaska was not included in this report. Following is a brief discussion on renewable energy in the planning area.

(1) *Photovoltaics*

Photovoltaics (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. The use of photovoltaics to generate supplemental power for rural off-the-grid homes is not uncommon in the planning area. To date, though, the Glennallen 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 lands.

(2) *Wind Resources*

Potential is measured by taking into account factors such as wind velocity, proximity to roads and electric transmission facilities, the degree to which State and local policies support wind energy development, and environmental compatibility. Given these factors, the likelihood of commercial wind energy generation facilities occurring in the planning area is low. To date, there has been no interest expressed. However, wind energy is utilized by some off-the-grid individuals in the planning area.

(3) *Biomass*

Biomass is the use of small diameter forest material for energy production. While black spruce would seem to be ideal for such a use, no such facility has been considered within the planning area.

H. Issue 7: Subsistence/Social and Economic Conditions

1. Subsistence

State and Federal law define subsistence as the “customary and traditional uses” of wild resources for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade. Subsistence uses are central to the customs and traditions of many cultural groups in Alaska, including Aleut, Athabaskan, Alutiiq, Euroamerican, Haida, Inupiat, Tlingit, Tsimshian, and Yup’ik. Subsistence fishing and hunting are important sources of employment and nutrition in almost all rural communities. Current Customary and Traditional Use Determinations, by Game Management Unit for each species, can be found in the Subsistence Management Regulations for the Harvest of Wildlife on Federal Public Lands In Alaska, published annually.

Sport fishing and sport hunting differ from subsistence in that, although food is one product, they are conducted primarily for recreational values following principles of “fair chase.” While subsistence is a productive economic activity that is part of a normal routine of work in rural areas, sport fishing and sport hunting usually are scheduled as recreational breaks from a normal work routine. From 1980-1990 the State managed subsistence hunting and fishing across Alaska in compliance with Title VIII of ANILCA. During that era, hunting by non-rural residents was commonly referred to as “sport hunting.” After 1990, the Federal government was obliged to directly manage the Title VIII rural subsistence priority on Federal public lands. The State continues to manage State-defined subsistence and other hunting and fishing activities, including on Federal public lands, except where these are closed to non-Federally qualified subsistence uses. Since 1990, the state no longer refers to “sport hunters”, since hunting by all Alaskans is considered state-defined subsistence hunting. State regulations do distinguish between “resident” hunting for all Alaskans and “non-resident” hunting by persons from other states or nations.

a) Subsistence Use Patterns and Harvest Levels

Rural residents continue their longstanding traditions of high rates of participation and production from subsistence hunting, fishing, and trapping, relying on a wide range of resources in the Glennallen Field Office, including the public lands in the planning area (Cuccarese and McMillan 1988). Table 32 summarizes information from 1988 concerning use of edible renewable resources by some of the region’s communities. In terms of pounds of edible resources harvested, fish provided the greatest bulk (53.7%), followed by game (35.6%), unidentified vegetation (5.3%), berries (4.6%), and greens

and mushrooms (0.7%). There was a great deal of variation from these averages between communities. For example, fish contribution varied from 78.8% of the harvested food in Copper Center to 20.7% in Mentasta Lake. Game showed a similar variation—from 63.8% in Cantwell to 12.5% in Copper Center. Twelve communities relied on fish, while six relied more on game to provide the bulk of their subsistence resources. None utilized vegetation, berries, or greens and mushrooms heavily; these resources probably serve to supplement or complement fish and game.

Table 32: Use of Subsistence Resources

Community	Population (1988)	Total lbs. Harvested	Pounds per Household	% Fish	% Game
Cantwell	136	15,241	324	28.2	63.8
Chistochina	83	9,545	308	40.9	37.8
Chitina	43	8,166	340	61.4	25.6
Copper Center	435	49,536	384	78.8	12.5
East Glenn Highway	182	27,915	429	49.0	38.6
Gakona	108	21,764	640	69.2	25.1
Glennallen	915	61,327	228	52.4	40.1
Gulkana	122	13,526	315	59.7	31.0
Kenny Lake	232	17,413	249	41.4	45.3
Lake Louise	39	6,927	462	44.3	29.2
Lower Tonsina	35	4,479	498	63.4	23.7
McCarthy Road	53	6,915	384	38.2	50.2
Mentasta Lake	96	11,025	394	20.7	53.9
Nabesna Road	44	12,240	1224	51.3	45.8
Paxson-Sourdough	55	6,829	310	39.6	47.6
Slana	70	17,654	679	47.4	42.8
S. Wrangell Mtns.	34	6,689	418	26.5	65.6
Tonsina	229	22,643	298	61.1	26.9

Resource harvest and use patterns in the Copper River basin are consistently related to a complexity of factors (ADF&G 1984). Among the most prominent influences on resource harvesting were the seasonal availability and abundance of wildlife and fish populations. Relying on a complex body of traditional ecological knowledge, communities generally harvested resources during seasons and at locations conducive to efficient harvesting. While the abundance of fish and wildlife resources depended upon climate, habitat and other ecosystem dynamics, human population density, harvest pressure, and the accessibility of the area also played a role. Other important factors influencing harvest activities were the length and kind of wage available in an area. Length of residency, age, available means of transportation, participation in domesticated resource production, alternative sources of natural resources, and regulations are also related to resource harvest and utilization patterns.

A 1983 household survey conducted by ADF&G, Division of Subsistence, showed, in general, a higher dependence on subsistence resource by Native people in the area. As stated in the results of the survey: “Native households had an average length of residency in the Copper basin of 47 years, compared with ten years for non-Native households. An average of 340 pounds of red salmon (approximately 81 fish) was

harvested by Native households [in the Glennallen area], more than eight times the mean non-Native harvest of 43 pounds (10 fish). Particularly divergent patterns emerged between the Native and non-Native samples when comparing resource harvest and use by general categories. Quantities of fish harvested was four times greater for Native respondents than for non-Natives. The differing levels of use of fish, big game, berries, and total resources were all statistically significant. Only in plant and berry harvests were the two groups similar.” (ADF&G 1984)

The Ahtna Athabascan Indians have lived in the Copper River Basin area and most of the present-day region encompassed by Game Management Units 11 and 13, for at least 1,000 years. During that time, caribou, along with moose, have been the principal big game animals hunted for subsistence use, and have probably ranked second overall to salmon as components of the annual subsistence harvest (de Laguna and McClellan 1981). Additional information about pre-historical settlement and subsistence practices is found in Section 7, Cultural Resources. Oral traditions documented by de Laguna and McClellan (1981), Reckord (1983a; 1983b) and others illustrate the continuing importance of caribou in the subsistence patterns of the Copper Basin area throughout the 20th century.

For specific data on subsistence fisheries, including the number of subsistence fisheries permits issued and number of fish harvested, see the *Subsistence Fisheries* section on page 278.

b) Traditional Use Areas

Traditional use areas for subsistence activities in the Copper Basin have been documented through several sources. Documents prepared by Ahtna, Inc. in the early 70's to aid in regional and community planning contain maps of traditional areas for hunting, trapping, berry-picking and other subsistence activities in the vicinity of each village (Ahtna Inc. 1973). Areas documented are in the vicinity of villages; consequently many of these lands are now Native or Native-selected. Some areas identified as important for traditional hunting, trapping, and berry-picking lie within the current boundaries of the transportation and utility corridor and are a part of the federal subsistence hunting area.

When interviewed in 1981, hunters from the Copper Basin communities did not report traveling elsewhere to hunt, while urban-based hunters named alternative areas if they could not hunt Nelchina caribou (Stratton 1982). Stratton noted:

“The perception of alternative resources differed from area to area. Several Fairbanks residents mentioned three other caribou herds, the Delta, Forty-Mile, and Porcupine herds as options, ones they hunted prior to using the Nelchina Herd and ones they were utilizing instead. Hunters in that region also mentioned a wider variety of areas utilized for moose hunting...Consistently lifelong residents of the local areas did not share this attitude. When Nelchina caribou

are not available to them, then the alternatives were local, either added emphasis on moose, and/or use of the Mentasta caribou herd. Salmon, lake fish, and small game were also the alternatives they commonly mentioned.” (Stratton 1982)

Fall and Simeone, in their Customary and Traditional Use Worksheets prepared in March 2005 for the Board of Game, note:

“Areas used for caribou hunting by Copper Basin communities are associated with the traditional areas of communities and families. For example, Stanek (1981) noted “Several people living in the Gulkana area have trap lines in the area west of the Richardson Highway or use the trail system running to the Ewan lake area and hunt that area.” Stratton (1982) noted however that the use of Richardson Highway and Crosswind and Ewan lakes areas was affected by closure of winter season (under State permits) in 1972.

The Division of Subsistence conducted a mapping project in Copper Basin communities in 1984. The project produced maps that depict areas used for caribou hunting from the early 1960’s to the early 1980’s (ADF&G 1985; Stratton and Georgette 1985; ADF&G 1991). These maps show that most caribou hunting by local communities occurs along road corridors and established trails, with areas off the Denali Highway, the Richardson Highway north of Gakona Junction, and the Lake Louise area being particularly important.” (Fall and Simeone 2005)

The Richardson Highway north of Gakona Junction and portions of the Denali Highway are areas that are currently managed under the federal subsistence hunt.

The Bering Glacier area is included within the traditional subsistence harvest areas of the residents of Yakutat, Cape Yakataga and Cordova. Subsistence activities occur throughout a broad resource rich area, including the portion located near the Bering Glacier. Subsistence is important both as an economic and a social activity. It is necessary because human work is translated into food to eat similar to the “cash” economy. It is a social issue because it has been the traditional lifestyle of the Yakutat-Tlingit and is part of the general culture and social fabric of Yakutat residents. In 1987, 96.5% of area households participated in subsistence activities. (Yakutat Planning Commission, 2004).

c) Socio-cultural Factors

The importance of subsistence to area residents extends far beyond its economic contribution (Cuccarese and McMillan 1988). For example, the Ahtna Tanacross Association (1988), in an interim draft report submitted to Hart Crowser, summarized the sociocultural importance of subsistence to the Ahtna and Tanacross people. The subject draft notes in part that it plays a central role in the maintenance of Indian

ceremonial and religious life. Natives honor deceased relatives with a funeral potlatch which features the giving and sharing of as wide a variety of wild products as are available. In time, the bereaved family reciprocates and holds a memorial potlatch to pay back the opposite clan for taking over the stressful duties of dressing the body, building the coffin, digging the grave, and erecting a grave fence or grave house (Ahtna-Tanacross Association, 1988).

The Ahtna Tanacross Association (1988) document goes on to point out that subsistence provides Natives with a wealth of psychological and medicinal benefits as well as nutritional rewards. Many Ahtna, while realizing that human and biological factors can each affect animal populations, maintain that the numbers of animals which make themselves available to hunters is generally more dependent on how humans treat them than on natural conditions. Today, as in the past, Athabaskans generally believe that if wild animals are mistreated or shown disrespect, their descendents will not return to the area and hard times will follow.

Subsistence is important in maintaining the identity of the Ahtna and Tanacross people and is central to social organization. Sharing of wild resources is a binding social force within and between villages and extends across the region (e.g., Halpin 1987; Haynes et al. 1984; Martin 1983). Demonstrated competency and success in hunting and fishing is very important to personal prestige, which is also gained through sharing.(Ahtna Tanacross Association 1988)

Subsistence is important in a sociocultural sense to non-Native residents of the study region, too. Reckford (1983) summarized this and Stratton and Georgette (1984) provided supporting evidence. Subsistence resources first became important to non-Native households because they were the principal sources of food. Today, non-Native resident hunting, fishing, and gathering activities not only help defray the high cost of living, they also have assumed a sociocultural role extending far beyond whatever recreational benefits are associated with them. Many non-Natives residing in remote settlements probably have consciously chosen to do so, in part, because they wish to live a rural lifestyle and desire to be dependent to some extent on products of the land.

d) History of Subsistence Administration

In deliberations leading to the Alaska Native Claims Settlement Act of 1971, the U.S. Congress acknowledged the importance of subsistence hunting and fishing to Alaska Natives but provided no specific protection of these rights. By the late 1970s when oil and gas development on Alaska's North Slope was booming, more direct action was obviously needed to protect subsistence activities in the state.

The Alaska National Interest Lands Conservation Act of 1980 requires that rural subsistence users have a priority over other users to take fish and wildlife on Federal public lands where a recognized customary and traditional pattern of use exists. When it is necessary to restrict the taking of fish and wildlife on these lands, rural subsistence

uses are given preference over other consumptive uses. Title VIII of ANILCA also mandated establishment of Regional Advisory Councils to ensure that local residents with specialized knowledge of subsistence resources and uses have a meaningful role in management. Under the cooperative federalism provisions of Title VIII, the Federal government would defer to a unified program of subsistence management by the State of Alaska, provided it met the requirements of ANILCA.

From 1980 to 1990 the State implemented a subsistence management program that complied with Title VIII of ANILCA, until this was overturned by the Alaska Supreme Court. Since 1990, the Federal Subsistence Board has directly managed the title VIII rural subsistence priority on Federal Public lands, including establishment of Federal Subsistence Regional Advisory Councils. The State continues to manage State-defined subsistence and other hunting and fishing activities, including on Federal lands, unless these have been closed to non-Federally qualified subsistence users.

As directed by the 9th Circuit Court in the Katie John case, and to meet the requirements of the rural subsistence priority in Title VIII of ANILCA, the Federal subsistence management program expanded on October 1, 1999, to include subsistence fisheries on the navigable waters of Alaskan rivers and lakes within and adjacent to Federal conservation units.

e) Current Program Administration

Subsistence fishing and hunting in the planning area are regulated by the State of Alaska or the Federal government, depending upon where the harvests occur. This system is called a “dual management system” because there are separate and sometimes overlapping State-Federal jurisdictions in many areas. The Federal government regulates Federal subsistence fisheries and hunts on Federal public lands and Federally-reserved waters in the planning area. Specifically within the planning area, on behalf of the Federal Subsistence Board the BLM administers subsistence hunting on unencumbered BLM public lands within the Delta and Gulkana Wild and Scenic River corridors, the transportation and utility corridor, and other small scattered parcels (see Map 2, General Land Status, in Chapter I). Regulations are developed by the Federal Subsistence Board, with administrative and technical support from the Office of Subsistence Management. The State of Alaska regulates State subsistence fisheries and hunts on all State lands and waters. In addition, hunting and fishing under State regulations is generally authorized on Federal lands, unless these have been closed to non-Federally qualified harvesters, by the Federal Subsistence Board in order to protect subsistence resources of Federal subsistence uses.

The Federal Subsistence Management Program involves each of five Federal agencies (USDA Forest Service, BLM, National Park Service, Bureau of Indian Affairs, and U.S. Fish and Wildlife Service), with the U.S. Fish and Wildlife Service serving as the lead agency. The director for each of these five Federal agencies or their designated representative in Alaska and a representative of the Secretary of the Interior, make up

the Federal Subsistence Board which oversees the subsistence program in Alaska. Subsistence Regional Advisory Councils and State representatives play an active role in Board deliberations.

The 10 Regional Advisory Councils were established by ANILCA as an administrative structure to provide a “meaningful voice” for subsistence users in the management process. BLM field staffers, along with those of other agencies, meet twice each year with the Regional Advisory Councils to identify emerging issues in conservation, allocation, and appropriate regulation of subsistence harvests. These meetings provide an ongoing forum for intensive dialogue among users and managers to solve problems.

Glennallen Field Office staff are specifically involved in the following facets of subsistence management:

- Involve subsistence users in issues identification and regional problem solving,
- Manage BLM land and habitat and assess impacts to subsistence,
- Monitor resource populations used for subsistence purposes,
- Participate in development of interagency subsistence management regulations and policies, and
- Manage subsistence harvests.

These are described in detail in *Chapter II, Issue 7: Subsistence/Social and Economic Conditions, Management Common to All Alternatives*.

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: 1) travel, tourism and recreation, 2) forest products, and 3) mineral exploration and mining. This section also describes subsistence and environmental justice.

a) Regional Overview

The planning area overlaps geographic provinces on either side of the Chugach Mountain Range: the interior basin, including the Copper River Basin, and the Bering Glacier area, in coastal Prince William Sound. The town of Glennallen is somewhat centered near BLM-managed land in the interior basin. It also has the largest population (554) of the more than 20 towns and villages in the planning area north of the Chugach Mountain Range. Glennallen is at the intersection of the Richardson and Glenn Highways, which provide access to the largest cities in Alaska, as well as access to Canada. Glennallen is the only town in the planning area located north of the

Chugach Mountains that has scheduled air service to cities (twice weekly). Valdez (population 4,036) lies 115 miles south of Glennallen and has direct highway access to the Copper River Basin. Cordova (population 2,454) and Yakutat (population 680) lie 80 miles to the west and east, respectively, of the Bering Glacier area. Neither Yakutat nor Cordova have road access to any other town. Both towns have daily scheduled airline service. Marine Highway (ferry) service is available to Valdez and Cordova.

The planning area has been characterized as a mixed subsistence-market economy. Villages such as Gulkana and Mentasta Lake fit this description closely, while Valdez is closer to the classic industrial-capitalist character. The community school, stores, fuel supplies, and support services are concentrated in Glennallen, a hub for the Copper River Basin.

The interior basin is not incorporated as a political subdivision, nor is it a census subdivision; rather, most of it is unincorporated, with pieces of the planning area included in several incorporated cities and boroughs. Fairbanks North Star Borough, Denali Borough, Matanuska-Susitna Borough, and the City of Valdez either bound or encroach upon the basin. BLM land near Prince William Sound is located between the Yakutat City and Borough, and the City of Cordova. Revenues are not discussed as the BLM planning areas are not within an organized borough; therefore, taxes cannot be levied. Data used in this analysis are from the Alaska Department of Labor and Workforce Development, the U.S. Census Bureau, the Copper Valley Development Strategy Report, and from the Sonoran Institute's Economic Profile System.

The planning area includes lands owned by two ANCSA Regional Corporations: the Ahtna Corporation and the Chugach Alaska Corporation.

Historic change agents in the planning area include construction of the TAPS, the passage of ANCSA, and the passage of ANILCA, including creation of Wrangell-St. Elias National Park and Preserve. These events directly resulted in increased population, employment, and income in the planning area. With growth of major population centers (Anchorage and Fairbanks), visitation, and use of area resources has dramatically increased, particularly in the last 20-30 years. Population in the interior basin has roughly tripled over the last three decades.

b) Demographics

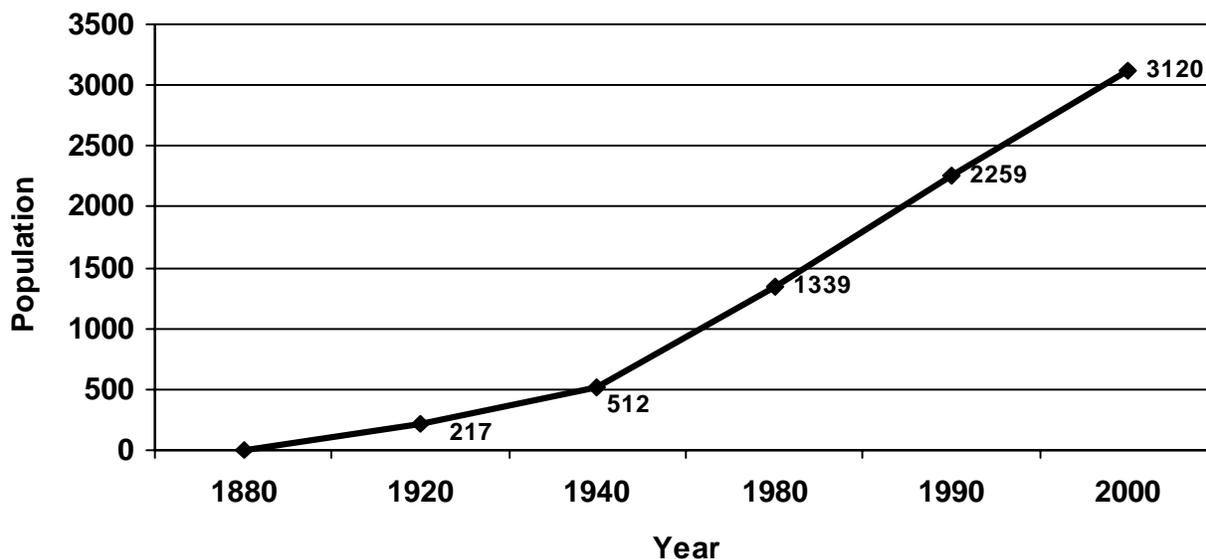
The 2000 census reported the Copper River Basin population as 3,120 living in the 20 communities.

Table 33. Population per Community, Historical Data U.S. Census-Copper River Basin Only

Community	Year						
	1940	1950	1960	1970	1980	1990	2000
Chisana	29	0	0	0	0	0	12
Chistochina	34	31	28	33	55	60	93
Chitina	176	92	31	38	42	49	123
Copper Center	138	90	151	206	213	449	362
Copperville	0	0	0	0	0	163	179
Gakona	46	50	33	88	87	25	215
Glennallen	0	142	169	363	511	451	554
Gulkana	25	0	51	53	104	103	88
Kenny Lake	0	0	0	0	0	423	410
McCarthy	49	0	0	0	23	25	42
Mendeltna	0	0	0	0	31	37	63
Mentasta Lake	15	0	40	68	59	96	142
Nelchina	0	0	0	0	0	0	71
Paxson	0	0	0	0	30	30	43
Silver Springs	0	0	0	0	0	0	130
Slana	0	0	0	0	49	63	124
Tazlina	0	0	0	122	0	247	149
Tolsona	0	0	0	0	0	0	27
Tonsina	0	0	0	0	135	38	92
Willow Creek	0	0	0	0	0	0	201
Total population	512	405	503	971	1339	2259	3120

The growth of the Copper River Basin began in earnest in the 1960s. Older census data is unreliable because none of the area villages are reported. The 2000 census recognized the last several older villages that had been lumped with other towns (Glennallen, Valdez). The population jump from 2,259 in the 1990 census to a population of 3,120 in the 2000 census (72 percent growth) makes this one of the highest growth areas in the state. However, the change in population adjusted for earlier census reporting in Valdez, for example, would indicate a lower growth rate. Figure 3 illustrates the population changes for the entire area from 1880 to 2000.

Figure 3. Population Growth in the Copper River Basin 1880-2000



According to the 2000 census of the 3,120 people of the Copper River Basin, 1,660 are male and 1,448 are female. The average age is 37 years and the median age is 33.7. According to the census, 20 percent of the population is Native American, mostly Athabaskan Indians, and 80 percent of the population is non-native.

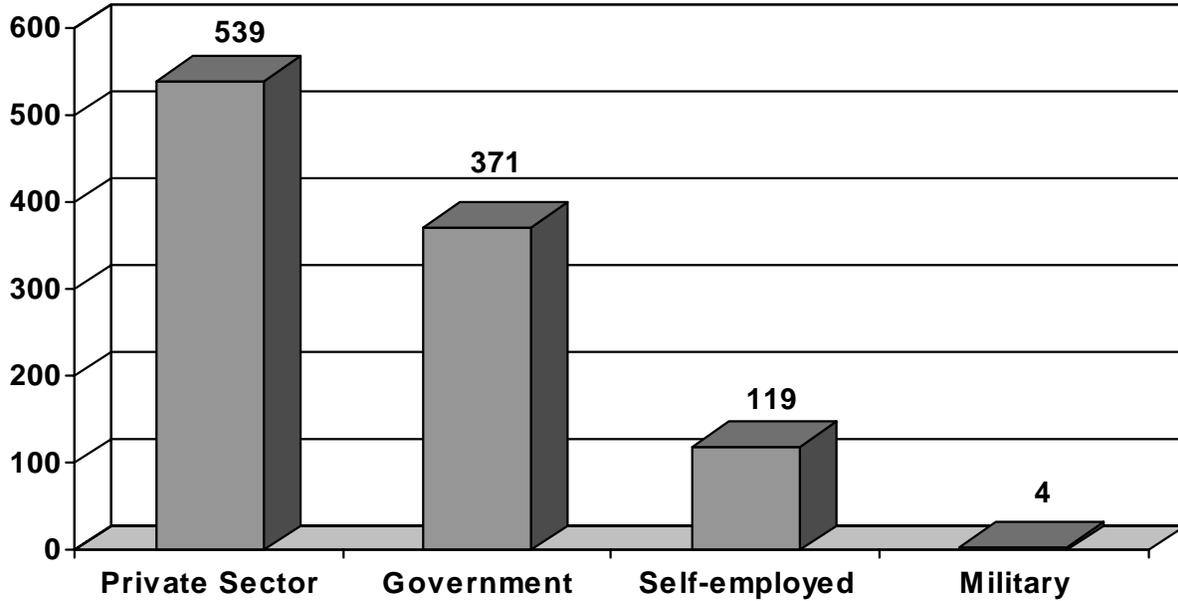
The population of other selected communities outside the Copper River Basin is shown in Table 34. These communities are included since they are either in the planning area (Cantwell), they are the closest communities to the planning area (Cordova, Yakutat), or have populations that may influence or use BLM-managed land in the planning area.

Table 34. Population of Selected Communities Outside the Copper River Basin

Community	Year						
	1940	1950	1960	1970	1980	1990	2000
Cantwell	17	67	85	62	89	147	222
Cordova	938	1165	1128	1164	1879	2110	2454
Valdez	529	554	555	1005	3079	4068	4036
Yakutat	292	298	230	190	449	534	680
Fairbanks	3,455	5,771	13,311	14,771	22,538	30,843	30,224
Anchorage	4,229	32,000	82,833	126,385	174,431	226,338	260,283
Total population	9,460	39,855	98,142	143,577	202,465	264,040	297,899

c) Employment and Labor Force

Figure 4. Jobs Per Economic Sector



Year-round employment can be found with service industries, Federal and State agencies, the local school district, Ahtna Inc., Alyeska Pipeline, Copper River Native Association, and other tribal governments. The majority of the seasonal employment is geared toward tourism and construction. Federal and State agencies also hire seasonal employees for fire protection, maintenance, and visitor services. Residents also work outside the region in Valdez and on the North Slope. The Copper River Basin area has no industrial enterprises and limited commercial agriculture in the Kenny Lake area. Many residents augment income with subsistence activities and Alaska permanent fund dividends.

Table 35 shows the most recent information available the area employment by sector.

Table 35. Copper River Basin Area Employment by Sector*

Employment by Sector	Number Employed
Agriculture, forestry, fishing, hunting, mining	22
Construction	118
Manufacturing	15
Wholesale trade	38
Retail trade	106
Transportation, warehousing and utilities	85
Information	9
Finance, insurance, real estate, rental and leasing	41
Professional scientific, management, administrative and waste management	50
Education, health and social services	264
Arts, entertainment, recreation, accommodation and food services	87
Other services	99
Public administration	113

* Information from 2000 Census-Copper River Basin only (Copper Valley Economic Council 2003)

Employment figures specifically for the Copper River Basin are not provided by the Alaska Department of Labor but are grouped with the Valdez/Cordova Census area. It is estimated that unemployment estimates range as high as 41 percent in one community. Underemployment is common in the region. Because of the seasonal nature of employment in the region, unemployment rates vary greatly between summer and winter as shown in Figure 5. The 2000 Census Bureau data on unemployment for individual towns and villages is presented in Table 37 on page 388.

In 2002, 18 percent of the Alaskan workforce was classified as non-resident; 30.5 percent of the Valdez/Cordova census area workforce was classified as non-resident.

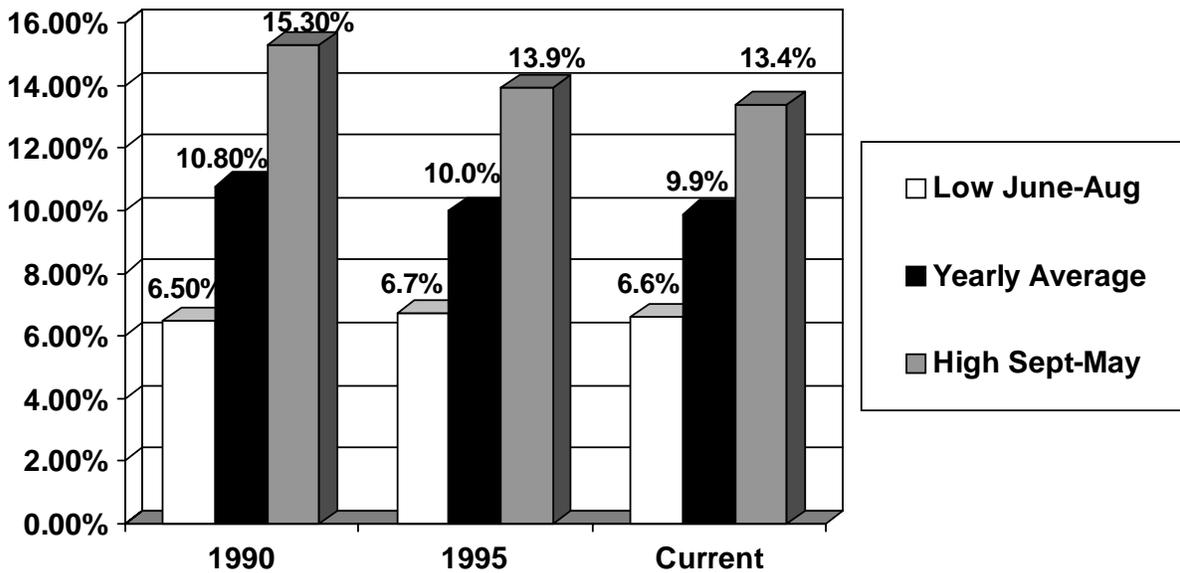
Two mining projects in the area may provide employment and income. They are not on BLM land.

The Mann Project, north of the Denali Highway and Paxton, AK is an array of claims primarily on land recently conveyed to the State of Alaska. Existing mining claims also extend onto the outer transportation and utility corridor. This project is still in the exploration stage. Employment is currently estimated at 10 in a field crew for at least part of the year. (P. Bittenbender, USBLM, personal communication, 10/24/05). The prospects are expected to continue in this stage for the foreseeable future.

The Pogo Mine Project lies northeast of Delta Junction. A final feasibility study was issued in May, 2004. An underground mine and mill operation is currently under construction with startup planned for the first quarter of 2006. This mine will eventually produce 2500 short tons per day (STPD) and may employ as many as 288 at 2500 STPD at this output. (EPA 2003). The direct effect of employment at the mine will be felt primary in Fairbanks, and the Fairbanks North Star Borough. The mine lies outside the planning area.

The RFDS prepared by BLM for the planning area concluded that the likely mineral development activity will be small placer operations. It should be noted that no new mining will occur in the Copper River basin until segregations resulting from native and state selections end with either conveyance out of BLM ownership, or the selections are relinquished or rejected. Mining exploration and development activities such as Man and Pogo are occurring on existing mining claims and patented land.

Figure 5. Seasonal Unemployment Rates*



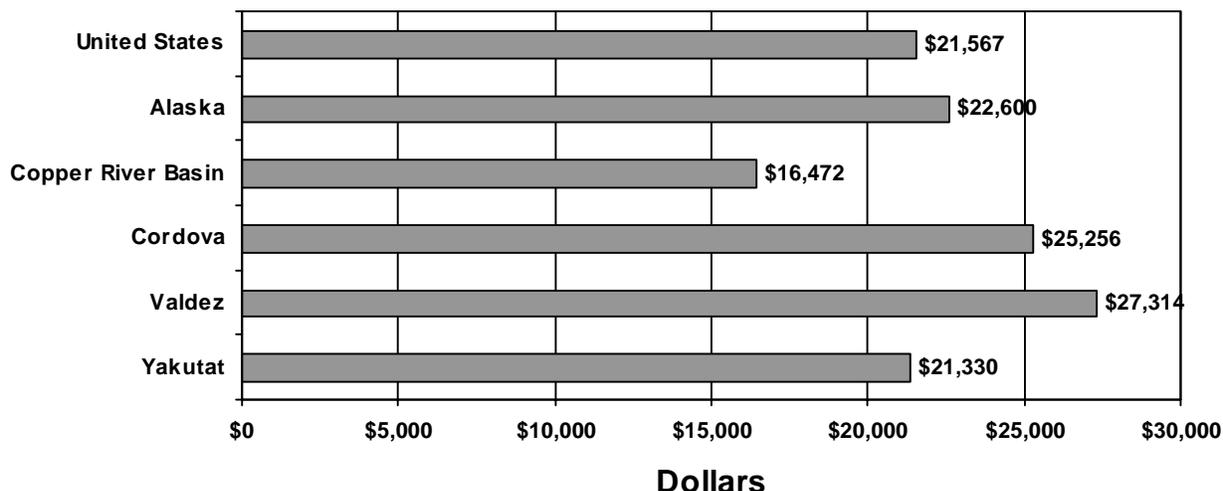
* Alaska Department of Labor Valdez-Cordova Census Area

d) Income

Community and regional wages per capita from the 2000 Census are shown on the chart below. This is compared with Alaska and national averages. The State per capita income average for 2000 was \$22,660, which is close to the national average of \$21,567. The 2000 Census Bureau data on per capita income are for individual towns and villages is presented in Table 37 on page 388.

The Alaska Division of Public Assistance and Department of Education and Early Development showed that in the 1999-2000 school year, 23 percent of area school children in local district schools were living with parents receiving public assistance, including temporary assistance, Medicaid, or food stamps.

Figure 6. Comparison of Per Capita Income



e) BLM Spending

The BLM operates a permanent office in Glennallen that employs local residents. Personnel at this office are estimated to remain at the 2004 level for less than five years, or until land conveyance diminishes the land managed by the agency.

Table 36. BLM Spending*

Fiscal Year	Number of Positions	Total Budget
2001	24 (\$1574)	2,777
2002	21 (\$1380M)	2,264
2003	24 (\$1675M)	2,565
2004	29 (\$2030)	3,365
2005 (estimate)	29	N/A
2010-15 (estimate)	20	N/A

* Source: BLM internal budget records (dollar figures in thousands)

3. Environmental Justice

The Athabaskan Natives are the predominant minority population of the planning area. The Athabaskans continue to supplement their diets with subsistence foods. Other minorities within the planning area include Eyak and Tlingit Natives, and in one community, Asians. Demographic characteristics for communities within the planning area are presented in Table 35 on page 384. Data shows that several villages or towns have minority populations in excess of 50 percent. These same locales have high

percentages of individuals and households with incomes below poverty level, although there is wide variability between villages.

Environmental Justice is an initiative that culminated with President Clinton's February 11, 1994, EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," and an accompanying Presidential memorandum. The EO requires that each Federal agency consider environmental justice to be part of its mission. Its intent is to promote fair treatment of people of all races so no person or group of people bears a disproportionate share of the negative environmental effects from the country's domestic and foreign programs. While the EO focuses on minority and low-income populations, the USEPA defines environmental justice as the "equal treatment of all individuals, groups or communities regardless of race, ethnicity, or economic status from environmental hazards" (Envirosense 1997; U.S. Department of Energy 1997). Specific to the EIS process, the EO requires that proposed projects be evaluated for "disproportionately high adverse human health and environmental effects on minority populations and low income populations."

EO 13175, "Consultation and Coordination with Indian Tribal Governments," requires the BLM to consult with Athabaskan and other tribal governments of the planning area on Federal matters that significantly or uniquely affect their communities. The USEPA's Environmental Justice guidance of July 1999 stresses the importance of government-to-government consultation. As one way to foster tribal participation, the BLM held scoping meetings in every village in the planning area.

Scoping meetings and alternative development meetings were held during development of the draft RMP and EIS. The scoping meetings were held during February through June, 2003, in the 30 communities in the planning area, including Anchorage, Fairbanks, and Palmer. During this scoping process, the BLM received feedback on specific Environmental Justice concerns of local residents. In addition, the BLM held alternative development meetings at the same locations from April through June, 2004.

Major concerns expressed at these meetings included:

- Maintain subsistence opportunities
- Continue access/opportunities for subsistence hunting (concern from non-Native community); Impacts to subsistence activities, mostly related to increased recreational/sport hunting and fishing activities (concern from Native community).
- Maintain the transportation and utility corridor in Federal ownership
- Protect Native Allotments

A more detailed discussion of public concerns is provided in the East Alaska Resource Management Plan Scoping Report (BLM 2003b) and Comment Summary.

Table 37. Environmental Justice Data from the Alaska Department of Labor and Workforce Development

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 18 Years of Age
Alaska	\$22,660	19.0	9.4	6.7	6.1
Cantwell	\$22,615	27.0	2.0	0.0	7.5
Chisana ³	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Chistochina	\$12,362	63.4	29.0	29.6	25.3
Chitina	\$10,835	49.0	13.0	33.0	16.3
Copper Center	\$15,152	50.6	19.0	18.6	13.9
Copporville	\$21,733	21.2	7.0	11.7	9.4
Cordova	\$25,256	15.0	8.0	4.3	4.6
Gakona	\$18,143	17.7	11.0	8.4	7.1
Glennallen	\$17,084	12.1	8.0	4.8	3.5
Gulkana	\$13,548	73.9	41.0	35.3	23.0
Kenny Lake	\$13,121	13.4	26.0	22.7	1.3
Lake Louise	\$11,057	10.2	56.7	0.0	16.7
McCarthy	\$16,045	0.0	15.0	0.0	41.4
Mendeltna	\$11,289	7.9	0.0	0.0	14.6
Mentasta Lake	\$11,275	71.1	35.7	21.9	15.4
Nelchina	\$10,742	9.9	17.8	18.0	6.1
Paxson	\$26,071	0.0	0.0	0.0	0.0
Silver Springs	\$23,464	8.5	7.4	6.9	5.9
Slana	\$20,018	15.3	23.6	20.0	23.2
Tazlina	\$23,992	30.2	8.1	7.3	9.3
Tolsona	\$10,000	14.8	0.0	0.0	0.0
Tonsina	\$13,390	9.8	8.7	7.4	10.6
Valdez	\$27,341	10.2	6.2	6.0	4.5
Willow Creek	\$18,242	11.9	0.0	3.8	7.7
Yakutat	\$21,330	55.1	16.7	11.8	6.7

¹ Native Alaskan/Native American is the dominant minority.

² The poverty level is \$8,794 for individuals and \$21,320 for households.

³ No data available.

Source: <http://www.labor.state.ak.us/research/cgin/cenmaps/profile>

I. Other Program Areas

1. *Hazardous Materials*

Hazardous Materials is a BLM program that focuses on environmental protection. Environmental protection encompasses the land, water, people, and habitat associated with Federal lands. The backbone of this program is found in Federal and State environmental laws and regulations. Federal and State laws cover the release, storage, handling, and disposal of hazardous materials, fuels, and other liquid hydrocarbons; the laws provide guidance for investigation and cleanup of contaminated lands, worker chemical safety or exposures, transportation of hazardous materials, and legal liabilities.

Hazardous materials are sometimes used or produced by recreational or industrial processes, or result from illegal activities such as dumping or drug manufacturing. Authorized industrial processes may include mineral exploration or production; recovered minerals may include oil and gas, metallic ores, and gravel or rock material for construction processes.

The Glennallen Field Office strives to be in full compliance with all Federal laws, regulations, and policies, including those addressing hazardous materials. Activities on BLM lands are analyzed according to NEPA. As part of this analysis, impacts related to hazardous materials are evaluated. Activities that would adversely impact lands or resources, or activities that would not be in compliance with Federal laws, regulations, and policies, would not be approved, and or must be altered to be approved. Inspection and monitoring is conducted on an as-needed basis. Requests for inspections have come from concerned citizens, Native Corporations, State agencies, other Federal agencies, and BLM personnel. Most hazardous material program investigations and cleanup activities have been related to the problems associated with abandoned mine lands and illegal dumping.

Generally the lands within this planning area are unaffected by hazardous materials; however, some past human activities have created contaminated sites within the area. One of the most common and expensive hazardous material site categories is that of abandoned mines. Former mine claimants and operators have left hazardous materials in the form of drums of chemicals, fuels, oils, solvents; as well as batteries, asbestos, and contaminated soils. Hazardous materials also impact BLM lands from illegal dumping, trespass activities, oil and gas activities, or any activity that uses or produces a hazardous material as defined by 49 CFR 171.8. Basically, a hazardous material, as defined here, means a substance or material that is capable of posing an unreasonable risk to health, safety, and property (i.e., the environment).

a) Management Concerns

Current management concerns related to hazardous materials in the planning area consist of several active and inactive hazmat sites. These sites are discussed below.

(1) *Dennis Dump Site*

The Dennis Dump Site was discovered in 2001 and is on an 8 acre parcel of BLM land located near Eureka. The site is located at Section 18, T. 21 N., R. 12 E., Copper River Meridian, off the Belanger Pass Road. BLM contractors removed several drums of waste oil, 60 cubic yards of contaminated soil, 50 wrecked vehicles, and 60 cubic yards of solid waste. The BLM is still awaiting post removal soil samples. Violators have been prosecuted.

(2) *Maclaren Glacier Mine Site*

The Maclaren Glacier Mine Site is located at T. 19 S., R. 6 E., Section 11 and 14, Fairbanks Meridian, at the headwaters of the Maclaren Glacier. The site is a former copper mine on the south side of the Alaska Range. Remnants of the abandoned mine included over 200 drums of waste oils, fuel, and solvents, contaminated soils, miscellaneous solid waste, and an open mine adit. A BLM contractor cleaned up the site in 2000, excavating 900 cubic yards of contaminated soil and land spreading it to a 6-12 inch lift for bio-remediation. Currently, the site is being monitored by taking soil samples to test whether or not the land farm soils meet the DEC acceptable limits.

(3) *Susitna Lodge Dump*

The Susitna Lodge Dump is a garbage dump on BLM property. The dump is west of the Denali Highway on BLM land. The dump has been in use by the Susitna River Lodge for many years and contains drums, vehicles, and other trash.



Chapter IV: Environmental Consequences

Chapter IV: Environmental Consequences

A.	How to Read this Chapter	397
B.	Introduction	398
1.	Types of Effects.....	399
2.	Availability of Data and Incomplete Information.....	400
3.	Critical Elements.....	401
C.	Analysis Assumptions and Guidelines.....	402
1.	General Assumptions	402
2.	Resource Assumptions.....	403
a)	Issue 1: Travel Management.....	403
b)	Issue 2: Recreation	403
c)	Issue 3: Natural and Cultural Resources	404
d)	Issue 4: Lands and Realty.....	407
e)	Issue 5: Vegetation Management	408
f)	Issue 6: Leasable and Locatable Minerals.....	409
g)	Issue 7: Subsistence/Social and Economic Conditions.....	411
D.	Impacts by Alternative	413
1.	Issue 1: Travel Management	413
a)	Impacts Common to All Alternatives	413
b)	Alternative A.....	414
c)	Alternative B.....	414
d)	Alternative C	415
e)	Alternative D (Proposed RMP).....	416
2.	Issue 2: Recreation.....	418
a)	Impacts Common to All Alternatives	418
b)	Alternative A.....	419
c)	Alternative B.....	423
d)	Alternative C	428
e)	Alternative D (Proposed RMP).....	432
3.	Issue 3: Natural and Cultural Resources	438
a)	Soils	438
b)	Water Quality	450
c)	Air Quality	463
d)	Vegetation.....	464
e)	Wildlife (Including Sensitive Status Wildlife Species).....	474
f)	Fish (Including Sensitive Status Fish Species)	501
g)	Cultural Resources	517
h)	Paleontological Resources.....	529
i)	Visual Resources	530
j)	Areas of Critical Environmental Concern	540
4.	Issue 4: Lands and Realty	544
a)	Impacts Common to All Alternatives	544
b)	Alternative A.....	546
c)	Alternative B.....	548
d)	Alternative C	550
e)	Alternative D (Proposed RMP).....	552

5.	Issue 5: Vegetation Management.....	554
a)	Impacts Common to All Alternatives	554
b)	Alternative A.....	555
c)	Alternative B.....	556
d)	Alternative C	557
e)	Alternative D (Proposed RMP).....	558
6.	Issue 6: Leasable and Locatable Minerals	559
a)	Alternative A.....	560
b)	Alternative B.....	560
c)	Alternatives C.....	561
d)	Alternative D (Proposed RMP).....	562
7.	Issue 7: Subsistence/Social and Economic Conditions	564
a)	Impacts Common to All Alternatives	564
b)	Alternative A.....	564
c)	Alternative B.....	567
d)	Alternative C	572
e)	Alternative D (Proposed RMP).....	574
E.	Cumulative Impacts.....	579
1.	Issue 1: Travel Management	579
a)	Access	579
b)	OHV Management and Trails.....	579
c)	Roads	580
2.	Issue 2: Recreation.....	580
a)	General Recreation.....	580
3.	Issue 3: Natural and Cultural Resources	581
a)	Soils	581
b)	Water Quality	581
c)	Air Quality	582
d)	Wildlife	582
e)	Fish.....	584
f)	Cultural Resources	585
g)	Paleontological Resources.....	585
h)	Visual Resources	585
i)	Designation of Areas of Critical Environmental Concern	585
j)	Wild and Scenic Rivers	586
k)	Climate Change	587
4.	Issue 4: Lands and Realty	588
5.	Issue 5: Vegetation Management.....	588
a)	Forest and Woodland.....	588
b)	Riparian Vegetation	589
c)	Noxious Weeds and Invasive Plants.....	589
d)	Sensitive Status Plant Species	590
6.	Issue 6: Leasable and Locatable Minerals	590
a)	Leasable Minerals.....	590
b)	Locatable Minerals.....	590
7.	Issue 7: Subsistence/Social and Economic Conditions	591

- a) Subsistence 591
- b) Social and Economic Conditions..... 591
- c) Environmental Justice 592
- F. Irreversible or Irretrievable Commitment of Resources 593
 - 1. Issue 1: Travel Management 593
 - 2. Issue 2: Recreation..... 593
 - 3. Issue 3: Natural and Cultural Resources 593
 - a) Soil..... 593
 - b) Water Quality 593
 - c) Air Quality 593
 - d) Wildlife 594
 - e) Fish..... 594
 - f) Cultural Resources 594
 - g) Paleontological Resources..... 595
 - h) Visual Resources 595
 - i) Designation of Areas of Critical Environmental Concern 595
 - j) Wild and Scenic Rivers 595
 - 4. Issue 4: Lands and Realty 595
 - 5. Issue 5: Vegetation Management 596
 - a) Forest Products..... 596
 - b) Forests and Woodland..... 596
 - c) Riparian and Wetland 596
 - d) Sensitive Status Plant Species 596
 - 6. Issue 6: Leasable and Locatable Minerals 597
 - a) Oil and Gas Leasing 597
 - b) Locatable Minerals..... 597
 - c) Mineral Materials..... 597
 - 7. Issue 7: Subsistence/Social and Economic Conditions 597
 - a) Subsistence 597
 - b) Social and Economic Conditions..... 598
- G. Unavoidable Adverse Impacts 599
 - 1. Travel Management..... 599
 - 2. Recreation 599
 - 3. Cultural Resources 599
 - 4. Vegetation Management 600

CHAPTER IV: ENVIRONMENTAL CONSEQUENCES

A. How to Read this Chapter

Chapter IV presents the potential impacts to the natural and human environment in terms of environmental, social, and economic consequences that are projected to occur from implementing the alternatives presented in Chapter II. Chapter IV contains seven main sections:

- How to Read this Chapter
- Introduction
- Analysis Assumptions and Guidelines
- Impacts by Alternative
- Cumulative Impacts
- Irreversible or Irrecoverable Commitment of Resources
- Unavoidable Adverse Impacts

The *Introduction* section includes definitions of the types of effects that will be projected throughout the impact sections, discusses the availability of data, and identifies the BLM's Critical Elements. This section is followed by *Analysis Assumptions and Guidelines*, which presents important assumptions that are used throughout the chapter.

The detailed analysis of impacts in *Impacts by Alternative* is organized by issue, as presented in Chapters I, II, and III. Major issue headings are:

- Issue 1: Travel Management
- Issue 2: Recreation
- Issue 3: Natural and Cultural Resources
- Issue 4: Lands and Realty
- Issue 5: Vegetation Management
- Issue 6: Leasable and Locatable Minerals
- Issue 7: Subsistence/Social and Economic Conditions

The order of the issues does not reflect their level of importance. Subsistence is discussed last to consider potential impacts to subsistence that could result from proposed management actions or allowable uses described under the previous six issues.

As in Chapters II and III, there are sub-headings under each of these major issue headings. Under each of these issue headings and sub-headings, impacts are discussed for each alternative. Since Required Operating Procedures and Oil and Gas

Leasing Stipulations have been included in the action alternatives (Alternatives B, C, and D) as design features, many impacts are reduced or eliminated up front.

The sub-section under each heading titled *Impacts Common to All Alternatives* describes impacts that will not vary by alternative. This information is presented to avoid repetition in the *Impacts by Alternative* section. These impacts are not discussed again. Resources that only have impacts that are common to all alternatives are only discussed in this section as well and are not discussed further.

Laws, regulations, and policies affecting BLM management and planning are included as Appendix G. Standard operating procedures resulting from these laws, regulations, and policies would continue to be followed under all alternatives. These standard operating procedures constitute day-to-day implementation of policy and management, and often result in certain projects being mitigated, redesigned, or dropped from consideration. Associated limitations or complications they may present to programs (e.g., increased processing times or costs) are not considered impacts and are not discussed further in this document.

Separate sections at the end of this chapter describe *Cumulative Impacts* (page 579), *Irreversible or Irrecoverable Commitment of Resources* (page 593), and *Unavoidable Adverse Impacts* (page 599).

B. Introduction

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 discussed.

When quantitative information is available, impacts have been calculated primarily through GIS applications. Since the alternatives generally describe overall management emphasis, the environmental consequences are most often expressed in comparative, general terms.

Impact analyses and conclusions are based on interdisciplinary team knowledge of the resources and the planning area, information provided by experts in the BLM or in other agencies, and information contained in pertinent existing literature. The baseline used for the impact analysis is the current condition or situation described in Chapter III, Affected Environment. Analysis assumptions have also been developed to help guide the determination of effects (see *Analysis Assumptions and Guidelines* beginning on page 402 of this chapter). Since the Draft RMP/EIS provides a broad management framework, the analysis in this chapter represents best estimates of impacts since exact

locations of development or management are often unknown. Impacts are quantified to the extent practical with available data. In the absence of quantitative data, best professional judgment provides the basis for the impact analysis.

1. Types of Effects

Direct, indirect, and cumulative impacts are considered in this effects analysis, consistent with direction provided in 40 CFR 1502.16.

Direct impacts 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 impacts also result from an action or implementation of an alternative, but usually occur later in time or removed in distance from the action or implementation. Cumulative impacts result from individually minor but collectively significant actions over time.

Actions anticipated over the next 20 years on all lands in the planning area, including private, State, Native corporation, and Federal (USDA FS, 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 the following:

- ANCSA and State land entitlements will be fulfilled within the 20-year planning period.
- BLM will retain 15-25 percent of the lands currently selected by the State or Native Corporations; conversely, the BLM will lose 75-85 percent of lands that are currently State- or Native-selected.
- Land sales (settlement and remote settlement areas) will continue on State lands consistent with State DNR area plans.
- Mineral exploration and development will increase on State lands within the planning area.
- Mineral exploration and development will increase on Native Corporation lands.
- Mineral exploration and development will remain minimal in Wrangell-St. Elias National Park and Preserve and on adjacent USDA Forest Service lands.
- Timber harvest will occur on Ahtna Native Corporation lands (in some areas occurring in large harvest blocks); timber will be chipped and trucked to shipping in Valdez.
- Some timber harvest will occur on State lands, particularly on lands south and west of Glennallen. Harvest on State lands will be constrained by access.
- Large scale, stand-replacing wildland fires can be expected on State, Native, and NPS lands as average temperatures continue to increase.
- Access to public lands will decrease as land entitlements by Native Corporations are fulfilled.

- Wrangell-St. Elias National Park and Preserve will continue to manage for fly-in, remote, primitive recreation experiences throughout most of the 13-million acre Park.
- Unmanaged proliferation of OHV trails will continue on accessible State-managed lands.
- Road construction will increase on State lands in support of mineral exploration and development.
- The number of trails and roads within Wrangell-St. Elias National Park and Preserve will remain stable.
- The State will continue to push for conveyance of the transportation and utility corridor and use of this corridor as a possible gas pipeline route.
- Use of communication sites and corridors will increase.
- Military activities and infrastructure will increase.

To avoid repetition, if the impacts of an action would be the same as previously described for an earlier alternative, a statement such as “impacts would be the same as under Alternative A” or “impacts would be the same as under Alternative A, except for . . .” may be inserted as applicable.

Irretrievable or irreversible commitment of resources and unavoidable adverse impacts are also discussed at the conclusion of the environmental consequences section after the *Cumulative Impacts* section. Irreversible commitments of resources result from actions in which resources are considered permanently *changed*; irretrievable commitments 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 are no mitigation measures.

2. Availability of Data and Incomplete Information

The best available information pertinent to the decisions to be made was used in development of the RMP. Considerable effort has been taken to acquire and convert resource data into digital format for use in the plan. Data has been acquired from BLM sources and from outside sources such as the State of Alaska and National Park Service.

Some information was unavailable for use in developing this plan, usually because inventories have either not been conducted or are not complete. Specific data that was unavailable include:

- Complete inventory/assessment of an estimated 1,300 miles of trails.
- Detailed soil surveys.
- Invasive weed occurrence.
- Definitive sensitive species occurrence (plant and animal).

- Certain wildlife data (specific critical habitat locations for many species).
- Watershed assessments for areas outside the Gulkana River watershed.
- Riparian assessments outside the Delta and Gulkana Rivers and their tributaries.

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 instances, are described as unknown. Subsequent project-level analysis will provide the opportunity to collect and examine site-specific inventory data necessary to determine the appropriate application of the RMP level guidance. In addition, ongoing inventory efforts identified in Chapter II will continue to update and refine the information used to implement this plan.

3. Critical Elements

The BLM's National Environmental Policy Act 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 1988b Appendix 5; BLM 1999):

1. Air Quality
2. Areas of Critical Environmental Concern
3. Cultural Resources
4. Environmental Justice
5. Floodplains
6. Hazardous or Solid Wastes
7. Invasive, Non-native Species
8. Native American Religious Concerns
9. Prime or Unique Farmlands
10. Threatened or Endangered Species
11. Water Quality
12. Wetlands/Riparian Zones
13. Wild and Scenic Rivers
14. Wilderness

There are no Prime or Unique Farmlands on BLM-administered lands within the planning area, nor are there any Areas of Critical Environmental Concern (ACECs). The remaining 12 elements are identified and addressed in the pertinent sections of this chapter. Impacts related to proposed designations or findings are described.

C. Analysis Assumptions and Guidelines

Several assumptions were made to facilitate the analysis of potential impacts. These assumptions set guidelines and provide reasonably foreseeable projected levels of development that would occur within the planning area over the next 15-20 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 particular resource, the heading is not included in the following sections.

1. General Assumptions

- Sufficient funding and personnel would be available for implementation of the final RMP decision.
- Implementation of actions from any of the RMP alternatives would be in compliance with all valid existing rights, Federal regulations, bureau policies, and other requirements.
- Appropriate maintenance would be carried out to maintain the functional capability of all developments.
- The discussion of impacts 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 impacts where data is 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 will be met sometime within the planning period, reducing current BLM-managed lands in the planning area by as much as 5.5 million acres (7.1 million acres are currently managed by the BLM).
- State- 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 returned upon rejection of land selection.

2. Resource Assumptions

a) Issue 1: Travel Management

(1) Access

Demand for adequate access – the physical ability and legal right of the public, agency personnel, and authorized users to reach public lands – will remain high over the life of the plan. Access to public lands will decrease slightly as Native Corporation entitlements are met and as private lands become more developed.

(2) OHV Management and Trails

Demand for access and use of OHV trails will increase. The use of OHVs for recreational purposes (including sport fishing) will increase while the use of OHVs for hunting and subsistence will remain stable or increase slightly. 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.

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.

(3) Roads

Demand for roads within the planning area to access private inholdings or to support mineral exploration and development or other resource developments on or across BLM-managed lands will increase.

b) Issue 2: Recreation

(1) General Recreation

Demand for recreational use of public lands will increase over the life of the plan. Increases will be focused on sport fishing, recreational OHV use (including snowmachines), hiking and canoeing/rafting, and highway tourism (bus tours, summer use of Recreation Vehicles [RVs]). Commercial recreation applications will increase in number.

c) Issue 3: Natural and Cultural Resources

(1) Soils

Climate change will impact soils in the area, probably to a greater extent than any other activity analyzed in this EIS. This change will occur through the decrease of permafrost in the area, with subsequent impacts on evapotranspiration, runoff, fire frequency, and vegetation.

(2) Water Quality

Demand for water (both quantity and quality), especially in the planning area's clear-water streams and rivers, will increase as a result of increasing recreation use, an increasing population in the Copper River Basin, and an increase in mineral exploration and development. Water quality requirements will be achieved through the use of Required Operating Procedures.

(3) Air Quality

Increasing uses of the area for recreational and aesthetic reasons may lend importance to maintaining the current quality of the air, especially during seasons of high visitation.

The most likely causes of deterioration in air quality in the planning area are emissions from fire (wildfire or prescribed), dust from travel on roads (particularly on the Denali Highway), and dust and exhaust from construction or development activities.

(4) Vegetation

(a) Forest, Woodlands, and Shrublands

Demand for healthy forests and woodlands will increase based on desires for wildlife habitat and maintenance of healthy upland communities to support watershed health and support of the sustainable production of forest products such as firewood and house logs. Demand for subsistence uses associated with these vegetation types will also increase. These uses include personal firewood and house log gathering, as well as berry-picking and collection of plant materials such as diamond willow for arts and crafts. Vegetation treatments to forests, woodlands, and shrublands will promote successional changes that will restore vigor and vegetation production, create a mosaic of vegetation types, and promote maintenance of early-seral shrub-dominated plant communities. Climate change will continue, with potential for significant changes in arctic and sub-arctic vegetation over time. Warming has the potential to cause land cover changes in high latitude regions through both vegetation replacement and increasing frequency of disturbance. There is some evidence that tundra in Alaska is becoming more shrubby, and there is the potential for climatic warming to transform tundra regions into boreal forest (Walsh 2004).

Both natural and human-caused fire events will likely increase as fuel loading increases in both black spruce and beetle-kill white spruce. Fires will most likely increase in size and intensity during the life of this plan due to fuel loading, lack of periodic fire across the landscape in the last 50 years, and increasing temperatures. Fire suppression efforts will continue in areas of urban interface and where wildland fire would produce undesirable resource effects.

(b) Riparian and Wetland

The condition of riparian communities will be maintained at proper functioning condition as management measures are implemented. Demand on specific riparian and wetland areas will increase with general increased recreational use, particularly in the Delta and Gulkana Wild and Scenic River corridors. This increase will result in localized impacts to riparian vegetation, but not at levels that threaten proper functioning condition.

(c) Noxious Weeds and Invasive Plants

Inventory efforts will continue to identify specific occurrence of noxious weeds and invasive species. The demand for control of weeds will increase as general public knowledge of the detriments of noxious weeds increases. Increases in invasive species will reduce habitat quality and quantity.

(5) *Wildlife*

There is a direct relationship between the quantity and quality of habitat and the size, diversity, and viability of species populations. Habitat requirements for any particular species cannot be met everywhere (species specific needs are often very site-specific). Habitat may be only seasonally available due to elevation, aspect, type of vegetation present, and proximity of human disturbance. Habitat conditions will vary due to natural processes and wildlife uses even if human-caused influences are reduced or eliminated.

Management actions intending to benefit a specific habitat for a priority species will influence any other species occurring in that same habitat. Therefore, impacts to wildlife populations and habitat are not discrete since actions may benefit one species while having an adverse, or beneficial, impact on another. Maintaining high quality habitat conditions can have some influence on reducing the severity of outbreaks of and subsequent losses from diseases, but the prevalence in the environment of various diseases cannot be fully controlled, particularly at chronic levels of occurrence.

Demand for the improved health of wildlife habitat will increase over the life of the plan given the generally linear increase in demand for caribou and moose permits within the planning area. Demands on habitat from caribou and moose will generally increase with current predator control programs as ungulate populations increase, though populations will fluctuate over the course of the planning period

(a) Special Status Wildlife Species

Continuing and additional inventory will identify additional sensitive status species on lands administered by BLM, and will likely include the expansion of known ranges of species currently on the BLM-Alaska special status species list. Nationally, demand for the protection of species listed under the Endangered Species Act, as well as for species not yet listed but of concern, will likely increase. There are no listed threatened or endangered species within the planning area, but there are several plant and animal species listed as sensitive status species. Demand for protection of these species will increase as inventory indicates specific habitat niches or requirements, and as increased visitor use or development activities place demands on associated habitats.

(6) *Fish*

The demand for fisheries resources from increased sport and subsistence fishing will increase over the life of the plan, resulting in increased pressure on populations in the planning area. There is a direct correlation between the amount of quality habitat and fish populations. Potential impacts to habitat quality will increase over the planning period. 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 salmon.

(7) *Cultural Resources*

Federal undertakings and unauthorized uses have the potential to cause irreversible disturbance and damage to non-renewable cultural resources. The BLM will continue to mitigate impacts to cultural resources from authorized uses through project abandonment, redesign, and, if necessary, data recovery investigations in accordance with the 1997 BLM National Programmatic Agreement for Section 106 Compliance and the 1998 Implementing Protocol with the Alaska State Historic Preservation Officer for managing cultural resources on lands administered by the BLM in Alaska.

Without a limited inventory of cultural resources on public lands within the planning area, the exact number, kind, and variability of cultural resources will remain unknown. However, new cultural resources will continue to be found and evaluated for eligibility to the National Register of Historic Places as additional inventories are completed for compliance projects. Eligible cultural resources will continue to be treated similarly and equally in terms of type, composition, and importance, but many will continue to deteriorate through natural agents, unauthorized public use, and vandalism. The BLM will continue to consult with Native and Village Corporations on traditional cultural properties and values that are of concern to them.

All archaeological resources will be assessed according to BLM use categories. The demand for use of cultural resources will increase over the life of the plan. Interest from the general public in cultural resources and from Village corporations and councils in

traditional uses will increase. The demand to use cultural resources by the academic community in scientific research will increase slightly.

(8) *Paleontological Resources*

Federal undertakings and unauthorized uses have the potential to cause irreversible disturbance and damage to non-renewable paleontological resources. The BLM will continue to mitigate impacts to paleontological resources from authorized uses through project abandonment, redesign, and specimen recovery. Geologic formations with exposures containing vertebrate and non-vertebrate fossils will continue to be impacted from natural agents, unauthorized public use, and vandalism.

The demand for use of both vertebrate and non-vertebrate fossils will increase over the life of the plan. The casual-use and collection of non-vertebrate fossils by rock hounds and fossil collectors will increase. Scientific interest in vertebrate fossils by the academic community will increase slightly.

(9) *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 planning area over the life of the plan. Increasing tourism will increase the value of scenic views, undeveloped landscapes, and open spaces.

(10) *Wild and Scenic Rivers*

Recreational use of the Delta and Gulkana Wild and Scenic River corridors will continue to increase. Prescribed management will protect the outstandingly remarkable values for which the rivers were designated, requiring a mix of education and regulatory measures. Mineral development will occur outside the Delta River corridor, placing possible demands for access or rights-of-ways across the corridor.

d) Issue 4: Lands and Realty

(1) *Land Use Authorization*

There will be a continued demand for land use authorizations such as rights-of-way and various types of leases and permits within the planning area for the life of the plan. The demand for these land use authorizations will fluctuate directly with the degree of economic growth and development occurring within and adjacent to the planning area.

(2) Land Ownership Adjustment

State and Native Corporation land entitlements will be met within the planning period, with the BLM retaining management on approximately 15-25 percent of lands currently selected by the State. Once land status is resolved, there will be a demand, both from within and outside the BLM, for land ownership adjustments to improve the manageability of Federal and non-Federal lands.

Land identified for disposal will usually go into private ownership and will be used for its highest and best use (residential, commercial, industrial, or public purposes).

(3) Transportation and Utility Corridor

The BLM will continue to manage some portion of the transportation and utility corridor. There will be increased demand to utilize this corridor for additional utilities or infrastructure to support a gas pipeline route.

e) Issue 5: Vegetation Management

(1) Fire Management

(a) Wildland Fire

Wildland fire frequency and intensity will increase over the planning period due to fuel build-ups and increasing temperatures. Cooperative interagency fire planning and suppression, as described in Chapter III, will continue. Suppression classes will be changed over time to respond to specific resource or urban-interface concerns.

(b) Prescribed Fire

Prescribed fire will be utilized with more frequency to accomplish habitat improvement and fuels reduction objectives. Prescribed burn treatments will create mosaic patterns on the landscape which would in turn maintain structure and diversity.

(2) Forest Products

Opportunities that utilize forest products in return for other resource service work will continue and may increase slightly. Vegetation treatments will improve timber stand quality and quantity. Because of inaccessibility, insects and disease will continue to contribute to the loss of growth in white spruce stands. Local demand for forest products such as firewood and house logs will increase as population in the Copper River Basin increases.

f) Issue 6: Leasable and Locatable Minerals

(1) *Leasable Minerals*

No development of coal or geothermal leases is anticipated within the life of the plan. Oil shale will not be leased and no development of phosphate will occur within the life of the plan. It is unlikely the Copper River coal field would support exploration and development of coalbed methane gas due to low-ranked (lignite) coal deposits.

Oil and gas exploration will occur as described in the reasonably foreseeable development scenario (RFD) (BLM 2004f). The RFD predicts activity based on geologic potential as well as past exploration, accessibility, and lack of existing infrastructure. The following is predicted for Alternative D:

- Five frontier wildcat wells would be drilled during phase one exploration, with an additional three drilled after discovery is made; one of the initial five wells would have an appreciable show resulting in three field delineation wells.
- One gas field likely would be developed. The gas field would initially consist of 10 production wells. Four additional development wells would be drilled with the assumption that two of the total number of wells in the field would be sub economic and thus have short-term impacts. To maximize recovery and minimize waste, production pads would be spaced at distances of about twice the reservoir depth. In the Copper River Basin, for example, a typical 2,500 foot reservoir requiring two production pads would have pads located approximately 5,000 feet apart. Drilling pad footprints have been reduced up to 80 percent from older pad designs by using closer wellhead spacing and by replacing surface mud-reserve pits with storage tanks.
- Typical life of a producing well is 10 to 12 years of gas production; therefore, 1-3 of the 6 gas production wells may be plugged during the planning period. Field abandonment may take from 2-5 years after production ends.
- Approximately 120 miles of transmission pipeline would be needed to transport the gas out of the planning area to the existing pipeline network in the Anchorage/Mat-Su area.
- A compression/gas plant facility would be developed as part of the field's infrastructure.
- One in-field underground injection well would be permitted and installed to dispose of drilling waste, wastewater, spent fluids, chemicals, and the produced water.

This level of development is assumed for the purposes of impact analysis in this Environmental Impact Statement. Actual development may vary considerably based on current gas exploration results, price of oil and gas, accessibility, marketability, and land conveyance. For example, if current gas exploration on private lands in the Copper Basin shows promising results, it is likely that adjacent Native or State-selected lands might become a high priority for conveyance. That being the case, the likelihood of this level of development on BLM-managed lands would be low. Alternative D would “open”

79% of lands currently managed by BLM by removing withdrawals that are currently in place on these lands. However, most of these lands are currently State or Native selected, and because of a segregation against mineral leasing on selected lands, no development would occur on these lands until they are conveyed or the selection is relinquished and the land is retained in long-term BLM ownership.

Alternative D lifts an existing withdrawal against mineral leasing on the eastern 1/3 of the Bering Glacier area. However, this analysis anticipates little to no development during the life of the plan because of poor accessibility, distance from current oil and gas infrastructure, and extreme topography.

(2) Locatable Minerals

(a) Placer Gold

Placer gold mining has been the most common type of mining to occur in the planning area. The RFD for locatable minerals concludes that the historical data indicates that small placer mines will be more likely to reappear in the planning area than either medium or large placer mines (BLM 2004e).

(b) Other Deposits

Intense exploration focused on deposits of rare metals (nickel and platinum group elements) has occurred in the Nikolai Belt area north of the Denali Highway. Exploration results to-date on this area indicate that it has the potential for a significant discovery of these metals. This area has recently been conveyed to the State of Alaska.

If additional exploration leads to the discovery of an economically developable deposit, the deposit will be developed in a similar manner as the Pogo Mine (about 38 miles northeast of Delta Junction). The Pogo project is being developed as a cut and fill underground mine. A detailed mine design and plan have not been developed. 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 800-1,600 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 lands, some road construction or powerlines would be anticipated across BLM-managed lands.

(3) Mineral Materials

Demand for gravel will increase over the life of the plan as road maintenance and construction continue on State highways, State lands, Native corporation lands, and private lands.

(4) Renewable Energy

Considering such factors as the amount and intensity of sunlight, wind velocity, proximity to roads and electric transmission facilities, and the degree to which State and local policies support renewable energy development, no applications will be received to permit or lease commercial construction of facilities on BLM-managed lands.

g) Issue 7: Subsistence/Social and Economic Conditions

(1) Subsistence

The BLM will continue to play a role in the management of subsistence resources on public lands. The demand for subsistence resources will increase over the life of the plan.

(2) Social Conditions

The population of the State and census area is projected to increase; the only exception to this projection within the planning area is the Valdez-Cordova Census Area, where population levels are expected to remain level, a result of possible loss of employment at the Valdez Marine Terminal which is currently undergoing reconfiguration to address lower Trans-Alaska Pipeline throughput. Population projections are not available for individual communities in the Copper River Basin; however, it is assumed that these populations would grow parallel to the rest of the State.

(3) Economic Conditions

The economic impact analysis is based on BLM-related management changes. Other factors that would affect the local economy, such as population growth, tourism trends, or resource extraction on other lands, are assumed to be the same for all alternatives.

(4) Health and 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.

(5) Tribal Treaty Rights

As a government agency, the BLM will maintain a special government-to-government relationship with Federally-recognized Indian Tribes. Within this planning area, this includes the villages of Mentasta Lake, Chistochina, Gakona, Gulkana, Tazlina, Copper Center, Cantwell, Chickaloon, and Eyak. Residents of these areas utilize Native and Village Corporation lands as well as BLM 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.

D. Impacts by Alternative

1. Issue 1: Travel Management

For a detailed description of the Travel Management proposals by alternative, see Table 3 in Chapter II beginning on page 58.

Table 38. OHV Designations by Alternative

OHV Designation	Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Open	6,755,000	96	6,755,000	96	0	0	0	0
Limited to designated trails	196,000	3	196,000	3	3,392,000	48	1,692,000	24
Limited to existing trails	105,000	1	105,000	1	3,369,000	48	5,320,000	75
Closed	0	0	0	0	295,000	4	44,000	<1

* Percent of BLM-managed lands (7,056,000 acres) within the planning area.

a) Impacts Common to All Alternatives

(1) Access

(a) 17(b) Easements

Consistent with ANCSA, the BLM would continue to manage 17(b) easements that access public lands across Native lands. Where 17(b) easements access public lands other than BLM-managed lands, the BLM would attempt to transfer management responsibility of the easement to the appropriate agency. Easement termination would only occur where documented non-use exists and would be subject to public involvement. To ensure maintenance of access to public lands as ANCSA conveyances take place, the Glennallen Field Office staff would recommend the extension of 17(b) easements or reserve new easements as needed. There would be little to no decrease in access currently provided by 17(b) easements.

b) Alternative A

(1) Access

The only areas with any travel restrictions in place are the 196,000-acre Tangle Lakes Archaeological District (TLAD), which was designated as “limited” to OHVs in 1982, and the Delta and Gulkana Wild and Scenic River corridors (with a combined acreage of 105,000 acres), which were designated as “limited to existing trails” for OHVs in 1983. These areas comprise 301,000 acres, or 4 percent of the BLM-managed lands in the planning area. No new travel restrictions would be implemented under Alternative A. Once on public lands, there would be very few limits to access.

(2) OHV Management and Trails

Existing OHV designations would remain in place in TLAD (OHVs limited to designated trails) and trails in the Delta and Gulkana Wild and Scenic River corridors would be designated (OHVs limited to existing trails). Outside of these three areas, the proliferation of unmanaged OHV trails would continue, with a net increase of OHV trails throughout the area. Impacts to trails would continue and development of additional trails on potentially unsuitable soils would create more rutting, trail braiding, thermal erosion, mud bogs, and maintenance needs. The backlog for trail maintenance, even when prioritized based on the worst resource problems, would increase.

(3) Roads

Alternative A would see a slight potential for increase in new road construction associated with mineral exploration and development on State and Native corporation lands. “Slight” increase in this case means an increase in minor gravel roads of 1-10% over what is listed in Table 14. Existing Roads within the Planning Area on page 184. Because of constraints associated with land selection and ANCSA (d)(1) withdrawals, little to no mineral development would occur on BLM-managed lands. Proposed roads would access activities on State and Native corporation lands.

c) Alternative B

(1) Access

Same as for Alternative A.

(2) OHV Management and Trails

Same as for Alternative A.

(3) Roads

This alternative would result in a moderate increase in new road construction associated with mineral exploration and development on BLM-managed lands, as well as forestry activities on BLM-managed lands. Moderate means an anticipated increase in minor gravel roads of 20-40% over what is listed in Table 14. Existing Roads within the Planning Area on page 184. There would also be moderate potential for an increase in new road construction associated with resource development on State and Native corporation lands. Roads on BLM-managed lands would be subject to Required Operating Procedures to minimize impacts. This alternative would result in more potential new road construction than would any other alternative.

d) Alternative C

(1) Access

Alternative C would limit OHV travel to existing or designated trails on 6,768,000 acres (96 percent) of BLM-managed lands, and close 281,000 acres (4 percent) to OHV use. While access to public lands would still be provided, the once unlimited motorized access on public lands would no longer be available, and some areas would not be accessible to motorized users. This alternative is the most restrictive on motorized user's ability to access public lands using motorized means.

(2) OHV Management and Trails

As described in the previous paragraph ((1) Access) for this alternative, OHV travel would be limited to existing or designated trails on all BLM-managed lands, and closed to motorized use on the areas listed above. These designations would minimize the unmanaged proliferation of trails, though some proliferation would still occur, especially on State-selected lands (where OHVs would be limited to existing trails) where specific trail designations and enforcement might not occur unless selections are relinquished by the State and the BLM retains long-term ownership. OHV restrictions would reduce impacts such as rutting, trail braiding, mud bogs, and thermal erosion. Over the planning period, trail designations would allow the BLM to focus maintenance on specific existing and designated trails. While more OHV use might be focused on existing trails as a result of these designations, trail hardening or rerouting would minimize negative impacts over time.

(3) Roads

This alternative would result in very little potential for new road construction due to specific area designations (including ACECs, SRMAs, and RNAs) restricting or prohibiting road construction, as well as the maintenance of most ANCSA (d)(1) withdrawals within those areas with specific designations to provide maximum

protection for resource values. These actions would severely constrain potential for mineral exploration or development. Very little commercial timber harvest or the associated construction of roads to provide harvest access would occur on BLM-managed lands because of the constraints on road construction and on forestry activities.

e) Alternative D (Proposed RMP)

(1) Access

This alternative would limit OHV travel to existing or designated trails on 99 percent of all BLM-managed lands, and close 1 percent of land to OHV use (snowmachines in the Delta Mountains sub-unit). As described in Chapter II, the closure of some specific trails to motorized use would be considered in implementation-level planning in order to meet objectives. While access to public lands would still be provided, the once unlimited motorized access on public lands would no longer be available. This alternative is slightly less restrictive on motorized user's ability to access all public lands using motorized means than Alternative C, and more restrictive than Alternative A or B.

(2) OHV Management and Trails

As described under *Access* in the previous paragraph, OHV travel would be limited to existing or designated trails on 99 percent of all BLM-managed lands. These designations would minimize the unmanaged proliferation of trails, though some proliferation would still occur, especially on State-selected lands where trail designation and enforcement would not occur unless the State relinquished their selection and the BLM retained long-term ownership. OHV restrictions would reduce impacts such as rutting, trail braiding, mud bogs, and thermal erosion, particularly on unencumbered BLM lands where specific trail designations and enforcement would occur as implementation-level planning takes place. Over the planning period, these designations would allow BLM to focus maintenance on specific existing and designated trails. More use might occur on designated trails as a result of these designations, but trail hardening and rerouting would minimize negative impacts over time.

(3) Roads

There would be a slight increase in new road construction under this alternative over the amount of construction that would occur under Alternative A. "Slight increase" in this case means an anticipated increase in minor gravel roads of 5-20% over what is listed in Table 14. Existing Roads within the Planning Area on page 184. No new roads would be permitted within the Gulkana Wild and Scenic River corridor. Road construction would be avoided in all segments of the Delta Wild and Scenic River corridor, but overland transportation systems within or across the river corridor may be authorized if it is determined that there are no economically feasible and prudent alternative routes.

New roads would be permitted subject to seasonal or visual impact restrictions in the Delta bison calving area, Nelchina caribou calving area, West Fork Gulkana area, and Denali Highway area.

2. Issue 2: Recreation

For a more detailed description of the Recreation proposals by alternative, see Table 4 in Chapter II beginning on page 75.

Table 39. Special Recreation Management Area Designations by Alternative

Area	SRMA Acreage by Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Delta River	0	0	0	0	44,000	<1	44,000	<1
Denali Highway	0	0	0	0	559,000	8	0	0
Gulkana River	0	0	0	0	105,000	1	105,000	1
Tiekel	0	0	0	0	848,000	12	120,000	2
Delta Range	0	0	0	0	360,000	5	360,000	5
Total	0	0	0	0	1,916,000	27	629,000	9

* Percent of BLM-managed lands (7,056,000 acres) within the planning area.

a) Impacts Common to All Alternatives

(1) Impacts to Recreation from Wild and Scenic River Management

(a) Gulkana Wild and Scenic River Corridor

The Gulkana Wild and Scenic River corridor would continue to be managed under the 1983 River Management Plan for the Gulkana National Wild and Scenic River until a revised river management plan is released in early spring 2006. This revised plan will establish visitor use limits based on monitoring of standards, and prescribe management to address impacts such as human waste, litter, and campsite impacts. The revised plan will maintain ANILCA withdrawals against mineral leasing or locatable mineral entry within the entire Wild and Scenic River corridor. Outstandingly remarkable values for which the river was designated would continue to be protected.

(2) Impacts to Recreation from Vegetation Management

(a) Fire Management

Fire promotes vegetation and wildlife diversity, which can enhance recreation opportunities in both the short- and long-term. Vegetative diversity provides variation in vegetation types, providing variation in form, texture, and color and enhancing scenic qualities. Long-term opportunities for wildlife viewing or hunting may be enhanced by new vegetation growth and improved habitat quality. Negative effects of fire on recreation are generally short-term and are directly related to fire's

effects on specific resources used in recreation, such as recreation facilities. Effects on visual and cultural resources, wildlife, and vegetation would have immediate and direct effects on use of these resources for camping, sightseeing, hunting, and other activities. Recreation users are generally mobile, thus, if recreation is precluded by fire in one area, they generally can find an alternate area in which a similar recreational activity can be pursued. However, smoke thick enough to limit aircraft flights could result in impacts on recreational and commercial activities.

(3) Impacts to Recreation from Mineral Exploration and Development

(a) Oil and Gas Leasing

Oil and gas development has the potential to create impacts to recreation, particularly if development occurs in areas that provide primitive or semi-primitive recreation experiences. Construction of roads, pipelines, powerlines, and other necessary infrastructure would compromise any primitive, semi-primitive, or semi-primitive motorized experience. By creating linear features (such as roads and pipelines) across the landscape, oil and gas development has the potential for significantly impacting visual resources. Public access into areas of development would have secondary effects on adjacent areas by increasing visitor use and leading to the development of additional dispersed campsites and trails. In areas managed for a roaded-natural experience, additional access provided by oil and gas roads could positively affect the recreation experience.

(b) Locatable Minerals

Existing small placer mining operations (disturbing less than five acres) have provided secondary access to recreational opportunities. In areas managed for a primitive or semi-primitive experience, access roads and associated mining infrastructure, even that needed for small operations, would compromise the recreation experience. Large-scale mining operations with associated infrastructure (such as roads and powerlines) would have similar effects to recreation as described under (a) *Oil and Gas Leasing* above.

b) Alternative A

(1) Impacts to Recreation from Travel Management

(a) OHV Management and Trails

Primitive and semi-primitive recreation opportunities would be maintained on lands currently designated for OHVs as “limited” to designated trails (TLAD and the Delta and Gulkana Wild and Scenic River corridors). As all other BLM-managed lands

within the planning area would remain “open” to OHV use, trail proliferation would continue, with increased user conflicts and impacts to visual resources. In these areas, some primitive and most semi-primitive recreation experiences would trend towards semi-primitive motorized or roaded-natural experiences. In the Delta Range area, dispersed snowmachine use would increase and snowmachines would continue to access areas that have traditionally provided non-motorized winter mountaineering and backcountry skiing opportunities.

(b) Roads

This alternative would result in a slight potential for increases in road construction associated with mineral exploration and development on State and Native Corporation lands. Road construction would result in direct and indirect significant impact to primitive recreation experiences. These impacts would occur through increased visitor encounters, the introduction of motorized use into the area, and potential impacts to the visual resource.

(2) Impacts to Recreation from Recreation Designations

No Special Recreation Management Areas (SRMAs) would be designated under Alternative A. The failure to consider the addition of public use cabins to the range of recreational experiences currently available would limit opportunities for those seeking road-accessible and remote backcountry experiences. The strong seasonal demand for public use cabins would not be met.

Current levels of environmental education and interpretation would continue, providing some opportunities to increase public awareness regarding cultural and natural resources, encourage ethical and sustainable use, and establish collaborative working relationships with the State, Native or village corporations, and special interest groups.

(3) Impacts to Recreation from Natural and Cultural Resource Protection

No Areas of Critical Environmental Concern (ACECs) or Research Natural Areas (RNAs), designations that provide measures for the protection of specific resource values, would be designated under this alternative. In general, resource values would be afforded less protection and wildlife viewing opportunities may decrease without the protective measures offered by these designations. No Required Operating Procedures or Oil and Gas Leasing Stipulations would be developed, which could result in direct impacts to resources from permitted activities. Impacts to resources described below would indirectly impact recreation experiences by impacting wildlife and fisheries habitat, water quality, and visual resources.

(4) *Impacts to Recreation from Wild and Scenic River Management*

(a) Delta Wild and Scenic River Corridor

No specific recreation objectives or visitor use limits would be established. With increased visitor use, this lack of objectives and limits would result in the loss of primitive and semi-primitive experiences on the river. Trails would not be designated (except within TLAD, where trail designations already exist and would continue common to all alternatives) so some proliferation of motorized trails within the corridor would occur. Locatable mineral entry would be allowed on 16,000 acres in the scenic segment of the river corridor. With mineral exploration or development occurring in the river corridor, scenic, cultural, and primitive recreation experience values would be difficult to maintain; conversely, access to a semi-primitive motorized experience and subsistence resources would be increased.

Acquisition of lands within the Delta and Gulkana Wild and Scenic River corridors would allow opportunities for more active management of the recreation use that has occurred historically and provide protection of these resources to ensure long-term positive recreation experiences. Consistent with management direction in the 1983 River Management Plans for both the Delta and Gulkana Rivers, both corridors are identified as emphasis areas for land acquisition as willing seller opportunities arise.

(5) *Impacts to Recreation from Lands and Realty Actions*

(a) FLPMA Disposals

No disposals would occur in the Slana area other than those associated with the resolution of unauthorized use. There would be no impact to recreation.

(b) Acquisitions

Under Alternative A, acquisitions would continue to be considered on a case-by-case basis as opportunities arise. Where acquisitions of private inholdings occur, particularly in heavy use recreation areas, they would provide a benefit to recreation by eliminating the potential for private development or limitations on access.

(c) Land Use Authorizations

Rights-of-way, R&PP leases, FLPMA permits and leases, and military permits would be determined on a case-by-case basis. Leases and permits often result in additional developments that may result in significant adverse effects on areas being managed for a primitive recreation experience. These effects may include impacts to visual resources, increased visitor encounters, and a diminished recreation experience. Alternative A would address mitigation of these effects on a case-by-case basis as no area-wide constraints on authorized uses are identified. Therefore,

Alternative A has more potential for negative impacts to recreation than do Alternatives C and D, but less potential than does Alternative B.

(d) Withdrawal Review

Under Alternative A, no withdrawal review would take place and, pending some other legislation, all ANCSA (d)(1) withdrawals would be maintained.

(e) Transportation and Utility Corridor Withdrawals

The transportation and utility corridor would be maintained as under current management. This area would continue to provide roaded natural and semi-primitive motorized recreation opportunities.

(6) *Impacts to Recreation from Vegetation Management*

(a) Forest Products

Current levels of timber harvest (approximately 40 acres/year) and firewood and house log permitting on BLM-managed lands have little effect on recreation. Existing, temporary, or winter roads are utilized for these activities, and most harvest areas are adjacent to existing roads or highways. Consideration of existing recreation facilities or trails is given on a case-by-case basis, with appropriate buffers provided. The continuation of forestry practices at this level would have little to no effect on recreation.

(7) *Impacts to Recreation from Mineral Exploration and Development*

(a) Oil and Gas Leasing

No oil and gas leasing would occur under Alternative A; therefore, there would be no effects.

(b) Locatable Minerals

Given existing constraints (ANCSA (d)(1) withdrawals), little potential exists for large scale mining operations to occur on BLM-managed lands, and none could occur on BLM-managed lands within the viewshed of the Denali Highway because of existing ANCSA (d)(1) withdrawals in the Denali Scenic Highway Study Corridor. Given these constraints, no effects to recreation would occur from new development under this alternative.

(c) Mineral Materials

Most gravel pit development occurs within or adjacent to existing highway right-of-ways. Consequently, gravel extraction has little impact on recreation experiences but can negatively impact visual resources. In the planning area, old gravel pits provide de-facto parking areas, motorized play areas, and swimming holes. Given current development levels, no effects to recreation would occur under this alternative.

c) Alternative B

(1) Impacts to Recreation from Travel Management

(a) OHV Management and Trails

Same as for Alternative A.

(b) Roads

This alternative would result in a moderate increase in road construction associated with mineral exploration and development on BLM-managed lands, as well as forestry activities on BLM-managed lands. Road construction would result in direct and indirect significant impacts to primitive recreation experiences. These impacts would occur through increased visitor encounters, the introduction of motorized use into the area, and potential impacts to visual resources. In most areas, the construction of roads would move the recreation experience from primitive, semi-primitive, or semi-primitive motorized to a roaded-natural experience. Roads that access a specific resource development could result in an unmanaged proliferation of trails and satellite dispersed sites around these access points.

Road construction in areas managed for a semi-primitive motorized or roaded-natural experience could provide a positive impact by providing additional access to these areas.

(2) Impacts to Recreation from Recreation Designations

No SRMAs are proposed under this alternative. Generally, recreation objectives within this alternative are to allow existing recreation experiences to trend towards a more developed experience. Increasing visitor use would be addressed through the construction of new facilities rather than through the use of intensive management, establishment of visitor capacity, or regulations.

In general, this alternative would result in existing recreation experiences trending into at least the next class of development along the Recreation Opportunity Spectrum. For

example, many semi-primitive experiences currently available near existing roadways would trend towards semi-primitive motorized or roaded-natural experience. No attempts would be made to maintain primitive experiences, and, given currently increasing user trends, most would trend towards semi-primitive or semi-primitive motorized experiences. The exception would be those areas of BLM-managed lands that are completely inaccessible because of their remote nature (such as the Bering Glacier). Without visitor use limits for commercial and general users in certain areas, recreational experiences and natural resources would be degraded and user conflicts would develop.

Under this alternative, the 135-mile Denali Highway would be designated as a Back Country Byway. This designation would enhance public awareness of the Highway and increase visitation and recreation within the highway corridor and adjoining lands. The potential ramifications of this designation are displacement of traditional uses and users and the need for more developed facilities as proposed to accommodate the potential increase in visitation.

This alternative allows for the indiscriminate placement of public use cabins. This may be a positive impact in some areas, but may compromise recreation objectives in other areas.

Development of additional facilities would redirect recreational use to specific areas, alleviating unmanaged use of other areas while meeting public demand associated with increasing visitation. Establishment of visitor centers and viewpoints would enhance the delivery of environmental education and interpretation opportunities that would increase public awareness regarding cultural and natural resources, encourage ethical and sustainable use, and establish collaborative working relationships with the State, Native or village corporations, and special interest groups.

(3) Impacts to Recreation from Natural and Cultural Resource Protection

Alternative B adopts the Required Operating Procedures and Oil and Gas Leasing Stipulations, but does not designate any ACECs or RNAs. In general, application of Required Operating Procedures and Stipulations would protect relevant and important values, preventing irreparable damage and reducing threats within the affected areas. Measures proposed in order to protect resource values would significantly impact recreation opportunities and experiences, specifically:

- Maintenance of healthy fish and wildlife populations would culminate in enhanced fishing, hunting, and wildlife viewing.
- Protection of cultural resources would provide opportunities for interpretation of cultural and social histories to enhance visitor experiences.
- Healthy watersheds would support a vast array of recreational opportunities for present and future generations.

If no ACECs or RNAs are designated, resource values would be afforded less protection and wildlife viewing opportunities may be decreased. This alternative affords less protection to special values than do Alternatives C and D, but more protection than does Alternative A because of the implementation of ROPs.

(4) Impacts to Recreation from Wild and Scenic River Management

(a) Delta River

Recreation objectives under Alternative B would allow for primitive recreation experiences to trend towards semi-primitive or semi-primitive motorized experiences. No motorized restrictions or horsepower limits would be proposed for the Tangle Lakes. No visitor use limits would be established, which would eventually lead to an increase in user conflicts, degradation of resources at specific points (such as campsites), and displacement of some users. Mineral exploration and development would be allowed to occur within the scenic and recreational portions of the river, which could compromise scenic values as well as the primitive and semi-primitive experiences that currently exist. Overall, this alternative would do the least to protect the outstandingly remarkable values within the river corridor.

(5) Impacts to Recreation from Lands and Realty Actions

(a) FLPMA Disposals

Land disposals in Slana would have little effect on future recreational opportunities as current opportunities are minimal. Land disposals elsewhere within the Glennallen Field Office may have significant effects. Development would likely occur on these disposals, negatively impacting visual resources and altering recreation experiences. By identifying specific tracts for disposal, Alternative B has more potential to impact recreation than does Alternative A.

(b) Acquisitions

No acquisitions are considered under this alternative. In the future, areas with recreation potential may become available that would expand or increase recreation opportunities; failure to acquire these lands may negatively impact future recreation opportunities. By identifying no areas for acquisitions, this alternative closes the door on future opportunities as compared to Alternative A, which identifies the Delta and Gulkana Wild and Scenic River corridors as emphasis areas for acquisitions.

(c) Land Use Authorizations

Rights-of-way, R&PP leases, FLPMA permits, and military permits would be determined on a case-by-case basis. Leases and permits often result in additional developments that may result in significant adverse effects on Wild and Scenic River corridors and primitive recreation experiences. These potential effects may include

impacts to visual resources, increased visitor encounters, and a diminished recreation experience.

(d) Withdrawal Review

This alternative would revoke all existing ANCSA (d)(1) withdrawals, which would allow increased mineral exploration and development on unencumbered BLM lands and on lands currently selected that are relinquished because of over-selection by the State or Native Corporations. For effects of mineral exploration and development on recreation, see discussion below under *(6) Impacts to General Recreation from Minerals Exploration and Development*.

(e) Transportation and Utility Corridor Withdrawals

Alternative B would revoke the transportation and utility corridor withdrawal, which would allow increased mineral exploration and development on unencumbered BLM lands and on lands currently selected that are relinquished because of over-selection by the State or Native Corporations. Revocation would also allow conveyance of the transportation and utility corridor to the State. This would eliminate two of the SRMA designations proposed under alternatives C and D (Delta Range and Tiekel SRMAs) and the areas would be managed by the State of Alaska. Without an emphasis on recreation management in these areas, one could expect, in accessible areas, a trend from primitive and semi-primitive opportunities towards semi-primitive motorized and roaded natural experiences.

(6) Impacts to Recreation from Vegetation Management

(a) Forest Products

The effects of aggressive harvest (100-200 acres/year) of commercial and personal wood products in beetle kill areas have the potential to significantly impact visual resources. These effects, however, can be mitigated through the use of harvest methods other than clear cutting, or through the use of contoured and irregular cutting units. The potential for road development related to the harvest of wood products may be beneficial to recreation in areas managed for semi-primitive or roaded natural experiences if the vegetation management areas are designated using sound and responsible long-term recreational planning objectives. For information on the impacts of road construction on recreation, see the discussion above under *(1) Impacts to Recreation from Travel Management, (b) Roads*.

(7) Impacts to Recreation from Mineral Exploration and Development

(a) Oil and Gas Leasing

This alternative would have the greatest potential of all the alternatives for oil and gas exploration and development given the revocation of all ANCSA (d)(1) withdrawals and the lack of area-wide constraints such as ACEC or RNA designations. The anticipated level of development would be twice that described in the Reasonably Foreseeable Development Scenario under the *Analysis Assumptions and Guidelines for Leasable Minerals* on page 409, as follows: Ten frontier wildcat wells would be drilled during phase one exploration, with an additional six wells drilled after discovery is made; two of the initial ten wells would have an appreciable show resulting in six field delineation wells.

- Two gas fields likely would be developed. Each gas field would initially consist of 10 production wells. Eight additional development wells would be drilled with the assumption that four of the total number of wells in the field would be sub economic and thus have short-term impacts.
- Typical life of a producing well is 10 to 12 years of gas production; therefore, 2-6 of the 12 gas production wells may be plugged during the planning period. Field abandonment may take from 2-5 years after production ends.
- Approximately 120 miles of transmission pipeline would be needed to transport the gas out of the planning area to the existing pipeline network in the Anchorage/Mat-Su area.
- A compression/gas plant facility would be developed as part of the field's infrastructure.
- Two in-field underground injection wells would be permitted and installed to dispose of drilling waste, wastewater, spent fluids, chemicals, and the produced water.

General impacts from these kinds of development activities are described in *Impacts Common to All Alternatives, Impacts to Recreation from Mineral Exploration and Development* on page 419. Alternative B anticipates the highest level of oil and gas exploration and development of all alternatives, and therefore has the highest level of impacts to recreation.

(b) Locatable Minerals

This alternative anticipates the most exploration and development for locatable minerals given the revocation of all ANCSA (d)(1) withdrawals and the lack of area-wide constraints such as ACEC or RNA designations. Dependent on gold prices, there would be a moderate increase in small placer operations on BLM-managed lands. Large operations are possible during the planning period, but would most likely occur on State lands. Roads or infrastructure necessary for those operations, however, would cross BLM-managed lands. For general impacts to recreation, see *Impacts Common to All Alternatives*.

(c) Mineral Materials

Gravel pit development in support of other resource development activities and road construction is expected to increase under this alternative. Under Alternative B, only the Gulkana Wild and Scenic River corridor and the wild segment of the Delta Wild and Scenic River corridor would be closed to mineral material development. Impacts to recreation would be a result of impacts to visual resources. More de-facto camping and parking areas would develop out of old gravel pits than under Alternative A, thus increasing access points and dispersed recreation areas along the transportation corridor.

d) Alternative C

(1) *Impacts to Recreation from Travel Management*

(a) OHV Management and Trails

This alternative would be the most effective at maintaining a diversity of recreational experiences across the landscape over time based on stringent measures to regulate OHV use. All areas would be designated as either limited (96 percent) or closed (4 percent) to OHV use, and some areas would be closed to snowmachines. Within areas where OHVs are limited to existing trails (i.e., on State-selected lands), new impacts from OHVs would be only slightly reduced and the unmanaged proliferation of trails would continue to some extent because trails would not be designated and designations would not be enforced until implementation-level planning occurred. The focus for implementation-level planning would be on unencumbered lands, as conveyance may take place for selected lands before implementation-level planning for those lands could occur. Impacts to recreation in these areas would result in a gradual trend away from primitive recreation experiences towards semi-primitive motorized or roaded natural experiences. Within limited designation areas where OHVs are limited to designated trails, the BLM would have the tools to more intensively manage the effects of OHV use by reducing impacts to natural and cultural resources and supporting State of Alaska anadromous stream crossing regulations. Within these areas, primitive, semi-primitive, and semi-primitive motorized recreation experiences would be maintained. Lands that would be closed seasonally to OHV use would provide quiet recreation opportunities. These areas would ensure the maintenance of a primitive or semi-primitive recreation experience. Lands that would be closed to snowmachine use (170,000 acres) would provide quiet recreation opportunities. In the Delta Mountains sub-unit, seasonal closure to snowmachines would ensure maintenance of a primitive non-motorized backcountry skiing and mountaineering experience. Some OHV users may be temporarily displaced during seasonal closures, which may increase use in limited or open areas. This displacement and shifting of use may result in redeployment of management and maintenance oversight to those areas.

(b) Roads

This alternative would result in very little potential for new road construction. Areas closed to road development would preserve ecological integrity, as well as visual resources and existing recreation experiences. The potential for new road construction would be similar to that under Alternative A; however, Alternative C would apply ROPs and area-wide constraints to protect resources.

(2) Impacts to Recreation from Recreation Designations

Five areas totaling 1,916,000 acres would be designated as SRMAs under Alternative C: Delta River (44,000 acres), Denali Highway (559,000 acres), Gulkana River (105,000 acres), Tiekel (848,000 acres), and Delta Range (359,000 acres). These designations would allow for intensive management and preservation of identified high value recreation resources to ensure the protection of visual resources and the maintenance of the recreation experiences currently available. The expanded acreage proposed for inclusion in SRMAs under this alternative as compared with Alternative D, which proposes 629,000 acres for SRMA designation, would afford enhanced protections to the viewsheds and watersheds, preserving high value recreation resources. Increased delivery of environmental education and interpretation would increase public awareness regarding cultural and natural resources, encourage ethical and sustainable use, and establish collaborative working relationships with the State, Native or village corporations, and special interest groups.

The establishment of visitor use limits in specific areas would help ensure the quality of recreation experiences for commercial and non-commercial users while protecting the resources. However, establishment of visitor use limits may limit recreational opportunities for some as well as opportunities for commercial development or expansion for others.

By electing not to develop additional road accessible facilities, the demand for increased developed visitor services and the opportunity to direct visitor use to sustainable locations would be negatively affected. Unmanaged use of undeveloped areas would ultimately increase resource damage, resulting in the proliferation of user-created dispersed camping areas, trails, and waysides. The failure to consider the addition of public use cabins to the range of recreational experiences currently available would limit opportunities for those seeking road-accessible and remote backcountry experiences. A strong seasonal demand for public use cabins would not be met.

(3) Impacts to Recreation from Natural and Cultural Resource Protection

In general, application of resource protection measures (through the establishment of ACECs and RNAs and implementation of ROPs) would protect relevant and important values, preventing irreparable damage and reducing threats within affected areas.

Actions proposed by other programs in order to protect resource values would positively impact recreation opportunities and experiences, as described below.

- Maintenance of healthy fish and wildlife populations would culminate in enhanced fishing, hunting, and wildlife viewing.
- Protection of cultural resources would provide opportunities for interpretation of cultural and social histories to enhance visitor experiences.
- Healthy watersheds would support a vast array of recreational opportunities for present and future generations.
- Active trail inventory and management would curtail trail proliferation, prevent new resource damage, reduce user conflicts, and allow for successful maintenance of visual resources and current recreation opportunities.

(4) Impacts to Recreation from Wild and Scenic River Management

(a) Delta River

Alternative C would provide for management of the Delta River to maintain primitive experiences, which would require a high degree of regulation on visitor use, OHV use within the corridor, and other resource development in the corridor. This alternative would be the most effective at protecting the outstandingly remarkable values for which the Delta Wild and Scenic River was established.

(5) Impacts to Recreation from Lands and Realty Actions

(a) FLPMA Disposals

There would be no land disposals within the Glennallen Field Office other than those associated with resolutions of failed claims in Slana; therefore, there would be no adverse effects.

(b) Acquisitions

The acquisition of lands within the Delta, Gulkana, Denali Highway, and Tielke SRMAs that may become available would allow opportunities for more active management of recreation use than has occurred historically, and would provide for protection of the resources to ensure long-term maintenance of recreation opportunities in these areas.

(c) Land Use Authorizations

R&PP leases and FLPMA permits would not be authorized within any SRMA. Leases and permits often result in additional development. The absence of development would help to maintain existing recreation experiences.

(d) Withdrawal Review

Alternative C would maintain withdrawals on approximately 3 million acres of land, thus preventing minerals development and its associated impacts on recreation.

(e) Transportation and Utility Corridor Withdrawals

Same as for Alternative A.

(6) Impacts to Recreation from Vegetation Management**(a) Forest Products**

The effect of prohibiting personal use firewood gathering within the Delta and Gulkana Wild and Scenic River corridors would protect visual resources. However, the quality of the recreation experience may be diminished for those who can no longer gather firewood. The effect of focusing the harvest of commercial and personal wood products on certain areas would result in a concentration of impacts in areas of lower recreation priority. The potential for temporary winter road development related to the harvest of wood products is less under Alternative C than under any other alternative. This use of temporary winter roads may be beneficial to recreation if these areas are designed using sound and responsible recreation planning objectives.

(7) Impacts to Recreation from Mineral Exploration and Development**(a) Oil and Gas Leasing**

Alternative C identifies 4,141,000 acres as being open for leasing. However, 2,322,000 of those acres would only be open subject to major constraints (No Surface Occupancy). The remaining 1,819,000 acres are currently State- or Native-selected. Given these constraints, it is assumed that little to no oil and gas development would occur under this alternative.

(b) Locatable Minerals

Same as for Alternative A. Given the constraints proposed under Alternative C (maintenance of ANCSA (d)(1) withdrawals; designation of ACECs, RNAs, and SRMAs), no change is anticipated from the current situation.

(c) Mineral Materials

Same as for Alternative A. Given the constraints proposed under Alternative C (maintenance of ANCSA (d)(1) withdrawals; designation of ACECs, RNAs, and SRMAs), no change is anticipated from the current situation. The following areas

would be excluded from mineral material sale or development under this alternative: Delta Bison Calving ACEC, Nelchina Caribou Calving ACEC, West Fork ACEC, Delta River SRMA, Denali Highway SRMA, Gulkana River SRMA, Tiekel SRMA, and Bering Glacier RNA.

e) Alternative D (Proposed RMP)

(1) Impacts to Recreation from Travel Management

(a) OHV Management and Trails

This alternative would be the second most effective (after Alternative C) at maintaining a diversity of recreational experiences across the landscape over time based on measures to regulate OHV use. Ninety-nine percent of BLM-managed lands would be designated as limited to OHVs, and some areas would be closed to snowmachines. Within areas where OHVs are limited to existing trails (i.e., on State-selected lands), new impacts from OHVs would be only slightly reduced and the unmanaged proliferation of trails would continue to some extent because trails would not be designated and designations would not be enforced until implementation-level planning occurred. The focus for implementation-level planning would be on unencumbered lands, as conveyance may take place for selected lands before implementation-level planning for those lands could occur. Impacts to recreation in these areas would be a gradual trend away from primitive recreation experiences towards semi-primitive motorized or roaded natural experiences. Within limited areas where OHVs are limited to designated trails (24 percent of BLM-managed lands), the BLM would have the tools to more intensively manage the effects of OHV use by reducing impacts to natural and cultural resources and supporting State of Alaska anadromous stream crossing regulations. Within these areas, primitive, semi-primitive and semi-primitive motorized recreation experiences should be maintained. Portions of the Canwell and McCallum Creek drainages (44,000 acres) would be closed seasonally to snowmachine use. Seasonal closure to snowmachines would ensure maintenance of a primitive non-motorized backcountry skiing and mountaineering experience. Some OHV users may be temporarily displaced during the seasonal closures which may increase use in limited or open areas resulting in redeployment of management and maintenance oversight to those areas.

(b) Roads

This alternative anticipates a slight increase in road construction over that anticipated under Alternative A. Areas that are closed to road development would preserve the ecological integrity as well as maintain the visual resources and recreation experiences that exist in the area. Road development may have potential benefits to recreation if the development occurs in areas managed for a roaded

natural or semi-primitive motorized experience. Road construction in areas managed for a primitive or semi-primitive experience would permanently alter that experience by increasing access, resulting in increased use (encounters), proliferation of trails, and satellite recreation sites adjacent to roads.

(2) Impacts to Recreation from Recreation Designations

Four areas totaling 546,000 acres would be designated as SRMAs under Alternative D: Delta Range (276,000 acres), Delta River (44,000 acres), Gulkana River (105,000 acres), and Tielkel (120,000 acres). These designations would allow for the development of comprehensive management strategies, with the identification of specific goals and objectives, that would help preserve high value recreation resources while managing recreation experiences and visual resource impacts. Until those management strategies are in place, interim management for lands within the Denali and Tielkel planning regions would experience a minimal level of recreational management and development, potentially eroding the existing resource values and opportunities. If large contiguous tracts of land are retained in long-term Federal ownership within these areas, more developed recreation could be provided to the public, offering a broader spectrum of opportunities.

Development of additional facilities under this alternative would redirect recreational use to specific areas, alleviating unmanaged use of other areas while meeting public demand associated with increasing visitation. Management objectives for other areas, such as those managed for a primitive experience, could be improved by directing use to more sustainable locations if those areas are selected for the developments. The increased delivery of environmental education and interpretation would enhance public awareness regarding cultural and natural resources, encourage ethical and sustainable use, and establish collaborative working relationships with the State, Native or Village Corporations, and special interest groups.

The addition of public use cabins to the range of opportunities currently available would provide opportunities not only for those seeking road accessible experiences, but also to those seeking a remote, backcountry experience.

The establishment of visitor use limits in specific areas would help ensure positive recreation experiences for commercial and non-commercial users while protecting the resources. However, the establishment of visitor use limits may limit recreational opportunities for some users if implementation-level planning resulting in the use of permit systems.

Areas outside of SRMAs would not receive the management emphasis afforded SRMAs. In accessible areas, this may result in a gradual shifting of recreation experiences to a more developed Recreation Opportunity Spectrum class.

(3) Impacts to Recreation from Natural and Cultural Resource Protection

Where special designations are applied, effects under Alternative D would be similar to those described under Alternative C. However, Alternative D does not provide the level of area-wide protection afforded by Alternative C. Alternative C would designate 1.8 million acres as ACECs and RNAs, while Alternative D would designate 827,000 acres as the Bering Glacier RNA. Protective measures described for permitted activities in the ROPs would apply to both alternatives.

(4) Impacts to Recreation from Wild and Scenic River Management

(a) Delta River

As detailed in Chapter II, recreation objectives would be established to protect and maintain primitive, semi-primitive, and semi-primitive motorized experiences. This alternative would be more effective than Alternative A or B at protecting the outstandingly remarkable values for which the Delta Wild and Scenic River was established. Under this alternative, the BLM would modify PLO 5150 to allow conveyance to the State of approximately 59,000 acres north and west of the Delta River corridor. The State has expressed high interest in these lands because of the high mineral potential in the area. Increased mineral exploration and development in this area would almost certainly result in requests for access across the Delta Wild and Scenic River corridor. These requests would have to be carefully evaluated, consistent with section 1110 of ANILCA, as described in Chapter II of this document (page 51).

(5) Impacts to Recreation from Lands and Realty Actions

(a) FLPMA Disposals

Lands in the Slana area would be available for future disposal to resolve unauthorized use. This would have little to no effect on recreation experiences in the area. Some positive effects could result from clean up of some of the material left on abandoned homesites.

There would be minimal effects from the disposal of small isolated tracts within the Glennallen Field Office, though disposal of some tracts may displace local use within the area.

(b) Acquisitions

The acquisition of lands within the Delta SRMA and Gulkana SRMA that may become available would provide opportunities for a more active management spectrum of recreation use than has occurred historically, and would provide protection of the resources to ensure long-term quality of the recreation experiences

in these areas. Other land acquisitions within the Glennallen Field Office are not a priority and effects to recreation would be minimal.

(c) Land Use Authorizations

All land use authorizations would result in adverse effects on Wild and Scenic River corridors and primitive recreation experience areas. Potential effects may include increased visitor encounters, negative impacts to visual resources, and a diminished recreation experience. Alternative D identifies the Wild and Scenic River corridors as avoidance areas for these authorizations. Other SRMAs land use authorizations (outside the transportation and utility corridor) must be consistent with recreation objectives for the area.

(d) Withdrawal Review

Alternative D would maintain withdrawals on approximately 1.5 million acres, thus preventing mineral development and potential effects to recreation.

(e) Transportation and Utility Corridor Withdrawals

Same as for alternative A. However, Alternative D allows for modification of PLO 5150 to allow conveyance to the State of 83,000 acres north of Paxson. A part of this area (Gunn Creek) is an area on which a portion of the annual Arctic Man ski/snowmachine race is held, an event that attracts as many as 10,000 people and lots of dispersed snowmachine use. Conveyance to the State would not effect the permittee's ability to continue to conduct this activity. Conveyance of these acres to the State would reduce the size of the Delta Range SRMA by 83,000 acres. Without an emphasis on recreation management in these areas, one could expect, in accessible areas, a trend from primitive and semi-primitive opportunities towards semi-primitive motorized and roaded natural experiences. Mineral exploration and development in the area could accelerate this trend and have negative impacts on scenic values in the area.

(6) Impacts to Recreation from Vegetation Management

Alternative D identifies 144,000 acres as being suitable for commercial harvest, with an anticipated annual harvest of 40-100 acres. This harvest of commercial and personal wood products in beetle-kill areas has the potential to impact visual resources. These effects, however, could be mitigated through the use of harvest methods other than clearcutting, or through the use of contoured and irregular cutting units. Temporary road development related to the harvest of wood products may be beneficial to recreation in areas managed for semi-primitive motorized or roaded natural experiences if the vegetation management areas are designated using sound and responsible long-term recreational planning objectives.

(7) Impacts to Recreation from Mineral Exploration and Development

(a) Oil and Gas Leasing

Alternative D anticipates oil and gas exploration and development at the level described in the Reasonably Foreseeable Development Scenario under the *Analysis Assumptions and Guidelines for Leasable Minerals* on page 409, as follows: Five frontier wildcat wells would be drilled during phase one exploration, with an additional three wells drilled after discovery is made; one of the initial five wells would have an appreciable show resulting in three field delineation wells.

- One gas field likely would be developed. The gas field would initially consist of 10 production wells. Four additional development wells would be drilled with the assumption that two of the total number of wells in the field would be sub economic and thus have short-term impacts.
- Typical life of a producing well is 10 to 12 years of gas production; therefore, 1-3 of the 6 gas production wells may be plugged during the planning period. Field abandonment may take from 2-5 years after production ends.
- Approximately 120 miles of transmission pipeline would be needed to transport the gas out of the planning area to the existing pipeline network in the Anchorage/Mat-Su area.
- A compression/gas plant facility would be developed as part of the field's infrastructure.
- One in-field underground injection well would be permitted and installed to dispose of drilling waste, wastewater, spent fluids, chemicals, and the produced water.

General impacts from these kinds of development activities are described in *Impacts Common to All Alternatives, Impacts to Recreation from Mineral Exploration and Development* on page 419. The impacts associated with oil and gas development under Alternative D would be potentially greater than under Alternatives A and C, and approximately half that of impacts under Alternative B.

(b) Locatable Minerals

This alternative would maintain withdrawals against locatable mineral entry in both the Wild and Scenic River corridors and in the Bering Glacier area (totaling 1,068,000 acres), an area approximately five times larger than that proposed for closure under Alternative B. In areas open to locatable mineral entry, anticipated levels of mining activity and effects to recreation are similar to those described under Alternative B.

(c) Mineral Materials

Mineral material extraction under Alternative D would be prohibited in the Bering Glacier RNA, the Gulkana Wild and Scenic River corridor, and in the wild and scenic

portions of the Delta Wild and Scenic River corridor (though extraction would be allowed in the recreational portion of the Delta corridor). The Denali Highway is identified as an avoidance area. Other gravel pit development would be subject to measures described in the ROPs. Most gravel pit development occurs within or adjacent to existing highway right-of-ways. Consequently, gravel extraction has little impact on recreation experiences but can negatively impact visual resources.

3. Issue 3: Natural and Cultural Resources

For a more detailed description of the Natural and Cultural Resources proposals by alternative, see Table 5 in Chapter II beginning on page 98.

Table 40. Area of Critical Environmental Concern Designations by Alternative

Special Area Designation	Acres and Percentages by Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Area of Critical Environmental Concern								
Delta Bison Calving	0	0	0	0	19,000	<1	0	0
Nelchina Caribou Calving	0	0	0	0	389,000	6	0	0
West Fork	0	0	0	0	490,000	7	0	0
Total	0	0	0	0	898,000	13	0	0
Research Natural Area								
Bering Glacier	0	0	0	0	939,000	13	827,000	12

* Percent of BLM-managed lands (7,056,000 acres) within the planning area.

a) Soils

(1) Impacts Common to All Alternatives

(a) Impacts to Soils from Travel Management

1. OHV Management and Trails

Continuous OHV travel over a soil leads to compaction. There are several adverse environmental impacts associated with compaction, including increased soil erosion, increased runoff, increased soil surface strength, reduced vegetation production, alteration in plant succession, reduced soil permeability to air and water, reduced soil moisture, reduction in soil depth and organic matter, reduction of groundwater recharge, alteration of hydrological flows, reduced nutrient cycling, and increased risk of colonization by exotic species.

The most serious and permanent impact from OHVs is soil erosion, with water being the primary displacement mechanism. While soil compaction may recover to some degree during periods of non-use, erosion usually continues whether use stops or not. Most OHVs have powerful motors and deeply treaded tires. When the tires spin they displace large amounts of soil quickly, removing vegetation and topsoil and creating or accelerating ruts. This is especially evident on steep slopes, wetland crossings, and mud bogs. The displaced soil often finds its way into waterways, resulting in increased turbidity

and sedimentation. This can negatively impact water quality and numerous aquatic organisms, including fish species such as salmon that rely on spawning beds that can be covered up by sediment. Displaced soil can also bury down-slope vegetation.

2. Roads

The construction of roads could result in increased soil compaction, soil loss, and erosion. Compaction of native soils could occur through construction activity and excessive vehicle traffic in unpaved areas. Excessive surface water runoff or loss of protective vegetation cover could cause erosion.

(b) Impacts to Soils from Recreation

Most impacts from recreation on soils are related to OHV use, the impacts of which area described above under *OHV Management and Trails* on page 438.

Recreational activities generally do not cause long-term impacts to the soil, but some activities, such as extensive use of camping sites along roadways or rivers, may cause localized impacts that include soil loss and compaction.

(c) Impacts to Soils from Vegetation Management

1. Fire Management

Generally, there should be minimal impacts to the soils in the planning area due to fire. Many of the changes in soil chemical, physical, and biological properties that occur during a fire are related to the degree and duration of soil heating. In low intensity burns there would be enough remaining vegetative material and duff to impair most soil changes. Minor erosion of exposed mineral soil would occur from wind and rain in areas where intense burns create chemical changes through combustion of plant biomass sometimes heating and altering the underlying litter and mineral soil. In soils made up of permafrost and ice lenses where vegetation and duff material are completely burned, there is potential for post-burn thawing. This could result in sluffing and deep erosional channeling, especially in steeper areas. It is expected that post-burn vegetation would recover quickly through sprouting and natural seeding, restoring soil stability and making the erosional impacts to soil short-term in nature.

2. Forest Products

Most harvesting occurs in winter when the ground is frozen and covered with at least 8 inches of snow. This has helped reduce potential severe effects, especially in wet areas, from compaction and erosion. Even with winter soil conditions there is potential to damage vegetation mat and compact soils. In areas with permafrost and ice lenses, disturbance or removal of the duff layer may result in sluffing, especially on steeper slopes. In general, the more

severe the disturbance, the greater the potential for thaw of unstable slopes. Trees, shrubs, and organic mat provide insulation and protect the soils from raindrop fall (splash), surface runoff, and wind erosion. Impacts to soils due to timber harvest at times other than winter and especially when soils are wet could be very disruptive to ecosystems.

(d) Impacts to Soils from Mineral Exploration and Development

1. **Locatable Minerals**

Impacts to soils due to mining would include surface disturbance with removal of duff and vegetation materials; soil compaction; soil erosion through water and wind (dust); and removal of soil profile. Placer mining destroys the structure of the existing soil profile through stripping of overburden. Sometimes reclamation requires recontouring, overburden replacement, and fill placement in excavated areas. The materials used for filling usually do not match the original profile, they do not naturally drain, and are susceptible to further erosion, especially if not contoured or revegetated.

(2) ***Alternative A***

(a) Impacts to Soils from Travel Management

1. **OHV Management and Trails**

This alternative would result in the continued proliferation of unmanaged trails. Since there are significantly more acres open to OHVs with no limitations, it is anticipated there would be greater negative impacts to soils under Alternative A than under Alternatives C and D, and the same level of impacts as under Alternative B.

2. **Roads**

Alternative A would result in a slight potential for an increase in road construction associated with mineral exploration and development on State and Native Corporation lands. Existing standard stipulations would apply that minimize the effects of erosion; however, these stipulations are not as effective or protective as the Required Operating Procedures that would be applied under Alternatives B, C, and D.

(b) Impacts to Soils from Recreation

Other than maintenance of facilities, Alternative A makes no attempt to manage recreation activities through the designation of SRMAs, establishing objectives, or establishing visitor use limits for any areas. Impacts to soils would be greater under this alternative than under Alternative C or D, but would be the same as under Alternative B.

(c) Impacts to Soils from Natural and Cultural Resource Protection

No ACEC or RNA designations are proposed under Alternative A. Stipulations for permitted activities would be considered on a case-by-case basis.

(d) Impacts to Soils from Lands and Realty Actions

1. FLPMA Disposals

There would be no impact to soils from FLPMA disposals under this alternative as no additional lands in the Slana area would be made available for disposal other than those required to resolve unauthorized use.

2. Land Use Authorizations

Some permitted or leasing activities have the potential to negatively impact soils. Without the application of the Required Operating Procedures that would be required under all other alternatives, these activities would be more likely to cause adverse impacts to soils under Alternative A than under Alternative B, C, or D.

3. Withdrawal Review

Under this alternative, no withdrawal review would occur 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 potential soil-disturbing activities than under Alternative B or D.

4. Transportation and Utility Corridor Withdrawals

Alternative A would maintain the transportation and utility corridor withdrawal.

(e) Impacts to Soils from Vegetation Management

1. Fire Management

Alternative A proposes less vegetation management through the use of prescribed fire than does Alternative B or D.

2. Forest Products

Given the current level of forestry activities within the planning area (approximately 40 acres of commercial harvest per year) and assuming the continued use of temporary or winter roads, impacts of forestry activities under Alternative A would be minimal and less than Alternative B or D.

(f) Impacts to Soils from Mineral Exploration and Development

1. **Oil and Gas Leasing**

No oil and gas leasing would occur under this alternative.

2. **Locatable Minerals**

As most BLM-managed lands are currently closed to mineral entry, Alternatives A and C would have less impact to soils from mining activity than would Alternatives B and D.

3. **Mineral Materials**

Mineral material sales would continue to be considered on a case-by-case basis, with specific operating stipulations developed through the NEPA process. The current level of sales is low. Gravel extraction includes removal of topsoil to extract the underlying gravel. Gravel pits can stay open for long periods of time, but reclamation would include recontouring and respreading of topsoil on the site.

(3) Alternative B

(a) Impacts to Soils from Travel Management

1. **OHV Management and Trails**

Same as for Alternative A.

2. **Roads**

This alternative would result in a moderate increase in road construction associated with mineral exploration and development on BLM-managed lands as well as forestry activities on BLM-managed lands. Road construction could result in increased soil compaction, soil loss, and erosion. Compaction of native soils could occur through construction activities, concentrated visitor use, or excessive vehicle traffic in unpaved areas. Construction excavation and replacement of native soils with fills contribute to the reduction of local native soil. Excessive surface water runoff or loss of protective vegetative cover could cause erosion.

Alternative B would allow more road construction than any other alternative; therefore, effects to soils would be greater under this alternative than under Alternatives A, C, and D.

(b) Impacts to Soils from Recreation

Same as for Alternative A.

(c) Impacts to Soils from Natural and Cultural Resource Protection

No special designations, such as ACECs or RNAs, would be considered under this alternative; however, the ROPs and Stips that specifically address minimizing impacts to soil would be adopted for all permitted activities.

(d) Impacts to Soils from Lands and Realty Actions

1. FLPMA Disposals

Under this alternative, there would likely be land development in the Slana area following the disposal process. This development would have a negative impact on soils and vegetation as the surface is disturbed and vegetation is removed because of the construction of access road and structures. Soil loss (through compaction and erosion) per acre of disturbance would increase significantly, causing minor impacts until soils are stabilized, in most cases, through reestablishment of vegetation. This alternative would result in more land disposal than under any other alternative.

2. Land Use Authorizations

Permitted activities have the potential to create short-term soil disturbances; however, the ROPs that would be applied under this alternative would minimize soil disturbances from these activities.

3. Withdrawal Review

Alternative B would revoke most ANCSA (d)(1) withdrawals, which would allow for increased mineral development potential.

4. Transportation and Utility Corridor Withdrawals

Alternative B would allow conveyance of the transportation and utility corridor to the State and would open the corridor to potential mineral development.

(e) Impacts to Soils from Vegetation Management

1. Fire Management

Alternative B proposes approximately 1.5 million acres of prescribed burning for habitat improvement and fuels reduction, the same acreage recommended under Alternative D, and more than recommended under Alternative A or C.

2. Forest Products

Under Alternative B, adoption of the Required Operating Procedures would minimize negative impacts to soils occurring from forestry activities. However, because of the number of acres proposed for potential harvest (100-200

acres/year), and the number of miles of potential new roads needed to access those acres, this alternative has more potential to adversely impact soils than does Alternative A, C, or D.

(f) Impacts to Soils from Mineral Exploration and Development

1. Oil and Gas Leasing

This alternative would have the greatest potential of all the alternatives for oil and gas exploration and development given the revocation of all ANCSA (d)(1) withdrawals and the lack of area-wide constraints such as ACEC or RNA designations. The anticipated level of development under this alternative would be twice that described in the Reasonably Foreseeable Development Scenario, as described above under *Impacts to Recreation from Mineral Exploration and Development, Oil and Gas Leasing for Alternative B* on page 427. The Reasonably Foreseeable Development Scenario itself is described on page 409 under the *Analysis Assumptions and Guidelines* for leasable minerals.

Impacts to soils due to oil and gas production would potentially include surface disturbance with possible removal of duff and vegetative materials; soil compaction; soil erosion through water and wind (dust); and disturbance or removal of soil profile. Seismic operations could affect soils through the action of on-the-ground travel.

If the vegetative layer is removed or disturbed, the soil's insulation protection is then lost. The use of heavy equipment or vehicles has the potential to trample the vegetative layer and reduce insulation. All vehicle use has the risk of removing the vegetative mat. During the summer months soils are more susceptible to disturbance. The disturbed layer may contain large amounts of melt water and the saturated soils may not be capable of resisting the forces of vehicle traffic. In the foothills, where soils are thin or soils are well-drained, or vegetation is otherwise underlain by materials containing less water, vehicle traffic in the summer may result in less disturbance. Generally, frozen soils are capable of supporting the weight of heavy vehicles.

Holes are dug into the earth to construct well cellars (pits in the ground beneath the rig floor), resulting in soil loss and thermokarsting. This type of action would probably make up less than one acre of disturbance during the life of the plan under any anticipated development scenario. In addition, modern cellars often have insulated walls and floors to prevent the melting of surrounding permafrost during well drilling. Development of oil and gas work sites normally involves a long-term commitment of resources which includes sacrificing soils. Soils are destroyed through burial or truncation. Natural soils are completely covered by work pads, camp pads, roads, and pump stations made from sand, gravel, or rock fragments. The soil profile is destroyed by working material sites, conventional pipeline construction, digging, scraping,

and excavating. Off-pad traffic (including foot traffic) and other surface-disturbing activities damage the vegetative cover and surface organic mat. The exposed mineral portion of the soils may erode through wind and water. These activities also alter the thermal balance of the soils, and the risk of thermokarsting increases.

The amount of soil erosion increases with the amount of surface disturbance. The most effective mitigation is to keep the areas of surface disturbance as small as possible using design approaches to minimize the effect to the surrounding area. Under Alternative B, the effects of oil and gas leasing on soils, as described here, would be greater than under Alternative A or C, but would occur at twice the level anticipated under Alternative D.

2. Locatable Minerals

Because this alternative encourages development and presents the least amount of environmental constraints, it would have the greatest potential of all alternatives for direct impacts to soils from mining activities.

3. Mineral Materials

Alternative B anticipates a greater level of mineral material sales than under any other alternative. Where mineral material sales would occur, practices described in the ROPs in Appendix C would be followed. Even with an increase in mineral material sales, application of the ROPs would minimize impacts to soil through appropriate reclamation measures.

(4) Alternative C

(a) Impacts to Soils from Travel Management

1. OHV Management and Trails

Alternative C would have fewer negative impacts on the soil resources than all other alternatives as it closes more acres to OHV use and limits OHVs to designated or existing trails on more acres than any other alternative.

2. Roads

This alternative would result in very little potential for new road construction. Alternative C would have fewer negative impacts on the soil resources than all other alternatives as there are more acres that limit or prohibit road construction in this alternative than in any other.

(b) Impacts to Soils from Recreation

This alternative limits recreational use in specific areas through the establishment of visitor use limits for both general and commercial uses, limiting impacts somewhat in

specific areas. This positive effect could be off-set by the decision in this alternative to not build any additional recreational facilities. Heavy-use areas would consequently see increased impacts to soils, such as the compaction and removal of ground-cover vegetation.

(c) Impacts to Soils from Natural and Cultural Resource Protection

This alternative would designate three ACECs, five SRMAs, and one RNA with specific measures identified to protect resource values. These designations would indirectly benefit soils by restricting development in these areas. This alternative also adopts the ROPs, which contain specific measures for the prevention of soil erosion.

(d) Impacts to Soils from Lands and Realty Actions

1. FLPMA Disposals

No effects.

2. Land Use Authorizations

This alternative identifies specific areas where land use authorizations would be limited to protect specific resource values, resulting in an indirect benefit to soils.

3. Withdrawal Review

This alternative maintains withdrawals on approximately 50 percent of BLM-managed lands, severely limiting development. Maintenance of withdrawals would be an indirect benefit to soils.

4. Transportation and Utility Corridor Withdrawals

Same as for Alternative A.

(e) Impacts to Soils from Vegetation Management

1. Fire Management

Alternative C proposes the least amount of use of prescribed fire for habitat improvement or fuels reduction; it relies instead on wildland fire. While fewer acres may burn under this alternative, wildland fires may be more intense due to the build up of fuels, thus resulting in more duff removal and soil erosion.

2. Forest Products

Given the low level of forestry activities that are anticipated, the fact that most forestry activities would utilize temporary winter roads, and the application of

ROPs under this alternative, impacts to soils under Alternative C would be insignificant.

(f) Impacts to Soils from Mineral Development and Exploration

1. Oil and Gas Leasing

Alternative C identifies 4,141,000 acres as being open for leasing. However, 2,322,000 of those acres would only be open subject to major constraints (No Surface Occupancy). The remaining 1,819,000 acres are currently State- or Native-selected. Given these constraints, it is assumed that little to no oil and gas development would occur under this alternative.

2. Locatable Minerals

Alternative C anticipates the same level of locatable mineral exploration and development as does Alternative A, but the application of ROPs under this alternative would minimize impacts to soils from what limited mining activity would occur.

3. Mineral Materials

Alternative C anticipates the same level of mineral material sales as does Alternative A, but the application of ROPs under this alternative would minimize impacts to soils from what limited gravel extraction would occur.

(5) Alternative D (Proposed RMP)

(a) Impacts to Soils from Travel Management

1. OHV Management and Trails

The negative impacts to soils as a result of travel management under this alternative would be less than under Alternative A or B as Alternative D would result in more limits and controls on OHV use than would Alternatives A and B. Overall negative impacts to soils would be slightly greater than those under Alternative C.

2. Roads

This alternative anticipates few proposals for new road construction. Most proposals would be related to accessing private land adjacent to existing State highways. Under this alternative, the potential for increased road construction is less likely than under Alternatives A and B and therefore has a lower potential negative effect on soils. Application of measures identified in the ROPs would minimize adverse impacts from road construction.

(b) Impacts to Soils from Recreation

This alternative would minimize impacts from recreational OHV use by limiting OHVs to existing or designated trails and reducing cross-country travel. Alternative D also sets the framework for establishing visitor use limits in specific areas where impacts to soils are currently occurring (i.e., heavy use of dispersed camping sites causing soil compaction). This alternative also allows for the construction of new recreation facilities in areas of heavy recreation use to minimize the impacts currently resulting from heavy dispersed use. Alternative D would be more effective at minimizing negative impacts on soils than would Alternative A or B, and it would be equally effective as would Alternative C.

(c) Impacts to Soils from Natural and Cultural Resource Protection

The ROPs and Stips listed in Appendix C would be adopted under this alternative, and the Bering Glacier would be designated as an RNA. Alternative D also applies measures in other locations to protect specific resource values, such as seasonal constraints on certain activities in wildlife calving areas. Because of the adoption of specific measures to protect special values, this alternative would be more effective than Alternative A or B at protecting soil resources; it would be less effective at protecting soil resources than Alternative C.

(d) Impacts to Soils from Lands and Realty Actions

1. FLPMA Disposals

Disposal in the Slana settlement area would be used to resolve unauthorized use. Because development already occurs on these parcels, this action would have no effect on soils. In some cases, effects would be beneficial if clean up of abandoned or hazardous materials occurs.

Other disposals would have minimal impacts because of the small scale of the proposals and because development already exists on some tracts.

2. Land Use Authorizations

Alternative D adopts the ROPs listed in Appendix C, which would apply to all permitted activities and application of which would minimize impacts to soils. This alternative also limits leasing or permitting in the Bering RNA, the Delta and Gulkana Wild and Scenic River corridors, and caribou and bison calving areas to protect resource values in those areas. This alternative would be more effective at protecting soil resources from the impacts of land use authorizations than would Alternative A or B, and less effective than Alternative C.

3. **Withdrawal Review**

This alternative would maintain ANCSA (d)(1) withdrawals in the western two-thirds of the Bering Glacier RNA and in portions of the Delta Wild and Scenic River corridor. These withdrawals would prevent mineral leasing and locatable mineral entry. For the effects of mineral exploration and development on soils under this alternative, see *Impacts to Soils from Mineral Exploration and Development* below on page 449.

4. **Transportation and Utility Corridor Withdrawals**

Same as for Alternative A.

(e) **Impacts to Soils from Vegetation Management**

1. **Fire Management**

This alternative would allow for the use of more prescribed fire than would Alternative A or C, and allow for the same amount of use as Alternative B.

2. **Forest Products**

Alternative D anticipates a slight increase in forestry activities on BLM-managed lands, with those activities targeted specifically at the harvest of 144,000 acres of beetle-kill white spruce. Anticipated harvest level would be 40-100 acres/year. Given the forestry constraints that are generally practiced in the area (use of temporary, winter access) and the application of the ROPs that would be adopted under this alternative, the negative impacts to soils from forestry activities would be slight to insignificant.

(f) **Impacts to Soils from Mineral Exploration and Development**

1. **Oil and Gas Leasing**

The anticipated level of development under Alternative D would be at the level described in the Reasonably Foreseeable Development Scenario under the *Analysis Assumptions and Guidelines* for leasable minerals on page 409.

Alternative D would have more potential impact on soils from oil and gas exploration and development soils than would Alternative A or C, and half the impact that would occur under Alternative B.

2. **Locatable Minerals**

Alternative D anticipates potential mining exploration and development activities at levels less than those anticipated under Alternative B, but more than under Alternative A or C. Compared to Alternative B, no potential development would occur in the western two-thirds of the Bering Glacier RNA,

the inner corridor of the transportation and utility corridor, or in portions of the Delta Wild and Scenic River corridor.

3. Mineral Materials

The application of the ROPs adopted under this alternative would minimize the effects of gravel removal operations. This alternative anticipates gravel removal operations and effects to soils at lower levels than Alternative B, but at higher levels than Alternative A or C.

b) Water Quality

(1) Impacts Common to All Alternatives

(a) Impacts to Water Quality from Travel Management

1. OHV Management and Trails

Major impacts to water quality from OHV use include siltation and disruption of hydrologic systems. Continuous overland OHV use leads to vegetation trampling, soil compaction, and soil erosion. In addition, continuous stream crossings with an OHV can break down the streambed and bank. The consequence of overland travel and stream crossings is increased siltation in the water system. There is a noticeable breakdown of soils resulting from OHV use, and water is the main mechanism to relocate soil. Through erosion, muddy runoff from trails eventually ends up in waterbodies, affecting turbidity.

The hydrology of wetlands and bogs is generally controlled by shallow groundwater, organic soils, flat topography, and vegetation. OHV travel, especially in wetlands and bogs, creates large depressions that change drainage patterns. Many depressions may appear daunting to an OHV rider, who may go around the depression, trampling more vegetation and widening or braiding the trail. These actions can lead to severe erosion and alteration or death of vegetation. Disrupting the soils and vegetation in turn disrupts the hydrological balance.

2. Roads

Road construction negatively alters the hydrology of watersheds through changes in water quantity and quality, stream channel morphology, and ground water levels. Roads increase the amount of impervious surface in a watershed, resulting in substantial increases in peak runoff and storm discharges. When a road bed is raised above the surrounding land surface, as is normally the case, it will act as a dam and alter surface sheet flow patterns, restricting the amount of water reaching downstream areas.

Roads concentrate surface water flows, which can thereby increase erosion potential on road sides and cuts. Water tables are almost always lowered in the vicinity of a road. Culverts and bridges alter flow patterns by diverting natural flow patterns. Channelization removes natural diverse substrate materials, increases sediment loads, lowers the stream channel, reduces the stability of banks, and intensifies downstream flooding.

All roads produce sediment; unpaved roads continue to produce sediment for as long as they remain unvegetated.

(b) Impact to Water Quality from Recreation

Casual recreation uses such as hunting, fishing, camping, boating, and hiking generally do not cause long-term impacts to water quality. Within the planning area, most water quality impacts are associated with human waste disposal along rivers that experience a high volume of users and from water pollution generated by motorized watercraft, particularly those with two-stroke engines.

(c) Impacts to Water Quality from Vegetation Management

1. Fire Management

Wetlands and riparian zones are generally fire resistant except in extreme drought years. The riparian zones of tributaries and major river corridors contain a relatively small amount of volatile vegetation or vegetation that could create an intense type of burn. This would reduce post-burn potential for soil erosion into waterways effecting water quality. The primary effect of fire on water quality would be wind blown materials and rain wash of the exposed burned landscape, and eventual drainage and/or deposit of ashes and soils into the water system resulting in temporary water quality degradation. This is highly dependent on the intensity of the burn, exposure of mineral soil, and how completely materials are burned. The long-term benefits of most burns are an increase in the proportion of younger, more vigorous vegetation and greater soil stability. Fire generally results in long-term stabilizing effects on water quality.

(d) Impacts to Water Quality from Mineral Exploration and Development

1. Locatable Minerals

Possible impacts to water quality from mining would include degradation of water quality through sedimentation and other pollutants, changes in stream geometry, diversion of subsurface water flow, and depletion of water supplies. Thermal effects of construction, both in and out of the floodplain, could affect ground water movement and alter surface drainage. There could be long-term

water pollution from surface runoff and from material piles, along with materials that are potentially spilled such as lubricants for machinery.

(2) *Alternative A*

(a) Impacts to Water Quality from Travel Management

1. OHV Management and Trails

Ninety-six percent of BLM-managed lands in the planning would remain designated as open to cross-country OHV travel under Alternative A, with 4 percent of lands limited to designated or existing trails. No areas would be designated as closed to OHV travel. As a result, both this alternative and Alternative B (which proposes the same OHV acreage designations as does Alternative A) would have the greatest potential for short-term direct negative impacts to water quality resulting from OHV disturbance as compared to Alternatives C and D.

2. Roads

This alternative would result in a slight potential for an increase in road construction associated with mineral exploration and development on State and Native Corporation lands. Stipulations to minimize effects on water quality would be considered on a case-by-case basis. This would not provide the same level of protection as the ROPs that would be applied under Alternatives B, C, and D.

(b) Impacts to Water Quality from Recreation

Other than maintenance of recreation facilities, Alternative A provides no management of recreation activities through the designation of SRMAs, establishment of recreation objectives, or establishment of visitor use limits for any areas (other than the Delta and Gulkana Wild and Scenic Rivers, for which both objectives and visitor use limits have already been established). Impacts to water quality from unmanaged and unlimited recreational activities would be greater than for Alternative C or D, and the same as for Alternative B.

(c) Impacts to Water Quality from Natural and Cultural Resource Protection

There are no ACEC or RNA designations under Alternative A that would offer area-wide protection of resources. Stipulations to minimize effects to water quality from permitted activities would continue to be handled on a case-by-case basis.

(d) Impacts to Water Quality from Lands and Realty Actions**1. FLPMA Disposals**

The Slana disposal would have no impact on water quality because no additional lands would be made available for disposal other than those necessary to resolve unauthorized use. This alternative would have impacts similar to those under Alternative C, but fewer potential for impacts than under Alternative B or D.

2. Land Use Authorizations

Some permitted or leasing activities have the potential to negatively impact water quality. Without a set of ROPs, these activities are more likely to cause adverse impacts to water quality than they would under Alternatives B, C, and D.

3. Withdrawal Review

Under Alternative A, no withdrawal review would occur 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 potential water quality disturbing activities. This alternative maintains more withdrawals than does any other alternative.

4. Transportation and Utility Corridor Withdrawals

Alternative A would maintain the existing transportation and utility corridor and associated withdrawals, which would prohibit mineral leasing in the entire (both inner and outer) corridor, and prohibit mineral entry in the inner corridor.

(e) Impacts to Water Quality from Vegetation Management**1. Fire Management**

Alternative A would result in less prescribed burning than allowed under Alternative B or D, but more than allowed under Alternative C. Effects on water quality from prescribed fire are generally minimal because burning takes place under a prescription that results in less intense burns, thus less complete loss of duff layer and less potential for erosion into streams and rivers.

2. Forest Products

Given the small area available for forestry activities under Alternative A (approximately 40 acres/year) and the standard practices of winter harvest and travel over frozen surfaces, impacts under this alternative would be insignificant. This alternative would have fewer potential impacts than would Alternative B or D, and more potential impacts than would Alternative C.

(f) Impacts to Water Quality from Mineral Development and Exploration

1. Oil and Gas Leasing

No oil and gas leases would be issued under this alternative; therefore, there would be no impacts to water quality.

2. Locatable Minerals

Under Alternative A, most BLM-managed lands (97 percent) are closed to mineral entry due to withdrawals or selections. However, active placer mining through valid rights does occur. There would be fewer impacts to water quality under Alternative A than under Alternatives B and D, and a similar level of impacts from Alternative C.

3. Mineral Materials

The level of mineral material sales would remain low and all sites would remain located on uplands. There would be effects to water quality as a result of these activities under Alternative A.

(3) Alternative B

(a) Impacts to Water Quality from Travel Management

1. OHV Management and Trails

Same as for Alternative A.

2. Roads

Alternative B would see a moderate increase in road construction associated with mineral exploration and development on BLM-managed lands, as well as increases associated with forestry activities. Because of the amount of anticipated road construction, this alternative would have the greatest potential for direct impacts to water quality resulting from road construction disturbance compared to the other alternatives.

(b) Impacts to Water Quality from Recreation

Same as for Alternative A.

(c) Impacts to Water Quality from Natural and Cultural Resource Protection

Under Alternative B, no ACECs or RNAs would be designed to provide area-wide resource protection. Alternative B adopts ROPs that prescribe measures that would minimize impacts to water quality from road construction.

(d) Impacts to Water Quality from Lands and Realty Actions**1. FLPMA Disposals**

This alternative would make approximately 10,000 acres in the Slana area available for disposal. It is anticipated that land development would follow the disposal process, and that the development would have a negative impact on water quality. During periods of disturbance to vegetation and soils, water quality would be degraded in nearby lakes and streams as turbidity and total dissolved solids (TDS) increase. The amount of increased turbidity and TDS would be a function of the sediment that reaches the water, the volume of water, and the natural amounts of turbidity and TDS. The disposal of lands in this area would also increase the likelihood of hazardous materials being stored and transported in the area, thus increasing the likelihood of spills or leakage through improper storage. This alternative would have more impacts to water quality from FLPMA disposals than would any other alternative.

2. Land Use Authorizations

Some permitted or leasing activities have the potential to negatively impact water quality. This alternative would handle land use authorizations on a case-by-case basis, with no area-wide constraints to protect specific resource values. The ROPs would be applied, minimizing impacts to water quality from permitted activities. This alternative, along with Alternative A, would have the most potential to negatively impact water quality from land use authorizations.

3. Withdrawal Review

The potential effects from revocation of ANCSA (d)(1) withdrawals are detailed in the *Impacts to Water Quality from Mineral Exploration and Development* section on page 456. This alternative would revoke all ANCSA (d)(1) withdrawals to allow for increased mineral exploration and development. This alternative would remove more withdrawals than would any other alternative.

4. Transportation and Utility Corridor Withdrawals

Alternative B would allow for conveyance of the transportation and utility corridor to the State of Alaska. Effects to water quality would be no different than if the corridor were managed by BLM.

(e) Impacts to Water Quality from Vegetation Management**1. Fire Management**

Alternative B proposes up to 1.5 million acres of prescribed burning to improve habitat and reduce fuels, the same acreage for prescribed burning proposed by Alternative D, but more than in proposed under Alternative A or C. Prescribed burns would have minimal effect on water quality because burning occurs

when fire behavior is less intense, less bare ground would be exposed, and erosion into waterways would be less likely than in a wildfire. In addition, prescribed burning on the scale proposed would reduce fuel loading, making large stand-replacement fires less likely.

2. Forest Products

While this alternative proposes the most acres for potential harvest, measures identified in the ROPs (such as buffer areas around riparian areas and use of winter logging) would minimize negative impacts to water quality. Because of the amount of area considered for potential harvest, this alternative has more potential for impacting water quality than does Alternative A, C, or D.

(f) Impacts to Water Quality from Mineral Exploration and Development

1. Oil and Gas Leasing

This alternative would have the greatest potential of all the alternatives for oil and gas exploration and development given the revocation of all ANCSA (d)(1) withdrawals and the lack of area-wide constraints such as ACEC or RNA designations. The anticipated level of development under this alternative would be twice that described in the Reasonably Foreseeable Development Scenario, as described above under *Impacts to Recreation from Mineral Exploration and Development, Oil and Gas Leasing* for Alternative B on page 427. The Reasonably Foreseeable Development Scenario itself is described on page 409 under the *Analysis Assumptions and Guidelines* for leasable minerals.

The extent of the impacts to water resources would depend on location and the nature of existing conditions. Possible impacts due to oil and gas production include thermokarst, drainage disruption, erosion and sedimentation, water removal, gravel removal, pipelines, and spills.

Thermokarst is ground subsidence that occurs when the removal of surface cover exposes ice-rich permafrost to higher temperatures, resulting in melting of the permafrost. Stream banks and lakeshores are particularly vulnerable to thermokarst because the wave action of the water would accelerate the removal of the degrading protective cover. Fine-grained sediments are the most likely to contain ice-rich permafrost, resulting not only in extensive thermokarst but also in increased sediment erosion and changes to stream channel and bed morphology. Many of the streams and lakes in the planning area have banks or shorelines consisting largely of fine-grained lacustrine sediments. Application of ROP-F&W-a-6 (see Appendix C) would minimize any impacts associated with thermokarsting affecting water quality. This measure prohibits any drilling within 500 feet of fish-bearing rivers and lakes.

Natural drainage patterns could be disrupted when oil and gas 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 can also result in increased bank or shoreline erosion and sedimentation as well as potential thermokarst. Proper siting and adequate design capacity of culverts, bridges, pipelines, and other structures would minimize or eliminate drainage problems.

In addition to thermokarst and drainage alteration, erosion and sedimentation can be caused by construction or other activities that disturb the streambed or stream banks, or that remove protective shoreline vegetation. Inadequate design or placement of structures, culverts, or bridges can alter natural sediment transport and deposit, 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. Winter or low-water construction and transport activities and adequate armoring or fill would minimize erosion and sedimentation problems. Again, these negative impacts would be minimized with application of the ROPs, particularly those that prohibit drilling or provide buffers for riparian areas.

Summer water conditions are usually plentiful; however, depending on precipitation, lakes and riverine pools could be subject to dewatering if consumptive use is high. During the winter, most lakes and riverine pools are subject to dewatering if consumptive use is high. Depending on the areas leased and number of development wells drilled, annual water usage for development activities would vary considerably. Removal or compaction of snow cover can increase the depth of freezing, greatly reducing the water quantity within a lake or pool.

Oil pipelines resulting from development could affect water resources, primarily through temporary impoundments, diversions, and sedimentation during construction. If gas pipelines are also constructed, impacts would be similar. 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. 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 species sensitive to exposure for several years. These spills could be pumped out of the water body, if confined, or they could be neutralized and then diluted with uncontaminated freshwater.

Under Alternative B, the effects of oil and gas leasing on water quality, as described here, would occur at twice the level anticipated under Alternative D.

2. Locatable Minerals

Because this alternative encourages development and presents the least amount of environmental constraints, it would have the greatest potential for direct impacts to water quality from mining activities. The extent of the impacts to water resources would depend on the location and nature of existing conditions. Possible impacts due to mining could include degradation of water quality through sedimentation and other pollutants; changes in stream geometry; diversion of subsurface water flow; formation of aufeis; and depletion of water supplies. Thermal effects of construction, both in and out of the floodplain, could affect ground water movement and alter surface drainage. There could be long-term water pollution from surface runoff and from material piles, along with materials that are potentially spilled such as lubricants for machinery. Application of the ROPs would minimize these impacts, but based on the amount of land made available for mineral development under this alternative, the potential for adverse impacts to water quality is greater than under Alternative A, C, or D.

3. Mineral Materials

This alternative anticipates the greatest amount of gravel extraction in association with increased road construction and mineral development. Improper placement of gravel-removal operations can result in changes to 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 breakup or storm flooding as required by the ROPs would greatly minimize these effects to water resources. Because of the amount of potential gravel extraction anticipated, this alternative has more potential to cause impacts to water quality than does Alternative A, C, or D.

(4) Alternative C

(a) Impacts to Water Quality from Travel Management

1. OHV Management and Trails

None of the BLM-managed lands in the planning area would be designated as open to OHV travel under Alternative C. OHVs would be limited to designated or existing trails on 96 percent of BLM-managed lands, while the remaining 4 percent of lands would be designated as closed to OHV use. As a result, this alternative would have the least potential for direct impacts to water quality resulting from OHV disturbance as compared to Alternatives A, B, and D.

2. Roads

Alternative C would result in fewer negative impacts on the water resources than would all other alternatives as there are more acres where new road construction is limited, and any new roads that would be constructed would be subject to the measures identified in the ROPs.

(b) Impacts to Water Quality from Recreation

By identifying specific areas where visitor use limits will be set, this alternative takes the most aggressive stance of all the alternatives towards regulating recreational activities that could potentially impact water quality. This alternative also proposes the most limitations to cross-country OHV use. Fewer impacts to water quality would be expected under this alternative than under Alternative A, B, or D.

(c) Impacts to Water Quality from Natural and Cultural Resource Protection

Alternative C would designate three ACECs and one RNA, designations that would provide area-wide protection for specific resource values. Because of constraints associated with these designations, the potential for water quality impacts from mineral development, road construction, or other resource development would be minimized. This alternative would also adopt the ROPs, which contain specific measures to minimize impacts to water quality from permitted activities.

(d) Impacts to Water Quality from Lands and Realty Actions

1. FLPMA Disposals

There would be no effects under this alternative because no disposals would occur.

2. Land Use Authorizations

Alternative C identifies specific areas (Wild and Scenic River corridors, some SRMAs where areas are managed for a primitive experience, bison and caribou calving areas, and trumpeter swan nesting areas) where land use authorizations would be limited to protect specific resource values.

Restrictions on authorizations would be an indirect benefit to water quality. Other land use authorizations would be subject to measures identified in the ROPs to protect water quality.

3. Withdrawal Review

This alternative maintains withdrawals on approximately 50 percent of BLM-managed lands. Maintenance of these withdrawals would severely limit development, an indirect benefit to water quality.

4. Transportation and Utility Corridor Withdrawals

Same as for Alternative A.

(e) Impacts to Water Quality from Vegetation Management

1. Fire Management

Alternative C identifies the fewest acres for potential prescribed burning of all the alternatives; therefore, impacts to water quality would be minimal. However, lack of prescribed burning could lead to a build up of fuels and higher intensity wildland fires, which would be more prone to intense fire behavior resulting in greater levels of subsequent erosion and water quality impacts.

2. Forest Products

Given the anticipated low level of forestry activities, the use of temporary winter roads, and the application of ROPs (including protection of riparian buffers), impacts to water quality under this alternative would be insignificant. There would be fewer potential impacts to water quality from forestry activities under this alternative than there would be under Alternative A, B, or D.

(f) Impacts to Water Quality from Mineral Development and Exploration

1. Oil and Gas Leasing

Same as for Alternative A.

2. Locatable Minerals

Alternative C anticipates similar levels of locatable mineral development as does Alternative A, but the application of ROPs under this alternative would minimize impacts to water quality from what limited mining activity would occur.

3. Mineral Materials

Alternative C anticipates similar levels of mineral material sales as does Alternative A, but the application of ROPs under this alternative would minimize impacts to water quality from what limited gravel extraction would occur.

(5) Alternative D (Proposed RMP)

(a) Impacts to Water Quality from Travel Management

1. OHV Management and Trails

None of the BLM-managed lands in the planning area would be designated as open to OHV travel under Alternative D. OHVs would be limited to designated and existing trails on 99 percent of BLM-managed lands, while less than 1

percent of lands would be designated as closed to OHV use. Because of these limits and controls on OHV use under this alternative, there would be fewer negative impacts on water quality under Alternative D than under Alternative A or B; negative impacts would be slightly greater under this alternative than they would be under Alternative C.

2. Roads

This alternative anticipates a slight increase in road construction from the current situation. Under this alternative, the potential for increased road construction is less likely than Alternative B and therefore has a lower potential negative effect on water quality. Measures identified in the ROPs would minimize adverse impacts from road construction.

(b) Impacts to Water Quality from Recreation

Alternative D applies measures to minimize impacts from recreational OHV use and identifies areas where visitor use limits will be established where potential impacts to water quality currently occur (Delta and Gulkana Rivers). It also provides for the construction of recreational facilities in areas of heavy recreation use to minimize impacts from heavy dispersed use that is currently occurring. Because of these measures, this alternative would be more effective at minimizing negative impacts than Alternatives A or B, and equally effective at minimizing impacts as Alternative C.

(c) Impacts to Water Quality from Natural and Cultural Resource Protection

The ROPs and Stips listed in Appendix C would be adopted under this alternative, and the Bering Glacier would be designated as an RNA. Alternative D also applies measures such as seasonal constraints in bison and caribou calving areas to protect specific resource values. Because of the adoption of specific measures to protect special values, this alternative would be more effective than Alternative A or B at protecting water quality; it would be less effective at protecting water quality than would Alternative C.

(d) Impacts to Water Quality from Lands and Realty Action

1. FLPMA Disposals

Disposals would be used in the Slana area to resolve unauthorized use. Effects to water quality would be positive where resolution of unauthorized use results in clean up of abandoned property or hazardous materials.

Other disposals would have minimal impacts because of the small scale of the proposals, and because development already exists on some tracts.

2. Land Use Authorizations

This alternative adopts the ROPs that would apply to all permitted activities that would minimize impacts to water quality. Alternative D also limits leasing or permitting in some specific areas, such as the Wild and Scenic River corridors and the Bering Glacier RNA, to protect resource values in those areas. This alternative would be more effective than Alternative A or B and less effective than Alternative C at protecting water quality.

3. Withdrawal Review

This alternative would maintain ANCSA (d)(1) withdrawals in the western two-thirds of the Bering Glacier RNA and in portions of the Delta Wild and Scenic River corridor. These withdrawals prevent mineral leasing or locatable mineral entry. Impacts to water quality from mineral development under this alternative are discussed under the *Impacts to Water Quality from Mineral Development and Exploration* section on page 463. This alternative maintains more withdrawals than does Alternative B, but fewer than do Alternatives A and C.

4. Transportation and Utility Corridor Withdrawals

Same as for Alternative A.

(e) Impacts to Water Quality from Vegetation Management

1. Fire Management

Same as for Alternative B.

2. Forest Products

This alternative anticipates a slight increase in forestry activities on BLM-managed lands, targeted at 144,000 acres of beetle-kill white spruce. Anticipated actual harvest level would be 40-100 acres/year. Given the measures identified in the ROPs (use of temporary and mainly winter access and buffers around riparian areas), it is anticipated that negative impacts to water quality from forestry activities would be slight to insignificant.

Alternative D anticipates a slight increase in forestry activities on BLM-managed lands, with activities targeted specifically at the harvest of 144,000 acres of beetle-kill white spruce. Given the application of the ROPs that would be adopted under this alternative (use of temporary roads and mainly winter access, and buffers around riparian areas), negative impacts to water quality would be slight to insignificant.

(f) Impacts to Water Quality from Mineral Exploration and Development

1. Oil and Gas Leasing

The anticipated level of development under Alternative D would be at the level described in the Reasonably Foreseeable Development Scenario under the *Analysis Assumptions and Guidelines* for leasable minerals on page 409.

Alternative D would have more potential impact on water quality from oil and gas exploration and development than would Alternative A or C, but half the potential impacts than would Alternative B.

2. Locatable Minerals

This alternative anticipates potential mining exploration and development activities and potential impacts to water quality at similar levels as described in Alternative B, but at greater levels than under Alternative A or C.

3. Mineral Materials

This alternative anticipates gravel removal operations at lower levels than would occur under Alternative B, but at higher levels than would occur under Alternative A or C. Measures identified in the ROPs would minimize impacts from gravel-removal operations that could otherwise result in changes to stream channel or lake configuration, stream-flow hydraulics or lake dynamics, and ice damming and aufeis formation.

c) Air Quality

(1) *Impacts Common to All Alternatives*

Under all four alternatives, the anticipated impacts to air quality from resource development and other activities would be negligible to minor. This assumption is based on data from Nuiqsut on the North Slope, where, in addition to village emission sources, several large oil and gas production facilities occur 8-70 miles east of the village. Ambient air quality monitoring in Nuiqsut has shown that air quality is in compliance with National and Alaska Ambient Air Quality Standards (BLM 2004k). No alternative in this analysis anticipates the level of development that occurs at Nuiqsut.

There may, however, be periods of time when smoke from wildland fires exceeds air quality standards. Potential smoke-related problems include effects on individuals with respiratory problems and reduced visibility for aircraft. This short-term impact would apply to all alternatives equally depending on the location, number, and intensity of fires.

d) Vegetation

This *Vegetation* section under *Issue 3: Natural and Cultural Resources* describes impacts to the occurrence and condition of vegetation within the planning area. For information regarding the impacts to the management of vegetation, fire, and forest products, see *Issue 5: Vegetation Management* beginning on page 554.

(1) **Impacts Common to All Alternatives**

(a) Impacts to Vegetation from Travel Management

1. **OHV Management and Trails**

The use of OHVs can negatively impact upland and riparian vegetation and all plant species from grasses to trees. Impacts may include crushing, breaking, trampling, reduction of vegetative cover, damage to germinating seeds, or increased erosional forces that alter soil structure and weaken the plant and its roots, resulting in impaired growth or death.

Loss of cover vegetation as a result of OHV use often alters soil temperatures, with negative impacts to soil fauna, soil fertility, nutrient cycling, and hydrological processes. The loss of vegetation increases the likelihood of compaction and erosion. Compaction increases the resistance of the soil to plant root penetration. Compaction also causes the soil to become denser, less porous, and less permeable to water and air. Compaction over large areas inhibits the germination, emergence, and establishment of new plants. Seeds lying on a compacted surface are prone to desiccation and less likely to receive proper incubation and moisture. Erosion of soil through wind and water displaces the soil, making conditions unstable for plant growth. Erosion, especially on steep slopes, can permanently alter the reestablishment of vegetation.

Some individuals traveling cross-country on OHVs have cut down trees and vegetation or branches to facilitate travel. As described above, cross-country OHV use can also disturb natural conditions in soils and vegetation, facilitating the invasion of noxious weeds. OHVs not only create the disturbance conditions in soils and vegetation favoring the spread of noxious weeds, they also carry and spread the weed seed themselves. The spread of noxious weeds by OHVs has been documented in lower 48 states such as Montana and Wyoming.

2. **Roads**

The effects to vegetation from road construction include the direct removal of vegetation, the fragmentation of habitat and habitat loss, and a facilitation of weed invasions.

(b) Impacts to Vegetation from Recreation

Most impacts to vegetation from recreation are related to OHV use, as described above under *OHV Management and Trails* on page 464. Recreational activities generally do not cause impacts to the vegetation, but some activities, such as extensive and continued use of camping sites along roadways or rivers, may cause localized impacts including vegetation trampling, cutting, and removal.

(c) Impacts to Vegetation from Mineral Development and Exploration

1. Locatable Minerals

Impacts to upland and riparian vegetation from mineral activities would include loss of vegetation and riparian habitat and creation of disturbance conditions in soils and vegetation that would favor the spread of noxious weeds. Equipment used in mining operations may carry and spread weed seeds. Nearby vegetation may be indirectly impacted by dust generated from roads and mining activities. Plant leaves can collect a coating of dust that can interfere with photosynthesis and eventually kill the plant.

(2) *Alternative A*

(a) Impacts to Vegetation from Travel Management

1. OHV Management and Trails

Alternatives A and B would both designate 96 percent of BLM-managed lands as open to OHVs, with 4 percent of the land limited to designated or existing trails. No acres would be designated as closed to OHV use. As a result, these two alternatives have the greatest potential for direct impacts to vegetation resulting from OHV disturbance as compared to Alternatives C and D.

2. Roads

This alternative would result in a slight potential for an increase in road construction associated with mineral exploration and development on State and Native Corporation lands. Stipulations to minimize impacts to vegetation from road construction are considered on a case-by-case basis; however, these stipulations are not as effective or protective as the ROPs that would be applied under Alternative B, C, or D. Based on the anticipated level of new road construction, this alternative would have fewer potential impacts to vegetation from road construction than would Alternative B or D, and more impacts than would Alternative C.

(b) Impacts to Vegetation from Recreation

Other than maintenance of recreation facilities, Alternative A provides no management of recreation activities through the designation of SRMAs, establishment of recreation objectives, or establishment of visitor use limits for any areas (other than the Delta and Gulkana Wild and Scenic Rivers, for which both objectives and visitor use limits have already been established). Because of the lack of established visitor use limits and lack of OHV regulations restricting cross-country travel, impacts to vegetation would be greater under Alternative A than they would be under Alternative C or D; impacts would be the same as under Alternative B.

(c) Impacts to Vegetation from Natural and Cultural Resource Protection

Alternative A would not designate any ACECs or RNAs, thus no area-wide resource protection measures would be implemented. This alternative prescribes measures to minimize impacts to vegetation from permitted activities on a case-by-case basis.

(d) Impacts to Vegetation from Lands and Realty Actions

1. FLPMA Disposals

Disposal of the Slana area under Alternative A would have no impact because no additional lands would be made available for disposal other than those necessary to resolve unauthorized use. There would be fewer impacts to vegetation from FLPMA disposals under this alternative than under alternatives B and D, and more than under alternative C.

2. Land Use Authorizations

Some permitted or leasing activities have the potential to negatively impact vegetation. Under Alternative A, stipulations to minimize impacts to vegetation are considered on a case-by-case basis. Without the application of ROPs, such as those that apply to Alternatives B, C, and D, these activities are more likely to cause adverse impacts to vegetation. This alternative anticipates more land use authorizations than does Alternative C, but fewer than do Alternatives B and D.

3. Withdrawal Review

No withdrawal review would occur under Alternative A, and all existing withdrawals would remain in place. Because of the constraints in place under these withdrawals, there would be less potential for resource development and potential vegetation-disturbing activities. More withdrawals are retained under this alternative than under Alternative B, C, or D.

4. **Transportation and Utility Corridor Withdrawals**

Under Alternative A, all withdrawals associated with the transportation and utility corridor would remain in place. Mineral leasing would therefore be prevented in the entire corridor and locatable mineral development would be prevented in the inner corridor, thus minimizing impacts to vegetation from these activities.

(e) Impacts to Vegetation from Mineral Exploration and Development

1. **Oil and Gas Leasing**

There would be no oil and gas leases issued under Alternative A, therefore, there would be no effects to vegetation.

2. **Locatable Minerals**

Alternatives A and C would have the least impact to vegetation from mining because most BLM lands are currently closed to mineral entry, and would be recommended to remain that way under Alternative C. The potential for locatable mineral development and associated impacts to vegetation is greatest under Alternatives B and D.

3. **Mineral Materials**

This alternative anticipates a continued low level of mineral material sales. There are currently 12 active pits, each less than 5 acres in size. At this level of development, impacts to vegetation are insignificant.

(3) *Alternative B*

(a) Impacts to Vegetation from Travel Management

1. **OHV Management and Trails**

Same as for Alternative A.

2. **Roads**

This alternative would result in a moderate increase in road construction associated with mineral exploration and development and forestry activities occurring on BLM-managed lands. Alternative B would have the greatest potential for direct impacts to vegetation resulting from road construction disturbance compared to the other alternatives.

(b) Impacts to Vegetation from Recreation

Same as for Alternative A.

(c) Impacts to Vegetation from Natural and Cultural Resource Protection

No ACECs or RNAs would be designated under Alternative B, thus no area-wide constraints would be established for these areas and resource developments could occur, with impacts to vegetation as described under other sections of this analysis. This alternative would adopt ROPs which identify measures for permitted activities to minimize impacts to vegetation.

(d) Impacts to Vegetation from Lands and Realty Actions

1. FLPMA Disposals

It is anticipated that land development would follow the disposal process in the Slana area, and that the development would have a negative impact on soils and vegetation. The vegetative surface would be disturbed and vegetation removed as a result of the construction of access roads and structures. Increased settlement in the area would result in an additional loss of vegetation through the creation of additional trails, more vegetation clearance, and more consumptive use of vegetation (e.g., firewood and berry picking). This alternative would result in more potential impacts to vegetation from FLPMA disposals than would Alternative A, C, or D.

2. Land Use Authorizations

Permitted activities have the potential to disturb vegetation through vegetation removal on a specific site or through removal of a swath of vegetation for rights-of-way. Measures identified in ROPs would minimize disturbance to vegetation associated with land use authorizations. However, this alternative anticipates a high level of land use authorizations associated with resource development. Given this anticipated increase, Alternative B has more potential for impacts to vegetation than does Alternative A, C, or D.

3. Withdrawal Review

This alternative would revoke all ANCSA (d)(1) withdrawals and open these areas to mineral exploration and development, pending State and Native conveyances. More withdrawals are revoked under this alternative than under Alternative A, C, or D.

4. Transportation and Utility Corridor Withdrawals

Alternative B would remove withdrawals and allow for conveyance of the transportation and utility corridor to the State of Alaska. This would potentially allow for mineral development within the corridor, with impacts to vegetation as

described in the following section, *Impacts to Vegetation from Mineral Exploration and Development*.

(e) Impacts to Vegetation from Mineral Exploration and Development

1. Oil and Gas Leasing

It is assumed that exploration or development activities would be more likely to occur in wetland portions of the planning area, such as the West Fork Gulkana area. However, impacts to vegetation from any disturbance from oil and gas production would occur to many different land-cover classes. The effects of exploration and development include the impacts of ice roads or OHVs; the destruction of vegetation under gravel pads, material sites, pipelines, and spilled oil; and the alteration of vegetation communities resulting from dust, salinity of gravel fill, snowdrifts, and blockage of normal surface water flow. The impacts of gravel pads are considered permanent, while those of oil spills, which are cleaned up immediately, allow recovery within a few years to two decades. Most oil spills occur on gravel or ice pads, and consequently, their effects do not reach the vegetation. Overall, past spills on Alaska's terrestrial habitats have caused minor ecological damage, and ecosystems have shown a good potential for recovery, with wetter areas recovering more quickly.

Sensitive Status Species plants in areas of prospective energy development would be subject to the same detrimental effects as described above for common plant species. Where populations are known to exist, Sensitive Status plant species would be provided a buffer from surface disturbing activities as described in the ROPs that would be applied under this alternative. Because of the amount of land made available for mineral leasing under this alternative, it has the most potential to impact vegetation from oil and gas development of all the alternatives.

2. Locatable Minerals

Because Alternative B encourages development and provides the least amount of environmental constraints, it would have the greatest potential of all the alternatives for direct impacts to vegetation from mining activities.

3. Mineral Materials

This alternative anticipates an increase in gravel extraction with increased road construction and mineral development. Impacts to vegetation from gravel extraction are similar to those impacts described above for locatable minerals. This alternative would have the greatest effect on vegetation from gravel extraction than would any other alternative.

(4) Alternative C

(a) Impacts to Vegetation from Travel Management

1. OHV Management and Trails

Alternative C would have fewer negative impacts on the vegetation resources than would all the other alternatives. This alternative designates more acres as closed to OHVs, and there are more acres limited to designated trails.

2. Roads

This alternative would result in very little potential for new road construction. Alternative C would have fewer negative impacts on vegetation resources than would all other alternatives as this alternative limits or prohibits road construction on the greatest number of acres.

(b) Impacts to Vegetation from Recreation

Alternative C identifies specific areas (such as the Wild and Scenic River corridors) where visitor use limits would be established through implementation-level planning. This would limit impacts somewhat in specific areas, but this positive effect could be off-set by the decision to not build any additional recreational facilities. Heavy-use areas consequently would see increased impacts to soils such as compaction and removal of ground-cover vegetation.

(c) Impacts to Vegetation from Natural and Cultural Resource Protection

This alternative would designate three ACECs, five SRMAs, and one RNA, all with specific measures identified to protect resource values. These designations would indirectly benefit vegetation by restricting development in these areas. This alternative also adopts the ROPs, which contain specific measures for protection of vegetation and Sensitive Status Plant Species.

(d) Impacts to Vegetation from Lands and Realty Actions

1. FLPMA Disposals

There would be no effects under this alternative because no FLPMA disposals would occur. This alternative would have fewer effects on vegetation from FLPMA disposals than would any other alternative.

2. Land Use Authorizations

This alternative identifies specific areas where land use authorizations would be limited to protect specific resource values. This would be an indirect benefit

to vegetation. In addition, because of area-wide constraints on resource development, this alternative anticipates less land use authorizations than any other alternative. Consequently, this alternative has less potential to impact vegetation than does Alternative A, B, or D.

3. **Withdrawal Review**

This alternative maintains withdrawals on approximately 50 percent of BLM-managed lands, more than would be maintained under Alternative B or D. This would limit development, resulting in an indirect benefit to vegetation.

4. **Transportation and Utility Corridor Withdrawals**

Same as for Alternative A.

(e) Impacts to Vegetation from Mineral Development and Exploration

1. **Oil and Gas Leasing**

Same as for Alternative A.

2. **Locatable Minerals**

Alternative C anticipates similar levels of locatable mineral development as does Alternative A, but the application of ROPs under this alternative would minimize impacts to vegetation from what limited mining activity would occur.

3. **Mineral Materials**

Alternative C anticipates similar levels of mineral material sales as does Alternative A, but the application of ROPs under this alternative would minimize impacts to vegetation from what limited gravel extraction would occur.

(5) **Alternative D (Proposed RMP)**

(a) Impacts to Vegetation from Travel Management

1. **OHV Management and Trails**

Because there are more limits and controls on OHV use in Alternative D, the negative impacts would be fewer than under Alternative A or B. Negative impacts to vegetation would be slightly greater than the impacts under Alternative C.

2. **Roads**

Alternative D anticipates a slight increase in road construction from the current situation. Under this alternative, the potential for increased road construction is less likely than under Alternative B, and more likely than under Alternatives A

and C, and therefore it has a lower potential to negatively effect vegetation than does Alternative B. The measures identified in the ROPs would minimize adverse impacts from road construction.

(b) Impacts to Vegetation from Recreation

This alternative minimizes impacts from recreational OHV use and identifies specific areas where visitor use limits would be set through implementation-level planning. This would reduce impacts such as vegetation removal and compaction resulting from heavily-used dispersed camping sites. Alternative D also allows for the construction of recreational facilities in areas of heavy recreation use to minimize impacts from heavy dispersed use that is currently occurring. Because of these measures, this alternative would be more effective at minimizing negative impacts than would Alternative A or B, and it would be equally effective as Alternative C.

(c) Impacts to Vegetation from Natural and Cultural Resource Protection

The ROPs and Stips listed in Appendix C would be adopted under this alternative, and the Bering Glacier would be designated as an RNA. Alternative D also applies measures in other locations to protect specific resource values, such as seasonal constraints in caribou and bison calving areas or trumpeter swan nesting areas. Because of the adoption of these measures, this alternative would be more effective than Alternative A or B, and less effective than Alternative C at protecting vegetation resources.

(d) Impacts to Vegetation from Lands and Realty Actions

1. FLPMA Disposals

Disposal in the Slana area would be used to resolve unauthorized use, along with limited disposals for community purposes. In cases of unauthorized use or abandonment, positive effects would result where disposal results in clean-up of abandoned materials.

Other disposals would have minimal impacts because of the small scale of the proposals, and because development already exists on some tracts. Because Alternative D will not result in large scale disposal in the Slana area, it has less potential for disposal and development of homesites than does Alternative B. Consequently, it has less potential to impact vegetation than does Alternative B, and more potential than Alternatives A and C.

2. Land Use Authorizations

This alternative adopts Required Operating Procedures, which would apply to all permitted activities and which would minimize impacts to vegetation. This

alternative also limits leasing or permitting in some specific areas to protect resource values in those areas. Overall, this alternative would be more effective than Alternative A or B and less effective than Alternative C at protecting soil resources.

3. **Withdrawal Review**

Alternative D would maintain ANCSA (d)(1) withdrawals in the western two-thirds of the Bering Glacier RNA and in portions of the Delta Wild and Scenic River corridor. These withdrawals prevent mineral leasing and locatable mineral entry. Effects of mineral development under this alternative are discussed below in the *Impacts to Vegetation from Mineral Exploration and Development* section.

4. **Transportation and Utility Corridor Withdrawals**

Same as for Alternative A.

(e) **Impacts to Vegetation from Mineral Exploration and Development**

1. **Oil and Gas Leasing**

For impacts to vegetation resources from oil and gas exploration and development, see description under Alternative B. Under Alternative D these effects would occur over approximately half the affected area as described in B. Alternative D anticipates a level of oil and gas exploration and development as described in *Analysis Assumptions and Guidelines*, Alternative D would have more potential impact from oil and gas exploration and development on vegetation than Alternative A or C and less than Alternative B.

2. **Locatable Minerals**

This alternative anticipates potential mining exploration and development and effects to vegetation at similar levels as described in Alternative B.

3. **Mineral Materials**

This alternative anticipates gravel removal operations at lower levels than would Alternative B, but at higher levels than would Alternative A or C. Impacts from gravel extraction to vegetation consist of vegetation removal while gravel mining is occurring.

e) Wildlife (Including Sensitive Status Wildlife Species)

(1) Impacts Common to All Alternatives

(a) Impacts to Wildlife from Travel Management

1. Access

Continued access to public lands via the maintenance and/or extension of 17(b) easements across Native and Native-selected lands would have negligible impacts on wildlife habitat and wildlife populations. Improved management of 17(b) easements as specified under all alternatives, would be beneficial to wildlife resources because OHV use by the general public would be limited to the easement, thereby limiting the amount of disturbance and reducing the potential for habitat degradation.

2. OHV Management and Trails

OHVs (including snowmachines) can adversely affect wildlife populations both directly and indirectly. OHVs can magnify the impacts of individual users: the noise, mobility and associated human activity resulting from OHV use are synergistic in that the sum of their effects is greater than the individual effect of each factor (ADF&G 1990). Direct effects occur when wildlife are physically stressed and/or displaced by OHVs to less than preferable habitats. Both stress and displacement may result in a loss of wildlife fitness, productivity, and/or abundance. Changes to the traditional movement patterns, distribution, and expected normal behavior of wildlife can result from exposure to OHVs. (ADF&G 1990).

Indirect effects include habitat alteration and degradation. Wildlife are particularly vulnerable to disturbance at areas of concentration such as mineral licks; calving, lambing, and kidding areas; post-rut and winter range areas; and waterfowl reproduction areas during inherently stressful periods of the year (ADF&G 1990). Refugia, areas inherently inaccessible to humans where wildlife populations could escape from the regular intrusion of humans, are disappearing from the landscape due to the proliferation and unmanaged use of OHVs (ADF&G 1990).

3. Roads

Habitat fragmentation is the division of a continuous habitat or ecosystem into smaller fragments by alteration of the size, shape, or spatial arrangement of habitat types on the landscape-level. Fragmentation of wildlife habitat is caused mainly by human activities such as road construction. The indirect consequences of habitat loss and fragmentation may be less obvious but can result in negative consequences for animal welfare and habitat conservation. At the heart of the fragmentation dilemma is the essential need for expanses of

undeveloped habitat large enough to allow for the maintenance of wildlife population genetic diversity.

(b) Impacts to Wildlife from Vegetation Management

1. Fire Management

Fire is a natural occurrence within Alaskan ecosystems. Generally, the effects of fire on habitat are much more significant than the effects of fire on resident animals. Habitat changes determine the suitability of the environment for future generations of animals. Fires may have a short-term negative impact on resident animals by displacing them, disrupting critical reproductive activities, or, rarely, killing them. However, these animal populations recover quickly if suitable habitat is available. Generally, fire alters habitat and may improve some components for some species while degrading some or all components for others. The adverse effects that the immediate generation of wildlife may experience are usually offset by the benefits accrued for future generations.

Within the planning area, fire is the primary agent of change in the boreal forest and is responsible for maintaining habitat heterogeneity. Wildlife have evolved in the presence of fire and have adapted to its presence. Indeed, the continued well-being of most species of wildlife depends on periodic disturbance of the habitat by fire.

Moose populations usually increase following fire due to increased production of high quality browse in the burned area. However, if the moose population has declined for reasons other than poor habitat, moose may be slow to utilize new habitat created by burning and population numbers may not increase dramatically. Under these circumstances the remaining moose have little trouble obtaining sufficient browse without utilizing the new burn. Use of a burned area would depend largely on whether it is situated in an area traditionally used by moose or through which they migrate. Dispersal to new areas may be slow. If, however, a fire occurs in an area where the moose population is near capacity of the range, then competition for food and social pressures between individuals would result in more rapid exploitation of new habitat created by a fire. The use of burned areas by moose is also related to the amount of available cover. Fires of moderate size or large fires that contain numerous unburned inclusions enhance the edge effect resulting in better moose habitat as compared to extensive severe fires.

The short-term effects of fire on caribou winter range are mostly negative, and include destruction of forage lichens, reduced availability of other preferred species in early post-fire succession, and temporary alterations in caribou movements. However, forage quality of vascular plants are improved by fire. Long-term effects are generally beneficial. Light fires may rejuvenate stands of lichens with declining production. Fire helps maintain diversity in vegetation type, replacing old forest stands where lichens have been replaced by mosses,

thereby initiating the successional cycle that leads to the reestablishment of lichens. Fire creates a mosaic of fuel types that naturally precludes a series of large, extensive fires that may be devastating to caribou habitat. Caribou are nomadic and each herd has historically utilized a range much larger than necessary to meet its short-term food needs. Thus, effects of fire upon the forest system can be accommodated and may be essential to prevent large severe fires that burn huge portions of a herd's range and result in lowering of range carrying capacity.

As stated in Chapter III, fire frequency in the Copper River Basin in the last 50 years has been low. As a consequence, wildlife species such as moose, ruffed grouse, sharp-tailed grouse, and golden-crowned sparrows that are dependent upon early seral stage plant communities have been marginalized in the Copper River Basin due to the lack of vegetation-rejuvenating fire events.

(2) *Alternative A*

(a) Impacts to Wildlife from Travel Management

1. OHV Management and Trails

Under Alternative A, the unregulated use of OHVs on 96 percent of all BLM-managed lands (the remaining 4 percent limit OHV use to designated or existing trails within the TLAD and Delta and Gulkana Wild and Scenic River corridors) would translate to an overall loss of wildlife refugia, further habitat degradation and/or loss beyond the current situation due to mechanical breakdown of vegetation and the potential introduction of invasive plant species. Current OHV management would also lead to continued increasing physical stresses on wildlife populations due to disturbance and displacement from preferred habitats. Alternatives A and B, which propose the same levels of OHV management, would have more potential adverse impacts to wildlife than would Alternative C or D.

2. Roads

As described in Chapter III, proposals for new road construction are rare and are mostly associated with short access routes to private lands. This level of new road construction is expected to continue under Alternative A. Mitigation measures for case-by-case new road construction projects would provide protective restrictions for the benefit of local wildlife and their habitat where necessary.

(b) Impacts to Wildlife from Recreation

Under Alternative A, both commercial and non-commercial recreation would continue to be managed reactively. Consequently, no areas are identified for commercial or non-commercial use limits, and impacts to wildlife associated with

these activities (such as helicopter-supported commercial recreation) would continue to be handled on a case-by-case basis. No recreation facility construction is considered, which could lead to localized habitat degradation at heavy-use dispersed camp sites or user-created waysides along highways. Consequently, this alternative has more potential for impacts to wildlife than does Alternative B, C, or D.

(c) Impacts to Wildlife from Natural and Cultural Resource Protection

Alternative A would be less effective in its ability to provide protective mitigation from permitted activities as none of the ROPs or Stips that would be applied under Alternatives B, C, and D would be adopted under this alternative, though stipulations would continue to be generated based on site-specific analysis.

Under Alternative A, discrete areas of known high value habitat for local and regional wildlife populations (such as the Nelchina caribou calving area, the Delta bison calving area, and the breeding habitat for trumpeter swans and other waterfowl in the wetlands of the West Fork Gulkana watershed) would be particularly susceptible to adverse impacts from OHV use as there would be no specific protective measures (such as OHVs being limited to designated trails) within these areas to protect resource values. No RNA would be designated for the Bering Glacier area, which could leave this area's unique ecological areas vulnerable to impacts from resource development or from unmanaged recreation use or proliferation of OHV trails.

(d) Impacts to Wildlife from Lands and Realty Actions

1. FLPMA Disposals

Under Alternative A, the resolution of failed claims in the Slana area would occur, but no new land disposals would be allowed. Consequently, no habitat degradation or permanent habitat loss associated with land disposal and development of homesites would occur under this alternative. This alternative would have fewer potential impacts to wildlife as a result of FLPMA disposals than would Alternative B or D, and more potential impacts than would Alternative C.

2. Acquisitions

Existing management intent to acquire private inholdings as they are made available to the Federal government within the Wild and Scenic River corridors would curtail further development and conserve wildlife habitat resources therein.

3. Land Exchanges

No land exchanges would occur under Alternative A.

4. Land Use Authorizations

Land use authorizations would continue to be handled on a case-by-case basis under Alternative A. Potential impacts to wildlife from these authorizations would be considered on a site-specific basis and stipulations to minimize impacts assigned as needed. This alternative anticipates fewer requests for land use authorizations than would be received under Alternative B or D, but more than would be received under Alternative C.

5. Withdrawal Review

Under Alternative A, 4,832,000 acres would remain withdrawn from mineral leasing and entry across BLM-managed lands. An additional 2,171,000 acres (1.9 million acres of which are selected) would remain withdrawn from mineral leasing but open for locatable minerals pending conveyance on those lands that are selected. These existing withdrawals would provide a protective constraint against mineral exploration and development and the impacts associated with those activities on wildlife habitat. This alternative retains more withdrawals than any other alternative.

6. Transportation and Utility Corridor Withdrawals

Alternative A would maintain existing withdrawals associated with the transportation and utility corridor. These withdrawals prohibit conveyance of the area to the State and prohibit mineral leasing in both the inner and outer corridor, and prohibit locatable mineral entry in the inner corridor.

(e) Impacts to Wildlife from Vegetation Management

1. Fire Management

Under Alternative A, vegetation treatments for the benefit of wildlife are limited to the improvement of critical moose habitat, especially within the Alphabet Hills area. No other specific areas have been identified for moose habitat improvement using prescribed fire or wildland fire.

2. Forest Products

Mechanical treatments of vegetation, including timber harvest, can mimic some of the beneficial rejuvenating effects of fire. Under Alternative A, small scale timber harvests would occur sporadically as the local demand for wood fiber allowed, and all harvests would be subject to mitigation measures on a case-by-case basis for the benefit of wildlife resources. Harvests would allow for the reestablishment of an early seral stage plant community in a sea of homogenous late seral stage forests.

Special status wildlife species (including Canada lynx, olive-sided flycatcher, Townsend's warbler, blackpoll warbler, and gray-cheeked thrush) that are

dependent on a mature forest setting for all or part of their yearly life cycle could be negatively impacted by large-scale loss of mature habitat.

(f) **Impacts to Wildlife from Mineral Exploration and Development**

1. Oil and Gas Leasing

No oil and gas development would be anticipated under Alternative A.

2. Locatable Minerals

Under Alternative A, most areas within the planning area would remain closed to locatable mineral entry due to selections or underlying ANCSA (d)(1) withdrawals. However, there are some active operations on BLM-managed lands that would continue. Existing placer mining operations are small, with an annual disturbance of less than 5 acres per operation. These operations and any future proposals for locatable minerals exploration and development would be subject to review and standard stipulations 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. This alternative has more potential for impacts to wildlife from locatable mineral development than does Alternative C, and less potential than Alternative B or D.

3. Mineral Materials

Existing gravel pits are generally located within or adjacent to existing rights-of-way; therefore, any additional loss of habitat and wildlife disturbance would be minimal. This alternative anticipates a continued low level of mineral material sales.

(3) Alternative B

(a) **Impacts to Wildlife from Travel Management**

1. OHV Management and Trails

Same as for Alternative A.

2. Roads

This alternative would result in a moderate increase in road construction associated with mineral exploration and development and forestry activities on BLM-managed lands. ROPs for new road construction actions would provide protective measures for the benefit of localized wildlife populations and their habitat where necessary. However, this alternative would also result in the most impacts from road construction associated with habitat fragmentation.

Based on the amount of potential new road construction anticipated under this alternative, it would have more potential impacts to wildlife than would any other alternative.

(b) Impacts to Wildlife from Recreation

Alternative B would allow for the significant expansion of BLM-managed recreational facilities in the Delta Wild and Scenic River corridor, along the Denali Highway, and within the Tielke planning sub-unit to accommodate increasing levels of recreational use. This alternative would also promote increased levels of recreational use and activity for both the general public and commercial recreation ventures as there would be very few limitations or restrictions on OHV use or helicopter-supported recreation. This alternative would have potentially more wildlife impacts from recreation than would Alternatives C and D, and fewer impacts than Alternative A.

(c) Impacts to Wildlife from Natural and Cultural Resource Protection

Under Alternative B, most ANCSA (d)(1) withdrawals would be revoked to allow for the greatest potential for mineral exploration and development. Consequently, high value wildlife habitat areas previously protected under the umbrella of existing ANCSA (d)(1) withdrawals would be made available to mineral exploration and development, but all permitted activities would be subject to the ROPs and Stips listed in Appendix C.

In general, ROPs provide detailed and quantified measures for the temporal and/or spatial protection and conservation of wildlife habitat (and other resource values) on a case-by-case basis. Areas of high value wildlife habitat, such as parturition areas for the Nelchina caribou herd, the Delta bison herd, moose, raptors, Dall sheep, mountain goats, waterfowl, and those species of wildlife considered Sensitive Status Species, and areas such as winter ranges would receive protection only during the season of critical wildlife use; otherwise, permitted activities could occur within these critical habitats subject to site-specific mitigation measures and outside of the critical seasons. No RNA would be designated for the Bering Glacier area. Impacts to the Bering Glacier would be the same as described under Alternative A on page 477.

(d) Impacts to Wildlife from Lands and Realty Actions

1. FLPMA Disposals

Under Alternative B, approximately 10,000 acres of undeveloped and relatively uninhabited land would be made available for further homesite development in both the north and south Slana blocks. Land disposal under this alternative could range from a maximum development of 2,000 5-acre homesites to a minimum development scenario of 250 5-acre homesites. Of the total 7.1 million acres managed by the BLM, disposal of 10,000 acres within the north

and south Slana blocks would result in degradation and/or permanent loss of wildlife habitat on 0.14 percent of the total land base.

Local wildlife species directly or indirectly affected by disposals (through displacement from preferred habitats, habitat loss, and habitat fragmentation) would include black bears and grizzly bears within their general range, bald eagles within their seasonal breeding habitat, the Nelchina caribou herd within its traditional winter range, moose within their seasonal winter range and general year-round use range, and trumpeter swans within their seasonal breeding habitat. These impacts would affect individuals, not the long-term viability of populations for any of the species listed in this paragraph.

Other disposals would affect local populations of Sensitive Status Species, such as Canada lynx and certain migratory birds, which may be permanently displaced from preferred habitats (both seasonally for breeding purposes and yearlong for less critical life phases). However, these negative impacts are not expected to affect local wildlife populations or their habitats due to the discontinuous nature and small acreages (less than 100 acres total) of land under consideration for disposal. This alternative has more potential for impacts to wildlife through FLPMA disposals than does Alternative A, C, or D.

2. Acquisitions

By not pursuing the acquisition of available private inholdings within the Delta and Gulkana Wild and Scenic River corridors or within the proposed Bering Glacier RNA, private entities may further develop their properties for commercial profit, thereby increasing the levels of human activity within otherwise mostly intact and unfragmented wildlife habitat. Local populations of wildlife in close proximity to development may be potentially disturbed and/or displaced.

3. Land Exchanges

Alternative B would not consider land exchanges until all State and Native entitlements are met. After that point, the potential for land exchanges benefiting both parties would increase the effectiveness of habitat management by enabling resource managers to apply maintenance or enhancement actions on more consolidated or contiguous blocks of land.

4. Land Use Authorizations

Alternative B anticipates the greatest number of land use authorizations associated with increased resource development. Impacts to wildlife would be minimized through application of the ROPs that would be adopted under this alternative.

5. Withdrawal Review

Under Alternative B, 7,003,000 acres of BLM-managed lands would be made available to all forms of mineral leasing and entry. However, 5.5 million of these acres are currently encumbered by State or Native selections and no mineral development would occur until the lands are conveyed or the selection relinquished back to the BLM. All development would be subject to review and application of the ROPs and Stips. The following areas would be protected from disturbance during periods of sensitivity with a timing and/or spatial restriction: parturition areas and winter range for big game species, waterfowl production and molting habitat, and other specialized habitats (e.g., mineral licks) and known critical habitats of Sensitive Status Species (e.g., Canada lynx and certain migratory birds).

Specific effects to wildlife from mineral development are discussed in the *Impacts to Wildlife from Mineral Exploration and Development* section below on page 483. This alternative revokes more withdrawals than any other alternative.

6. Transportation and Utility Corridor Withdrawals

This alternative provides for the revocation of PLO 5150 to allow for mineral entry and to allow for State of Alaska selection for conveyance of the transportation and utility corridor, actions that would have long-term adverse impacts on wildlife habitat resources in the area.

Allowing for mineral entry within both the inner and outer corridors of the transportation and utility corridor would open up 434,000 acres to potential exploration and development. If development were to occur, it could impact the following acreages within the transportation and utility corridor: 13,000 acres of bison calving range along the Delta River (87 percent of the range); 136,000 acres of Dall sheep range (12 percent) on slopes within the Alaska Range and Chugach Mountains; 140,000 acres of moose winter range (10 percent); 42,000 acres of moose calving range (5 percent); 107,000 acres of caribou winter range (2 percent); 19,000 acres of trumpeter swan breeding habitat (7 percent); and 59,000 acres of bald eagle breeding habitat (8 percent). All proposals for mineral entry or leasing would be subject to review and application of ROPs and Stips for the protection of wildlife populations and their habitat. Alternatives A, C, and D would retain withdrawals associated with the transportation and utility corridor.

(e) Impacts to Wildlife from Vegetation Management

1. Fire Management

Alternative B proposes as much habitat improvement through prescribed fire as does Alternative D, and more than does Alternative A or C. Continuance of a

prescribed fire program in the Alphabet Hills would improve habitat conditions, particularly for moose, by maintaining a lower-seral shrub-dominated plant community in burned areas. Lack of prescribed fire in other areas would allow for continued dominance of late-seral black or white spruce cover types and an aging and unproductive shrub component.

2. Forest Products

Under Alternative B, the proposed increase in timber harvest in areas heavily affected by the spruce bark beetle infestation, and the associated road building that would be necessary for timber removal, would have both beneficial and adverse effects on wildlife habitats. Wildlife species that are directly or indirectly dependent upon early seral stage plant communities would benefit from the increased vegetation treatments on a broader landscape level, as would wildlife species that thrive in the presence of diverse micro-scale habitats in close proximity to each other or within edge habitats.

Wildlife species (including pine marten, chickadee, white-winged crossbill, northern goshawk, black-backed woodpecker, boreal owl, great gray owl, great horned owl, Townsend's warbler, and olive-sided flycatcher) that prefer mature spruce forests for all or a portion of their annual life cycle would be adversely affected by the increased timber harvest, as would species (including black-backed woodpecker, olive-sided flycatcher, great gray owl, and boreal owl) that are dependent upon standing dead trees for insect foraging, cavity nesting and roosting, perching, and hawking.

Timber harvest necessarily entails increased human activity and disturbance, and increased road construction for access to the timber. As outlined in Alternative A under *Impacts to Wildlife from Travel Management* on page 476, motorized access can be detrimental to wildlife and their habitat, often displacing wildlife from preferred habitats, contributing to the physical stresses on wildlife, degrading the quality of habitat (via mechanical breakdown of vegetation, increased sedimentation in nearby streams and wetlands, introduction and proliferation of invasive plant species, and habitat fragmentation), and contributing to the potential reduction in the amount of existing wildlife refugia.

The ROPs adopted under this alternative would ensure that timber harvest would provide for the conservation of valuable wildlife habitats or adequately compensate for their degradation.

(f) Impacts to Wildlife from Mineral Exploration and Development

1. Oil and Gas Leasing

Under Alternative B, 5,195,000 acres of BLM-managed lands (74 percent) would be available to leasing for oil and gas activities subject to the terms and

conditions of the standard lease form, pending conveyance of selected lands (4.7 million acres) to State and Native entities. BLM lands open to oil and gas leasing, but subject to minor constraints such as seasonal restrictions for the benefit of wildlife resources, include a total of 1,724,000 acres (24 percent); of these, 898,000 acres are selected by either the State or Native Corporations. The wild portions of the Delta and Gulkana Wild and Scenic River corridors, totaling 137,000 acres (2 percent), would not be open to oil and gas leasing. Under Alternative B, there would be no areas (0 acres) that would be subject to a No Surface Occupancy requirement.

In general, Alternative B represent a 100 percent increase in the amount of lands open to oil and gas leasing as compared to Alternative A.

The development and production of oil and gas is multi-phased (beginning with *exploration through development, production, and abandonment and rehabilitation*), lasting from a minimum of one year for no show of oil or gas at exploratory sites, up to a maximum of 44 years for productive wells that have been exhausted and finally reclaimed. The potential for adverse effects from oil and gas activities to wildlife resources are of equal scope and complexity. In general, the potential for (noise and visual) disturbance and displacement from preferred habitats (during any season of the year), temporary or permanent loss of habitat, habitat fragmentation, loss of individual fitness, or individual mortality (direct or indirect) is expected. Potentially, the adverse effects from oil and gas activities on wildlife would be moderated by implementation of the ROPs and Stips, and by implementation of site-specific mitigation measures for each activity. Oil and gas activities would therefore not be expected to have detrimental population-level effects to any species of wildlife, including birds, terrestrial mammals, marine mammals, and Sensitive Status Species.

Alternative B anticipates twice the level of exploration and development activity as is predicted in the Reasonably Foreseeable Development Scenario as described above under *Impacts to Recreation from Mineral Exploration and Development, Oil and Gas Leasing* for Alternative B on page 427. The Reasonably Foreseeable Development Scenario itself is described on page 409 under the *Analysis Assumptions and Guidelines* for leasable minerals.

Exploration and development of oil and gas fields could occur throughout the year while adhering to the terms and conditions of the standard lease form as well as the ROPs and Stips. If activities were to take place during the winter months when the majority of bird species within the planning area have migrated south to wintering areas, there would be no direct to the birds. However, bird habitats would be directly affected by the development of access roads (either gravel or ice) and/or gravel pads for wells and all associated human activity on a localized level. A limited number of yearlong resident birds such as the common raven, great gray owl, boreal owl, northern hawk owl,

ptarmigan species, grouse species, and other resident passerines could be disturbed and temporarily displaced from localized preferred foraging habitats by oil and gas activities during the exploration and development phase. Exploration and development activities that continue into the warmer months of the year could affect migratory bird species as they return to Alaska for the breeding and brood-rearing season, but such exposures are not expected to have any population level effects due to the implementation of ROPs, Stips, and site-specific mitigation measures that would minimize adverse impacts and/or restrict activities during the critical breeding/brood-rearing season.

Water withdrawn from nearby lakes for the construction of ice roads in winter would alter water levels and adjacent habitats; however, water recharge during the spring thaw would minimize adverse effects to the aquatic invertebrate populations utilized by migratory birds and the potential for long-term adverse effects.

Impacts to terrestrial mammals would also be expected during the exploration and development phase from motor vehicle, foot, and aircraft traffic; seismic operations; oil spills; gravel mining; and construction within a localized, 1-mile perimeter of these activities. The primary impacts to mammals would likely be associated with visual and audible disturbance, displacement from preferred habitats, habitat alteration (associated with gravel placement for access roads and pads for well sites), and habitat fragmentation (see also the fragmentation discussion on page 474 under *Impacts Common to All Alternatives, Impacts to Wildlife from Travel Management, Roads*). Movements of the Nelchina caribou herd while on their calving grounds in the eastern Talkeetna Mountains and wintering moose on critical winter ranges may be affected by exploration and development activities during winter (and late winter) months, but these discrete areas would be protected by the proposed ROPs and Stips. Omnivorous predators like grizzly bear, black bear, red fox, and coyote may potentially be attracted to oil and gas developments where human food stuffs and garbage are available, thereby bringing these mammals into direct conflict with the safety of oil and gas field workers; however, proper handling of human foods and generated wastes would greatly reduce or eliminate this potential conflict.

According to the Reasonably Foreseeable Development scenario, depending upon the results of the exploratory activities, construction of approximately 120 miles of new pipeline may be necessary to transfer the petroleum to distant refinery facilities. Large mammals, especially caribou, are known to hesitate before crossing under an elevated pipeline for periods of time ranging from several minutes to a few days. Construction of below-ground pipelines, wherever possible (dependent upon the absence of local permafrost), is highly desirable to eliminate adverse effects to the natural movements of caribou and moose. However, it is expected that the mere physical presence of above-ground pipelines would have a minimal adverse effect on the behavior,

movement, or distribution of wildlife and would not be expected to have adverse population-level effects to these species.

Winter exploration and development in the Bering Glacier area would have no foreseeable adverse effects to marine mammals. The north Gulf Coast harbor seal population (a BLM Sensitive Status Species) is known to peak in its abundance in Vitus Lake (in the foreground of the Bering Glacier) during the month of September when prey is most abundant. Alaska's total harbor seal population is estimated at between 200,000 and 300,000 animals. For most of the year, however, fewer than 200 seals have been observed hauled out on Vitus Lake icebergs (Saverese and Burns 2004).

The Reasonably Foreseeable Development scenario predicts that given the typical life of a producing well (10-12 years for gas and 30 years for oil), two to six of the potential ten gas production wells would be plugged during the planning period. The production phase of oil and gas activities would have similar impacts as described above for the exploratory and development phase, but would be of longer duration. Habitat alteration, loss, and fragmentation would be long-term for well sites that are in full production; however, localized production wells are generally no larger in size than 2-4 acres each per 640-acre gas field. Access roads to full production wells typically average two miles per 160 acres. Wildlife become habituated to long-term routine and predictable human activities and associated disturbances, and are capable of normal daily and lifelong processes and functionality without undue adverse effects to individuals or populations.

Due to the documented extensive replacement of and conversion from valuable wetland habitat to open water as associated with producing oil and gas fields in the Gulf of Mexico region of the United States, the implications of hydrocarbon production-induced wetlands subsidence within the planning area is a significant concern. As stated in a Fact Sheet prepared by the U.S. Geological Survey regarding wetland subsidence,

When large volumes of oil, gas, and associated formation water are extracted from the subsurface, the natural pressures in the reservoirs are reduced and stresses around the reservoir increase. The increased stresses cause reservoir compaction, which, in places, leads to surface subsidence (USGS 2001).

Fluid hydrocarbon production is inherently concentrated within specific field areas, but the potential for the depressurization effect extends far beyond the individual fields. "Where multiple fields are producing from the same strata, regional depressurization can cause subsidence and wetland losses in the areas between the fields" (USGS 2001). Wetlands habitat comprise roughly 3.9 million acres (55 percent) of the planning area, and 1.4 million of those acres (20 percent) are managed by the BLM. These wetlands, regardless of

ownership, support large volumes of waterfowl reproduction in southcentral Alaska; of particular concern are those wetlands within the Clearwater block, the West Fork Gulkana watershed, and the foreground of the Bering Glacier. Wetland subsidence would have significant adverse effects on waterfowl production, especially those species considered Sensitive Status Species such as the trumpeter swan, dusky Canada goose, tule white-fronted goose, and Vancouver Canada goose.

The Reasonably Foreseeable Development scenario for the Bering Glacier region predicts there is high potential for the generation of oil and gas, but low development potential. Under Alternative B, BLM-managed lands within the Bering Glacier region would be open for oil and gas activities. The BLM-managed lands in this region are subject to the influences of the Gulf of Alaska, and, at their nearest point to marine waters, are approximately 3 miles distant in the Malaspina Glacier and the White River Glacier areas, and 6 miles distant in the Suckling Hills area. In 2004, the U.S. Fish and Wildlife Service named the Kittlitz's murrelet (*Brachyramphus brevirostris*), a seabird typically found in glacial-fed marine waters, as a candidate for listing under the Endangered Species Act. Recent Section 7 Consultation with the U.S. Fish and Wildlife Service (FWS 2004) indicates that the murrelet may be found offshore of the Bering Glacier and Malaspina Glacier. In addition, harbor seals are known to swim up the Seal River and haul-out on icebergs in Vitus Lake (in the foreground of the Bering Glacier) yearlong. Several other Sensitive Status Species, including dusky Canada goose, Vancouver Canada goose, tule white-fronted goose, red-throated loons, Canada lynx, and trumpeter swan, are known to occupy parturition habitat in Vitus Lake and the terrestrial foreground of Bering Glacier.

Generally, marine mammals and birds in the northern Gulf of Alaska, especially harbor seals and Kittlitz's murrelet, would be protected from oil and gas activities that would occur in the area under Alternative B due to the extent of the land buffer between BLM-managed lands and the coastline. In addition, ROPs, Stips, and site-specific seasonal and temporal mitigation measures would ensure adequate habitat protections, ensuring leasing activities would not lead to adverse population-level effects. Consequently, there would be no adverse effect to any Sensitive Status Species or other wildlife species and their habitat in the area.

Abandonment and rehabilitation of dry exploratory wells and formerly active oil and gas wells generally lasts from two to five years per site, with restoration of the surface area being most beneficial to wildlife resources. Among other abandonment activities such as plugging and capping of the well, reclamation includes recontouring of the area to match the natural lay of the land, stabilization of the soil, possible addition of fertilizer to hasten the vegetation regrowth, and reseeding with native plant seed mixtures. Motorized human activities are necessarily associated with the abandonment and rehabilitation

phase, but are relatively short-term. Overall, this final phase of oil and gas activities denotes the coming conclusion of disturbance and displacement of wildlife from formerly preferred habitats, and the reestablishment of early seral stage native plant communities. As with the expected effects associated with oil and gas production, it is not expected that abandonment and rehabilitation activities would jeopardize the viability of any wildlife population, including those species considered Sensitive Status Species by BLM-Alaska. Standard Lease Terms, Lease Stipulations, ROPs, and site-specific mitigation measures would ensure the integrity of critical habitats during critical seasons of use.

2. Locatable Minerals

Alternative B proposes the opening of 6,919,000 acres (98 percent) of BLM-managed lands for locatable mineral activities; of this amount, 5.5 million acres are selected by either State or Native entities for conveyance. A total of 137,000 acres (2 percent) within the wild portions of the Delta and Gulkana Wild and Scenic River corridors would be closed to all locatable mineral activities under this alternative. Alternative B represents a 95 percent increase in the amount of lands open to locatable mineral activity over that available under Alternative A. However, mineral exploration and development would not occur on all lands that are available.

The opening of the majority of BLM-managed lands to locatable mineral mining would result in the same adverse effects described above for oil and gas activities beginning on page 483. Locatable minerals mining would necessitate the need for road construction, infrastructure development, and significant increases in the volumes of motorized and human activity in a localized area. As indicated in Alternative B for oil and gas activities above (page 483), motorized human activities have direct and indirect detrimental effects to wildlife and their habitat due to disturbance and displacement from preferred habitats, habitat fragmentation, and loss of individual fitness, productivity, and abundance. Changes to the traditional movement patterns, distribution, and expected normal behavior of wildlife are also anticipated. Scavenging wildlife such as bear, coyote, fox, common raven, and gray jay would be attracted to human developments associated with mining activities if human food and garbage were handled improperly; in the case of bears, this attraction would create safety concerns for mine employees and would likely lead to the destruction of garbage-habituated bears.

Long-term habitat alteration, loss, and fragmentation due to the development of an open pit mine(s) (and the possibility of associated toxic settling pond development) are unavoidable and would potentially have long-term adverse effects on localized wildlife; however, the extent of habitat that would be affected and the possible location(s) of a potential mine are not known and cannot be addressed in detail at this level of planning (RMP) with regard to specific wildlife species. All proposed mining operations, however, would be subject to ROPs, Stips, and site-specific mitigation measures to protect and

conserve localized wildlife resources, including Sensitive Status Species of wildlife.

3. Mineral Materials

This alternative anticipates increased levels of gravel extraction. In general, effects to wildlife would be the same as described above for locatable minerals.

(4) Alternative C

(a) Impacts to Wildlife from Travel Management

1. OHV Management and Trails

Under Alternative C, OHV use would be limited or precluded within specified areas of BLM-managed lands, which would provide for the maintenance of current refugia and for the potential reestablishment of former areas of refugia.

Proposed seasonal limitations on OHV use in specific areas of critical wildlife habitat would provide for the integrity of these habitats during the critical parturition (Nelchina caribou herd, trumpeter swans, Delta bison herd, and moose) and winter (moose) seasons. Potential disturbances to wildlife for motorized uses would be greatly reduced and/or eliminated. Alternative C provides for proactive management of snowmachines in specific areas of concentrated moose use during winter if current or future research indicates there are significant adverse impacts to wintering moose.

Active OHV management along designated trails would minimize habitat degradation and/or loss. The potential for the introduction and proliferation of invasive plant species would be constrained to designated trail corridors and would be more easily managed or eliminated, thereby protecting native vegetation and dependent wildlife populations. Introduction of invasive plant species might occur by other means. This alternative, through proposal of more areas that would limit OHV use to designated trails, would be expected to decrease impacts of OHVs on wildlife more than Alternative A, B, or D would.

2. Roads

Under Alternative C, the potential for new road construction would be less than under any of the other alternatives. In total, no new road construction would be permitted on 3,782,000 acres (54 percent) of BLM-managed lands. New road construction would be permitted on the remaining 46 percent, but would be subject to a case-by-case review and the application of ROPs for the benefit of wildlife and their habitat.

(b) Impacts to Wildlife from Recreation

Alternative C provides the most stringent protective measures for the benefit of wildlife resources through designation of five SRMAs totaling 1,916,000 acres (27 percent of BLM-managed lands in the planning area), by maintenance of or additions to existing ANCSA (d)(1) withdrawals, by limiting OHV use to designated or existing trails, through maintenance of recreational facilities at the current levels, through continued management for existing levels of recreation, and through establishment of recreational visitor use limits in specific areas to ensure human uses are in balance with the needs of the natural resources.

Under this alternative, limited OHV use (including use of snowmachines) within the proposed SRMAs would benefit wildlife resources as described for this alternative above under *Impacts to Wildlife from Travel Management* on page 489.

Within the proposed Tiekel SRMA, helicopter-supported recreational activities would not be allowed north of the Tiekel River or adjacent to Stuart Creek on BLM-managed lands. This restriction would eliminate the potential for disturbance and displacement of wildlife (including Dall sheep, mountain goat, and moose) on winter ranges in these areas by low-level, high decibel aircraft. Research clearly indicates that Dall sheep, mountain goats, and other wildlife are susceptible to disturbance by low-level helicopters, particularly while the animals are on their winter ranges (Cote et al. 1996; Frid 2003; Goldstein et al. forthcoming; Joslin 1986; Krausman et al. 1998).

The northern Tonsina subunit of the Tiekel SRMA would be closed seasonally to motorized vehicles from April 15 through October 15 of each year to eliminate the potential for motorized disturbance and displacement of wildlife. The southern Tonsina subunit would be closed yearlong to motorized vehicles (including snowmachines and helicopter-supported recreation) to allow for the maintenance of existing wildlife refugia in this area.

Within the Delta Range SRMA, designation of motorized trails would afford protection for large acreages of Dall sheep lambing and bison calving areas, and an area of known heavy use by grizzly bears along the Delta River's western floodplain. In addition, portions of the Augustana, Fels, Canwell, **McCallum**, and Castner glaciers and drainages (all within this proposed SRMA) would be designated yearlong as non-motorized (including prohibitions on snowmachine use), which would afford winter range protection for the local Dall sheep population. The entire Delta Range SRMA would be closed to commercial helicopter-supported recreation activities, which would eliminate the potential for disturbance and displacement of wildlife including Dall sheep and moose on winter ranges in these areas by low-level, high decibel aircraft. This alternative would be more effective at reducing impacts to wildlife from recreation than Alternative A or B, and less effective than Alternative D.

(c) Impacts to Wildlife from Natural and Cultural Resource Protection

Alternative C would designate three ACECs totaling 898,000 acres (13 percent of the BLM-managed land in the planning area) for areas of known high wildlife use and habitat. These three discrete areas include the calving grounds for the Nelchina caribou herd (eastern Talkeetna Mountains), the calving grounds for the Delta bison herd (western floodplain of the Delta River within the Alaska Range), and the Gulkana River wetlands breeding habitat of the trumpeter swan (a Sensitive Status Species). ACEC designation would set aside these discrete areas for the primary purpose of protecting critical wildlife habitat yearlong by 1) maintaining existing ANCSA (d)(1) withdrawals or implementing new withdrawals from minerals activities, and 2) implementing other area-specific objectives such as OHV use limitations, prohibitions on new road or airstrip construction, prohibitions on issuing military permits, and identification of right-of-way avoidance areas.

ACEC designation was specifically proposed for three species (caribou, bison, and trumpeter swan) because their critical habitat areas are discrete and well-documented. However, numerous other wildlife species, including several Sensitive Status Species would benefit from the ACEC designations as these other species and their habitats are located within the same geographic areas.

The designation of approximately one million acres in the Bering Glacier region as an RNA under Alternative C would afford all-encompassing protection from possible threats to not only the flora and fauna of this area, but to the ecologically unique and glacially-influenced environment near the Gulf of Alaska coastline. Through on-going research efforts in the Bering Glacier region, several Sensitive Status wildlife Species have been observed and documented using the area during critical reproductive and molting seasons. These species include, but are not limited to, Canada lynx, harbor seal, tule white-fronted goose, dusky Canada goose, Vancouver Canada goose, red-throated loon, and trumpeter swan. Furthermore, paleontological research has documented a diverse assemblage of invertebrate species, preserved forests, and ancient peats. Preliminary botanical studies have identified more than 350 vascular and nonvascular species. The glacier forelands are also known to support a highly diverse vertebrate community including fresh and anadromous fishes and a previously undocumented harbor seal haul-out. The diversity of fauna and flora in the area around the margins of the Bering Glacier is likely due to the dynamic physical habitat (Payne et al. 2004).

(d) Impacts to Wildlife from Lands and Realty Actions

1. FLPMA Disposals

Disposal of land in the Slana area would have the same effects as described under Alternative A on page 477. Regarding Sensitive Status Species, no habitat degradation or permanent habitat loss would occur associated with the resolution of failed claims or lack of new land disposals.

No positive or negative effects to local wildlife populations or their habitat would result from the disposal of these small and isolated tracts of land along the main highway corridors.

2. Acquisitions

The direction under this alternative to acquire private inholdings as they are made available to the Federal government within the Delta and Gulkana Wild and Scenic River corridors and within the proposed Bering Glacier RNA would curtail further development and conserve wildlife habitat resources. This would include habitat for local populations of Sensitive Status Species migratory birds or Canada lynx.

3. Land Exchanges

Under Alternative C, the potential for land exchanges benefiting both parties would increase the effectiveness of habitat management by enabling resource managers to apply maintenance or enhancement actions on more consolidated or contiguous blocks of land.

4. Land Use Authorizations

Under Alternative C, to protect the integrity of high value wildlife habitat and other natural resource values, no FLPMA or R&PP permits would be issued in specific discrete areas. This would moderately benefit wildlife resources, as there would be less potential for disturbance and displacement of wildlife from preferred habitats.

Increased right-of-way avoidance for specific areas and seasonal restrictions on rights-of-way in other high value wildlife habitat areas would significantly improve the situation for wildlife resources within the Glennallen Field Office. Of particular significance would be the avoidance of overhead powerlines in the area of concentrated trumpeter swan (a Sensitive Status Species) use within the West Fork Gulkana area.

5. Withdrawal Review

Alternative C maintains withdrawals on more acres than does Alternative B or D, and on fewer acres than does Alternative A. Maintenance of withdrawals prevents locatable mineral entry and mineral leasing. The impacts of mineral exploration and development to wildlife under this alternative are discussed under *Impacts to Wildlife from Mineral Exploration and Development* on page 493.

6. Transportation and Utility Corridor Withdrawals

Same as for Alternative A.

(e) Impacts to Wildlife from Vegetation Management**1. Fire Management**

Alternative C would not differ significantly from current vegetation management under Alternative A, except that commercial timber harvest would be prohibited within the Delta Bison Calving ACEC, the Nelchina Caribou Calving ACEC, the West Fork ACEC, and the Bering Glacier RNA.

Given the historically demonstrated difficulty in realizing prescribed burn objectives in the Copper River Basin, the proposal to enhance wildlife habitat using only wildland or prescribed fire would severely hamper the efforts of resource managers to positively affect change and reestablish diverse seral stages on a landscape level within the Glennallen Field Office. Barring the occurrence of large scale wildfires in the Copper River Basin, resource managers could expect to see a continued decline in overall habitat quality and productivity under this alternative. Compared to Alternatives C and D, this alternative may provide limited benefits to those species of wildlife that thrive in the presence of diverse and nutritionally productive habitats.

2. Forest Products

Small-scale localized timber removal for personal and commercial use firewood and house logs, and the use of only temporary winter access roads, would significantly limit the adverse effects normally associated with road construction and motorized human activity on wildlife populations and their habitat. The proposed ROPs would ensure that timber removal and prescribed fire management actions would provide for the conservation of valuable habitats or adequately compensate for their degradation.

(f) Impacts to Wildlife from Mineral Exploration and Development**1. Oil and Gas Leasing**

Same as for Alternative A.

2. Locatable Minerals

Alternative C anticipates similar levels of locatable mineral development as described under Alternative A, but the application of ROPs under this alternative would minimize impacts to wildlife from what limited mining activity would occur.

3. Mineral Materials

Alternative C anticipates similar levels of mineral material sales as described under Alternative A, but the application of ROPs under this alternative would minimize impacts to wildlife from what limited gravel extraction would occur.

(5) Alternative D (Proposed RMP)

(a) Impacts to Wildlife from Travel Management

1. OHV Management and Trails

Under Alternative D, no ACEC designations or seasonal restrictions on OHV uses for the benefit of wildlife and their habitat would occur in the known calving areas of the Nelchina caribou herd and the Delta bison herd or within the known breeding wetlands habitat of the trumpeter swan. However, OHVs would be spatially restricted to the use of designated or existing trails on 99 percent of BLM-managed lands, so disturbance or displacement of wildlife by OHVs would be limited and actively managed in these specific areas of critical habitat concern.

Proposed OHV management within SRMAs would extend the areas of protection for wildlife habitat and especially wildlife refugia, provide for active management and control of potential invasive plant species by limiting cross-country travel by OHVs, and greatly reduce the areas of potential disturbance to wildlife and reduce their displacement from preferred habitats year-round.

Active OHV management along designated trails would minimize habitat degradation and loss. The potential for the introduction and proliferation of invasive plant species by OHVs would be constrained to designated and existing trail corridors and would be more easily managed or eliminated, thereby protecting native vegetation and dependent wildlife populations.

Alternative D provides for the potential long-term proactive management of snowmachines in areas of concentrated moose use during winter if current or future research indicates there are significant adverse impacts to wintering moose. Active management of snowmachine use is beneficial to wildlife during the most physically demanding time of year wherever proposed, but especially in areas of known wildlife winter ranges.

Under Alternative D, long-term beneficial effects to terrestrial Sensitive Status Species (Canada lynx and certain migratory birds) and their habitat are expected, as described in this section for other wildlife populations and their habitat, but to a lesser degree than provided for under Alternative C. By limiting OHV use to existing or designated trails and not condoning off-trail cross-country travel, this alternative is more effective at managing impacts to wildlife from OHV use than is Alternative A or B, and less effective than Alternative D.

2. Roads

The construction of new roads would be limited seasonally within critical wildlife parturition areas, which would provide for the necessary protection of sensitive preferred habitat and eliminate the potential for disturbance of wildlife populations during this critical life phase. In total, approximately 6,889,000 acres of BLM-managed lands would be open to new road construction with seasonal restrictions or under the guidelines of the ROPs. A total of 167,000 acres of BLM-managed lands would be closed to all new road construction.

(b) Impacts to Wildlife from Recreation

In general, Alternative D provides for moderate levels of protection for the benefit of the wildlife resource through the designation of SRMAs on currently unencumbered lands (the Delta and Gulkana Wild and Scenic River corridors and the Delta Range area) and on other specific land areas that may be retained in long-term BLM ownership (the Denali Highway corridor and Tielkel area). Outside of these specific areas, no particular management emphasis is placed on recreational activities.

Under Alternative D, the existing ANCSA (d)(1) withdrawals specified within the Gulkana Wild and Scenic River corridor would remain in place; however, all other (d)(1) withdrawals within the previously discussed areas would be partially modified to allow for increased potential development of minerals. Incoming proposals for mineral development activity in these areas would be subject to site-specific reviews and mitigation measures for the benefit of the wildlife resource.

OHV use would be limited to designated or existing trails on all lands that are currently under long-term BLM management, or that would be retained under long-term BLM management. Some areas of limited OHV use (including limitations to snowmachines) would benefit wildlife resources as indicated under *Alternative A, Impacts to Wildlife from Travel Management* on page 476. Within the Delta Wild and Scenic River corridor, **BLM would recommend** that motorized watercraft on Tangle Lakes be limited to small horsepower “kickers,” thereby benefiting local nesting, brood-rearing, and molting waterfowl and shorebirds through the reduction of noise level disturbances and the amount of detrimental wake action behind watercraft and along shorelines.

In general, recreation facilities would be improved or added where current heavy use levels are creating impact problems, such as along the Denali Highway or in the Tielkel area. Developing facilities to handle impacts should minimize some localized impacts to habitat that are occurring, such as loss of vegetation from dispersed campsites or social trails.

Upper use limits for commercial helicopter-supported recreation would be determined for the Tielkel and Delta Range areas. These limits, in combination with the application of the measures described in the ROPs, would reduce or eliminate the detrimental effects of low-level, high decibel aircraft on wildlife on a site-specific

basis. Overall, Alternative D would be more effective than Alternative A, B, or C at managing impacts to wildlife from recreation activities.

(c) Impacts to Wildlife from Natural and Cultural Resource Protection

Although Alternative D does not designate any areas as ACECs, it does afford a multiple-use approach for the protection of known high value wildlife habitat areas for the specific benefit of a particular species. Alternative D's protective measures are not as all-inclusive or as restrictive as those proposed under Alternative C, but they do identify seasonal restrictions built around the core minimum critical seasons of use for caribou, bison, trumpeter swans, Dall sheep, and mountain goat critical habitat areas. This would provide more area-wide protection than under Alternative A.

The proposed ROPs, which would apply to all permitted activities under Alternative D, afford further specific seasonal and spatial limitations for the protection and conservation of critical habitats for the wildlife species listed above, as well as for moose, migratory and resident birds, and Sensitive Status Species. The habitats of other wildlife species including members of the rodent family, large and small furbearers, and amphibians would directly benefit from protective measures proposed for various other resource values (including wildlife species-specific habitat, fisheries, habitat, riparian areas, water quality, wetlands, soils, vegetation, cultural and visual resources, and control of invasive plant species) within BLM-managed lands.

Although there would be no ACEC designations, limitations would be imposed on OHV use in the three discrete critical wildlife habitat areas for the specific benefit of caribou, bison, and trumpeter swans. Outside of these areas on BLM-managed lands, OHVs would be limited to designated or existing trails for the purpose of protecting other natural resource values, all coincidental to the benefit of wildlife habitat in general. Less than 1 percent of BLM-managed lands would be closed to OHV use (44,000 acres).

Again, the habitat concerns of Sensitive Status Species would be addressed given the habitat information available per species and as afforded under the ROPs.

The designation of approximately 827,000 acres of the Bering Glacier region as an RNA with OHV limitations and maintenance of ANCSA (d)(1) withdrawals on the western two-thirds of the area would maintain and enhance the ecological integrity of this unique area. Wildlife habitat and local wildlife populations (including Sensitive Status Species) would benefit from RNA designation. This alternative provides greater protection to wildlife resources in the Bering Glacier area than does Alternative A.

(d) Impacts to Wildlife from Lands and Realty Actions**1. FLPMA Disposals**

Disposals would be used in the Slana area to resolve scattered cases of unauthorized occupancy. Because development of homesites has already occurred, effects of this action on wildlife habitat would be insignificant. Some positive effects could occur if clean-up of abandoned materials or hazardous materials occurs as a result of resolution of unauthorized use.

Other disposals are expected to have no positive or negative effects to localized wildlife populations or their habitat due to the discontinuous nature and small acreages (less than 100 acres total) of land under consideration for disposal under FLPMA.

No positive or negative effects to Sensitive Status Species or their habitat are expected due to the isolated nature of these small tracts of land. This alternative would have more potential impacts to wildlife through FLPMA disposals than Alternative A or C, and fewer than Alternative B.

2. Acquisitions

The direction under this alternative to acquire private inholdings as they are made available to the Federal government within the Delta and Gulkana Wild and Scenic River corridors and within the proposed Bering Glacier RNA would curtail further development and conserve wildlife habitat resources.

Upon Federal government acquisition, any existing structure(s) would either be maintained for public and/or administrative uses or permanently removed, depending upon structure soundness and quality. If the structure(s) is maintained, slight increases in the level of human activity at these sites would be expected each year.

Regarding Sensitive Status Species, no habitat degradation or permanent habitat loss would occur within seasonal habitat for migratory birds or yearlong habitat for Canada lynx. Effects to localized populations of Sensitive Status Species migratory birds or Canada lynx would be insignificant if acquisition of scattered small tracts of land within the Wild and Scenic River corridors and the proposed Bering Glacier RNA occurred.

3. Land Exchanges

The potential for land exchanges benefiting both parties would increase the effectiveness of habitat management by enabling resource managers to apply maintenance or enhancement actions on more consolidated/contiguous blocks of land.

4. Land Use Authorizations

Other FLPMA and R&PP applications for land uses, leases, and issuance of authorized permits would be closely reviewed and potentially allowed if consistent with proposed primary wildlife habitat objectives for known high value wildlife habitat areas (e.g., Nelchina caribou calving area, Delta bison calving area, West Fork Gulkana trumpeter swan breeding habitat) and other special natural resource value areas.

Increased right-of-way avoidance for specific areas and seasonal restrictions on rights-of-way in other high value wildlife habitat areas would reduce potential adverse effects that could occur under Alternatives A and B. Of particular significance would be the avoidance of overhead powerlines in the area of concentrated trumpeter swan (a Sensitive Status Species) use within the West Fork Gulkana area.

5. Withdrawal Review

Although Alternative D opens up large areas of land (5,793,000 acres, or 83 percent of the planning area, pending conveyance or relinquishment on selected lands) within the Glennallen Field Office for potential minerals exploration and development, significant amounts of withdrawn acreage are maintained (1,210,000 acres, or 17 percent of the planning area). Where withdrawals are revoked, all proposed activities would be subject to ROPs, Stips, and site-specific mitigation measures for the conservation of wildlife resources.

6. Transportation and Utility Corridor Withdrawals

Retention of existing withdrawal status for both the inner and outer corridors of the transportation and utility corridor would maintain management of large linear blocks of land (430,000 acres over 112 linear miles) with established and structured types and levels of disturbance.

The maintenance of existing allowable uses for only locatable mineral entry within the outer corridor of the transportation and utility corridor (approximately 173,000 acres) would occur on big game winter habitat, big game calving and lambing habitat, and migratory bird breeding habitat. The transportation and utility inner corridor (approximately 261,000 acres) would remain closed to all mineral entry. This alternative would modify PLO 5150 to allow for conveyance of 83,000 acres to the State. This area is located north of Paxson and includes Gunn Creek, Fish Lake, and an area north and west of the Delta River. Gunn Creek and areas adjacent to the Delta River are areas that are vegetated with dwarf birch and willow and provides excellent moose winter range. Transfer of this land to the State would not alter its quality as moose winter range. It would, however, change the emphasis of management in these areas, from recreation to mineral exploration and development.

The amendment to dispose of scattered, unmanageable tracts of land (<100 acres) created by highway realignment would have negligible effects on localized wildlife populations and/or their habitat.

The maintenance of the existing allowable uses for only locatable mineral entry within the outer corridor of the transportation and utility corridor, subject to site-specific review, and no mineral entry within the inner corridor would protect Sensitive Status Species habitat and localized populations of Canada lynx and certain migratory birds.

(e) Impacts to Wildlife from Vegetation Management

Alternative D would provide for increased levels of flexibility in vegetation management and habitat enhancement actions while still providing for the conservation of wildlife resources using the ROPs and site-specific mitigation measures. In contrast to current management direction and its emphasis on the enhancement of moose habitat only, habitat enhancement opportunities for moose, caribou, bison, and Dall sheep would be actively pursued in close cooperation with ADF&G biologists, thereby having a larger landscape-level net effect for the benefit of multiple wildlife species and their habitat.

1. Fire Management

Same as for Alternative B.

2. Forest Products

Under Alternative D, both the beneficial and adverse effects of the proposed increased salvage harvest of beetle-killed spruce, targeted at approximately 144,000 acres, would be the same as described for Alternative B, but on a more modest level. Anticipated levels of actual harvest would be 40-100 acres/year.

Emphasis would be placed on the use of temporary roads for access to primarily winter harvest areas, thereby significantly reducing the potential adverse impacts associated with road construction and human activity. However, the potential for limited construction of permanent secondary roads would have long-term adverse effects on localized wildlife populations and their habitat as described generally for roads/trails in Alternative A.

The allowance for personal use firewood gathering within the Delta and Gulkana Wild and Scenic River corridors, consistent with current river management plans, would have negligible effects on local or landscape-level wildlife habitat or wildlife populations.

Given the remote nature of the proposed Bering Glacier RNA and the subsequent protection and conservation of its unique natural values, any proposed timber harvest in that area would be subject to intense scrutiny and would have to be compatible with established wildlife resource values.

(f) Impacts to Wildlife from Mineral Exploration and Development

1. Oil and Gas Leasing

Under Alternative D, a potential 3,907,000 acres of BLM-managed lands (55 percent) would be available to leasing for oil and gas activities subject to terms and conditions of the standard lease form and pending conveyance of selected lands to State and Native entities. No BLM lands would be open to oil and gas leasing subject to major constraints, such as No Surface Occupancy. A total of 1,730,000 acres (25 percent) would be open to leasing but subject to minor constraints such as seasonal restrictions for the benefit of wildlife and critical wildlife habitat (including all lands within known trumpeter swan breeding habitat, known moose winter range, caribou and bison calving areas, lands within one-fourth mile of active bald eagle nests, and lands of greater than 25 percent slope for protection of Dall sheep and mountain goat parturition habitat and winter ranges). A total of 1,463,000 acres (21 percent) would be closed to oil and gas leasing for the protection of resource values, including lands within the western two-thirds of the Bering Glacier RNA, both Wild and Scenic River corridors, and the transportation and utility corridor, except where overridden by PLO 6329.

In general, Alternative D represents a 79 percent increase in the amount of lands open to oil and gas leasing relative to the current management situation represented by Alternative A. The expected effects are the same as outlined above for Alternative B for oil and gas leasing on page 483, but at half the level of development.

2. Locatable Minerals

Under Alternative D, 6,032,000 acres (85 percent) of BLM-managed lands would be open to the operation of mining laws, pending potential conveyance of 5.5 million acres of selected Federal lands to State and Native entities. A total of 1,068,000 acres (15 percent) would be closed to the mining of locatable minerals within the Delta and Gulkana Wild and Scenic River corridors, the western two-thirds of the Bering Glacier RNA, the inner corridor of the transportation and utility corridor, and the Slana settlement area.

In general, Alternative D represents a 78 percent increase in the amount of lands open to the operation of mining laws relative to the current management situation represented by Alternative A. The expected effects are the same as outlined above for Alternative B for locatable minerals on page 488.

3. Mineral Materials

Alternative D anticipates a greater level of mineral material sales than does Alternative A or C, but less than does Alternative B. Because of the limited area involved in gravel extraction (generally 5 acres or less) and the application of ROPs to ensure adequate revegetation of affected sites, impacts to wildlife habitat would be minimal.

f) Fish (Including Sensitive Status Fish Species)

(1) *Impacts Common to All Alternatives*

(a) Impacts to Fish from Sedimentation

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, that could contribute to erosion or sedimentation into streams and rivers. Alternative-specific description of impacts will describe to what degree sedimentation may occur.

Erosion can lead to increased turbidity and sedimentation, which in turn 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 heavy sediments. 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, if food is abundant, to 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 suspended sediment that prevents emergence from spawning gravels and interferes with respiration. Embedded sediments fill interstitial spaces and essential winter habitat used by juvenile fish. Filling of pools further limits overwintering sites for adult and juvenile fish.

(b) Impacts to Fish from Recreation

Research has shown that the greatest recreational impacts to upland soils and vegetation occur from the initial use, with little additional effect from increased use

(Clark and Gibbons 1991). The main impacts on fish would come from additional trails or roads, which may gather runoff and begin to rut, thereby leading to increased erosion.

Riparian impacts from recreation (such as dispersed campsites along the Gulkana River) include erosion, loss of shade, loss of food and cover, loss of a “buffer” to upland impacts, and decreased bank stability. Recreational-related changes to the aquatic habitat can occur as alterations to channel morphology and increased pollution. Stream morphology changes would probably only occur as a result of OHV use. Although OHV/stream interactions are sometimes only considered applicable at stream crossings, there are times and places where OHVs users utilize streams as trails. This is not authorized under any alternative, so it is doubtful that it occurs except in isolated, unauthorized and undetected cases. If stream crossings are sited properly, their use would minimize impacts to stream morphology.

Increased pollution can occur as more people use the rivers and dump things into the river, either intentionally or unintentionally. As more boaters and OHV users enter and cross streams, the pollutants from petroleum products increase proportionately. Also, as use in general increases, recreational pollutants such as soaps, fuels, and herbicides also increase.

(c) Impacts to Fish from Vegetation Management

1. Fire Management

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 suppression category, which means that fires would only be suppressed for the protection of human life and structures. 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. Negative effects from aerial applications of retardant have been documented only a few times, and only in cases where high levels of retardant have been dumped directly into fish bearing streams. With modern retardants and standards for retardant use, it is highly unlikely that there would be any noticeable effects from fire or fire suppression activities on fish or fish habitat under any alternative.

Fire effects that can 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 alternation 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.

The extent of surface erosion after a fire would depend on the topography and soil type of the immediate area. Very little surface erosion normally occurs on burned sites in the planning area because of the gentle topographical features; therefore, stream siltation is usually negligible.

(d) Impacts to Fish from Mineral Exploration and Development

1. Locatable Minerals

In general, surface mining activities increase erosion. Surface mining operations may also disrupt subsurface and surface flow patterns. This could potentially affect seeps and springs that may provide thermal refugia in both summer and winter. Bridges, culverts, and low-flow crossings are integral features to road development associated with surface mining. These features can also interfere with migrations to spawning, feeding, 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.

Mining operations also have the potential to increase pollution that may enter streams through runoff. In addition, major channel and habitat changes could occur if surface mining operations are allowed in active stream channels.

(2) *Alternative A*

(a) Impacts to Fish from Travel Management

1. OHV Management and Trails

Under Alternative A, 96 percent of BLM-managed lands would retain designation as open to OHV use, resulting in some continued localized impacts from erosion due mainly to unauthorized stream crossings. 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 would increase under this alternative, with a resulting increase in erosion and sediment impacts.

2. Roads

This alternative would see a slight potential for an increase in road construction associated with mineral exploration and development on State and Native

Corporation lands. Under this alternative, road construction would be considered on a case-by-case basis. Existing standard stipulations would apply that minimize the effects of erosion, flow augmentation, and runoff; however, these stipulations are not as effective or protective as the ROPs that would be applied under Alternatives B, C, and D.

(b) Impacts to Fish from Recreation

Under Alternative A, recreation management is custodial. There are no SRMAs that would set recreation objectives or develop visitor use limits. Trails 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.

(c) Impacts to Fish from Natural and Cultural Resource Protection

Under Alternative A, there are no ACECs or RNAs. Protective measures for selected values would be implemented on a case-by-case basis. The standard stipulations currently applied do not afford the same protections as do the ROPs that would be applied under Alternatives B, C, and D. Alternative A would therefore have the most negative effects to fish and fish habitat of all the alternatives.

(d) Impacts to Fish from Lands and Realty Actions

1. FLPMA Disposals

Impacts to fisheries from lands and realty actions would be minor under Alternative A. No lands would be targeted for disposal under this alternative.

2. Acquisitions

Alternative A does not identify any areas for acquisition emphasis. Opportunities for acquisitions are considered on a case-by-case basis. Acquisitions, particularly when they occur along riparian areas, can have a positive impact on fish habitat by preventing development of private land and by providing consistent habitat management.

3. Land Use Authorizations

Under this alternative, specific lands use authorizations would be reviewed on a case-by-case basis for potential impacts. Alternative A anticipates more land use authorizations than does Alternative C, but fewer than does Alternative B or D.

4. **Withdrawal Review**

Under Alternative A, no withdrawal review would take place and all ANCSA (d)(1) withdrawals would remain in place. These withdrawals affect fish habitat by preventing mineral leasing and, in most cases, locatable mineral entry.

5. **Transportation and Utility Corridor Withdrawals**

Alternative A would maintain the existing transportation and utility corridor and all associated withdrawals. These withdrawals would prevent conveyance to the State as well as prevent mineral leasing in the inner and outer corridor and locatable mineral development in the inner corridor.

(e) **Impacts to Fish from Vegetation Management**

1. **Forest Products**

Impacts to fish from forestry operations are expected to be low under Alternative A. Negative impacts associated with logging activities include increased erosion and sedimentation, stream bank destabilization, shade removal, and negative impacts from roads. Standard stipulations are in place under this alternative that would minimize or prevent these impacts. Due to the nature of the terrain and the expense of road building, most forestry operations would be conducted in the winter or would occur close to existing roads, actions that would help minimize any negative effects. Overall, due to the standards stipulations that would apply, the nature of forestry operations in the planning area, and the small scale of likely activities (40 acres per year), there would be negligible effects to fisheries and fish habitat due to forestry operations under this alternative.

(f) **Impacts to Fish from Mineral Exploration and Development**

1. **Oil and Gas Leasing**

No oil and gas leasing would occur under Alternative A.

2. **Locatable Minerals**

Most areas within the planning area are currently closed to locatable mineral entry due to selections or underlying ANCSA (d)(1) withdrawals. However, there are some active operations on BLM-managed lands that would continue as currently stipulated. Of all the alternatives, Alternatives A and C would have the least potential to affect fish and fish habitat due to the small area that would be open for locatable mineral entry under these two alternatives.

3. Mineral Materials

Alternative A anticipates a low level of mineral material sales (less than Alternative B or D, but more than Alternative C). Measures to minimize impacts to fish habitat are considered on a case-by-case basis.

(3) Alternative B

(a) Impacts to Fish from Travel Management

1. OHV Management

Same as for Alternative A.

2. Roads

Alternative B would result in a moderate increase in road construction associated with mineral exploration and development and forestry activities on BLM-managed lands. Under this alternative, road construction would be considered on a case-by-case basis. Application of the ROPs located in Appendix C would minimize the effects of erosion, flow augmentation, and runoff. Overall, the impacts on fish from road construction would be greater under Alternative B than under Alternative C or D, and slightly less than under Alternative A given the stronger ROPs associated with Alternative B.

(b) Impacts to Fish from Recreation

Under Alternative B, recreation management would continue to be custodial in nature, but more facilities would be developed to handle increased recreation use. No SRMAs would be designated to consider existing values or visitor use limits. The proliferation of trails would continue in some areas, with no guidance for proper construction and placement of new trails. Alternative B would provide more protection to fish than would Alternative A as a result of the stronger ROPs that would be applied; however, there would be more impacts than under Alternative C or D.

(c) Impacts to Fish from Natural and Cultural Resource Protection

Under Alternative B, no ACECs or RNAs would be designated. Protective measures for selected values would be implemented on a case-by-case basis. The ROPs would be the only measures to protect fish and fish habitat. These measures should be adequate, however, as all of the ACECs and RNAs proposed in Alternatives C and D are proposed for values other than fisheries. The protection to fish and fish habitat based on the area designations would be only slightly less for Alternative B than for Alternatives D and C.

(d) Impacts to Fish from Lands and Realty Actions**1. FLPMA Disposals**

The lands that are considered for disposal under Alternative D do not provide key fisheries habitat, nor do they have a great influence on the fisheries resources. Also, the utilization of the lands in question would probably change very little regardless of who manages it.

2. Acquisitions

Alternative B proposes no emphasis areas for acquisition. By precluding this option, this alternative would bypass a potentially positive impact on fisheries that could be achieved by the acquisition of private inholdings within the Wild and Scenic River corridors.

3. Land Use Authorizations

Alternative B anticipates the highest level of land use authorizations associated with increased resource development. This alternative adopts the ROPs listed in Appendix C, which identify measures for permitted activities that minimize impacts to fish habitat.

4. Withdrawal Review

Alternative B would revoke all ANCSA (d)(1) withdrawals to allow for increased mineral exploration and development. Effects of mineral development on fish habitat under this alternative are described below under *Impacts to Fish from Mineral Exploration and Development* on page 508.

5. Transportation and Utility Corridor Withdrawals

Alternative B would revoke existing withdrawals and allow for conveyance of the transportation and utility corridor to the State of Alaska. The BLM would lose some important fish habitat, including portions of the Little Tonsina and Tielke Rivers and tributaries to the Gulkana River.

(e) Impacts to Fish from Vegetation Management

This alternative proposes the highest use of fire and forestry to achieve vegetation management goals.

1. Forest Products

This alternative takes the most aggressive approach of all the alternatives to forest management. It anticipates actual harvest of 100-200 acres per year. Negative impacts usually associated with logging activities are increased erosion and sedimentation, stream bank destabilization, shade removal, and negative impacts from roads. Alternative B would implement ROPs that

minimize or prevent these impacts, including requiring buffer strips around streams to protect the vegetative cover, to protect stream banks, and to act as an erosion filter. There are also ROPs associated with road construction that would minimize impacts from road building. Despite the application of ROPs, this alternative has the most potential of any alternative to adversely impact fisheries from forestry operations, mostly due to proposed road construction necessary to access enough country to harvest 360,000 acres.

(f) Impacts to Fish from Mineral Exploration and Development

1. Oil and Gas Leasing

Alternative B anticipates twice the level of exploration and development activity as is predicted in the Reasonably Foreseeable Development Scenario as described above under *Impacts to Recreation from Mineral Exploration and Development, Oil and Gas Leasing* for Alternative B on page 427. The Reasonably Foreseeable Development Scenario itself is described on page 409 under the *Analysis Assumptions and Guidelines* for leasable minerals. Oil and gas operations may affect fisheries resources in several ways, as described below.

a. 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.

The potential level of seismic activity would be greater under Alternative B than under any other alternative, but it is expected that any impacts would still be localized.

b. 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 (PAI 2002). Moving waters may deter the thickening of ice, thereby providing overwintering habitat at shallower depths.

Under Alternative B, greater levels of water withdrawal would be expected in conjunction with the increased land available for exploration and development activities as compared to the other alternatives. However, careful adherence to the ROPs and Stips would offer adequate protection to fish. Therefore, winter withdrawal would not be expected to have an effect on fish populations in and adjacent to the planning area.

c. 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. ROP-Water-c-6 requires that all permitted operations be conducted in such a manner as to not cause the pollution of any stream or lake.

Even though the disturbance under Alternative B would be two times greater than the amount of disturbance under Alternative D, 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.

d. 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. Under Alternatives B, C, and D, the construction of permanent oil and gas facilities, roadways, airstrips, or pipelines would be prohibited within 500 feet of any fish-bearing stream or lake (ROP-F&W-a-6).

Alternative B anticipates twice the level of pad, road, and pipeline construction as does Alternative D. Rigorous adherence to ROPs and existing State environmental regulations would adequately protect fish. For this reason, it is not expected that the construction and placement of drill pads, roadways, pipelines, bridges, or culverts would have a measurable effect on fish populations in and adjacent to the planning area.

e. 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. However, mortality caused by a petroleum-related

spill is seldom observed outside the laboratory environment. 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 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.

The ROPs and Stips associated with Alternatives B, C, and D are designed to prevent or otherwise mitigate oil spills in the planning area. ROP-Water-c-2 specifically prohibits refueling within 500 feet of the active floodplain of fish-bearing waterbodies and within 100 feet from non-fish-bearing waterbodies. Also, all of the requirements under ROP-Haz-c deal specifically with spill prevention and cleanup.

Under Alternative B, the number of spills could increase proportionately with the increase in exploration and development. Using this logic, Alternative B has the potential to have twice as many spills as could Alternative D, and would therefore be twice as likely to have a catastrophic spill. Given the small volume of oil typically involved in leads and spills, as well as the safety requirements for operations in the oil field and stringent clean-up protocols, oil spills associated with Alternative B would not be expected to have a measurable long-term impact on fish populations in or adjacent to the planning area.

2. Locatable Minerals

Dependent on gold prices, Alternative B anticipates a moderate increase in small placer operations on BLM-managed lands. Large operations are possible in this planning period, but would probably occur on State lands, though roads or infrastructure would cross BLM-managed lands. Impacts to fisheries from mining activities are increased erosion, impacts associated with infrastructure (roads), and toxic pollution.

The 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 any effects to fish and fish habitat within the planning area, but there may be some short-term impacts on water quality and sedimentation based on the location of the actions. These impacts are expected to be short-term and small, and are not expected to have a significant impact to fish or fish habitat in the long-term. It

is likely that Alternative B would have twice the locatable mineral activity as Alternative D, and therefore twice the impact.

3. Mineral Materials

Alternative B anticipates increased gravel extraction. In general, gravel extraction would not likely have a harmful effect on fish spawning grounds as ROP-Water-d-1 prohibits gravel extraction in known fish spawning areas. However, if gravel mining activities were conducted in fish-bearing streams or in tributaries to fish-bearing streams, other detrimental effects could occur. These include the blocking and rerouting of stream channels and increased silt concentrations resulting in reduced primary production, loss of invertebrate prey species, and disruption of feeding patterns for sight dependent feeders (BLM 1989d).

Under Alternatives B, C, and D, ROP-Water-d-2,3 and 4 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 Alternative B would be superior to that provided under Alternative A, despite the fact that there would be increased activity under Alternative B.

(4) Alternative C

(a) Impacts to Fish from Travel Management

1. OHV Management and Trails

Travel management under Alternative C would be the most restrictive of all the alternatives, resulting in the fewest potential impacts to fish and fish habitat from unauthorized stream crossings or sedimentation into streams or rivers. In the short-term, there would continue to be some localized impacts from erosion as unmanaged trails continue to proliferate at a slower rate, mostly on State-selected lands. These impacts would be expected to decrease over the planning period as education and enforcement efforts are implemented.

2. Roads

Under Alternative C, the potential for new road construction would be less than under any of the other alternatives. In addition, application of ROPs would minimize the effects of erosion, flow augmentation, and runoff from authorized roads.

(b) Impacts to Fish from Recreation

The designation of 1,916,000 acres as SRMAs under Alternative C would attempt to maintain the existing character in these areas, including use levels and types of use. Proposed OHV management would focus on halting the unmanaged proliferation of

trails. In general, as OHV use becomes more restrictive, the impact or potential for impact to fisheries habitat decreases. Recreation management under Alternative C would have a positive benefit for fisheries habitat within the planning area, mainly due to the management of increased use in specific areas as determined by visitor use limits that would result in limiting the effects of increased use.

Commercial recreation use can have a direct effect on fish populations in that fishers who use guides are generally more successful than fishers who do not. Therefore, as more guides are authorized, there would be more fish harvested and proportionately more incidental mortality related to handling and stress. These effects would mainly occur on the Delta and Gulkana Rivers, and possibly on some of the lakes. Of all the alternatives, this is least likely to happen under Alternatives C and D due to the proposal to determine commercial use limits for commercial uses. However, under all alternatives, any negative changes in the health of the fish populations would likely evoke a response in management regulations by ADF&G.

(c) Impacts to Fish from Natural and Cultural Resource Protection

Under Alternative C, three ACECs totaling 898,000 acres (Delta Bison Calving, Nelchina Caribou Calving, and West Fork), and one RNA totaling 939,000 acres (Bering Glacier) would be designated. Although these ACECs and RNA were proposed for values other than fisheries, fish and fish habitat would benefit from the designations. Along with these special designations come restrictions on road building, trail use, and surface disturbing activities, all of which are discussed above under *Impacts Common to All Alternatives* on page 501. The designations would provide another level of prevention for impacts to fish and fish habitat above and beyond the ROPs that would still apply. The protection of fish and fish habitat based on these designations would be greater under Alternative C than under Alternative D, and would be much greater than under Alternative A or B.

(d) Impacts to Fish from Lands and Realty Actions

1. FLPMA Disposals

No disposals would occur, other than resolution of failed claims in Slana. There would be no effect to fish.

2. Acquisitions

Any acquisition of lands within the Wild and Scenic River corridors would have a positive benefit to fisheries in that the riparian areas would be in a more protected status than if in private ownership.

3. Land Use Authorizations

This alternative limits land use authorizations in SRMAs, ACECs, and RNAs to protect specific resource values. Where authorizations occur, they would be

subject to the ROPs, which contain measures to protect fisheries. Overall, Alternative C would be the most beneficial to fish and fish habitat of all the alternatives relative to land use authorizations.

4. Withdrawal Review

Many withdrawals are maintained to provide maximum protection of resources under Alternative C. Impacts to fish from mineral activities are described in the *Impacts to Fish from Mineral Exploration and Development* section on page 513.

5. Transportation and Utility Corridor Withdrawals

Same as for Alternative A.

(e) Impacts to Fish from Vegetation Management

1. Forest Products

Alternative C proposes very little commercial logging (proposed levels are lower than current harvest levels). At this level and with the use of temporary winter roads and application of ROPs, impacts to fisheries would be insignificant.

(f) Impacts to Fish from Mineral Exploration and Development

1. Oil and Gas Leasing

Same as for Alternative A.

2. Locatable Minerals

The anticipated level of locatable mineral development under Alternative C is similar to that identified under Alternative A, but the application of ROPs under this alternative would minimize impacts to fish from what limited mining activity would occur.

3. Mineral Materials

The anticipated level of mineral material sales under Alternative C would be similar to that identified under Alternative A, but the application of ROPs under this alternative would minimize impacts to fish from what limited mining activity would occur.

(5) Alternative D (Proposed RMP)

(a) Impacts to Fish from Travel Management

1. OHV Management and Trails

OHV trails have the potential to cause sedimentation in site-specific areas. Under Alternative D, 99 percent of the BLM-managed lands in the planning area would be designated as limited to designated or existing trails, while the remaining 1 percent would be closed to OHV use. There would continue to be some localized impacts from erosion, due mainly to stream crossings. Inventoried OHV trails have authorized anadromous stream crossings with a permit from the State Department of Natural Resources. Under this alternative, OHV trails would be managed with the objective of minimizing the unmanaged proliferation of trails.

2. Roads

Under Alternative D, there would be a few areas that would be off limits to road construction, even for resource development. ROPs would be applied that minimize the effects of erosion, flow augmentation, and runoff. The main difference between Alternative D and the other alternatives are the restrictions on road building in the Delta River SRMA and Gulkana River SRMA. These rivers are the highest value fisheries in the planning area, and the prohibition on road building would add another level of protection to the fish and fish habitat above and beyond the ROPs. Overall, the impacts from road construction are expected to be low under Alternative D for a variety of reasons: application of ROPs that apply to all road building, prohibitions on road building in the Delta and Gulkana Wild and Scenic River corridors, and limitations on road construction minimized at the level needed for resource extraction and rights-of-way.

(b) Impacts to Fish from Recreation

In general, the SRMAs proposed under Alternative D would attempt to maintain the existing character in these areas, including use levels and types of use. Proposed OHV management would focus on halting the proliferation of trails. In general, as OHV use becomes more restrictive, the impact or potential for impact to fisheries habitat would decrease. Recreation management under Alternative D is expected to have a positive benefit for fisheries habitat within the planning area due to the management of increased use as determined by visitor use limits in specific areas that would limit or eliminate increased impacts.

Commercial recreation use can have a direct effect on fish populations in that fishers who use guides are generally more successful than fishers who do not. Therefore, as more guides are authorized, there would be more fish harvested and proportionately more incidental mortality related to handling and stress. These

effects would mainly occur on the Delta and Gulkana Rivers, and possibly on some of the lakes. Of all the alternatives, this is least likely to happen under Alternatives C and D due to the proposal to determine commercial use limits. However, under all alternatives, any negative changes in the health of the fish populations would likely evoke a response in management regulations by ADF&G.

(c) Impacts to Fish from Natural and Cultural Resource Protection

Under Alternative D, 827,000 acres in the Bering Glacier area would be designated as an RNA. Due to the additional protective measures afforded by RNA designation, this designation would benefit fish and fish habitat in the area. Adoption of the ROPs and Stips would also benefit fish and fish habitat.

(d) Impacts to Fish from Lands and Realty Actions

1. FLPMA Disposals

Under Alternative D, the lands that are considered for disposal do not provide key fisheries habitat, and have little influence on the fisheries resources.

2. Acquisition

Any acquisition of lands within the Wild and Scenic River corridors would have a positive benefit to fisheries in that the riparian areas would be in a more protected status than if in private ownership.

3. Land Use Authorizations

Under Alternative D, land use authorizations would be limited in specific areas to protect resource values. Outside of these areas, land use authorizations would be covered by the ROPs, which would minimize impacts to fish and fish habitat from permitted activities.

4. Withdrawal Review

Although Alternative D opens up large areas of land (5,793,000 acres, or 83 percent of the planning area, pending conveyance or relinquishment on selected lands) within the Glennallen Field Office for potential minerals exploration and development, significant amounts of withdrawn acreage are maintained (1,210,000 acres, or 17 percent of the planning area). Where withdrawals are revoked, all proposed activities would be subject to ROPs, Stips, and site-specific mitigation measures for the conservation of fish habitat.

5. Transportation and Utility Corridor Withdrawals

Same as for Alternative A. However, this alternative would modify PLO 5150 to allow conveyance to the State of 83,000 acres north of Paxson. Fish Creek, an anadromous stream that runs out of Fish Lake, has been the focus of

cooperative efforts between the State, BLM, and Copper River Watershed Project, to re-locate an OHV trail to minimize damage to the creek. These efforts would continue regardless of the ownership of this parcel. Gunn Creek, which also runs through this parcel, is an anadromous stream. There is currently an OHV trail that parallels and crosses Gunn Creek a total of 45 times in 10 miles (Gunn 2005). Under BLM management, this parcel would be part of the Delta Range SRMA and trails would be designated. Under State management and subject to Generally Allowed Uses, the damage to Gunn Creek from OHV use could continue, with subsequent damage to fisheries habitat. Other streams that would be included in the 83,000 acres include portions of Rainy and Eureka creeks. These streams support only non-anadromous species. While conveyance to the State would not immediately effect the condition of these streams, management emphasis would change from recreation and subsistence to mineral exploration and development.

(e) Impacts to Fish from Vegetation Management

1. **Forest Products**

Forestry activities would focus on approximately 144,000 acres of beetle-infested white spruce stands, with an anticipated actual harvest of 40-100 acres per year. Impacts from forestry operations are expected to be low or nonexistent under this alternative. Negative impacts usually associated with logging activities are increased erosion and sedimentation, stream bank destabilization, shade removal, and negative impacts from roads. ROPs that minimize or prevent these impacts would be applied. ROP-F&W-a-10 requires buffer strips around streams to protect the vegetative cover, to protect stream banks, and to act as an erosion filter. Due to the nature of the terrain and the expense of road building, most forestry operations would be winter operations or would occur close to existing roads. Overall, due to the ROPs that are in place and the nature of forestry operations in the planning area, there would be negligible effects to fisheries and fish habitat due to forestry operations.

(f) Impacts to Fish from Mineral Exploration and Development

1. **Oil and Gas Leasing**

The effects of oil and gas exploration on fish and fish habitat are described in detail under Alternative B on page 508. Under Alternative D, these effects would occur over approximately one-half the affected area as described in Alternative B. The anticipated level of development under Alternative D would be at the level described in the Reasonably Foreseeable Development Scenario under the *Analysis Assumptions and Guidelines* for leasable minerals on page 409.

2. **Locatable Minerals**

Same as for Alternative B.

3. **Mineral Materials**

Alternative D anticipates a higher level of mineral material sales than does Alternative A or C, but a lower level than does Alternative B. Mineral material extraction under this alternative is prohibited in the Gulkana Wild and Scenic River corridor and in the wild and scenic portions of the Delta Wild and Scenic River corridor and in the Bering Glacier RNA. The Denali Highway is identified as an avoidance area. In addition, mineral material sales would be subject to ROPs, which would minimize any potential impacts to fish habitat through avoidance of important habitat, proper location of mineral activity locations, and adequate rehabilitation of affected sites.

g) **Cultural Resources**

(1) **Alternative A**

(a) **Impacts to Cultural Resources from Travel Management**

1. **Access**

There are no anticipated affects to cultural resources from maintaining access with 17(b) easements. Continued access along some of these routes across Native-owned lands may affect traditional Native trails that may be eligible to the National Register of Historic Places as a place of religious or cultural importance.

2. **OHV Management and Trails**

There are two types of effects that would result from continued designation of large areas as “open” for OHV use. The short-term effect would be continued, diffuse impacts on archaeological resources crossed by existing and newly-pioneered trails. In the long-term, additional sites would experience impacts from newly-pioneered OHV trails as well as continued erosion from subsequent use of new trails. Maintaining limitations in TLAD and in the Wild and Scenic River corridors would positively affect archaeological sites by limiting OHV impacts and erosion to designated trails where archaeological sites are not present.

3. **Roads**

Inventory and mitigation relative to Section 106 of the National Historic Preservation Act would be conducted on a case-by-case basis, thus avoiding or mitigating impacts to cultural resources.

(b) Impacts to Cultural Resources from Recreation

Under Alternative A, recreation management is custodial. There are no SRMAs with recreation objectives or visitor use limits. Trails proliferation would continue, with no guidance for proper construction and placement of new trails, and no cultural resource clearance as new trails develop. Of all the alternatives, Alternative A would have the most potential impacts to cultural resources.

(c) Impacts to Cultural Resources from Natural and Cultural Resource Protection

Under Alternative A, no areas would be designated as ACECs or RNAs, designations that would provide area-wide measures for the protection of cultural resources. TLAD, however, would continue to be managed with an emphasis on protection of cultural resources.

(d) Impacts to Cultural Resources from Lands and Realty Actions

1. FLPMA Disposals

Under Alternative A, no lands would be identified for disposal, thus there would be no effect on cultural resources from land disposals.

2. Land Use Authorizations

Land use authorizations may have an effect on cultural resources, but they would be handled on a case-by-case basis to locate cultural resources and to avoid or mitigate any impacts to the cultural resource.

3. Withdrawal Review

There would be no adverse effects on cultural resources from the maintenance of ANCSA (d)(1) withdrawals.

4. Transportation and Utility Corridor Withdrawals

Under Alternative A, all withdrawals within the transportation and utility corridor would be maintained. Permitted activities within the corridor supporting transportation or utilities would continue to require site-specific cultural review.

(e) Impacts to Cultural Resources from Vegetation Management

Forestry practices anywhere in the Glennallen Field Office have the potential to affect a number of historic resources. Habitat improvement and fuels reduction projects using prescribed burning, mechanical treatment, or logging have the potential to negatively affect cultural resources. However, each project would be

reviewed on a case-by-case basis to avoid or mitigate adverse impacts to historic resources. At the current and anticipated level of forest practices and with the application of case-by-case mitigation, impacts to cultural resources would be insignificant.

(f) Impacts to Cultural Resources from Mineral Exploration and Development

1. Oil and Gas Leasing

No oil and gas leasing would occur under Alternative A.

2. Locatable Minerals

Because of existing constraints (ANCSA (d)(1) withdrawals), Alternative A would have the least potential effect on cultural resources as a result of locatable mineral activities than all other alternatives. Current withdrawals prevent locatable mineral entry in most areas of the TLAD. There would be no anticipated change in effect from management of current mining activities on BLM-managed lands. Where small scale placer mining currently occurs, mining has the potential to affect cultural resources through excavation or access. These existing mining activities are handled on a case-by-case basis to locate cultural resources and avoid or mitigate any effects.

3. Mineral Materials

Mineral material extraction at current levels has minimal effect on cultural resources. Where gravel extraction occurs, it has the potential to affect cultural resources through excavation of the area. Potential gravel pits are handled on a case-by-case basis to locate cultural resources and avoid or mitigate any effects.

(2) *Alternative B*

(a) Impacts to Cultural Resources from Travel Management

1. Access

Same as for Alternative A.

2. OHV Management and Trails

Same as for Alternative A.

3. Roads

This alternative would result in a moderate increase in road construction associated with mineral exploration and development and forestry activities on BLM-managed lands. Inventories for compliance with Section 106 of the

National Historic Preservation Act would be conducted on a case-by-case basis, with appropriate mitigation to avoid impacts to cultural resources.

(b) Impacts to Cultural Resources from Recreation

Alternative B has the most potential of all the alternatives to negatively affect cultural resources. Generally, impacts to cultural resources and mitigation would increase for all areas except for TLAD (where OHV use is limited to designated trails), as 96 percent of BLM-managed lands in the planning area would remain open to OHV use with no limitations. Recreational use and development would also be expected to increase.

Recreation management within the Delta Wild and Scenic River corridor would increase impacts to cultural resources as well as increase the amount of required cultural compliance work. The construction of a public use cabin system and developed visitor facilities along the river would also have the potential to affect buried and surface archaeological resources.

Recreation management along the Denali Highway and within the Tiekel planning sub-unit would also increase potential effects on cultural resources through the development of a public use cabin system and the development of additional recreational facilities.

(c) Impacts to Cultural Resources from Natural and Cultural Resource Protection

Under Alternative B, no areas would be designated as ACECs or RNAs, designations that would provide area-wide measures for the protection of cultural resources. TLAD, however, would continue to be managed with an emphasis on protection of cultural resources. This alternative would adopt the ROPs listed in Appendix C, which identify measures to provide protection of cultural resources during permitted activities.

(d) Impacts to Cultural Resources from Lands and Realty Actions

1. FLPMA Disposals

Alternative B would have the greatest negative effect on cultural resources of all the alternatives. Disposal of lands to the public would require large scale Section 106 compliance work to review each area to determine if any National Register listed or eligible site may exist on those lands. The removal of those lands from Federal ownership may result in negative effects to such resources resulting from the private construction of structures, roads, or air strips. These areas may also require additional Native consultation with villages that may have properties of religious or cultural importance on those lands.

2. Land Use Authorizations

Land use authorizations may have an effect on cultural resources, but the authorizations would be handled on a case-by-case basis to locate cultural resources and to avoid or mitigate any impacts to the cultural resource.

3. Withdrawal Review

Revocation of all withdrawals under Alternative B would open the lands to additional uses and possible mineral exploration and development.

4. Transportation and Utility Corridor Withdrawals

Alternative B would revoke existing withdrawals and allow for conveyance of the transportation and utility corridor to the State. If conveyed, the BLM would lose 435,000 acres containing documented historic and pre-historic sites. The descriptions of the Tiekell and Gulkana/Delta Regions in Chapter III under Issue 3, Cultural Resources, include information on the cultural resources that would be lost as a result of the conveyance.

(e) Impacts to Cultural Resources from Vegetation Management

Alternative B is the most likely of all alternatives to increase the potential impacts to cultural resources and to increase required Section 106 compliance work. Forestry impacts anywhere in the Glennallen Field Office have the potential to affect a number of historic resources. Habitat improvement and fuels reduction projects using prescribed burning, mechanical treatment, or logging have the potential to negatively affect cultural resources and increase Section 106 compliance work. However, each project would be reviewed on a case-by-case basis to avoid adverse impacts to historic resources.

(f) Impacts to Cultural Resources from Mineral Exploration and Development

Opening the scenic and recreational portions of the river to mining exploration and development would affect cultural resources through access to the area by heavy equipment as well as by excavation, construction and development of mining related facilities

1. Oil and Gas Leasing

Generally, Alternative B has the most potential to negatively affect cultural resources due to the sizeable amount of land available for leasing. Access to areas open to leasing for exploration purposes may impact cultural resources through overland travel by OHVs, as well as through the drilling of wells. Drilling of wildcat wells may impact previously unknown cultural resources. Development of wildcat wells and any additional wells would require the

additional construction of support facilities like roads and camps, which can affect cultural resources through their construction. The additional construction of associated transmission pipelines and compression/gas plants also has the potential to affect cultural resources. Adhering to measures described in the ROPs and Stips would minimize adverse impacts, but some loss of cultural resources would be unavoidable.

2. Locatable Minerals

Alternative B would have the most potential to negatively affect cultural resources as only the Wild and Scenic Rivers would be closed to mineral location. Dependent on gold prices, this alternative anticipates a moderate increase in small placer operations on BLM-managed lands. Large operations are possible in this planning period, but would probably occur on State lands, though roads or infrastructure would cross BLM-managed lands. These operations could affect cultural resources through both exploration and development by eroding or excavating buried archaeological resources, damaging surface resources, or by causing adverse effects to places that have religious or cultural importance to local villages. These activities would result in increases in both potential affects to cultural resources as well as associated Section 106 workloads and Native consultation efforts.

3. Mineral Materials

Gravel pit development under Alternative B would be expected to increase, with affects to cultural resources similar to those described in the previous paragraph under *Locatable Minerals*.

(4) Alternative C

(a) Impacts to Cultural Resources from Travel Management

1. Access

Same as for Alternative A.

2. OHV Management and Trails

Under Alternative C, 96 percent of the BLM-managed lands in the planning area would be designated as limited to OHVs, either to designated or existing trails. Both short- and long-term effects would result from the "limited" OHV designation. In the short-term, there would be concentrated impacts upon archaeological resources crossed by existing trails as more travel is focused through these arterial routes. These effects would require additional archaeological work to fulfill Section 106 responsibilities for managing these resources. Long-term effects, however, would be positive, as fewer additional sites would experience impacts from newly-pioneered OHV trails. This effect

would also result in decreasing Section 106 work related to trails in the long-term.

In the 281,000 acres (4 percent of BLM-managed land) closed to OHV use under Alternative C, there would be no short- or long-term effects to cultural resources. No additional archaeological work would be required.

3. Roads

Alternative C would see very little potential for new road construction. Prohibitions and limitations on road construction within SRMAs, ACECs, and the RNA, as described in Table 3 in Chapter II, would protect cultural resources and reduce the amount of future Section 106 compliance work conducted as part of the road construction process.

(b) Impacts to Cultural Resources from Recreation

Generally, Alternative C has the least potential to negatively affect cultural resources as this alternative's emphasis in recreation is on maintaining existing recreation experiences. The designation of the Delta Range, Delta River, Gulkana River, Denali Highway, and Tielke SRMAs (totaling 1,916,000 acres, or 27 percent of BLM-managed lands) would reduce short- and long-term effects on cultural resources as well as on required archaeological inventory work and mitigation. Designation of 96 percent of the BLM-managed lands as limited to OHVs, and 4 percent of lands as closed to OHVs would reduce both impacts to cultural resources and required archaeological work over the long-term.

(c) Impacts to Cultural Resources from Natural and Cultural Resource Protection

Designation of 898,000 acres of ACECs (13 percent of BLM-managed lands) and 939,000 acres as an RNA (an additional 13 percent of BLM-managed lands) under Alternative C would provide protection to cultural resources in those areas. Adoption of ROPs would provide additional protection for permitted activities outside of ACECs and the RNA.

(d) Impacts to Cultural Resources from Lands and Realty Actions

Alternative C would have a slightly greater potential for impacting cultural resources than would Alternative A, and would have less potential for impacting these resources than either Alternative B or D.

1. FLPMA Disposals

Alternative C proposes that no disposals occur; therefore, there would be no effect on cultural resources.

2. Land Use Authorizations

Alternative C anticipates the least amount of land use authorizations of all the alternatives. Land use authorizations are limited in special designation areas such as ACECs and RNAs to protect the specific resource values identified for those areas. In addition, ROPs would be applied under this alternative to any land use authorization to protect cultural resources.

3. Withdrawal Review

Alternative C would maintain ANCSA (d)(1) withdrawals in the Wild and Scenic River corridors, all areas designated as ACECs and RNAs, and some portions of designated SRMAs. In most cases, these withdrawals prevent mineral leasing or locatable mineral development, thus preventing the effects under Alternative C discussed below under *Impacts to Cultural Resources from Mineral Exploration and Development* on page 524.

4. Transportation and Utility Corridor Withdrawals

Same as for Alternative A.

(e) Impacts to Cultural Resources from Vegetation Management

Generally, Alternative C is the least likely of all the alternatives to negatively affect cultural resources and increase required Section 106 compliance work. Forestry practices anywhere in the Glennallen Field Office have the potential to affect a number of historic resources. Habitat improvement projects using prescribed burning or mechanical treatment have the potential to negatively affect cultural resources and increase Section 106 compliance work.

(f) Impacts to Cultural Resources from Mineral Exploration and Development

1. Oil and Gas Leasing

Same as for Alternative A.

2. Locatable Minerals

Same as for Alternative A.

3. Mineral Materials

Same as for Alternative A.

(5) Alternative D (Proposed RMP)

(a) Impacts to Cultural Resources from Travel Management

1. Access

Same as for Alternative A.

2. OHV Management and Trails

Alternative D would designate 99 percent of BLM-managed lands as limited to OHVs, either to designated or existing trails. The remaining 1 percent of lands would be closed to OHVs. Both short- and long-term effects would result from the “limited” OHV designation. In the short-term, there would be concentrated impacts upon archaeological resources crossed by existing trails as more travel is focused through these arterial routes. These effects would require additional archaeological work to fulfill Section 106 responsibilities for managing these resources. Long-term effects, however, would be positive, as fewer additional sites would experience impacts from newly-pioneered OHV trails. This effect would also result in decreasing Section 106 work related to trails in the long-term.

In the 44,000 acres (less than 1 percent of BLM-managed land) closed to OHV use under Alternative D, there would be no short- or long-term effects to cultural resources. No additional archaeological work would be required.

3. Roads

There would be a slight increase in road construction from the current situation under Alternative D. Prohibitions and limitations on road construction in selected areas (as described in Table 3 in Chapter II) would protect cultural resources and reduce the amount of future Section 106 compliance work conducted as part of the road construction process. Road construction projects outside of those areas may impact cultural resources and increase required Section 106 work. However, these projects would be mitigated on a case-by-case basis, thus avoiding impacts to cultural resources.

(b) Impacts to Cultural Resources from Recreation

No effects to cultural resources along the Gulkana River are anticipated under Alternative D.

The use of existing historic cabins as public use cabins would require additional Section 106 compliance work to ensure that each cabin’s historic values would be retained. Each selected cabin would be evaluated and mitigated on a case-by-case basis. There would be no anticipated effects from inventory and monitoring activities

except by access to these areas along pioneered OHV trails that impact buried archaeological sites.

The Denali Highway passes through terrain with the highest densities of cultural resources within the Glennallen Field Office. Prehistoric and historic mining sites are scattered along the glacial remnant landforms all along the highway. The region also contains the Tangle Lakes Archaeological District (TLAD), one of the largest National Register districts in the United States. However, there would be few anticipated effects from the interim management of Native- and State-selected lands along the Denali Highway except for designations limiting OHVs to existing trails outside of the TLAD. The effects to archaeological resources from OHV traffic would increase during the short-term as buried archaeological sites are eroded by continued traffic along existing trails. These effects would also result in increased Section 106 work to locate and mitigate any sites being affected.

Long-term management of the Denali Highway would have similarly few effects on cultural resources. OHV travel limitations to designated trails would result in declining impacts to buried archaeological sites as fewer trails are pioneered and fewer archaeological sites are eroded by traffic. The construction of non-motorized trails has the potential to expose and erode archaeological sites. The development of recreational facilities along the highway would also have the potential to affect cultural resources. However, all of these activities would be handled on a case-by-case basis to locate cultural resources and mitigate any potential effects.

The Tiekel planning sub-region contains a variety of prehistoric archaeological sites and historic gold rush and later mining sites and trails. Additionally, the National Register Valdez Trail property and its branches pass through the region. The interim management of the region would have few short-term effects and would result in a decrease in both impacts as well as required Section 106 work over a longer term. The designation of BLM public lands as an SRMA with designated trails for OHVs would increase short-term impacts to cultural resources along the trails while reducing impacts to additional resources from newly-pioneered trails. The creation of additional loops to trails has the potential to erode additional archaeological sites, but can be handled on a case-by-case basis to locate any cultural resources and to mitigate any potential effects. The construction of recreational facilities and the use of the Egan Cabin as a public use facility all have the potential to affect cultural resources. These facilities would be addressed on a case-by-case basis to mitigate or avoid impacts to cultural resources.

The long-term management and inclusion of previously selected lands as BLM public land in the Tiekel SRMA would further reduce future potential impacts to cultural resources by designating trails on additional lands. Closure of lands in the Tonsina sub-unit to motor vehicle travel would have a positive affect on cultural resources by eliminating OHV erosion to buried archaeological sites. Helicopter-based skiing is unlikely to affect any resources other than erect historic structures.

Cultural resources in the Delta Range SRMA are poorly known; however, it is likely that the Delta River was used as a travel corridor prehistorically. Limitations confining snow-free OHV use to designated trails would reduce potential impacts to any cultural resources alongside bare ground trails. Limitations placed on winter snowmachine use would have no effect on cultural resources since snow cover protects the ground surface from direct impacts and erosion.

(c) Impacts to Cultural Resources from Natural and Cultural Resource Protection

Alternative D would designate the Bering Glacier as an RNA. Measures proposed for the area would protect cultural and paleontological resources from impacts associated with mineral development, road construction, and OHV use. Measures identified for other areas are not targeted at cultural resources but should afford some level of protection for cultural and paleontological resources. Measures adopted as part of the ROPs would minimize impacts from permitted activities on cultural and paleontological resources.

(d) Impacts to Cultural Resources from Lands and Realty Actions

Alternative D would have less potential to negatively affect cultural resources than would Alternative B, but would have more potential to negatively affect these resources than would Alternative A or C.

1. FLPMA Disposals

Under Alternative D, lands within the Slana settlement area would be made available for disposal under two scenarios (as described in Table 7 in Chapter II) that would have similar effects on cultural resources. Parts of the Slana settlement cover the Ahtna Slana village, and land disposals in the area may require additional Section 106 compliance work to locate cultural features as well as to consult with concerned villages about additional land disposals and their affect on local cultural resources.

Additional land disposals may similarly affect cultural resources and would be handled on a case-by-case basis to locate any cultural resources and to mitigate the effects of the disposal on any cultural resources.

2. Land Use Authorizations

Land use authorizations may have an affect on cultural resources, but would be handled on a case-by-case basis to locate cultural resources and to avoid or mitigate any impacts to the cultural resource. Under Alternative D, limitations would be placed on land use authorizations in specific areas to protect resource values, including cultural resources, in those areas.

3. **Withdrawal Review**

Alternative D would maintain ANCSA (d)(1) withdrawals in the western two-thirds of the Bering Glacier RNA and in portions of the Delta Wild and Scenic River corridor. These withdrawals prohibit mineral leasing or locatable mineral entry, thus preventing the effects under Alternative D discussed below under *Impacts to Cultural Resources from Mineral Exploration and Development* on page 528.

4. **Transportation and Utility Corridor Withdrawals**

This alternative would maintain PLO 5150 for most of the transportation and utility corridor in the planning area. However, PLO 5150 would be modified to allow conveyance to the State of 83,000 acres north of Paxson. Conveyance of these areas would not immediately effect any cultural resources present in the area. However, management emphasis in the area would be expected to change from recreation and subsistence to mineral exploration and development under State ownership.

(e) **Impacts to Cultural Resources from Vegetation Management**

Cultural resources throughout the Glennallen Field Office have the potential of being affected by forestry projects, habitat improvement projects, and fuels reduction projects. Forestry projects in the Tiekel and Tonsina Bluffs areas have the potential to affect a number of historic resources, including National Register Eligible portions of the Valdez Trail. Habitat improvement and fuels reduction projects using prescribed burning, mechanical treatment, or logging have the potential to negatively affect cultural resources and increase Section 106 compliance work. Based on the amount of area identified for potential forestry projects, this alternative has less potential to impact cultural resources than does Alternative B, and more potential to impact cultural resources than does Alternative A or C.

(f) **Impacts to Cultural Resources from Mineral Exploration and Development**

1. **Oil and Gas Leasing**

Generally, Alternative D has less potential to negatively affect cultural resources than does Alternative B, but it has greater potential to negatively affect those resources than do Alternatives A and C. Revocation of withdrawals, which would subsequently allow oil and gas leasing, has the potential to affect cultural resources through exploration and development related activities. Access to areas open to leasing for exploration purposes may impact cultural resources through overland travel by OHV as well as by the drilling of wells. Development of the wildcat wells and any additional wells would require the additional construction of logistic support facilities such as roads and camps, which could affect cultural resources through their

construction. The additional construction of associated transmission pipelines and compression/gas plants would also have the potential to affect cultural resources. ROPs, Stips, and stipulations contained in the standard lease would all minimize impacts and ensure pre-construction cultural compliance with the National Historic Preservation Act.

2. Locatable Minerals

Alternative D has less potential to negatively affect cultural resources than does Alternative B, but more potential than do Alternatives A or C. Areas closed to locatable mineral entry would include all portions of the Wild and Scenic River corridors, the Slana settlement area, the interior transportation and utility corridor, and the western one-third of the Bering Glacier RNA. The remaining areas that are open to mineral entry along the Denali Highway corridor, the Alphabet Hills, and within the Tiekel region have high concentrations of cultural resources or have cultural resources that are largely unknown. Large scale mining across many areas in the Glennallen Field Office could affect cultural resources through both exploration and development by eroding or excavating buried archaeological resources, damaging surface resources, or by causing adverse effects to places that have religious or cultural importance to local villages. These activities could result in increases in both potential affects to cultural resources as well as associated Section 106 workloads and Native consultation efforts.

3. Mineral Materials

Alternative D anticipates a higher level of mineral material sales than does Alternative A or C, but a lower level than does Alternative B. This alternative adopts ROPs to protect cultural resources. Site-specific cultural clearance would occur.

h) Paleontological Resources

(1) Impacts Common to All Alternatives

Required Operating Procedures and the standard language for cultural and paleontological resources that is used for stipulations that are common to all alternatives would preserve and protect paleontological resources for present and future generations. Adverse impacts would be mitigated through specimen recovery and analysis by professional paleontologists. Disposal of lands could result in loss of paleontological resources.

The greatest risk of damage or destruction of paleontological resources across all alternatives would result from casual, unauthorized activities (such as OHV use off of designated trails in TLAD and vandalism) and natural processes (natural decay,

deterioration, or erosion). Under all alternatives, unquantifiable indirect impacts would occur.

i) Visual Resources

(1) Impacts Common to All Alternatives

(a) Impacts to Visual Resources from Travel Management

1. OHV Management and Trails

Major impacts from OHV use on visual resources include changes in color, line, and texture from trail construction or as a result of unrestricted overland travel. Continuous overland OHV use leads to destruction of vegetation, which then results in soil exposure, resulting in a contrast between the adjacent greens of natural vegetation and the browns and grays of exposed soil and organic materials. A contrast in line occurs when the irregular characteristic of vegetation is replaced by a more regular line in the form of a developed or constructed trail. Texture characteristics change from the natural coarse or rough textures of diverse vegetation to the smooth uniform texture of a developed trail or mineral soil area.

Most routes or trails would attract the attention of the casual observer if viewed from a higher observation point and if the routes or trails were located within the foreground-midground zone. Trails or routes that are properly designed and viewed from ground level, however, would not generally attract the attention of a casual observer, except from trailhead observation points.

2. Roads

Major impacts from road construction are similar to those identified for OHV use. Impacts include changes in color, line, and texture from the destruction of vegetation, which then results in soil exposure in a predominantly vegetated area. The resulting contrast is between the adjacent greens of natural vegetation and the browns and grays of exposed soil. In addition, a contrast in line occurs when the irregular characteristic of vegetation is replaced by a more regular line in the form of a constructed road. Texture characteristics change from the natural coarse or rough textures of diverse vegetation to the smooth uniform texture of a constructed road. Additionally, fugitive dust is also a visual impact resulting from construction activities and from the use of gravel or natural material roads. However, fugitive dust is a short-term impact that can be temporary in nature and is dependent on the amount of traffic a road receives.

Road construction and use would attract the attention of the casual observer if viewed from a higher observation point and located within the foreground-middleground and background zones. Roads that are properly designed and viewed from ground level, however, would not generally attract the attention of a casual observer, except as the road is being traversed or where roads intersect.

(b) Impacts to Visual Resources from Recreation

Recreation activities such as facilities development would impact visual resources by introducing straight vertical lines and smooth textures into a predominately horizontal, random landscape. Increased use of existing and new facilities would impact visual resources by introducing different colors into a predominately green and brown landscape. Some of the facilities may be reflective or shiny instead of the more subtle colors of vegetation.

Proper design and construction techniques can reduce impacts from recreation facilities and help maintain a more natural appearing landscape. If viewed from a higher viewpoint, facilities and recreation activities in the foreground-middleground zone would attract the attention of a casual observer. Depending on size, facilities in the background zone may also attract the attention of a casual observer. As viewed from ground level, only activities in the foreground-middleground zone would attract the attention of a casual observer.

(c) Impacts to Visual Resources from Lands and Realty Actions

1. Land Ownership Adjustment

Consolidation of land ownership would reduce possible impacts to visual resources in that consolidation would eliminate the possibility of unmanaged development activities on private land.

2. Transportation and Utility Corridor Withdrawals

Most of the impacts from utilities would be from support structures for the utility, including pipelines. Impacts would introduce primarily vertical lines in a horizontal landscape. Color impacts would include changes from the matte greens of natural vegetation to glossy reflective colors of metal structures and other colors of support facilities such as buildings.

(d) Impacts to Visual Resources from Vegetation Management

1. Fire Management

Both wildland and prescribed fire affect the visual resource by changing line, color, and texture of burned areas in contrast to the surrounding unburned areas. Line would change from a more regular, smooth line to an irregular,

jagged line along the adjacent burned and unburned areas within in the foreground-middleground zones. Short-term color impacts would be expected in burned areas until revegetation occurs. Fire can enhance color over time by creating more diversity in the hues and colors associated with a more diverse vegetation composition. Vegetation texture can change from a medium to fine dense texture in natural areas to a coarse, sparse texture in burned areas as a result of fire. Burned areas, if viewed in the foreground-middleground and background zones, would attract the attention of the casual observer.

Fire suppression activities cause impacts to visual resources by introducing changes in color, texture, and line to a natural landscape. Colors change from the various hues of green vegetation to predominately brown soils and organic materials. Texture changes from a natural medium, subtle texture of vegetation to a coarse, rough contract of disrupted soils and organic materials. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and human-constructed fireline could occur. Even with revegetation of the fireline, which decreases the color contrast, a line contrast may be long-term depending on the vegetation composition between the undisturbed natural area and the disturbed fireline. These impacts may attract the attention of the causal observer in both the foreground-middleground and background zones.

2. Forest Products

Timber harvest activities would have impacts similar to those described above for Fire Management in that timber activities can primarily impact line and texture. The removal of trees changes the density of vegetation, a characteristic of texture. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and the harvest area is dependent on the harvest technique used. Clear-cutting would have the greatest impact to visual resources, while select cutting would have the least impact. Depending on size, timber harvest activities may attract the attention of a casual observer in the foreground-middleground zone, background zone, and even the seldom seen zone.

(e) Impacts to Visual Resources from Mineral Exploration and Development

1. Oil and Gas Leasing

Impacts from activities associated with the development of leasable minerals would primarily be connected with the construction of support facilities. Impacts would the same as impacts discussed under *Impacts to Visual Resources from Recreation* on page 531. Mining of some leasable minerals would have additional impacts to color, line, and texture of mined areas, with the removal of vegetative cover and stockpiled materials creating color contrast between the greens of vegetation and the browns of soils. Texture would

change from a natural medium, subtle texture of vegetation to a coarse, rough contract of disrupted soils and organic materials. Changes in line from the irregular, weak line of the natural landscape to a regular, strong line between natural vegetation and disturbed landscape could occur.

2. Locatable Minerals

The impacts from the extraction of locatable minerals would vary depending on the methods used and size of operation. Pit mining would have the greatest impact to visual resources impacting line, form, color, and texture characteristics of the natural landscape as described in the previous paragraph under *Oil and Gas Leasing*. Though placer mining techniques tend to be smaller in size, they would have the same impacts to visual resources as pit mining techniques. Shaft mining techniques would have the least impact through the development of support structures located above ground.

3. Mineral Materials

The impacts on visual resources from extraction activities for materials sources are the same as those described for pit mining techniques in the previous paragraph for *Locatable Minerals*.

(2) Alternative A

(a) Impacts to Visual Resources from Travel Management

1. OHV Management and Trails

Continued unmanaged proliferation of OHV trails would continue under Alternative A. Both Alternatives A and B would have the most potential for adverse impacts from OHV use on visual resources as both designate 96 percent of BLM-managed lands as open to OHV use, and only 4 percent of lands as limited to designated or existing trails.

2. Roads

Alternative A anticipates a slight increase in road construction in the planning area. Potential impacts to visual resources would be less than under Alternative B, but greater than under Alternative C or D.

(b) Impacts to Visual Resources from Recreation

Alternative A anticipates increased levels of recreation use. Without application of the ROPs that would be applied to Alternatives B, C, and D, and without assignment of Visual Resource Management (VRM) classes, this alternative has more potential to adversely impacts visual resources from recreation facilities and uses than would Alternatives C and D, and less potential than under Alternative B.

(c) Impacts to Visual Resources from Natural and Cultural Resource Protection

Alternative A does not designate any ACECs or RNAs for protection of specific resource values. For permitted activities, measures for protection of visual resources would continue to be considered on a case-by-case basis.

(d) Impacts to Visual Resources from Lands and Realty Actions

1. FLPMA Disposals

Little to no effect on visual resources would occur.

2. Land Use Authorizations

Without adoption of the ROPs that would be applied under Alternatives B, C, and D, and with land use authorizations considered on a case-by-case basis, Alternative A has more potential for impacts to visual resources than Alternative B, C, or D.

3. Withdrawal Review

Under Alternative A, no withdrawal review would occur and ANCSA (d)(1) withdrawals would remain in place. These withdrawals, in most cases, prevent mineral leasing and locatable mineral entry.

(e) Impacts to Visual Resources from Vegetation Management

Alternative A proposes fewer potential acres of timber harvest than do Alternatives B or D. However, without the adoption of the ROPs listed in Appendix C or assignment of VRM classes, the potential impacts to visual resources are greater under this alternative than under Alternative C or D, and less than under Alternative B.

(f) Impacts to Visual Resources from Mineral Exploration and Development

This alternative anticipates very little mineral development; however, without adoption of the ROPs that would be applied under all other alternatives, Alternative A has more potential for impacts to visual resources than does Alternative C, but less potential than do Alternatives B and D.

(3) Alternative B

In general, Alternative A anticipates the greatest amount of resource development and adopts the least-restrictive VRM classes.

(a) Impacts to Visual Resources from Travel Management

1. OHV Management and Trails

Same as for Alternative A.

2. Roads

Alternative B anticipates a moderate increase in road construction. Despite the application of the ROPs listed in Appendix C, this alternative has more potential for impacts to visual resources from road construction than any other alternative because of the amount of anticipated road construction.

(b) Impacts to Visual Resources from Recreation

This alternative proposes construction of the most number of recreation facilities, and therefore has the most potential for impacts of all the alternatives.

(c) Impacts to Visual Resources from Natural and Cultural Resource Protection

Alternative B does not designate any ACECs or RNAs for protection of specific resource values. Consequently, more area would be open for resource development and subsequent impacts to visual resources. This alternative adopts ROPs, which identify measures to minimize impacts to visual resources from permitted activities.

(d) Impacts to Visual Resources from Lands and Realty Actions

1. FLPMA Disposals

Alternative B has the most potential for impacts to visual resources resulting from the Slana disposal and subsequent settlement and development of 5,000-10,000 acres of land.

2. Land Use Authorizations

Alternative B anticipates a high level of land use authorizations associated with increased resource development. Because the ROPs listed in Appendix C would be adopted, this alternative would have less potential impact on visual

resources than would Alternative A, but more potential impact than Alternative C or D.

3. Withdrawal Review

Alternative B revokes all ANCSA (d)(1) withdrawals, allowing increased opportunity for mineral exploration and development.

(e) Impacts to Visual Resources from Vegetation Management

Alternative B proposes an aggressive forestry program that would include the construction of roads to access commercial timber stands, and therefore has more potential for impacts to visual resources than any other alternative.

(f) Impacts to Visual Resources from Mineral Exploration and Development

Alternative B anticipates the highest level of mineral exploration and development. Despite application of the ROPs, this alternative has more potential to impact visual resources than does any other alternative.

(4) Alternative C

In general, this alternative anticipates the lowest level of resource development and adopts VRM classes that would be the most restrictive to development activities.

(a) Impacts to Visual Resources from Travel Management

1. OHV Management and Trails

Alternative C would result in the least amount of unmanaged OHV trail development, as 96 percent of BLM-managed lands would be designated as limited to OHV use, while 4 percent of land would be closed to OHV use. Consequently, this alternative would result in fewer impacts to visual resources than would any other alternative.

2. Roads

Because of proposed constraints, Alternative C would anticipate less road construction and associated impacts to visual resources than would any other alternative.

(b) Impacts to Visual Resources from Recreation

Alternative C would anticipate less recreation facility development and associated impacts to visual resources than would any other alternative. However, this low

level of facility development may be offset by visual impacts (such as bare ground and social trails) from increased recreation use at dispersed sites where no facilities exist.

(c) Impacts to Visual Resources from Natural and Cultural Resource Protection

Alternative C designates three ACECs and one RNA. These designations are targeted at protection of specific resource values, but in general have the effect of constraining resource development. Consequently, there would be fewer impacts on visual resources under this alternative than under the other alternatives.

(d) Impacts to Visual Resources from Lands and Realty Actions

1. FLPMA Disposals

Alternative C proposes little to no land disposal (including the Slana area); therefore, there would be no effect on visual resources.

2. Land Use Authorizations

Because of area-wide constraints, Alternative C anticipates the lowest level of land use authorizations and associated impacts to visual resources.

3. Withdrawal Review

Alternative C maintains more ANCSA (d)(1) withdrawals than does Alternative B or D, but fewer than does Alternative A. In most cases these withdrawals prevent mineral leasing and locatable mineral entry.

(e) Impacts to Visual Resources from Vegetation Management

Alternative C anticipates less forestry and prescribed burning activity and associated impacts to visual resources than does any other alternative.

(f) Impacts to Visual Resources from Mineral Development and Exploration

Because of area-wide constraints, Alternative C anticipates little mineral development and exploration. Combined with the most restrictive VRM classes and the application of ROPs, impacts to visual resources under this alternative would be less under Alternative B or D, but potentially more than under Alternative A.

(5) Alternative D (Proposed RMP)

(a) Impacts to Visual Resources from Travel Management

1. OHV Management and Trails

Alternative D limits cross-country travel, but some unmanaged proliferation of OHV trails is expected to continue, particularly on State-selected lands where OHVs are limited to existing (but not designated) trails. This alternative would be more effective at limiting impacts to visual resources than would Alternative A or B, but would be less effective than Alternative C.

2. Roads

Alternative D anticipates a slight increase in road construction. With application of the ROPs, this alternative would see less impacts to visual resources than would Alternative A or B, but more impacts than would Alternative C.

(b) Impacts to Visual Resources from Recreation

Alternative D proposes construction of strategically-located recreational facilities to reduce existing impacts from dispersed use, including visual impacts. In combination with application of VRM classes and establishment of visitor use limits in specific areas, this alternative would be the most effective of all the alternatives at reducing or mitigating impacts to visual resources.

(c) Impacts to Visual Resources from Natural and Cultural Resource Protection

Alternative D would designate the Bering Glacier RNA and identifies measures to protect specific resource values in that area. This designation would constrain resource development and, consequently, impacts to visual resources would be minimal. Outside of the RNA, ROPs would be adopted that identify measures to minimize impacts to visual resources from permitted activities.

(d) Impacts to Visual Resources from Lands and Realty Actions

1. FLPMA Disposals

Disposals would be used in Slana to resolve unauthorized occupancy. Because disposals would occur where development already exists, negative effects on visual resources would be insignificant. Some positive effects could occur where resolution of unauthorized occupancy results in clean up of abandoned material.

2. Land Use Authorizations

Alternative D anticipates a slight increase in land use authorizations; however, application of the ROPs would result in fewer impacts to visual resources than would Alternatives A and B, but more potential impacts than would Alternative C.

3. Withdrawal Review

Alternative D would maintain ANCSA (d)(1) withdrawals in the western two-thirds of the Bering Glacier RNA and in portions of the Delta Wild and Scenic River corridor. Alternative D maintains fewer withdrawals than does Alternative A or C, but more than Alternative B. In most cases, these withdrawals prevent mineral leasing and locatable mineral entry. This alternative would maintain PLO 5150 for most of the transportation and utility corridor in the planning area. However, PLO 5150 would be modified to allow conveyance to the State of 83,000 acres north of Paxson. Conveyance of this area would not immediately effect visual resources in the area. However, management emphasis in the area would be expected to change from recreation and subsistence to mineral exploration and development under State ownership. Mineral development in the area could have negative impacts on the area's visual resources, some of which are visible from the Delta River or the Richardson highway.

(e) Impacts to Visual Resources from Vegetation Management

Alternative D anticipates more forestry activity than do Alternatives A or C. However, with application of the VRM classes and the ROPs, expected impacts to visual resources would be less than under Alternatives A or B, but more than under Alternative C.

(f) Impacts to Visual Resources from Mineral Exploration and Development

Alternative D anticipates more mineral exploration and development than would Alternatives A or C. However, with the application VRM classes, and the ROPs and Stips listed in Appendix C, the expected impacts to visual resources would be less than under Alternative B, but more than under Alternative A or C.

j) Areas of Critical Environmental Concern

(1) Alternative A

This alternative would not designate any ACECs or RNAs. Impacts to areas and/or resource values identified in other alternatives for ACEC designation would be as follows:

- Delta bison calving area: There would be little to no likelihood of mineral development due to existing withdrawals. Possible seasonal disturbance from construction or maintenance activities associated with the transportation and utility corridor could occur. This alternative allows for road construction in this area with no seasonal constraints. The area would be designated as “open” to OHV use, which would allow for cross-country motorized travel, with resulting associated impacts to bison habitat and calving bison.
- Nelchina caribou calving area: This area consists of predominantly State-selected lands. There is little to no likelihood of mineral development while the area is under BLM management. The area’s “open” designation for OHV use would allow for cross-country motorized travel, with resulting associated seasonal impacts to calving caribou.
- West Fork Gulkana area: This area consists of predominantly State-selected lands. There is little to no likelihood of mineral development while the area is under BLM management. The area’s “open” designation for OHV use would allow for cross-country motorized travel, with resulting associated impacts to wetlands and seasonal disturbance of nesting trumpeter swans.
- Bering Glacier area: There would be no potential for mineral development due to existing withdrawals. The area’s “open” designation for OHV use would allow for cross-country motorized travel, with resulting associated impacts to wetlands, ecologically unique areas, and cultural and paleontological sites, and possible disturbance of nesting waterfowl.

(2) Alternative B

This alternative would not designate any ACECs or RNAs. Impacts to areas and/or resource values identified in other alternatives for ACEC designation would be as follows:

- Delta bison calving area: There would be a moderate likelihood of locatable mineral exploration and development. All ANCSA (d)(1) withdrawals would be revoked. This alternative allows for road construction and development in this area with no seasonal constraints, which could result in long-term habitat alteration in bison calving areas, and displacement of animals off the area. The area would be designated as “open” to OHV use, which would allow for cross-country motorized travel, with resulting associated impacts to bison habitat and calving bison.
- Nelchina caribou calving area: This area consists of predominantly State-selected lands. There is little to no likelihood of mineral development while the

area is under BLM management due to selections. If the area were retained in long-term Federal ownership, it would be opened to mineral leasing and locatable mineral entry. ROPs would apply seasonal constraints on mineral activities, but mineral development with associated roads, powerlines, and activities would result in some habitat loss and possible displacement of the herd out of this area. The area's "open" designation for OHV use would allow for cross-country motorized travel, with resulting associated impacts to calving caribou.

- West Fork Gulkana area: This area consists of predominantly State-selected lands. There is little to no likelihood of mineral development while the area is under BLM management due to selections. If the area were retained in long-term Federal ownership, it would be opened to mineral leasing and locatable mineral entry, with an expected interest in mineral leasing. ROPs and Stips would provide seasonal constraints on mineral activities, but mineral development with associated roads, powerlines, and activities would result in some habitat and wetland loss, displacement of some waterfowl (including trumpeter swans) from nesting habitat, and would change the character of this remote wetland-dominated area.
- Bering Glacier area: Revocation of existing withdrawals would allow for mineral exploration and development, which would be limited on the glacier itself, but could occur on the glacier forelands. Mineral development, with associated roads, infrastructure, and activities, would result in some habitat loss for Special Status Species of waterfowl, and disturbance would likely displace some individuals. Access roads for such activities would provide increased access for recreational use and subsistence hunting and fishing, completely altering the primitive experience that currently exists. Research opportunities on unique ecosystems and Special Status Species would be compromised or lost.

(3) *Alternative C*

The following ACECs and RNA would be designated under this alternative, with protective effects as described:

- Delta Bison Calving ACEC: Designation would protect calving bison and their habitat by maintaining withdrawals against mineral development, prohibiting road construction, restricting off-trail OHV use, and limiting permits and leases in the area.
- Nelchina Caribou Calving ACEC: Designation would protect calving caribou and their habitat by maintaining withdrawals against mineral development, prohibiting road construction, restricting off-trail OHV use, and limiting permits and leases in the area.
- West Fork ACEC: Designation would protect wetlands, trumpeter swan habitat, and moose refugia by maintaining withdrawals against mineral development, prohibiting road construction, limiting other rights-of-way, restricting off-trail OHV use, and limiting permits and leases in the area.
- Bering Glacier RNA: Designation would protect unique ecological communities and habitats by maintaining existing withdrawals against mineral development,

restricting off-trail OHV use, prohibiting road construction, and limiting permits and leases in the area.

Alternative C adopts the strongest measures to protect important and relevant values identified within each ACEC and RNA.

(4) Alternative D (Proposed RMP)

Alternative D would not designate any ACECs, but it would identify specific measures within each area to provide protect important and relevant for that area's resource values. The Bering Glacier RNA would be designated, but at an acreage smaller than that recommended under Alternative C. Impacts to areas and resource values identified would be as follows:

- Delta bison calving area: There would be little to no likelihood of mineral development due to existing withdrawals. If exploration or development did occur, it would be subject to seasonal constraints to protect calving bison and their habitat. This alternative allows for road construction in the area, but seasonal constraints would be implemented. OHV use in the area would be limited to designated trails that would be located to minimize disturbance to calving bison. The BLM would work with ADF&G on a Habitat Management Plan for the area to identify habitat improvement potential for bison range.
- Nelchina caribou calving area: This area consists of predominantly State-selected lands. There is little to no likelihood of mineral development while the area is under BLM management due to selections. If portions of the area were retained in long-term Federal ownership, mineral exploration and development could occur subject to seasonal constraints to protect calving caribou. Road construction would be allowed, but only for resource development purposes and subject to seasonal constraints to protect calving caribou. OHVs would be limited to existing trails.
- West Fork Gulkana area: This area consists of predominantly State-selected lands. There is little to no likelihood of mineral development while the area is under BLM management due to selections. If portions of the area were retained in long-term Federal ownership, they would be managed as an ACEC. Mineral exploration and development would be permitted, but would be subject to seasonal constraints to protect wetlands and trumpeter swan nesting. The area would be an avoidance area for new road construction, as well as an avoidance area for the placement of overhead powerlines. OHVs would be limited to existing trails.
- Bering Glacier RNA: All BLM-managed lands in this area would be designated as an RNA. Withdrawals would be maintained in the western two-thirds of the area, which would prohibit mineral exploration or development. Because of harsh conditions and extreme topography, development in the eastern one-third of the area would be highly unlikely. OHVs would be limited to designated trails, which would avoid critical waterfowl nesting areas and ecologically-unique plant communities. Gravel extraction would be prohibited, as would new road construction unless it supported research activities in the area. Prohibition of

helicopter-supported recreational activities in the area would ensure minimal disturbance to sheep and goats and the maintenance of primitive recreation opportunities.

Overall, the protective measures identified in Alternative D would not be as strong as the measures in Alternative C, where ACECs would be designated. Alternative D permits resource development in these areas while protecting important and relevant values.

4. Issue 4: Lands and Realty

For a detailed description of the Lands and Realty actions proposals by alternative, see Table 7 in Chapter II beginning on page 124. The specific withdrawals proposed under Alternatives B, C, and D are listed in Table 6 in Chapter II on page 118.

a) Impacts Common to All Alternatives

(1) Impacts to Lands and Realty from Travel Management

(a) Roads

Transportation and facilities management could require that easements be acquired for any BLM roads or other types of facilities to be located on non-Federal lands. Right-of-way reservations could be needed for BLM roads and other types of facilities to be located on public lands.

(2) Impacts to Lands and Realty from Natural and Cultural Resource Protection

(a) Fish and Wildlife

The management of wildlife and fisheries habitat, including Special Status Species, would have several consequences. The need to protect Special Status Species as well as certain other species of fish and wildlife and their habitat would impact land use authorizations, land ownership adjustments (such as land exchanges or disposals), and the acquisition of legal and physical access to public lands. Facilities proposed for construction under various land use authorizations or access easements in areas that could result in adversely affecting wildlife or fisheries habitat may need to be mitigated, constructed in alternate locations, or in some cases, dropped from consideration. Land ownership adjustments such as exchanges or sales proposed in areas where wildlife or fisheries could be adversely affected may need to be restructured or eliminated from consideration. These types of actions (restructuring of actions to mitigate impacts to fish and wildlife) could increase processing costs and time for both the Federal and non-Federal parties.

(b) Cultural Resources

The management of cultural resources could affect several aspects of the lands and realty program, including land use authorizations, land ownership adjustments, and the reservation or acquisition of legal and physical access to public lands. These

lands and realty actions are considered Federal undertakings and must avoid inadvertent damage to Federal and non-Federal cultural resources through compliance with Section 106 of the National Historic Preservation Act. Cultural inventories would need to be completed prior to these Federal undertakings, and impacts to important cultural sites would need to be avoided by project redesign, project abandonment, and/or mitigation of adverse impacts through data recovery. Actions taken to avoid impacts could include rerouting a proposed right-of-way or road easement, or restructuring or abandoning a proposed land ownership adjustment such as a land exchange or sale. Such actions (restructuring of actions to mitigate impacts to cultural resources) can increase processing costs and processing time for both the Federal and non-Federal parties.

(c) Paleontological Resources

The impacts from the management of paleontological resources would be very similar to those of cultural resources as described in the previous paragraph. Lands and realty projects occurring in known fossiliferous areas would require that adequate time and resources be allocated to conducting an inventory of these resources. The discovery of scientifically-important paleontological resources could result in the rerouting or redesign of proposed right-of-way and easement facilities. The presence of these resources could also lead to the restructuring or abandoning of land ownership adjustments such as land exchanges or sales. Such actions (restructuring of actions to mitigate for paleontological resources) can increase processing costs and time for both the Federal and non-Federal parties.

(d) Visual Resource Management

Visual resource management would affect land use authorizations such as rights-of-ways, leases, and permits. Facilities would need to meet objectives for the particular VRM class in which a project was proposed, which could entail mitigation, relocation, or elimination of certain facilities resulting in additional time and costs in project development.

(3) *Impacts to Lands and Realty from Vegetation Management*

(a) General Vegetation

The management of vegetation, including Sensitive Status Species, could have several impacts on the lands and realty program. The need to protect Sensitive Status Species and riparian and wetland vegetation would impact land use authorizations, land ownership adjustments, and reservation or acquisition of legal and physical access to public lands. Facilities proposed for construction under various land use authorizations or access easements in areas where these types of vegetation are present may need to be mitigated, constructed in alternate locations, or, in extreme cases, dropped from consideration.

(b) Fire Management

Wildland fire poses a threat to structures and personal property; prescribed fires are planned and risks are mitigated. Sites are prioritized for protection based on the management option designated for the site or surrounding area. A protection response is also dependent on other factors including but not limited to the availability of firefighting resources, the site condition and location, surrounding vegetation and the statewide situation at the time of the threat. Increase in authorizations and land use increase the potential for human-caused fires. Fire management under all alternatives would generally help protect facilities on public lands authorized through the lands and realty program by reducing fuel loads and suppressing larger fires.

(4) Impacts to Lands and Realty from Mineral Exploration and Development

The management of leasable, salable, and locatable minerals under all alternatives would likely result in requests for land use authorizations such as rights-of-way and permits for utilities and access.

Any renewable energy development proposed for public lands could result in requests for land use authorizations such as rights-of-way and permits.

(5) Impacts to Lands and Realty from Hazardous Material

Land use authorizations for uses which would involve disposal or storage of materials which could contaminate the land would not be issued. Lands proposed for acquisition would need to be inventoried for the presence of hazardous materials. The presence of contaminants may lead to actions such as the modification or abandonment of a landownership adjustment proposal, or remediation in the form of cleanup and removal of the contaminants.

b) Alternative A

(1) Impacts to Lands and Realty from Travel Management

(a) Roads

Alternative A would see a slight potential for increase in road construction associated with mineral exploration and development on State and Native Corporation lands. Any new construction would be considered in applications for rights-of-way on a case-by-case basis. The Wild and Scenic River corridors would be avoidance areas for new construction. There would be no effects to the Lands and Realty program under this alternative.

(2) Impacts to Lands and Realty from Recreation

No SRMAs are currently in place and none would be designated in Alternative A. All land use authorizations would be considered on a case-by-case basis. The Wild and Scenic River corridors would be avoidance areas for land use authorizations. This alternative would have no effects on the Lands and Realty program.

(3) Impacts to Lands and Realty from Natural and Cultural Resource Protection

Under Alternative A, no ACECs or RNAs would be designated, and consequently no area-wide constraints on activities such as land use authorizations would be in place. Measures to minimize impacts to natural and cultural resources from permitted activities, including land use authorizations, would be considered on a case-by-case basis.

(4) Impacts to Lands and Realty from the Lands and Realty Program

For lands and realty, and specifically land use authorizations, this alternative would provide the greatest flexibility in locating certain facilities, such as transmission lines, pipelines, and communication sites as there would be no designated right-of-way corridors or use areas, and no right-of-way avoidance or exclusion areas except for the two Wild and Scenic River corridors.

(a) FLPMA Disposals

No disposals would occur in the Slana area other than those required for the resolution of failed claims. This resolution of failed claims would help to resolve a portion of the trespass issues in the area and would not greatly impact the lands and realty program.

(b) Land Exchanges

No land exchanges would occur under Alternative A.

(c) Land Use Authorizations

Land use authorizations under Alternative A would be considered on a case-by-case basis with site-specific environmental review conducted.

(5) Impacts to Lands and Realty from Vegetation Management

(a) Forest Products

Management for forest products would potentially result in the need for road access to forested areas in the form of road rights-of-way and road use agreements. Forest product management could also result in a need for the BLM to acquire easements for legal and physical access to public lands. In comparison with the other alternatives, Alternatives A and C would require the least need for access.

c) Alternative B

(1) Impacts to Lands and Realty from Travel Management

(a) Roads

Alternative B would potentially result in the need for new road construction associated with increased resource development. This new construction would be considered in applications for rights-of-way on a case-by-case basis.

(2) Impacts to Lands and Realty from Recreation

No SRMAs would be designated under Alternative B. Additional recreation facilities would be constructed along the Denali Highway and in the Tiekel area to handle increased visitor use. All land use authorizations would be considered on a case-by-case basis.

(3) Impacts to Lands and Realty from Natural and Cultural Resource Protection

Under Alternative B, no ACECs would be designated and no area-wide constraints would be identified that would impact lands and realty actions. Land use authorizations would be considered on a case-by-case basis, but ROPs would be adopted to minimize impacts to natural and cultural resources.

(4) Impacts to Lands and Realty from the Lands and Realty Program

(a) FLPMA Disposals

Alternative B would make approximately 10,000 acres in the Slana area available for disposal to the public at large by competitive or modified bidding procedures. While disposing of this land would potentially eliminate a block of unmanageable land, it

would also create a workload for the lands and realty staff to address, among other things, implementation-level planning and facilitating access needs and rights-of-way.

(b) Land Exchanges

Alternative B does not attempt to identify any areas for exchange until State and Native entitlements are met. After conveyances are completed, exchanges would be considered in the Chistochina/Slana, Tiekel, and Gulkana/Delta planning sub-regions. Land exchanges would have positive impacts on the Lands and Realty program by consolidating land status.

(c) Land Use Authorizations

Alternative B anticipates an increase in land use authorizations associated with increased resource development. While this would have an impact on the Lands and Realty program, adoption of ROPs would enable managers to apply measures consistently to address potential impacts to natural and cultural resources.

(d) Transportation and Utility corridor

Alternative B would revoke PLO 5150 and allow conveyance of the transportation and utility corridor to the State of Alaska.

Oversight and monitoring of the Trans-Alaska Pipeline System (TAPS) for compliance with the Federal Grant of Right-of-Way and State Right-of-Way Lease are the responsibilities of BLM and ADNR, who have agreed to cooperate in this effort through a “Joint Pipeline Office” (JPO). The administrative functions of the office are coordinated by the Federal Authorized Officer from the BLM and the State Pipeline Coordinator from the State Department of Natural Resources.

The Federal Government envisioned additional conveyances of pipeline corridor land from federal ownership as evidenced by the process described in the Federal Agreement and Grant Right-of-Way for TAPS. However, the document does not address the situation or the role of Department of the Interior (DOI) in the event that DOI would no longer manage lands along the TAPS. Although not legally tested, DOI has long asserted that its’ authority under the Trans Alaska Pipeline Authorization Act (TAPAA) to oversee TAPS is system-wide and not tied to land ownership. Whether TAPAA authority remains in full force and effect absent DOI land management responsibilities along TAPS would require further legal analysis. BLM responsibilities for TAPS are tied to its’ role as land manager of the TAPS right-of-way. The Grant provides that upon patent or TA of lands to the State, the right-of-way and other federal authorizations are terminated.

However, because both the State and Federal right-of-way agreements contain very similar conditions and stipulations, conveyance of these lands to the State will not result in a reduction of the authorities necessary to protect natural resources, human safety, public/private property or pipeline integrity. In addition, DOI, through TAPAA, will retain the ability to provide TAPS oversight authority.

Conveyance of these lands to the State would not appreciably change the balance of the roles and responsibilities in the Joint Pipeline Office. BLM would continue to administer the remaining 265 miles of federally owned lands within the corridor as well as represent DOI in administration of its' authorities under TAPAA, which are not based on land ownership and apply to the entire 800 mile pipeline system.

The participating Federal and State agencies rely on BLM and ADNR and their authorities outlined in the Federal Grant of Right-of-Way and the State Right-of-Way Lease to support and subsidize the agencies regulatory responsibilities. For example, the Department of Transportation/Office of Pipeline Safety (DOT/OPS), which has responsibility for administration of 49 CFR Part 195, Transportation of Hazardous Liquids, has traditionally relied on Federal and State staff assigned to the JPO to monitor TAPS and its related facilities, alerting DOT to potential problems on the pipeline.

The BLM has an MOU with the TAPS owner companies to provide funding for oversight activities. This is a funding mechanism that is not available to purely federal regulatory agencies resulting in a reliance on the BLM by nearly all the other participating federal agencies. Currently, the only full-time federal staff assigned to the JPO are from BLM. EPA has assigned one individual to the office on a part time basis, although this position does not rely on BLM for funding.

(5) *Impacts to Lands and Realty from Vegetation Management*

(a) Forest Products

Alternative B proposes an aggressive forestry program targeting beetle-kill white spruce that would, in some cases, require road construction and possibly the need to obtain easements to cross lands under other ownerships.

d) Alternative C

(1) *Impacts to Lands and Realty from Travel Management*

(a) Roads

Very little new road construction would be anticipated under Alternative C.

(2) Impacts to Lands and Realty from Recreation

Alternative C designates five SRMAs. Within portions of these SRMAs, issuance of land use authorizations would be constrained to allow for management consistent with recreation objectives. Some of these areas are also identified as avoidance areas for issuance of rights-of-way.

(3) Impacts to Lands and Realty from Natural and Cultural Resource Protection

Under Alternative C, three ACECs and one RNA would be designated (Delta Bison Calving ACEC, Nelchina Caribou Calving ACEC, West Fork ACEC, and Bering Glacier RNA). Land use authorizations and land ownership adjustments such as sales and exchanges would have to be evaluated on a case-by-case basis to determine whether the proposed action adversely affected relevant and important values. Land use permits and R&PP leases would need to be consistent with the protection of the values for which the areas were designated.

Implementation of VRM classes as proposed under this alternative would require design or citing adjustments for certain land use authorizations, resulting in additional time and cost in project development.

(4) Impacts to Lands and Realty from the Lands and Realty Program

(a) FLPMA Disposals

No disposals would occur in the Slana area other than those required for the resolution of failed claims. While having minimal impact on the Lands and Realty program, this lack of disposals in the Slana area would do nothing towards resolving an unmanageable land status situation. The BLM would continue to try and manage small scattered parcels with small private inholdings.

(b) Land Exchanges

No land exchanges would be considered under Alternative D, which would preclude opportunities for possible consolidation of land status and increasing efficiency in land management.

(c) Land Use Authorizations

Alternative C provides the least amount of flexibility in locating certain facilities such as transmission lines, pipelines, and communication sites. This alternative proposes numerous area-wide constraints and exclusion or avoidance areas for these types of activities.

(5) Impacts to Lands and Realty from Vegetation Management

(a) Forest Products

Given the level of forestry activity proposed under Alternative C, there would be little to no impact on the Lands and Realty program.

e) Alternative D (Proposed RMP)

(1) Impacts to Lands and Realty from Travel Management

(a) Roads

Management for travel would potentially result in a slight increase in the need for new road construction as well as driveways to private parcels of land. New construction would be considered in applications for rights-of-way on a case-by-case basis, except where there are restrictions in the following areas: a) Delta bison calving area; b) Nelchina caribou calving area; c) West Fork Gulkana area; and d) Denali Highway area. In addition, there would be no new road construction permitted in the Wild and Scenic portions of the Delta and Gulkana Wild and Scenic River corridors. New road construction would be avoided in areas managed for a primitive recreation experience in the Delta Range and Tiekel SRMAs.

(2) Impacts to Lands and Realty from Recreation

Alternative D designates four SRMAs and identifies measures to meet recreation objectives within these areas. In some cases, these measures would include exclusion of land use authorizations unless the permitted activity is consistent with recreation objectives. Overall, this alternative applies more constraints on land use authorizations than does Alternative A or B, but fewer constraints than does Alternative C.

(3) Impacts to Lands and Realty from Natural and Cultural Resource Protection

Under Alternative D, the only area that would receive a special designation would be the Bering Glacier, which would be designated as an RNA. Land use authorizations, land ownership adjustments (such as exchanges and sales), and access to public lands within the planning area would have to be evaluated to determine whether the proposed lands and realty action would adversely affect relevant and important values. In other areas where special values are protected (such as calving areas), land use permits and leases and R&PP leases would be evaluated to ensure protection of special values. Occupancy type permits would be authorized only under the criteria listed in Chapter II. Other occupancy permits (non-cabin) would be allowed if they have been identified as being consistent with protection of values.

(4) Impacts to Lands and Realty from the Lands and Realty Program

(a) FLPMA Disposals

Disposals would be used in the Slana settlement area to resolve unauthorized occupancy. Administration of this program would require working with individuals and the community of Slana but could be handled by existing staff.

Other lands and realty actions proposed under this alternative could be handled with existing staffing levels.

(b) Land Exchanges

Same as for Alternative B.

(c) Land Use Authorizations

Alternative D designates four SRMAs and identifies measures to meet recreation objectives within these areas. It also designates the Bering Glacier RNA and identifies measures to protect that area's specific resource values. In some cases, these measures would include exclusion of land use authorizations unless the permitted activity is consistent with recreation or RNA objectives. Overall, this alternative applies more constraints on land use authorizations than does Alternative A or B, but fewer constraints than does Alternative C.

(d) Transportation and Utility corridor

Under this alternative, the transportation and utility corridor would be maintained with the exception of 83,000 acres north of Paxson. PLO 5150 would be modified to allow for this parcel to be conveyed to the State of Alaska. This would have no effect on Lands and Realty.

(5) Impacts to Lands and Realty from Vegetation Management

(a) Forest Products

Management for forest products under Alternative D would potentially result in the need for road access to forested areas in the form of road rights-of-way and road use agreements. Forest products management could also result in the need for the BLM to acquire easements for legal and physical access to public lands. In comparison with the other alternatives, this alternative would require less need for access than would Alternative B, but more need for access than would Alternative A or C.

5. Issue 5: Vegetation Management

This section for *Issue 5: Vegetation Management* describes impacts to the management of vegetation, fire, and forest products within the planning area. For information regarding the impacts to the occurrence and condition of vegetation, see the *Vegetation* section under *Issue 3: Natural and Cultural Resources* beginning on page 464.

For a detailed description of the Vegetation Management proposals by alternative, see Tables 8 and 9 in Chapter II beginning on page 134.

a) Impacts Common to All Alternatives

(1) Fire Management

Fire is a natural and desirable component of vegetation management. Vegetation communities statewide have been impacted or have evolved through fire. A desired result of burning would be to achieve a mix of burn intensities, while avoiding the extremes of minimal or maximum duff removal over most of the burn area.

A low severity burn would generally only top-kill shrubs and deciduous trees capable of root or crown sprouting. These species would quickly put up new growth from their root systems. However, since little duff is consumed by a low severity burn, seed establishment would be poor. Post burn vegetation would be limited to the deciduous shrub and tree species capable of root or crown sprouting that were present before the burn, and their pre-burn distribution would govern subsequent abundance. However, a goal of restoring younger age diversity in a late-successional system would be met.

A higher severity burn would remove larger portions of the duff, creating good conditions for seed establishment. This might result in killing most of the plants capable of root or crown sprouting under less severe burn conditions, a loss that would be offset by the establishment of a wide variety of new plants through natural seeding. Vegetative recovery would be slower from seeding than from root or crown sprouting; however, reproduction resulting from a more severe burn is more likely to produce a vegetative change.

Sub-populations of Sensitive Status Species plants in areas of wild or prescribed fire events would be subject to the same potential beneficial and detrimental effects as described above. Where possible, prior identification of specific sub-populations would allow resource managers to protect and conserve rare plant habitats.

(a) Wildland Fire

Within the planning area, fire management has been conducted by agreements executed on an interagency, landscape-scale basis since the early 1980s. This effort standardized policies and procedures among land managing agencies in Alaska. As a result, four wildland fire suppression management options (Critical, Full, Modified, and Limited) are utilized statewide by all Federal, State, and Native land managers. This cooperative interagency approach would continue under all alternatives. Management options are adjusted as needed on an annual basis using resource and urban-interface objectives.

(2) *Forest Products*

The practice of forestry is associated with the removal, harvest, and/or replacement of some component of the forest vegetation (including Sensitive Status Species plants) to obtain desired yields or to steer development of the vegetation towards desired goals or conditions such as moose habitat improvement. It follows that the effects of forestry on vegetation would tend to be long-term in nature. In most cases within the planning area, dead and/or mature timber would be harvested. The removal of the upper canopy would set in motion a successional cycle favoring lower-seral species such as willow. In many cases, trampling and killing decadent sprouting vegetation stimulates new growth and invigorating more vegetative mass. This action favors many wildlife species, as forage can increase 20 to 45 fold with the right combination of harvest and scarification.

Harvesting timber may disturb natural conditions in soils and vegetation, which may facilitate the invasion of noxious weeds.

Sub-populations of Sensitive Status plant Species in areas of proposed timber harvest would be subject to the same potential beneficial and detrimental effects as described above. Where possible, prior identification of specific sub-populations would allow resource managers to protect and conserve rare plant habitats.

b) **Alternative A**

(1) *Fire Management*

(a) Prescribed Fire

Alternative A identifies the least amount of area for the utilization of prescribed fire to accomplish habitat improvement and fuels reduction projects. Approximately 5,000 additional acres would be burned in the Alphabet Hills with a primary objective of creating or maintaining lower-seral shrub-dominated plant communities to improve moose habitat.

(2) Forest Products

Forest products would continue to be produced at about the same level as they have for the past 10 years: an average of 250-300 annual cords of commercial saw logs and firewood over approximately 40 acres/year. In addition, there are also approximately 300 cords of dead white spruce harvested through personal use firewood permits annually. This amount of forest management has very little impact on overall forest health in the area, and contributes little to the achievement of desired conditions stated in Chapter II.

Access to forest products would remain limited, and temporary or winter roads would continue to be utilized in timber sales.

c) Alternative B

(1) Fire Management

(a) Prescribed Fire

Alternative B identifies 1.5 million acres to be targeted for habitat improvement through the use of prescribed burning. This alternative and Alternative D would result in the most acres meeting the desired conditions for moose and caribou, as described in Chapter II. Prescribed burning at this scale over the course of the planning period, combined with the effects of wildland fire, would result in the following landscape-scale effects to vegetation:

- In forest cover types, a mosaic of early-seral shrub dominated vegetation communities combined with late-seral spruce-dominated plant communities would be provided.
- Fuel-loading would be reduced, providing a mosaic of different vegetation cover types and fuel loading, thus reducing the possibility of future stand-replacement large wildfires.
- Resprouting in over-mature willow and aspen would be encouraged.

(2) Forest Products

Alternative B proposes the most acres for potential timber harvest and the most road construction to access harvest areas. Consequently, this alternative would have more short-term detrimental and long-term positive impacts on vegetation than would any of the other alternatives.

This alternative takes an aggressive stance at harvesting up to 360,000 acres throughout the planning area, using road construction where necessary to access units. Harvest would focus on salvage of beetle-kill white spruce, with anticipated harvest levels of 100-200 acres/year. Alternative B would result in the most acres meeting the

desired conditions for white spruce commercial stands as described in Chapter II. Transitional lower-seral shrub dominated cover types would provide a secondary benefit through improved habitat for moose. This positive effect would be offset by the negative impacts of road construction.

Local markets for house logs and firewood would be exceeded by this amount of harvest, so markets outside of the planning area would need to be utilized or alternative forest products (such as chipping or biomass) explored.

d) Alternative C

(1) Fire Management

(a) Prescribed Fire

Alternative C does not identify any areas for habitat improvement through the use of prescribed fire, but instead relies entirely on the use of wildland fire to accomplish objectives. Given the lack of large-scale wildland fires in the past 50 years, not much habitat improvement would occur. Overall, this alternative would be the least effective of all the alternatives at meeting desired conditions for moose and caribou habitat as described in Chapter II. In general, existing forest cover types would continue in a generally late-seral condition, with very little shrub-dominated early seral communities.

(2) Forest Products

Given the anticipated low level of forestry activities, the use of temporary winter roads, and the application of ROPs, impacts to vegetation under Alternative C would be insignificant. This alternative would see fewer long-term benefits from forestry management and fewer achievement of desired conditions for commercial forest stands.

This alternative only permits timber harvest to accomplish habitat improvement objectives; it does not permit new road construction to access harvest areas. Given these constraints, very little timber harvest would occur. Local small mills would probably rely on other private, State, or Native lands to obtain timber. This alternative would result in the least number of acres meeting the desired condition for white spruce commercial stands as described in Chapter II. Beetle-kill trees would continue to deteriorate in quality, becoming unusable even for firewood.

e) **Alternative D (Proposed RMP)**

(1) Fire Management

Alternative D proposes more prescribed fire than Alternative A or C, and the same amount as Alternative B.

(a) Prescribed Fire

Same as for Alternative B.

(2) Forest Products

Alternative D anticipates a slight increase in forestry activities on BLM-managed lands, targeted at 144,000 acres of beetle-kill white spruce. Anticipated harvest level would be 40-100 acres/year. Given the forestry constraints that would be practiced in the area (use of temporary and mainly winter access and application of ROPs), it is anticipated that negative impacts to vegetation from forestry activities would be slight to insignificant, and would be more than offset by positive long-term impacts as beetle-kill stands are replaced over the long-term by shrub-dominated plant communities and healthy stands of white spruce.

This alternative identifies 144,000 acres of beetle-kill white spruce for potential harvest or salvage work. As is currently practiced, temporary roads or winter access would be used to reduce costs and environmental concerns associated with road construction. Alternative D would result in more acres meeting desired condition for white spruce commercial stands, as described in Chapter II, than would Alternatives A or C. Transitional lower-seral shrub-dominated cover types would provide a secondary benefit through improved habitat for moose.

Local market and demand for house logs and firewood would be met by the amount of harvest provided under this alternative. Use of alternative forest products (such as chipping or biomass) would be explored to accomplish objectives if opportunities arose.

6. Issue 6: Leasable and Locatable Minerals

For a detailed description of the Leasable and Locatable Minerals proposals by alternative, see Tables 10 and 11 in Chapter II beginning on page 145.

Table 41. Oil and Gas Leasing by Alternative

Leasing Status	Acres and Percentages by Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Closed	4,325,000 ²	61	137,000 ²	2	2,915,000 ²	41	1,463,000 ²	21
Open with NSO	0 ²	0	0 ²	0	2,322,000 ²	33	0 ²	0
Open with seasonal or minor constraints	0 ²	0	1,724,000 ¹	24	0 ²	0	1,730,000 ²	24
Open subject to standard lease strips	2,731,000 ³	39	5,195,000 ⁴	74	1,819,000 ⁵	26	3,863,000 ⁶	55

* Percent of BLM-managed lands (7,056,000 acres) within the planning area.

- ¹ Includes 898,000 acres currently selected
- ² Includes 1,711,000 acres currently selected
- ³ Includes 2,563,000 acres currently selected
- ⁴ Includes 4,700,000 acres currently selected
- ⁵ Includes 1,819,000 acres currently selected
- ⁶ Includes 3,817,000 acres currently selected

Table 42. Locatable Minerals by Alternative

Mineral Entry Status	Acres and Percentages by Alternative							
	A		B		C		D	
	Acres	%*	Acres	%*	Acres	%*	Acres	%*
Closed	4,907,000 ²	70	137,000 ²	2	3,737,000 ¹	53	1,068,000 ²	15
Open	2,149,000 ²	30	6,919,000 ³	98	3,319,000 ⁴	47	5,988,000 ⁵	85

* Percent of BLM-managed lands (7,056,000 acres) within the planning area.

- ¹ Includes 2,500,000 acres currently selected
- ² Includes 1,903,000 acres currently selected
- ³ Includes 5,500,000 acres currently selected
- ⁴ Includes 3,200,000 acres currently selected
- ⁵ Includes 5,500,000 acres currently selected

a) Alternative A

(1) Oil and Gas Leasing

Currently, 2.7 million acres are open for oil and gas leasing, though most of these lands are encumbered by Native or State selections. However, there are currently no oil and gas leases and no oil and gas leasing would occur under Alternative A. No withdrawal review would occur and all ANCSA (d)(1) withdrawals would remain in place, pending future legislation or unrelated management direction.

Maintaining ANCSA (d)(1) withdrawals and not considering oil and gas leasing would preclude oil and gas exploration and development and render these resources unrecoverable.

(2) Locatable Minerals

Under Alternative A, no withdrawal review would occur and all ANCSA (d)(1) withdrawals would remain in place. PLO 6329, based on an amendment to the 1980 Southcentral Management Framework Plan, modified existing withdrawals in the Denali and Tielke planning sub-regions to allow for locatable mineral entry. However, most of these lands are currently State- or Native-selected. The Glennallen Field Office would continue to administer active claims through Plans of Operations, but the potential for future exploration and development on BLM-managed lands would be limited.

(3) Mineral Materials

Development of mineral material sites would not be constrained under Alternative A, as this alternative would not apply the ROPs listed in Appendix C or any area-wide designations such as ACECs, though site-specific stipulations would apply.

b) Alternative B

(1) Oil and Gas Leasing

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

Approximately 5,195,000 acres (74 percent) of the BLM-administered lands within the planning area would be open subject to the terms and conditions of the standard lease form. Approximately 1,724,000 acres (24 percent) of the planning area would be open to leasing subject to minor constraints (e.g., timing limitations). These constraints would limit exploration and development during specific time periods and increase recovery

costs. Approximately 137,000 acres (2 percent) of the planning area would be closed to oil and gas leasing. Closing these acres to leasing would preclude oil and gas exploration and development and render these resources unrecoverable.

(2) *Locatable Minerals*

Revocation of withdrawals under Alternative B would result in increased exploration and development activity, pending State and Native conveyances. Most operations would be small-scale placer mining operations, but potential would exist for larger mining operations on a scale similar to the Pogo mine. Increased placer mining activity would be dependent on prolonged high gold prices (over \$500/oz). Increased activity could be expected associated with mineral deposits north of the Denali Highway and in the Tiekkel and Bering planning sub-regions. Administration of Plans of Operations, compliance, and mine reclamation would be overseen by Glennallen Field Office personnel.

(3) *Mineral Materials*

Alternative B anticipates an increased demand for gravel to support mineral exploration, development, and road construction. Anticipated development would occur at sites adjacent to the Richardson, Glenn, and Denali Highways.

c) Alternatives C

(1) *Oil and Gas Leasing*

Under Alternative C, withdrawals would be maintained or recommended for all three ACECs (Delta Bison Calving, Nelchina Caribou Calving, and West Fork), the one RNA (Bering Glacier), and all five SRMAs (Delta Range, Delta River, Denali Highway, Gulkana River, and Tiekkel). These withdrawals would eliminate areas that possess the most geologic potential for oil and gas resources. These constraints, combined with State and Native selections, mean that very little potential would exist within the planning period for oil and gas leasing.

Approximately 1,819,000 acres (26 percent) of the BLM-administered lands within the planning area would be open subject to the terms and conditions of the standard lease form. Approximately 2,322,000 acres (33 percent) of the planning area would be open to leasing subject to major constraints (No Surface Occupancy). Oil and gas development in this area would possibly require directional drilling to extract hydrocarbon resources. Should areas with major constraints be wider than the technically feasible reach for directional drilling, some hydrocarbon resource may be rendered unrecoverable. Product price fluctuations may require premature abandonment that would dramatically decrease the recoverability of the resource and potentially create an irretrievable incremental loss of resources. Approximately 2,915,000 acres (41 percent) of the planning area would be closed to oil and gas

leasing. Closing these acres to leasing would preclude oil and gas exploration and development and render these resources unrecoverable.

Alternative C identifies 4,141,000 acres as being open for leasing. However, 2,322,000 of those acres would only be open subject to major constraints (No Surface Occupancy). The remaining 1,819,000 acres are currently State- or Native-selected. Given these constraints, it is assumed that little to no oil and gas development would occur under this alternative.

(2) Locatable Minerals

Under Alternative C, less potential exists for mineral exploration and development than under any other alternative due to the maintenance or recommendation of withdrawals for all three ACECs, the one RNA, and all five SRMAs. These restrictions would cover all areas within the viewshed of the Denali Highway, some of the most geologically promising areas in the planning area. Some mining activity would continue to occur on valid existing claims, but new development would be doubtful based on proposed area-wide constraints. The Glennallen Field Office would continue to administer active claims through Plans of Operations, and the ROPs listed in Appendix C would be implemented.

(3) Mineral Materials

Demand for gravel is not expected to increase under Alternative C; most existing demand would be fulfilled through extraction from private, State, or Native gravel pits. Mineral material extraction would be prohibited in the two Wild and Scenic River corridors, along the entire viewshed of the Denali Highway, in all three ACECs, and in the Bering Glacier RNA.

d) Alternative D (Proposed RMP)

(1) Oil and Gas Leasing

Under Alternative D, most existing ANCSA (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. Withdrawals would be kept in place within the two Wild and Scenic River corridors, portions of the transportation and utility corridor, and the western two-thirds of the Bering Glacier RNA.

Approximately 3,863,000 acres (55 percent) of the BLM-administered lands within the planning area would be open subject to the terms and conditions of the standard lease form. Approximately 1,730,000 acres (24 percent) of the planning area would be open to leasing subject to minor constraints (e.g., timing limitations). These constraints would limit exploration and development during specific time periods and increase recovery costs. Approximately 1,463,000 acres (21 percent) of the planning area would be

closed to oil and gas leasing. Closing these acres to leasing would preclude oil and gas exploration and development and render these resource unrecoverable.

The areas that show moderate potential for oil and gas are currently State- or Native-selected. Realistically, if exploration showed true potential for development, these lands would likely be conveyed to the Native corporations or the State. However, potential does exist for the leasing of 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 on page 409. Should Federal leasing take place, the BLM-Alaska State Office would assume lease administration responsibilities and oversight of field operations.

This alternative would modify PLO 5150 to allow conveyance to the State of 83,000 acres within the outer corridor of the transportation and utility corridor. These are acres that are currently closed to mineral leasing under PLO 5150. The likelihood of oil and gas leasing in this area is very low.

(2) Locatable Minerals

Same as for Alternative B. However, this alternative would modify PLO 5150 to allow conveyance to the State of 83,000 acres within the outer corridor of the transportation and utility corridor. Acres within the outer corridor are currently (under PLO 5150) open to mineral location (metaliferous metals), so this action would not represent a change.

(3) Mineral Materials

Alternative D anticipates a slight increase in demand for gravel over the planning period. Anticipated development would occur at sites adjacent to the Richardson, Glenn, and Denali Highways. Existing gravel pits on State, Native, and private lands would be utilized before new development would occur on BLM lands.

7. Issue 7: Subsistence/Social and Economic Conditions

For a detailed description of the Natural and Cultural Resources proposals by alternative, see [Table 12](#) in Chapter II beginning on page 169.

a) Impacts Common to All Alternatives

(1) Subsistence

(a) Vegetation Management

The goal of vegetation management under all alternatives is to maintain the key ecosystem components and vegetative structures within their natural range. This would be accomplished in varying amounts through fire management and other vegetation manipulation practices, including the extraction of resources (timber) where practical. Under all alternatives, the Authorized Officer would retain adequate discretion to sufficiently prevent any impacts to subsistence practices or resources. Vegetation management under all alternatives is not likely to have any adverse effects on subsistence management.

b) Alternative A

(1) Subsistence

(a) Effects of Use, Occupancy, or Disposition on Subsistence Uses or Needs

1. Travel Management and Recreation

Travel management and recreation under Alternative A would result in the continued unmanaged and unplanned proliferation of OHV use. Additional and poorly planned OHV trails would continue to compromise the effectiveness of habitat refugia for fish and wildlife by allowing easier and increased access to those areas.

Furthermore, unlimited access and unrestricted use would cause further habitat degradation that would affect fish, wildlife, and non-game resources. Protective measures would be reactionary as conflicts are identified and as issues are brought forth by the public. These reactive protective measures would tend to mitigate impacts to a certain extent, but there would probably be an overall decline in resource abundance over the short- and long-term. All

users, including subsistence and sport, would continue to have unrestricted access to subsistence areas and resources once they were on public lands.

2. Natural and Cultural Resources

No areas under Alternative A are designated for additional protection of special values. Current management practices are considered sustainable in regards to subsistence resources; therefore, there should be no noticeable adverse effects to subsistence resources.

3. Lands and Realty

a. Withdrawal Review

All existing withdrawals would be maintained under Alternative A, including withdrawals from selection and withdrawals from mineral entry and mineral leasing. Current management is considered adequate and sustainable to meet subsistence needs. For this reason, this alternative would have no effect on the use, occupancy, or disposition of subsistence uses or needs based on management of lands and realty.

b. Transportation and Utility Corridor Withdrawals

Alternative A would maintain existing withdrawals associated with the transportation and utility corridor. The existing withdrawal prevents mineral leasing or locatable entry as well as appropriations under the land laws. This area would be maintained as is (managed by the BLM). This alternative would have no effect on the use, occupancy, or disposition of subsistence uses or needs.

c. FLPMA Disposals

Under Alternative A, only minimal disposals are considered to resolve unauthorized settlement claims in the Slana area. There would be no impacts to subsistence.

4. Leasable and Locatable Minerals

Current management is considered adequate and sustainable to meet subsistence needs. For this reason, Alternative A would have no effect on the use, occupancy, or disposition of subsistence uses or needs based on management of oil and gas and locatable minerals.

(b) Availability of Other Lands for the Purpose Sought to be Achieved

This Resource Management Plan considers all BLM-managed lands located in the planning area, including selected lands. Conveyed lands, however, cannot be considered for management. No other lands within the Glennallen Field Office boundaries are available for meeting the BLM's multiple use mandate.

(c) Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The only alternative that would eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes would be an alternative that prohibited any activity that conflicted with subsistence use or subsistence users. However, the BLM operates under a multiple use mandate. This mandate prevents the BLM from managing resources based on single resources, such as subsistence. Alternatives C and D reduce the use, occupancy, or disposition of public lands needed for subsistence purposes.

(2) Social and Economic Conditions

Increasing State and local populations indicate higher pressure on resources and popular tourist destinations such as the Denali Highway. Visitation may also increase pressure on subsistence resources by increasing resource competition. Timber sales have been offered on BLM lands, and would be considered in the future at a rate of approximately 40 acres/year under Alternative A creating between 0 to 5 jobs. No oil and gas leasing is projected for BLM-managed lands in the planning area. Current small placer mining operations would be maintained, but very little new mining development would occur on BLM-managed lands. Tourism would continue to increase and recreation-related commercial permits would increase.

Of these activities, recreation-related activities have the most potential to benefit the area economically. This alternative places no constraints on these activities, and recreation-supported services and incomes would increase proportionately with increased population and visitor use, even though visitor experience may decline somewhat.

(3) Environmental Justice

Comparing the access to Federal land, use, and development under current management with potential activities under any of the alternatives indicates little likelihood of effect focused on minority or low-income populations.

c) Alternative B

(1) *Subsistence*

(a) Effects of Use, Occupancy, or Disposition on Subsistence Uses or Needs

1. Travel Management and Recreation

Travel and recreation impacts under Alternative B would be similar to, but slightly less than, impacts under Alternative A. Recreation management would continue to be reactive, but the more stringent ROPs that would be applied would minimize effects over Alternative A. New road construction would be considered on a case-by-case basis, but again, the more stringent ROPs would minimize effects over Alternative A. Access for subsistence uses would not be affected as restrictions would not apply to Federally-qualified users in pursuit of traditional activities.

2. Natural and Cultural Resources

Under Alternative B, there are no areas designated for additional protection of special values. Current management practices are considered sustainable in regards to subsistence resources. Under Alternatives B, C, and D, the ROPs that apply to all actions are even more protective than the standard stipulations that would be applied under Alternative A. These ROPs should give sufficient protection to the values the special areas were proposed to protect, although not as much protection as would be provided by Alternatives C and D. Therefore, there should be no noticeable adverse effects to subsistence resources based on special values determinations (or lack of) under Alternative B.

3. Lands and Realty

a. Withdrawal Review

Alternative B would revoke all ANCSA (d)(1) withdrawals, allowing for more mineral exploration and development than under any other alternative. The impacts of increased mineral development on subsistence are described for Alternative B below under *Leasable and Locatable Minerals* on page 569.

b. Transportation and Utility Corridor Withdrawals

This alternative would revoke PLO 5150, allowing conveyance of the transportation and utility corridor to the State. Federal subsistence regulations only apply to unencumbered (non-selected) Federal public lands. State conveyance of the transportation and utility corridor would remove up to 453,000 acres from Federal subsistence management jurisdiction, an area that represents 63 percent of the BLM-managed lands subject to the Federal subsistence priority in Unit 13. This will have a significant impact on

subsistence activities for communities having a customary and traditional use determination for Unit 13.

Local rural residents are exceptionally dependent upon their harvests from the Federal lands of the transportation and utility corridor. Federal public lands represent a very small portion of all land in Unit 13 (only 1.7 percent). The Unit as a whole has historically seen a very high level of hunting by non-rural residents of Anchorage, the Mat-Su Valley, and Fairbanks. Since moose and caribou populations have been at below optimum levels in the past decade, the resources cannot support all the desired hunting activity. State management on the non-Federal lands has reduced non-local hunting, while Federal subsistence regulations have provided for longer seasons and more liberal harvest limits to ensure the rural subsistence priority for local, rural residents. The BLM issued over 3,000 permits to Federally-qualified subsistence users in 2004. These permits resulted in significant subsistence harvest levels. For the nine years ending in 2002, Federal subsistence users annually harvested an average of 313 caribou. In the past three years, Federal permit holders took an average of 45 moose annually. The BLM estimates that 80 percent of these harvests occurred within the Federal lands of the transportation and utility corridor.

In addition to the regulatory protections of the Federal subsistence management program, the Federal lands of the corridor have been able to support large harvests because of their accessibility and strategic location along the migration route of the Nelchina caribou herd. The transportation and utility corridor follows the Richardson Highway, and in fact overlaps it for more than 75 miles. This provides substantial access to the Federal hunting areas by means of highway vehicles. Outside the corridor, there are only 5.5 additional highway miles that provide access to the Federal hunting areas. These additional 5.5 miles are on the Denali Highway, which is not maintained in the winter. The remainder of the Federal hunt areas can only be accessed by OHV, airplane, or boat. Opening up the corridor to conveyance to the State would significantly reduce the availability of resources and the access to the remaining areas. Local residents, currently highly dependent upon these lands for their subsistence harvests, would be obliged to compete with the far larger group of State-qualified hunters across Unit 13 under the State's Tier II system. Public testimony received as part of this planning process demonstrated that Tier II permits are difficult for local rural residents to obtain, particularly younger people, even if they are life-long rural residents. Displaced federal subsistence hunters would put additional pressure on other areas still open for the federal hunt (such as the Wild and Scenic River corridors and Wrangell/St. Elias National Park).

c. **FLPMA Disposals**

Disposal of additional lands in the Slana area under Alternative B would result in an influx of people into the area, most of whom would be seasonal residents. This could increase the demand for subsistence resources in that area.

4. Leasable and Locatable Minerals

Alternative B would revoke ANCSA (d)(1) withdrawals and PLO 5150, which would open up 98 percent of the land base to mineral extraction, including oil and gas. Specific impacts to fish and wildlife species and habitats are discussed previously, and will only be summarized here as they pertain to subsistence use patterns.

ROPs would apply to all activities and are designed to minimize or eliminate effects to fish and wildlife and their habitats. These ROPs would do a particularly good job of protecting fish, since they prohibit instream activities except under rare circumstances. Wildlife species, on the other hand, would be impacted due to loss of habitat. Also, the location of activities would determine what impact there is to subsistence. If activities were located within key migration routes, animals may bypass Federal hunting areas for the duration of the activity. If activities were located in winter range, calving grounds, or refugia, there would be a loss due to overall fitness. Also, roads and associated infrastructure may further expose all resources to non-subsistence users. Non-game subsistence resources may also be affected based on placement of activities. Ground disturbing activities would remove land for a resource production status (e.g., berry picking), although it is unlikely that this would be on a large enough scale to be significant.

In summary, impacts affecting fish and wildlife, or fish and wildlife habitat, would also have a negative effect on subsistence. Mineral exploration activities under Alternative B would impact subsistence wildlife species to a greater degree than would any of the other alternatives. These impacts to subsistence resources and access would probably be localized and minimal. In addition, the ROPs contain measures designed to reduce or eliminate significant restrictions to subsistence uses and needs would not occur.

(b) **Availability of Other Lands for the Purpose Sought to be Achieved**

This Resource Management Plan considers all BLM-managed lands located within the Glennallen Field Office boundaries, including selected lands. Conveyed lands, however, cannot be considered for management. No other lands within the Field Office boundaries are available for meeting the BLM's multiple use mandate.

(c) Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The only alternative that would eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes would be an alternative that prohibited any activity that conflicted with subsistence use or subsistence users. However, the BLM operates under a multiple use mandate that prevents management of resources based on a single resources, such as subsistence.

Alternatives A, C, and D reduce the use, occupancy, or disposition of public lands needed for subsistence purposes.

(2) Social and Economic Conditions

The interpretation of this alternative's affect on economy is based on these assumptions and interpretations:

- All withdrawal orders would be modified or terminated to allow mining and oil and gas exploration and development on all Federal land (except wild portions of Wild and Scenic Rivers), and conveyance of the transportation and utility corridor to the State. Three to five small placer mines would open on BLM-managed lands, and a large mine would open on State lands north of the Denali Highway. Gas discovery and development would occur within 5-15 years.
- All land in the Slana disposal area would be offered for sale.
- Commercial timber sales would be offered on up to 360,000 acres over the planning period.
- In five years, the land base in the planning area would be at least 75 percent smaller as a result of land conveyance.
- Economic opportunity currently available to local residents through subsistence harvests may be substantially reduced, with the loss of the specific priority through the Federal subsistence management program. While hunting opportunities would continue under State regulations, competition for the resources would be higher, and likely levels of production much lower.

Mining related revenue sharing is theoretically possible only with the Matanuska-Susitna borough, as only they have the power to tax. This would only involve State-selected land within the borough boundary.

PLO 5150, which segregated the transportation and utility corridor from further appropriation, would be revoked. The State of Alaska has top filed this area, which contains 453,515 acres. This is the primary hunting location for local residents qualifying as Federal subsistence hunters. As noted above, these Federal lands support intense and highly productive subsistence hunting by local rural residents.

Revocation of PLO 5150 and the subsequent transfer of land within the transportation and utility corridor would redirect subsistence hunting activities. Subsistence hunters

would become more dependent on the State of Alaska Tier II permits or on opportunities under general hunting regulations.

One indication of the economic significance of Federal subsistence hunting is found in the estimate that the Federal subsistence moose and caribou harvests have a value in excess of \$250,000 per year, calculated at a replacement cost of \$4.00 per pound. About 30 percent of the wild food harvest for the village of Gulkana, for example, consists of caribou and moose (Wolfe 2004). Gulkana is one of the typical Athabaskan Native villages in the planning area where the loss of subsistence resources may be felt.

In summary, the implementation of Alternative B would have the following economic effects:

- Three to five small placer mines would open 5 to 15 years after the revocations, rejections, and conveyances are completed.
- 10-50 placer mining jobs (income of \$150,000 to \$250,000/year) would be created beginning approximately 5 years from the end of this planning process. These jobs may be created on State mining claims or on private land by agreement or lease if State and Native conveyance is complete.
- Oil and gas exploration and development may also occur on what is now state selected land in the Copper River basin from 5 to 15 years after the revocations, rejections, and conveyances are completed. If the land is returned to BLM ownership as a result of rejected selections, a field development EIS will be completed before development to analyze proposed well, and support facilities on Federal land.
- The Alaska Natural Gas development Authority (ANGDA) filed an application with the State of Alaska to construct a gasline to ship North Slope gas from the Glennallen area to a proposed terminus near Wasilla, Alaska. The gasline is assumed necessary for any gas development project in the planning area.
- 10-30 jobs related to exploration for oil and gas would be created beginning approximately 5 years from the end of this planning process. These jobs will be created on State lease or license areas or on private land if State and Native conveyance is complete, which is likely. Additional jobs would include 25 resulting during field development, 6 for the production stage, and 10 for the abandonment and restoration stages (BLM 2003c).
- The State and the Matanuska Susitna Borough may benefit from property tax on gas field capital improvements. The state can collect a 20 mil tax, which is passed in part to the Matanuska Susitna Borough (11.8 Mils.) A pipeline to or through Wasilla or Palmer area may also be taxed at their higher mil rates.
- Glennallen may benefit by providing lodging, meals, and other services as a result of gas exploration, development, or placer mining. Glennallen area restaurants and the Caribou Hotel received income resulting from the recent Forest Oil gas exploration. As many as 25 gas exploration contract employees stayed at the only local hotel in Glennallen, the closest location to the work activity. This is probably near the maximum number of workers the facility can handle.

- 10-20 jobs may be created related to commercial timber harvest and related road construction. The supply of wood products would exceed local demand for house logs and firewood. Commercial timber sales will be offered on up to 360,000 acres during the next fifteen years.
- Recreation and tourism growth would continue at current rates and continue to provide services employment opportunities for Copper River Basin residents.
- All Lands in the Slana disposal area would be offered for sale. This could have a small effect on the local economy, blended with increased residential and recreation construction occurring in the Copper River Basin.

(3) Environmental Justice

Comparing the access to Federal land, use, and development under current management with potential activities under any of the alternatives indicates little likelihood of effects focused upon minority or low income populations. However, revocation of PLO 5150 under Alternative B and subsequent transfer of lands within the transportation and utility corridor would redirect subsistence hunting activities. Subsistence hunters would become more dependent on the State of Alaska Tier II permits. As outlined above in the discussion for this alternative under Transportation and Utility Corridor Withdrawals on page 567, this action would have a highly adverse effect to low-income minority families within the planning area.

d) Alternative C

(1) Subsistence

(a) Effects of Use, Occupancy, or Disposition on Subsistence Uses or Needs

1. Travel Management and Recreation

Travel and recreation impacts under Alternative C would be similar, but slightly less than, recreation impacts under Alternative D. Recreation management would focus on maintaining the quality of existing experiences and providing for a variety of motorized and non-motorized uses. In general, motorized use allows users to get farther faster. The result is that fish and wildlife are disturbed more often. This can be negative in a variety of ways, ranging from direct killing or catching to increased energy expenditure that reduces overall fitness. Recreation management under Alternative C is the most aggressive in halting the unmanaged proliferation of OHV trails and establishing visitor use limits. Although these measures do not apply to users engaged in traditional subsistence activities, they would benefit the subsistence resources by limiting the recreational pursuit of these resources.

2. Natural and Cultural Resources

Under Alternative C, there would be four areas designated for additional protection of special values (three ACECs created for the protection of wildlife species, and one RNA), so it is anticipated that these additional protective measures would benefit subsistence resources based on the special values determinations of Alternative C. Of all the alternatives, Alternative C would have the most positive benefits to subsistence resources due to management of special values.

3. Lands and Realty

a. Withdrawal Review

Under Alternative C, most of the ANCSA (d)(1) withdrawals would be retained as a measure to protect specific resource values in areas designated as ACECs, RNAs, or SRMAs. In most cases, retention of these withdrawals would prevent mineral leasing and locatable mineral entry in these areas. The impacts of mineral development under Alternative C are found under *Leasable and Locatable Minerals* on page 573.

b. Transportation and Utility Corridor Withdrawals

Same as for Alternative A.

c. FLPMA Disposals

No disposals would occur under Alternative C; therefore, there would be no effect on subsistence.

4. Leasable and Locatable Minerals

Alternative C anticipates minimal mineral exploration and development. Exploration and development under this alternative would have fewer impacts on subsistence wildlife species than would the other alternatives. Anticipated impacts to subsistence resources and access would be localized and minimal. In addition, the ROPs contain measures designed to reduce or eliminate significant restrictions to subsistence uses and needs.

(b) Availability of Other Lands for the Purpose Sought to be Achieved

This Resource Management Plan considers all BLM-managed lands located within the Glennallen Field Office boundaries, including selected lands. Conveyed lands, however, cannot be considered for management. No other lands within the Field Office boundaries are available for meeting the BLM's multiple use mandate.

(c) Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The only alternative that would eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes would be an alternative that prohibited any activity that conflicted with subsistence use or subsistence users. However, the BLM operates under a multiple use mandate that prevents management of resources based on single resources, such as subsistence.

(2) *Social and Economic Conditions*

In summary, the implementation of Alternative C would have the following economic effects:

- No new jobs would be created from resource development.
- Timber related jobs created would be between 0 and 5, same as Alternative A.
- Recreation and tourism growth would continue at current rates and continue to provide employment opportunities and opportunities for Copper River Basin residents to provide services. Some commercial recreation opportunities may be limited based on establishment of commercial limits in specific areas.

(3) *Environmental Justice*

Actions proposed under Alternative C would have no negative effect on low-income or minority populations within the planning area. While no jobs would be produced by resource development activities, positive impacts would be derived from effects to subsistence uses and needs.

e) **Alternative D (Proposed RMP)**

(1) *Subsistence*

(a) Effects of Use, Occupancy, or Disposition on Subsistence Uses or Needs

1. **Travel and Recreation Management**

Recreation impacts to subsistence under Alternative D would be similar to, but slightly greater than, recreation impacts under Alternative C. Recreation management would focus on maintaining the quality of existing experiences and providing for a variety of motorized and non-motorized uses. In general, motorized use allows users to get farther faster. The result is that fish and wildlife are disturbed more often. This can be negative in a variety of ways, ranging from direct killing or catching to increased energy expenditure that

reduces overall fitness. Recreation management under Alternative D is aggressive in halting the unmanaged proliferation of OHV trails and establishing visitor use limits. Although these measures do not apply to users engaged in traditional subsistence activities, they would benefit the subsistence resources by limiting the recreational pursuit of these resources. In the short-term, there probably would be no difference in impacts from Alternatives C and D. Over the long-term, however, as trails are inventoried and designated, Alternative C would likely have a more beneficial effect on the abundance and distribution of subsistence resources.

2. Natural and Cultural Resources

Under Alternative D, only one RNA is proposed. The resource values of the other special areas proposed as ACECs under Alternative C would be protected with additional guidelines and protective measures. These additional protective measures make the impacts to subsistence for Alternative D very similar to the impacts under Alternative C, and both alternatives would result in fewer impacts than under Alternative A. In reality on the ground, the impacts would probably be indistinguishable between Alternatives C and D.

3. Lands and Realty

a. Withdrawal Review

Under Alternative D, some of the ANCSA (d)(1) withdrawals would be retained (e.g., those in the Bering Glacier RNA and portions of the Delta Wild and Scenic River corridor). These withdrawals would prevent mineral development within these areas. The impacts of mineral development on subsistence under Alternative D are discussed below under *Leasable and Locatable Minerals* on page 576. Overall, this alternative retains fewer ANCSA (d)(1) withdrawals than does Alternative A or C, but more than Alternative B. Lands that are currently open to Federal subsistence hunting would continue to be open.

b. Transportation and Utility Corridor Withdrawals

PLO 5150 would be modified to allow for 83,000 acres to be conveyed to the State. These lands include the Gunn Creek segment which is northeast of Paxson, and approximately 59,000 acres north of Paxson and west of the Delta river (see Map 18, Chapter 2). These areas represent approximately sixteen percent of the BLM-managed lands on which the Federal subsistence priority applies. However, these parcels have less access and less concentrated Federal subsistence hunting effort than other BLM-managed lands. The areas are off the highway and require access by foot, OHV, or snowmachine. Additionally, approximately 50 percent of the northern area, west of the Delta River, is mountainous, glaciated terrain, where no caribou or moose harvest occurs. Based on annual harvest data since 1994, the average annual federal subsistence harvest from these parcels for caribou is less than five percent of the total Federal subsistence harvest in the region. For moose, the average annual federal subsistence harvest from these parcels is approximately 10

percent. This would still leave a viable unit available for rural priority and federal harvest on the remainder of the BLM-managed lands where the Federal subsistence priority is implemented. Thus, this alternative would have little effect on the use, occupancy, or disposition of subsistence uses or needs.

c. **FLPMA Disposals**

Under Alternative D, disposal of lands in the Slana area to resolve unauthorized occupancy would have insignificant effects on demands for subsistence resources in the area.

4. Leasable and Locatable Minerals

Alternative D would revoke most of the ANCSA (d)(1) withdrawals, which would open up 85 percent of the land base to mineral extraction, including oil and gas (pending State or Native conveyance). Specific impacts to fish and wildlife species and habitats are discussed previously, and are only summarized here as they pertain to subsistence use patterns.

ROPs would apply to all permitted activities and are designed to minimize affects to fish and wildlife and their habitats. These ROPs would do a particularly good job of protecting fish, since they prohibit instream activities except under rare circumstances. Wildlife species, on the other hand, would be impacted due to loss of habitat. Also, the location of activities would determine what impact there is to subsistence. If activities were located within key migration routes, animals may bypass Federal hunting areas for the duration of activities. If activities were located in winter range, calving grounds, or refugia, there could be a loss due to overall fitness. Also, roads and associated other infrastructure may allow all resources (including fish, wildlife, and non-game resources) to be much more exploited by non-subsistence users. Non-game subsistence resources may also be affected based on the placement of activities. Ground disturbing activities would remove that land from a resource protection status, although it is unlikely that this would be on a scale large enough to be significant.

In summary, impacts affecting fish and wildlife, or fish and wildlife habitat, would also have a negative effect on subsistence. Mineral exploration activities under Alternative D would have fewer impacts on subsistence wildlife species than under Alternative A, but would have more impacts than under Alternative C. Exact impacts are hard to predict because of the unknown potential for exploration. The likelihood of large scale activity during the life of this plan is generally considered to be small. Therefore, any impacts to subsistence resources and access would probably be localized and minimal. In addition, the ROPs contain measures designed to reduce or eliminate significant restrictions to subsistence uses and needs.

(b) Availability of Other Lands for the Purpose Sought to be Achieved

The Resource Management Plan considers all BLM-managed lands located within the Glennallen Field Office boundaries, including selected lands. Conveyed lands, however, cannot be considered for management. No other lands within the District boundaries are available for meeting the BLM's multiple use mandate.

(c) Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The only alternative that would eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes would be an alternative that prohibited any activity that conflicted with subsistence use or subsistence users. However, the BLM operates under a multiple use mandate that prevent management of resources based on single resources, such as subsistence.

(2) *Social and Economics*

The interpretation of this alternative's affect on economy is based on these assumptions and interpretations:

- Most withdrawal orders would be modified or terminated to allow mining and oil and gas exploration and development on unencumbered Federal land.
- One to three additional small placer mines would open on BLM-managed lands, and a large mine would open on State lands north of the Denali Highway.
- Natural gas discovery and development would occur within 5-15 years.
- Commercial timber sales would be offered on a maximum of 144,000 acres over the planning period.
- In five years, the land base in the planning area would be at least 75 percent smaller as a result of land conveyance.
- Mining-related revenue sharing is theoretically possible only with the Matanuska-Susitna borough, as only they have power to tax. This would only involve State-selected land within the borough boundary.

In summary, the implementation of Alternative D would have the following economic effects:

- PLO 5150, which segregated the transportation and utility corridor from further appropriation, would be maintained, except for 83,000 acres to be conveyed to the State. The effect of this decision is described above and would have minimal impact on moose and caribou harvest on federal lands.
- One to three small placer mines would open 5 to 15 years after the revocations, rejections, and conveyances are completed. 5-15 placer mining jobs would be created beginning approximately 5 years from the end of this planning process. These jobs may be created on State mining claims or on private land by agreement or lease if State and Native conveyance is complete.

- Oil and gas exploration and development and effects will be the same as Alternative B.
- Mining related revenue from taxes is theoretically possible within the Matanuska-Susitna Borough, through property taxes. This would involve Native and State-selected land within the borough boundary. There is no other BLM managed land in the area.
- In addition, Glennallen may benefit by providing lodging, meals, and other services as a result of exploration or placer mining.
- 10-20 jobs related to timber harvest would be created. The supply of wood products would meet local demand for house logs and firewood through the planning period.
- Recreation and tourism growth would continue at current rates and continue to provide employment opportunities and opportunities for Copper River Basin residents. Some limits would be placed on specific areas on commercial recreation as well as general visitor use; however, this would not affect general trends in recreation use.
- Disposal of lands in the Slana area only to resolve unauthorized occupancy would have insignificant effect on the local economy.

(3) *Environmental Justice*

Same as for Alternative B.

E. Cumulative Impacts

Cumulative impacts result from individually minor but collectively significant actions over time. Actions anticipated over the next 20 years on all lands in the planning area, including private, State, Native corporation, and Federal (USDA FS, 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 are listed on page 402 of this Chapter.

1. Issue 1: Travel Management

a) Access

Common to all alternatives, access to public lands would become more difficult as Native corporation entitlements are met. The BLM would maintain existing 17(b) easements and would extend those easements across Native-selected lands where trails currently exist to ensure reservation of easements when conveyance occurs. However, as these public lands become private land, there would be some net loss of access. Future access is somewhat contingent on the resolution of State-recognized R.S. 2477 routes, particularly where they cross Native lands. Whether or not access routes to public land would be maintained in the long-term as a result of those determinations cannot be resolved in this planning effort.

b) OHV Management and Trails

Within the planning area, OHV users would be presented with a mix of opportunities, varying degrees of trail maintenance, and varying off-road regulations. OHV management within the 13 million acres of Wrangell-St. Elias National Park and Preserve would continue as limited to OHVs, with travel limited to designated trails. Native lands would be restricted in most areas, with general public use limited to easements that provide access to public lands across Native lands. As Native Corporation entitlements are met, this could mean a net loss of trails that are currently available on Native-selected lands. For the most part, State lands would remain open to OHVs, subject to conditions for generally allowed uses. Exceptions would be State lands within TLAD and other small areas where OHV use may be regulated by Special Use Land Designations. Other State lands may be subject to Controlled Use Area regulations, where OHV use may be limited to accomplish game management objectives or to provide a particular type of hunting experience.

In general within the planning area, OHV use is expected to become more restricted over the planning period, regardless of the alternative selected by the BLM. Consistent with ANILCA, allowance would still be made for access to subsistence resources by traditional means.

With an increase in OHV users and improvements in OHV technology, the accessibility of remote areas that were previously inaccessible would increase. As this occurred, the motorized and non-motorized user searching for a primitive recreation experience would have to venture farther into the backcountry to obtain the same primitive experience.

c) Roads

Regardless of the alternative selected by the BLM, road construction is expected to increase slightly over the planning period on State, Native, and private lands within the planning area. New roads would be used for access to private lands, mineral exploration and development, and forestry activities.

2. Issue 2: Recreation

a) General Recreation

The planning area currently provides a tremendous diversity of recreation experiences, conditions that are expected to continue over the planning period regardless of the alternative selected for BLM-managed lands. The largest influence on recreation experience within the planning area is use of OHVs. Without management and some limitations on OHV use, the general trend, in OHV-accessible topography, is for primitive and semi-primitive recreation experiences to trend towards semi-primitive motorized and roaded natural experiences. However, much of the planning area is dominated by steep topography, wetlands, or dense vegetation that is inaccessible to most OHVs; these areas would be maintained to provide for primitive and generally inaccessible recreation experiences, regardless of the BLM's selected alternative. Helicopter-supported commercial recreation ventures and winter snowmachine use have the potential to access and potentially alter experiences in some of these areas. It is assumed that 13 million acres within the Wrangell-St. Elias National Park and Preserve would continue to be managed mostly for remote fly-in primitive experiences, with the exception of the two access roads into the Park and the Kennicott/McCarthy area.

The Copper River Princess Lodge in Copper Center was opened in 2001. This lodge provides a land "base" for cruise ship passengers who are bused around the road-system portion of the State. The lodge hires local concessionaires to provide fishing,

local touring, or sightseeing experiences in the Copper Basin. These activities, most of which take place on State highway right-of-ways or non-BLM managed lands, have little impact on primitive back-country experiences. The general effect has been a seasonal increase in use levels along the highways and at highway rest stops, trailheads, scenic pullouts, etc. Potentially, this increased use, along with normal anticipated user trends, can change a roaded natural experience to a rural experience when more facilities are necessary to handle increased user impacts. While not yet a factor at the Copper River Princess Lodge, aerially-supported activities associated with the cruise ship industry have had major effects on recreation experiences in other portions of Alaska. Seasonal (summer) flightseeing, particularly using helicopters, could provide quick and “easy” access to tourists to remote, primitive experiences. Combined with an increasing trend in other motorized activities, this would accelerate a change from a primitive experience towards semi-primitive motorized.

There continues to be a need in the planning area for facilities to provide positive recreation experiences for motorists traveling the State highways. The State continually struggles with funding to support construction and especially maintenance of such facilities as waysides and outhouses for the motorist. Alternatives B and D would help address this need, but without a well-funded State recreation program, this rapidly growing need would not be met.

3. Issue 3: Natural and Cultural Resources

a) Soils

There would be a slight increase in activities that potentially cause soil disturbance or erosion on State, Native, and private lands within the planning area. Such activities would include an increase in the number and miles of OHV trails on State lands, as well as increased mineral exploration and development and forestry activities on State and Native lands. These activities would occur regardless of the alternative selected by the BLM. These impacts would have direct and indirect effects on soils but very little cumulative impact on site potential and soil productivity when combined with any actions proposed on BLM lands under any alternative. This conclusion is based on the small footprint of most development activities relative to the total planning area and the application of standards and guidelines described in State DNR Area Plans.

b) Water Quality

Under Alternatives C and D, water quality should improve over the long-term through management actions proposed in the alternatives, adoption of ROPs and Stips, and as a result of participating in cooperative planning efforts on a watershed basis with other

land management agencies. Actions on adjacent lands under other ownerships that produce sedimentation or nutrient loading into streams that then flow through BLM-managed lands, or inappropriate storage containers, small dumps or other potential sources of contamination from activities on non-BLM-managed lands could impact water quality in certain instances. Increased powerboat use in unregulated State waters could adversely impact water quality for short periods during peak use. Short-term cumulative impacts could occur as the result of drought. Changes in any flow regime across BLM-managed lands could result from actions taken on other jurisdictions.

c) Air Quality

Smoke from prescribed and wildland fires burning on State, Federal, Native, and private lands within the planning area or in other parts of the State could cause air quality to deteriorate in the local airshed. Large wildland fires or escaped prescribed fires could occur simultaneously, resulting in an increase in air quality degradation caused by separate events.

No other anticipated activities on State, Native, or private lands would have the impacts to air quality on the scale of fire activities.

d) Wildlife

(1) Travel Management and Recreation

Over the planning period, OHV management is expected to remain constrained within Wrangell-St. Elias National Park and Preserve and on private lands (including Native Corporation lands). State lands are expected to remain relatively open for OHV uses, where there would continue to be unmanaged proliferation of OHV trails. Over the planning period, habitat loss resulting from varying degrees of OHV use and regulation would be minor to insignificant, based on the amount of actual physical disturbance versus acres of available habitat. However, motorized access limited only by physical barriers would eventually lead to heavy hunting pressure and a subsequent drop in bull/cow ratios for moose and caribou, loss of security or refugia areas, and possible depletion of herd health during critical winter months. If these effects played out on State lands accessible to OHVs, lands with more regulated OHV management (such as lands managed by the National Park Service, Native Corporations, or the BLM under Alternatives C and D), may, over time, serve as wildlife refugia.

Increased road construction is expected to occur over the planning period on State lands to facilitate mineral exploration and development. Unless located through critical winter or calving ranges, a slight to moderate increase in roads should not significantly reduce available habitat. However, secondary effects from roads such as increased access, increased proliferation of OHV trails, increased hunting and recreational

pressure, and increased resource development and activity, could displace wildlife from traditional use areas or migration routes.

Limiting commercial recreation uses or general visitor use in specific areas under Alternative C or D could lead to increased commercial recreational uses on State lands. This shifting of use could increase impacts to wildlife associated with these activities, helicopter-supported recreation activities in particular. Limiting general visitor use in specific areas could lead to increased use on State lands in more remote areas.

(2) *Vegetation Management*

Fire management in the planning area occurs under cooperative interagency planning. Therefore, fire impacts (positive or negative) occur across land status. Fire management options can be adjusted on an annual basis to meet resource objectives (such as habitat improvement for moose balanced with maintenance of desired winter range for caribou).

Maximum forest management activities outlined in Alternative B, combined with increased forestry practices and associated road construction on State and Native lands, could lead to a short-term reduction in big game security areas, fragmentation of specific habitats, increase in road density, and short-term loss of late-seral habitat in specific areas. Under this scenario, proposed forestry practices on BLM-managed lands would need to be adjusted to account for short-term negative impacts on other lands from large-scale forest practices.

(3) *Lands and Realty Actions*

Land disposals on State lands in the planning area have the potential to negatively affect wildlife and wildlife habitat. These impacts would occur through increased demand on wildlife and impacts on habitat from access roads, powerlines, and home construction.

(4) *Mineral Exploration and Development*

Minerals exploration and development at the levels described in Alternative B, combined with increased activity on State and Native lands, could lead to habitat loss and wildlife displacement, particularly if activities were to occur in critical habitat areas such as calving areas or wetlands that provide critical waterfowl habitat (such as the West Fork Gulkana area). If permanent road construction is necessary to facilitate development, habitat loss and wildlife displacement could occur even with seasonal constraints.

(5) *Sensitive Status Wildlife Species*

Cumulative impacts result from actions on adjoining lands under other ownerships that affect habitat availability and levels of disturbance. The greatest factor influencing

Sensitive Status wildlife Species in the planning area is the scattered land ownership pattern. Since most species of concern are wide ranging, activities on adjoining ownerships may compromise or enhance efforts on BLM-managed lands. For example, seasonal constraints on oil and gas activities within trumpeter swan breeding habitat may be compromised if not practiced consistently on adjacent private or State-owned lands.

While public land road densities are minimized under all alternatives except for Alternative B, roads on other ownerships may increase habitat fragmentation and decrease habitat quality for Sensitive Status Species.

e) Fish

A continuation of current water and land use practices, by private, State, and other Federal agencies would continue to affect fish habitat within the planning area. Higher intensity OHV use, timber harvest, and mineral development or exploration on lands upstream from BLM-managed lands within a watershed could continue to be a concern due to sediment and water quality issues that influence the quality of fish habitat downstream from the source. Habitat improvement gains through more intensive management of recreation activities as proposed under Alternatives C and D could be offset or enhanced by regulatory sport-fishing changes made by ADF&G. Coordination would continue to be essential.

Coordinating with regional planning actions and conducting interagency watershed planning efforts could help protect important fisheries values in watersheds such as the Gulkana or Copper River.

Direct and indirect effects on fish habitat and fish populations from anticipated levels of oil and gas development on BLM-managed lands is expected to be insignificant, for reasons discussed in the preceding analyses. However, the Trans-Alaska pipeline crosses BLM-managed lands in this planning area and crosses rivers that are vitally important for Copper River salmon stocks (such as the Gulkana, Klutina, and Tazlina rivers). The 2002 Final Environmental Impact Statement for the Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way discusses the anticipated effects to fisheries of a spill from the pipeline in great detail. Generally, the effects of a crude oil spill from the TAPS would be a function of the amount of oil spilled (relative to stream discharge), the duration of exposure to spilled oil, and the sensitivities of the fish species and life stages present at the time of the spill. A major spill of oil from TAPS into a waterway as a result of a failure or guillotine break in the pipeline could result in severe effects on fish. Such spills are considered very unlikely to unlikely. Smaller spills would have less effect on fish resources but would have a higher probability of occurrence (BLM 2002). Severe effects on fish would have a major economic impact on the Copper Basin and Cordova, which utilize Copper River salmon for subsistence, commercial, and sport fishing.

(1) *Special Status Fish Species*

Impacts would be the same as those described in the preceding two paragraphs.

f) Cultural Resources

Cumulative impacts to cultural resources could occur through incremental degradation of the resource base from a variety of sources that reduce the information and interpretive potential of historic and prehistoric properties, or that affect traditional cultural values important to Native Alaskans. Other regional resource, land use, and economic development planning efforts could affect the types and intensity of uses on private, State, or other Federal lands within the planning area and could therefore potentially affect the regional cultural resource data base. Development of lands that are not protected by Federal or State cultural resource statutes and regulatory protections could decrease the regional resource base and potentially limit management options within the planning area. Restrictions on recreational activities in other areas, regional population growth, and increases in current levels of resource extraction and development may increase the use intensity within the planning area, potentially affecting cultural resources. Coordinating with regional planning actions could help protect important cultural resource values.

g) Paleontological Resources

Impacts would be similar to those described in the *Cultural Resources* section in the previous paragraph.

h) Visual Resources

Increased timber harvest and mineral development on State, Native Corporation, or private lands and the occurrence of wild and prescribed fires on adjacent lands would continue to affect the visual features of form, line, color, and texture at the landscape level. These changes would influence the design of similar projects on adjacent BLM-managed lands where repeating these basic elements is an objective of the visual resource management class where the project is implemented.

i) Designation of Areas of Critical Environmental Concern

Impacts from activities implemented on adjacent land under other ownership could create additional cumulative impacts to relevant and important values. In addition to the

effects described for each area by alternative, beginning on page 540, the following cumulative effects could be anticipated:

- Delta bison calving area: This area would see minerals development on adjacent State lands. While impacts to the calving area would be minimal, access needs and rights-of-way for pipelines or powerlines could negatively impact habitat in the area.
- Nelchina caribou calving area: This area consists of predominantly State-selected lands. The Susitna Area Plan (ADNR and ADF&G 1985) recognizes the value of the area for calving habitat, but allows for mineral exploration and development and open OHV use. Large scale mining or oil and gas development in the area, with associated roads and infrastructure, could displace calving caribou despite the implementation of seasonal constraints.
- West Fork Gulkana area: This area consists of predominantly State-selected lands. The Copper River Basin Area Plan (ADNR and ADF&G 1986) recognizes the value of the area for providing trumpeter swan habitat. Some uses are constrained but mineral exploration and development is still permitted. Large scale oil and gas development in the area, with associated roads and infrastructure, could alter nesting habitat and displace individual nesting pairs of swans despite the implementation of seasonal constraints.
- Bering Glacier RNA: This area is bordered by National Park Service, USDA Forest Service, and State lands to the south. Forestry activities are constrained by the Yakataga Game Refuge, which is managed by the State. Mineral exploration and development could occur on adjacent State lands along the coast.

The adoption of ROPs and Stips, as well as the designation of special areas such as ACECs, on BLM-managed lands is analyzed for each alternative in the preceding segments of this chapter. In areas where BLM-managed lands are commingled with other land ownerships, positive effects described through adoption of specific measures could be negated if similar measures are not adopted on commingled or adjacent lands. In most areas, other managing agencies recognize the specific values for which the BLM is attempting to manage, and appropriate measures would be taken.

j) Wild and Scenic Rivers

Resource development activities adjacent to the Delta and Gulkana Wild and Scenic River corridors could impact the outstandingly remarkable values for which the rivers were designated if activities were not carried out utilizing measures sensitive to protecting those values. This is a particular concern on the Delta River, where high mineral potential on adjacent State lands could result in mineral development on those adjacent lands. While not impacting values within the corridor directly, adjacent development could negatively impact visual resources, particularly in areas adjacent to the wide-open tundra-dominated scenic portion of the river. Access routes for roads,

pipelines, or powerlines across or adjacent to the river corridor could negatively impact visual resources as well as primitive recreation experiences.

Mineral development (particularly oil and gas development with its associated roads and infrastructure) adjacent to the Gulkana Wild and Scenic River corridor could negatively impact visual resources as well as opportunities for a primitive recreation experience on the river.

k) Climate Change

Changes in the vegetation cover have been documented on the Kenai Peninsula in south-central Alaska, an area with similar vegetation as the planning area. There is a significant landscape shift from wetlands to woodland and forest vegetation types. Woodland or forested areas have increased from 57% to 73% between 1950 and 1996 while wetlands have decreased from 5% to 1% (Klein 2005). Aerial photographs reveal a ring of new vegetation taking over land that used to be part of kettle ponds showing the impact of a drier and warmer climate (Klein 2005). This shift will have impacts on waterfowl and migratory birds who utilize Alaska's wetland areas for nesting as well as animals that depend on a tundra, low shrub or lichen habitat for food such as caribou.

Although no formal studies on the effects of climate change have been completed for the planning area, it can be assumed that similar changes and impacts of global climate change could be observed and will continue to alter the sub-arctic ecosystems and landscape characteristics. In particular, BLM will need to be sensitive to changes in vegetation and how those changes affect habitat. As changes occur, BLM can work within the interagency fire group to adjust suppression classes, if necessary, to adapt to changing conditions. BLM will also need to be aware of and adjust to changing permafrost and soils conditions. These will be site-specific considerations that will need to be considered in trails management, pipeline construction, or any ground-disturbing activity. The Required Operating Procedures described in Appendix C are designed to adapt to changing site-specific conditions so that protection will still be provided to soil, water, and vegetation resources.

Because climate change must be viewed from a global perspective, the magnitude of emissions potentially contributed by any proposed activities in the Planning Area needs to be viewed in that context. Activities associated with oil and gas or mineral exploration and development, recreation, prescribed burning, or forestry would produce some of the greenhouse gases. The incremental contribution of greenhouse gases from the proposed alternatives in the Planning Area would be minor when compared to total greenhouse gas contributions.

4. Issue 4: Lands and Realty

Effects from disposal, acquisition, and exchange proposals described for BLM-managed lands in any alternative are minor compared to the resolution of land status through continued land conveyances and meeting of Native Corporation and State entitlements. 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.

5. Issue 5: Vegetation Management

a) Forest and Woodland

Within the planning area, forestry practices are expected to increase, particularly on Native lands, with a slight increase on State lands. This increase, combined with the selection of any of the alternatives, would have only a minor impact when expressed in terms of change to vegetation cover types throughout the planning area. Even at a maximum activity level, these increases would change less than 4 percent of the total cover classes within the planning area. Short-term effects are mostly positive for wildlife habitat improvement, with a temporary increase in shrub-dominated cover types. Long-term effect would be an increase in age and cover type diversity within the planning area.

Increased development and settlement on private lands would convert woodland cover types to grass or shrub-dominated or cropland. Even at maximum development, this would impact less than 2 percent of the lands within the planning area (Copper Valley Economic Council 2003).

Wildland fire and prescribed fire have more potential than any other activity in the planning area to make landscape-level changes to vegetation composition. Alternatives B and D propose prescribed burning of up to 1.5 million acres. A large portion of this burning would occur on State-selected and State lands and would be conducted with interagency cooperation. At this scale and combined with an expected increase in wildland fire in the area, significant changes could occur in vegetation composition in woodland cover types over the planning area. Late-seral black and white spruce cover types would be interspersed with a mosaic of early seral shrub-dominated cover types. Dependent on size and intensity of wildland fires, prescribed fire objectives may need to

be tempered and management options may need to be adjusted to maintain quality caribou winter range. This would continue to be a coordinated and interagency effort to ensure landscape-level management.

b) Riparian Vegetation

Adoption of Alternative A or B, combined with increased resource development, settlement, and OHV activities on other lands within the planning area, could put some riparian areas into functioning at risk or non-functional categories. Most impacts to riparian areas and vegetation are local and development footprints are fairly small. However, mineral exploration and development or large-scale forestry activities without standards or stipulations to protect riparian vegetation could result in impacts to riparian vegetation and functionality.

c) Noxious Weeds and Invasive Plants

Noxious weeds are currently not a major issue within the planning area. However, preliminary inventory has revealed the presence of noxious weeds in some locations and non-native species in many areas. Common to all alternatives, the BLM would continue inventory and take measures to prevent the spread of noxious weeds. The spread of noxious weeds would potentially be controlled in some areas and spread more rapidly in others. Factors affecting the spread and control of invasive species include the frequency and amount of motorized traffic and recreational use on public lands in the planning area; development occurring on private lands adjacent to BLM lands; and the type of control or inventory actions taken on Federal, State, Native, and private lands. Any actions that limit the treatment or prevention of noxious weeds on public lands may limit the effectiveness of treatments on lands under other ownerships. Over the course of the planning period, the cumulative effects of reducing the effectiveness of control on noxious weeds and invasive species could decrease the amount and quality of native forage for wildlife and contribute to soil erosion and increased sediment loads in streams.

d) Sensitive Status Plant Species

The primary uses and management practices on lands adjacent to BLM-managed lands would have the potential for impacting Sensitive Status plant populations and habitats. Very little inventory exists for Sensitive Status Species, and current locations are mostly unknown except within portions of Wrangell-St. Elias National Park and Preserve. Particularly on private lands (including Native corporation lands), complete eradication of individuals or small populations could easily occur as a result of resource development projects or settlement. The potential for loss of individuals or small populations on other lands emphasizes the importance of continued inventory and efforts to protect Sensitive Status plant Species on BLM-managed lands, which would occur under Alternatives B, C, and D.

6. Issue 6: Leasable and Locatable Minerals

a) 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. The cumulative impact to Federal leases would be a reduction in lease value resulting from 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.

b) Locatable Minerals

Impacts to locatable minerals 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, such things as 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. Many of these issues are issues over which the BLM has no control. Most of these issues result

in additional costs and/or permitting delays that can individually or cumulatively add additional costs to projects.

Public land that currently has no 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 public lands are withdrawn from mineral entry because the deposit may not be economically feasible to develop if it crosses ownerships and only a portion is available for development.

Overall, Alternative C would be the most restrictive to mineral developments and could result in the most cumulative impacts. It proposes the most acres be maintained as withdrawn from mineral entry, the most areas limited or closed to motorized travel, and the highest protection to other resources.

7. Issue 7: Subsistence/Social and Economic Conditions

a) Subsistence

Assuming increased resource development and settlement on State, Native Corporation, and private lands in the planning area, adopting management described under Alternative A or B could result in significant impacts to subsistence resources. Alternatives A and B make no attempt (except for in limited areas) to manage OHV use. Continued unmanaged proliferation of OHV trails would lead to increased competition for subsistence resources, additional disturbance to areas that serve as refugia for caribou and moose, and continued habitat degradation. This combined with a moderate increase in resource development with associated roads and infrastructure could cause critical habitat loss or displacement of some animals from traditional migration routes. Increased access to subsistence resources would be offset by increased competition with recreationists and sport-hunters.

b) Social and Economic Conditions

Cumulatively, the potential economic benefits (in terms of employment opportunities and jobs created) could easily double dependent on resource development levels, particularly on State lands. Construction of a natural gas pipeline within the existing transportation and utility corridor (or alternate routes) on State and Federal lands could provide job opportunities and economic benefits over and above what is described for each alternative.

The Pogo Mine northeast of Delta Junction will increase direct and indirect employment in the Fairbanks NSB by about 1 percent. (EPA, 2003). However, mine workers are not

required to live locally, or even in the borough. 25% of mining industry workers are nonresidents. No effect upon employment within the planning area is foreseen (Hadland 2005). The Man prospects currently employ about ten workers per year. There is no data on a prospective developed project.

The Alaska Natural Gas development Authority (ANGDA) applied to the State of Alaska to construct a pipeline from the Glennallen area to a proposed terminus near Wasilla, Alaska. The pipeline is to transport gas from North Slope to market in Southcentral Alaska. However, the gas line is important to development of a field in the planning area, will be used if constructed. If it is not constructed gas may not be moved from the planning area as cost will be too high. Cost of gas project estimated at \$362 million, compressor and terminals \$80 million. The labor force is estimated to be 619 (Summer) and 686 (winter). Construction would take approximately two years, with the bulk of labor input in construction for one year. According to Hadlund 2005, 22.7 to 28.2 of oil and gas and oilfield service workers are nonresidents. Labor cost is estimated at \$746,501 total. Information on the proposed line may be found on the Joint Pipeline website at <http://www.jpo.doi.gov/ANGDA/ANGDA.htm>

The Copper River Basin has qualified as a potential borough, and formation of a borough in the area is being pushed by some State legislators (even though it is resisted locally). Formation of a borough could increase interest in resource development on BLM-managed lands as a source of revenue.

c) Environmental Justice

No cumulative impacts have been identified.

F. Irreversible or Irretrievable Commitment of Resources

1. Issue 1: Travel Management

No irreversible or irretrievable commitment of resources has been identified.

2. Issue 2: Recreation

No irreversible or irretrievable commitment of resources has been identified.

3. Issue 3: Natural and Cultural Resources

a) Soil

Erosion and loss of shallow soils could result in irretrievable and irreversible commitment of a resource, as once soils have eroded it could take thousands of years for new soils to form. Because of the lack of proposed OHV management under Alternatives A and B, these losses are more likely to occur under these two alternatives.

b) Water Quality

Irretrievable or irreversible commitment of water resources could occur if implementation of any of the alternatives altered the channel morphology of particular streams so they could not restore themselves through natural processes or be restored through other measures. This is not anticipated under Alternative B, C, or D because of the ROPs that would be applied. Without adoption of the ROPs, irretrievable or irreversible loss of water resources could occur under Alternative A.

c) Air Quality

No irreversible or irretrievable commitment of resources has been identified.

d) Wildlife

Both Alternatives A and B would result in the irreversible and irretrievable commitment of wildlife resources in that disturbance or displacement of wildlife from preferred habitats and significant losses of wildlife refugia would occur due to the continued unmanaged proliferation of OHV use.

Under Alternatives B and D in the Slana disposal area, habitat would be fragmented and wildlife species would be permanently displaced from preferred habitat (both seasonally for breeding purposes and yearlong for less critical life phases).

(1) Sensitive Status Wildlife Species

One of the criteria for designating Sensitive Status Species is to prevent the irreversible and irretrievable loss of species and their habitat. The combination of land disposals, resource development levels in sensitive habitats, and lack of OHV management in Alternative B could lead to such losses of habitat for specific local populations such as certain species of migratory birds.

e) Fish

Actions that alter an aquatic community sufficiently enough 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 large scale open pit mining, which are more likely to occur under Alternatives B and D.

(1) Sensitive Status Fish Species

Loss or decline in quality of aquatic habitat occupied by Sensitive Status fish Species (steelhead trout) could cause a population to die out, representing an irreversible or irretrievable commitment of resources. This is not anticipated under any alternative.

f) Cultural Resources

Management measures provide a systematic means to address direct impacts on cultural resources from authorized projects and activities. 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 be an irretrievable and irreversible commitment of these resources. This would be more likely to occur under Alternatives A and B, where very limited management of OHVs is proposed. Also, any management action that disposes of lands with cultural resources would be an irretrievable and irreversible commitment of these resources.

g) Paleontological Resources

Under all alternatives, there would continue to be impacts on paleontological resources associated with unauthorized activities such as OHV use, dispersed recreation, land disposals, and vandalism. Unauthorized activities, dispersed activities, and natural processes could cause unmitigated impacts on paleontological resources that would result in an irreversible and irretrievable loss.

h) Visual Resources

No irreversible or irretrievable commitment of resources has been identified.

i) Designation of Areas of Critical Environmental Concern

No irreversible or irretrievable commitment of resources has been identified.

j) Wild and Scenic Rivers

No irreversible or irretrievable commitment of resources has been identified.

4. Issue 4: Lands and Realty

BLM-managed lands or interests in lands disposed of through the land ownership adjustment program would likely be unavailable to the BLM for the life of the plan or longer, and would represent an irreversible and irretrievable commitment of resources.

For Alternatives C and D in which right-of-way avoidance and exclusion areas have been identified, the designation of such areas would essentially preclude the issuance of new rights-of-way in these locations.

5. Issue 5: Vegetation Management

a) Forest Products

Fire suppression in forest and woodland cover types has led to an accumulation of fuels and beetle-kill timber, making these forests more susceptible to stand replacing fires. The loss of forest products from stand replacing fires would be considered an irreversible, and in some instances, irretrievable commitment of resources if the fire burned extremely hot over a long period of time.

b) Forests and Woodland

A decrease in the amount of forest and woodland vegetation resulting from any amount of vegetation treatments could be considered an irreversible, but not irretrievable, commitment of resources given the time required to regenerate this vegetation type.

c) Riparian and Wetland

The loss of riparian function can compromise the ability of riparian and wetland areas to resist degradation. Habitats in nonfunctional condition may have sustained sufficient degradation that they may no longer be capable of being restored to original site potential. Currently all riparian areas on BLM-managed lands within the planning area are in functioning condition. Loss of function would only be anticipated through activities such as placer mining or large-scale open pit mining, activities that would be most likely to occur under Alternatives B and D. With appropriate reclamation measures proposed under the ROPs in Alternatives B, C, and D, these activities would result in irreversible, but not irretrievable, losses. Without appropriate reclamation measures, activities would result in both irreversible and irretrievable losses.

d) Sensitive Status Plant Species

Irreversible and irretrievable impacts to individual Sensitive Status plants or isolated populations may occur to unknown individuals or populations as a result of surface disturbing activities such as mineral extraction, road construction, or OHV use. Pre-project botanical inventories identified under the ROPs would minimize, but not eliminate these impacts to sensitive species. These impacts would be most likely to occur under Alternative B.

6. Issue 6: Leasable and Locatable Minerals

a) Oil and Gas Leasing

The production of oil and gas results in the irretrievable and irreversible loss of those natural resources. Most, if not all, surface disturbance and use can be restored through proper reclamation techniques.

b) Locatable Minerals

The removal of minerals from public lands results in the irretrievable and irreversible loss of those natural resources.

The maintenance of withdrawals that prevent locatable mineral entry would cause an irretrievable, but not irreversible, loss of mineral extraction during the life of the plan. Some proposed withdrawals fall in high and moderate mineral potential areas.

c) Mineral Materials

The extraction of mineral materials from lands within the planning area would be an irreversible and irretrievable commitment of resources.

7. Issue 7: Subsistence/Social and Economic Conditions

a) Subsistence

Conveyance of the transportation and utility corridor to the State, as proposed under Alternative B, would constitute an irreversible and irretrievable loss of area available for subsistence hunting under Federal subsistence regulations.

b) Social and Economic Conditions

Maintenance of withdrawals that prevent locatable mineral entry or mineral leasing constitutes an irretrievable, but not irreversible, loss of mineral extraction and associated economic benefits during the life of the plan. Loss of primitive recreation opportunities, including the wildland setting character and resulting experiences and benefits, result in an irretrievable and irreversible loss of income and jobs to the local, regional, and state tourism economies and the commercial businesses that depend on those opportunities.

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 of the alternatives, while others are a result of public use of BLM-managed lands within the planning area. Potential unavoidable adverse impacts are generally long-term and difficult to quantify. Only those issues or topics that would have unavoidable adverse impacts are included here; if an issue or topic is not included, no unavoidable adverse impacts would occur.

1. Travel Management

Travel off of roads and trails would continue to cause soil compaction and loss of protective vegetative cover, thereby increasing soil erosion. These activities would occur even under the most aggressive trails management scenario. Any facility developments or utility and road facilities that are not properly restored even after mitigation measures are applied could result in increased soil erosion.

2. Recreation

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.

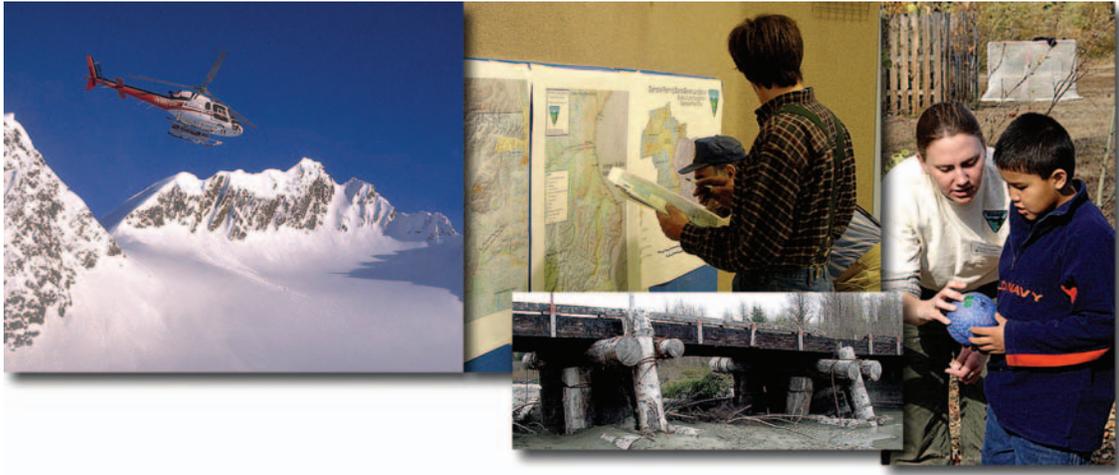
3. Cultural Resources

While measures are in place to identify threats to cultural resources and prioritize management actions, some impacts would be unavoidable. There would continue to be impacts to National Register of Historic Places-eligible, unevaluated, and undiscovered cultural resources associated with dispersed recreation activities, OHV use, vandalism, and other types of activities not authorized by BLM. Natural processes such as erosion and natural decay or deterioration could also result in unmitigated damage to cultural resources.

4. *Vegetation Management*

Vegetation treatments, mineral development, and other authorized activities as well as unauthorized travel could cause short-term displacement of wildlife during the activity or treatment, and while the treated area regenerates or recovers. There could be short-term increases in stream sedimentation and soil erosion from these activities as well.

Large scale, stand replacing wildland fires that are expected to occur within the planning area over the life of the plan could quickly change the scenic quality of the landscape without regard to visual resource objectives. Scarring of the landscape could also occur from cross-country travel.



Chapter V: Consultation and Coordination

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- A. Introduction 605
- B. Public Participation Opportunities 605
 - 1. Scoping 606
 - 2. Draft Alternative Development..... 606
 - 3. [REDACTED] 607
 - 4. Other Outreach Efforts 608
- C. Consultation 609
 - 1. U.S. Fish and Wildlife Service Consultation 609
 - 2. National Marine Fisheries Service Consultation 609
 - 3. Tribal Consultation..... 610
- D. Collaborative Efforts 610
 - 1. Cooperation with the State of Alaska..... 610
 - 2. [REDACTED] 611
- F. Plan Distribution 611
- G. Interdisciplinary Team 615

CHAPTER V: CONSULTATION AND COORDINATION

A. Introduction

This chapter describes the public participation opportunities made available through the development of the East Alaska Proposed RMP/Final EIS, the formal consultation that has occurred to date, and collaborative efforts conducted with the State of Alaska and the Alaska Resource Advisory Council (RAC). It also lists agencies and organizations that received copies of the Proposed RMP/Final EIS for review, and lists preparers of the document. There have been and will continue to be many ways for the public to participate in the planning process for public lands under the jurisdiction of the Glennallen Field Office.

The East Alaska RMP/EIS was prepared by an interdisciplinary team of specialists from the Glennallen Field Office and the BLM Alaska State Office. The State of Alaska has participated in the development of the document. Technical review and support were provided by both the field office and State office staffs.

Members of the RMP team have consulted formally or informally with numerous agencies, groups, and individuals in the RMP development process. Consultation, coordination, and public involvement occurs as a result of scoping and alternative development meetings, meeting and briefing with the Federal, State, and Tribal government representatives and informational meetings with interested individuals and organizations.

B. Public Participation Opportunities

Several steps in the planning process require that the public be provided an opportunity to participate. Major public participation events are described below and include a number of opportunities that are not required in the planning process. Appendix F contains a list of specific events convened as the Proposed RMP/Final EIS was developed.

1. Scoping

Scoping for the East Alaska RMP/EIS was initiated with the publication of a Notice of Intent in the Federal Register on March 18, 2003. Identification of issues, concerns, and nominations for Areas of Critical Environmental Concern and Wild and Scenic Rivers were requested during scoping. All scoping comments and input were collected through the meeting process and as well as via email and U.S. Mail. The scoping period ended on June 18, 2003.

Throughout the scoping period, a total of 30 public meetings were held, mostly within the Copper River Basin. The meetings were widespread and focused on scattered small communities and villages within the planning area. Meetings were also held at the larger towns and cities of Anchorage, Cordova, Fairbanks, and Valdez. At communities within the Copper River Basin, two meetings were held: the first to identify issues and concerns and the second to discuss how (or if) those issues and concerns would be addressed within the RMP. One hundred ninety-two people attended these scoping meetings. News releases to local media sources and flyers posted at key locations advertised the scoping meeting times and locations within each affected community.

2. Draft Alternative Development

Another round of public meetings was held from late April through early June 2004 to gather comments and input on the draft alternatives. No BLM preferred alternative was identified at that point. The public was asked which alternative they supported and if they had any changes to contribute to the formulation of a preferred alternative. One hundred eighty-five people attended the draft alternative meetings.

Over 500 packets of information were distributed to the public and organizations for review at these meetings and upon request. The packet included a summary of the East Alaska RMP and the planning process, maps of proposed designated areas, comparative alternative tables, a glossary, and a comment form. Comments were collected and compiled from electronic means, comment forms, and written responses.

Briefings were also held to present alternative packets to Ahtna Native Corporation, Tazlina Village Council, Chickaloon Village Council, Chitina Village Council, Eyak Village Council, the Mat-Su Borough, the Cordova City Planner, and the Copper Valley Development Association (Copper Valley does not have a borough). In addition, the Alaska RAC was presented with an alternative packet. They subsequently formed a sub-committee to make recommendations on the issue of OHV management.

3. Draft RMP/EIS public meetings and subsistence hearings

On April 29, 2005 a Notice of Availability for the East Alaska Draft RMP/EIS was published in the Federal Register by the Environmental Protection Agency (Federal Register 2005.) This began a 90 day comment period on the Draft. From May 16th through May 26th BLM held public meetings in Chistochina, Glennallen, Valdez, Cordova, Anchorage, Fairbanks, and Delta Junction with attendance of 134 stakeholders.

At each public meeting, seven stations were set up around the room, one for each of the seven issues. Stations consisted of a map related to the issue, an alternative summary table showing exactly what is being proposed for each alternative, and an informational sheet that explained the more complex ideas and relationships that affected each issue. Those in attendance could easily focus in on the issues that were most important to them and had all of the information needed to gain an understanding of what is being proposed. BLM staff were available to answer any questions. After this “open house,” a formal public hearing was held. The meeting format varied slightly based on the size of the group and their desire to ask questions or give spoken testimony.

The main purpose for the public hearings held at the end of the meeting was to gather testimony on the impacts to subsistence by alternatives presented in the Draft. Alternative B of the Draft RMP/EIS proposed the revocation of Public Land Order 5150 which makes up the transportation and utility corridor that houses the Trans-Alaska Pipeline System. This action, as identified by the ANICLA section 810 Analysis, would significantly restrict subsistence uses and therefore required that subsistence hearings be held in the area affected by the proposed action.

Seven subsistence hearings were held and spoken testimony heard from village elders, Ahtna Inc., rural Alaskan residents, and the youth of the community as to the impacts revocation of PLO 5150 would have on their subsistence lifestyle. BLM also hosted a special session of the Southcentral Federal Regional Subsistence Advisory Council to allow the council to hear testimony on the revocation of PLO 5150 and submit a formal comment.

4. Other Outreach Efforts

Briefings were conducted for organizations upon request. The Alaska Outdoor Council, Alaska Coalition, Alaska Miner's Association, and the Alaska Outdoor Access Alliance each received a briefing for their members two to three months prior to the release of this document. These meetings allowed for open conversation about the preferred alternative, provided a chance for the public to be included on the mailing list, and address concerns about the plan. These meetings also provided an opportunity for the BLM to develop a relationship with those stakeholders they serve.

Concurrently with scoping, an East Alaska RMP website was developed containing information about the East Alaska planning process and a method to post comments and questions. This website continues to be utilized as a medium to distribute information and is kept current. The East Alaska Draft RMP/EIS and Proposed RMP/Final EIS, with all associated maps and appendices, are also available on the website.

Due to uncontrollable circumstances, the BLM websites nationally were offline during the 90-day public comment period on the Draft. This adversely affected the public's ability to download and view the Draft RMP/EIS as well as access information regarding public meeting times and locations and methods and deadlines for commenting. The Glennallen Field Office sent a postcard to all those on the mailing list explaining the situation and how to obtain a hard copy or CD of the Draft RMP/EIS document. Public meetings were advertised in the local media and front office staff were supplied with information to answer questions they may receive from the public regarding the public meetings and deadlines for comments. The Draft RMP/EIS was posted on alternative websites, the State of Alaska's and BeringGlacier.org which is a site BLM sponsors but was not affected by the network outages. Over 400 CDs and 300 hard copies of the document were distributed and could be requested through the Glennallen Field Office or the BLM State Office in Anchorage.

An East Alaska RMP newsletter has been sent out at several stages of the planning process. This newsletter is used to inform the public of meetings, where we are in the planning process, and contact information for the planning team. A mailing database has developed over the life of the plan and currently contains over 1400 names of individuals and organizations who are notified about plan developments through email and hard copy newsletter.

C. Consultation

1. U.S. Fish and Wildlife Service Consultation

Consultation with the U.S. Fish and Wildlife Service is required under Section 7 of the Endangered Species Act of 1973 prior to initiation of any project by the BLM that may affect any Federally listed or endangered species or its habitat.

The Glennallen Field Office submitted a project description, including a detailed description of the alternatives, as well as a species list request to Fish and Wildlife Service. This request was followed by a letter from Fish and Wildlife Service stating, “[t]he Service concurs with your determination that no adverse effects are expected to result from the actions described in the preferred alternative to the East Alaska Resource Management Plan” (FWS 2004). Concern was raised by FWS over potential for oil and gas development on State lands in the Bering Glacier area and the potential effects on the Kittlitz’s murrelet, a candidate species for listing. Potential effects to this species are displayed in the analysis in Chapter IV.

Because of the conclusion of no adverse effects to threatened or endangered species or critical habitat determined through informal consultation, no biological assessment was conducted.

2. National Marine Fisheries Service Consultation

The National Marine Fisheries Service (NMFS) is responsible for the administration of the Endangered Species Act as it applies to listed cetaceans and pinnipeds in Alaska. These include seven species of endangered whales, the threatened eastern population of Stellar sea lions, and the endangered western population of Stellar sea lions.

Informal consultation was initiated by the Glennallen Field Office through a letter describing the planning project and area and alternatives. NMFS responded with a letter stating, “[d]ue to the inland location of most of the planning area, threatened or endangered marine mammals do not occur in the vicinity, and critical habitat for the above listed species would not be affected” (NMFS 2004). The letter also stated that the planning area contains Essential Fish Habitat (EFH) for all five species of salmon and requested analysis of effects to this habitat. This analysis is contained in Chapter IV of this document.

3. Tribal Consultation

In accordance with the National Historic Preservation Act, as well as in recognition of the government-to-government relationship between Native Villages and Corporations and the Federal government, two letters inviting cooperation were sent and 11 government-to-government meetings were held throughout the planning process.

Scoping meetings were held with Ahtna Native Corporation and with each Tribal Government in the area. The purpose was to develop issues and concerns for management of BLM lands in the area. These meetings have resulted in the development of three different Memoranda of Understanding (MOUs) with different village corporations: Cheesh-Na, Chitina, and Tazlina. These MOUs will facilitate coordination with the villages throughout the planning process and open the door to increased coordination and consultation after the plan is completed. In addition, the BLM has a contract with a cultural anthropologist to work with the Village Councils and elders to identify cultural, traditional, and subsistence sites or areas important for maintenance or protection.

D. Collaborative Efforts

1. Cooperation with the State of Alaska

Because of the high percentage of State-selected lands within the planning area, the BLM has involved the State of Alaska from the beginning of this planning process. In May 2002, a letter was sent inviting the State of Alaska to participate in the process as a cooperator. A joint BLM-State position was been created, with that person acting as liaison between the State of Alaska and the BLM in this planning process. This has been effective in facilitating information exchanges and reviews of draft materials by State personnel.

Constant involvement throughout the planning process has taken place with the State of Alaska, and several meetings have been held between the State and the BLM at varying levels of authority to discuss the East Alaska RMP. These meetings have produced a preferred strategy on the management of State-selected lands.

E. Formal Government to Government Agreements

Formal agreements between governing entities serve to open lines of communication as well as facilitate coordination of management efforts. Currently BLM has a Memorandum of Understanding (MOU) with the following government entities:

- Ahtna Native Corporation (in progress)*
- Cheesh'na Tribal Council of Alaska*
- Chickaloon Village (Nay'dini'aa Na')*
- Chitina Traditional Indian Village Council (in progress)*
- Native Village of Eyak*
- Native Village of Tazlina Tribe of Alaska *
- State of Alaska

* Denotes MOU developed as a direct result of this land use planning process.

F. Plan Distribution

Since initial scoping, the 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 East Alaska RMP/EIS. The January 2006 East Alaska RMP Newsletter, sent to this mailing list, contained a way to request a copy of the Proposed RMP/Final EIS. The newsletter also noted that the Proposed RMP/Final EIS could be downloaded from the plan website that is currently online. Those who respond with a request for a hard copy will receive one. CD-ROMs with the Proposed RMP/Final EIS will also be developed to reduce printing costs and paper waste as a method for reviewing the Proposed RMP/Final EIS.

Copies of the East Alaska Proposed RMP/Final EIS are available for public inspection at the following locations:

- Anchorage Field Office
- BLM Alaska State Office, public room, Anchorage
- Chugach National Forest Office, Cordova
- Delta Junction Public Library
- Denali National Park and Preserve Office
- Fairbanks Public Library
- Glennallen Field Office
- Glennallen Public Library
- Kenny Lake Public Library
- Matanuska-Susitna Borough Offices
- Northern Field Office
- Valdez Public Library
- Wrangell-St. Elias National Park and Preserve Office

The Proposed RMP/Final EIS is also available electronically at the East Alaska RMP website, <http://www.ak.blm.gov/gdo/landplan/index.html>.

Concurrent with the distribution of the Proposed RMP/Final EIS, a Notice of Availability was published by the EPA in the Federal Register to mark the beginning of the 30-day protest period. The BLM also published a Notice of Availability in the Federal Register announcing the availability of the Proposed RMP/Final EIS.

Hard copies, or CD-ROMs when requested, of the Proposed RMP/Final EIS have been distributed to the following organization, agencies, and individuals who requested them, or as required by regulation or policy.

Federal Government Agencies

U.S. Environmental Protection Agency – Region 10, Seattle Office
USDA Forest Service, Chugach National Forest, Cordova
USDA Forest Service, Chugach National Forest, Yakutat Field Station
USDA Natural Resources Conservation Service
USDI U.S. Fish and Wildlife Service, Anchorage
USDI National Park Service, Alaska Region, Rivers, Trails & Conservation Assistance Program
USDI National Park Service, Denali National Park and Preserve
USDI National Park Service, Wrangell-St. Elias National Park and Preserve
USDI Office of Environmental Policy and Compliance
USDI Bureau of Land Management, Washington Office, Planning Group
USDI Bureau of Land Management, Alaska State Office
USDI Bureau of Indian Affairs, Anchorage

State Government Agencies and Organizations

Alaska Department of Administration
Alaska Department of Community and Economic Development
Alaska Department of Environmental Conservation
Alaska Department of Fish and Game
Alaska Department of Fish and Game, Advisory Committee
Alaska Department of Law
Alaska Department of Natural Resources
Alaska Department of Transportation and Public Safety
Alaska Department of Health and Safety
Honorable Frank Murkowski, Governor of Alaska

Local Governments and Committees

Cantwell Community, Inc
City of Cordova
City of Fairbanks, City Planning
City of Valdez, Planning and Zoning
Copper Valley Economic Development Council

Denali Borough
Denali Citizens Council
Fairbanks NorthStar Borough
Matanuska-Susitna Borough
USDI, BLM, Resource Advisory Council (RAC)
Yakutat Borough

Tribal Governments and Committees

Ahtna Inc.
Ahtna Heritage Foundation
Alaska Federation of Natives
Alaska Village Initiatives
Chickaloon Village Traditional Council
Cheesh-na Tribal Council
Chitina Native Corporation
Chitina Traditional Village Council
Chugach Alaska Corporation
Copper River Native Association
Eyak Preservation Council
Gakona Village Council
Gulkana Village Council
Mentasta Traditional Council
Mount Sanford Tribal Consortium
Native Village of Cantwell
Native Village of Eyak
Native Village of Kluti-Kaah
Pedro Bay Village Council
Tazlina Village Council

Congressionals

U.S. Representative Donald Young
U.S. Senator Lisa Murkowski
U.S. Senator Ted Stevens

State Legislators

Representative John Harris, District 12
Representative Woodie Salmon, District 6
Senator Gene Therriault, District F
Senator Albert Kookesh, District C

Non-governmental Organization and Businesses

Alaska Alpine Club
Alaska Center for the Environment
Alaska Coalition
Alaska Coop. Fish and Wildlife Research
Alaska Dog Musers Association

Alaska Fish & Trails Unlimited
Alaska Fly Fishers Association
Alaska Friends of the Earth
Alaska Frontier Trappers Association
Alaska Miners Association
Alaska National Heritage Program
Alaska Outdoor Access Alliance
Alaska Outdoor Council
Alaska Professional Hunters Association
Alaska Quiet Rights Coalition
Alaska Rifle Club
Alaska Snowmachine Association
Alaska State Snowmobile Association
Alaska Wilderness Council
Alaska Wilderness Studies
Alaska Wildlife Alliance
Alyeska Pipeline Service Company
Cascadia Wildlands Project
Copper Country Alliance
Copper River Watershed Project
Cordova District Fishermans United
Curry Ridge Riders
Ecotrust-Copper River Program
Maclaren River Lodge
MACTEC Engineering and Consulting
Matanuska Valley Sportsmen
National Parks Conservation Association
Nevada Star Resource Group
NOLS Alaska
Northern Alaska Environmental Center
Pacific Legal Foundation
Sierra Club
The Nature Conservancy
The Wolf Pack
Weston's Camp

Other Interested/Affected Individuals

The East Alaska Proposed RMP/Final EIS was also mailed to individuals requesting either a hard copy or the CD version by April 15, 2005. Additional copies of the draft will be mailed out upon request.

G. Interdisciplinary Team

The Draft RMP/EIS was prepared by an interdisciplinary team of specialists, as listed in Table 43, and included expertise from across the state. Organizations include the Environmental Careers Organization (ECO). BLM office abbreviations include the Alaska State Office (ASO), Northern Field Office (NFO), and the Glennallen Field Office (GFO).

Table 43. List of Preparers

Name	Agency	Area of Expertise
Ramone Baccus McCoy	BLM-GFO	Field Office Manager
Andi Bauer	BLM-ASO	Writer/Editor
Brenda Becker	BLM-GFO	Lands and Realty
Henri Bisson	BLM-ASO	BLM Alaska State Director
Marcia Butorac	BLM-GFO	Recreation, Facilities
Travis Calderwood	BLM-GFO	Forestry, Noxious and Invasive Plant Species
Tom Dilts	ECO	Recreation Opportunity Spectrum, Visual Resources
Heath Emmons	BLM-GFO	Recreation, Wild and Scenic Rivers, Trails
Marnie Graham	BLM-GFO	Public Affairs, Outreach Specialist
Denton Hamby	BLM-GFO	Recreation, Wild and Scenic Rivers
John Jangala	BLM-GFO	Cultural Resources and Paleontological Resources
Tami Jindra	BLM-GFO	EARMP website design and upkeep
Lauri Jones	BLM-GFO	GIS Specialist
Mike Kasterin	BLM-ASO	Social and Economic Conditions
Cory Larson	BLM-GFO	Recreation, Trails
Mary Lynch	BLM-AFS	Fire
Tamara Hamby	ECO	Cartography, Planning Support
Holli McClain	BLM-NFO	Visual Resources
Dave Mushovic	BLM-GFO	Realty Specialist
KJ Mushovic	BLM-GFO	Recreation, Special Recreation Permits
John Rego	BLM-GFO	Geology, Minerals
Liz Rice	BLM-GFO	Public Affairs Specialist
Bruce Rogers	BLM-GFO	Land Use Planner, NEPA Specialist, EARMP Project Lead
Kari Rogers	BLM-GFO	Wildlife, Sensitive Status Plant Species, Bering Glacier
William Runnoe	BLM-GFO	Recreation Lead
Mike Sondergaard	BLM-GFO	Soils, Water, Air, Vegetation, Hazardous Materials
Elijah Waters	BLM-GFO	Fisheries, Subsistence

