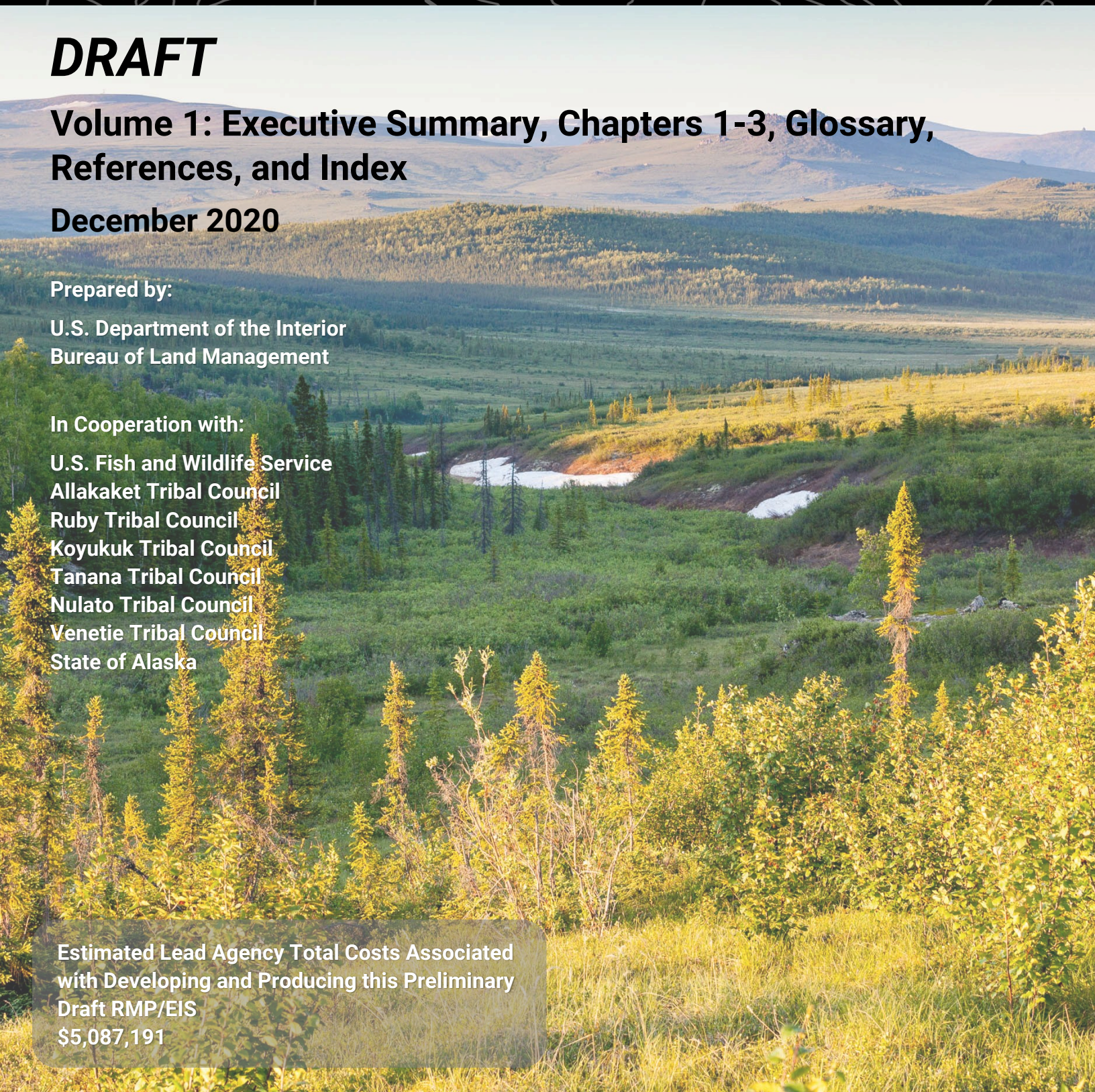
U.S. Department of the Interior
Bureau of Land Management

Central Yukon

Resource Management Plan and Environmental Impact Statement



DRAFT

Volume 1: Executive Summary, Chapters 1-3, Glossary, References, and Index

December 2020

Prepared by:

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

In Cooperation with:

U.S. Fish and Wildlife Service
Allakaket Tribal Council
Ruby Tribal Council
Koyukuk Tribal Council
Tanana Tribal Council
Nulato Tribal Council
Venetie Tribal Council
State of Alaska

Estimated Lead Agency Total Costs Associated with Developing and Producing this Preliminary Draft RMP/EIS
$5,087,191

Mission

To sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

Cover Photo: Dalton Highway Utility Corridor.

Photo by Craig McCaa (BLM).

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Fairbanks District Office
222 University Avenue
Fairbanks, Alaska 99709-3816
www.blm.gov/alaska

Dear Reader letter

Dear Reader:

Enclosed is the Draft Resource Management Plan (RMP) and Draft Environmental Impact Statement (EIS) for the Central Yukon Field Office planning area. The Bureau of Land Management (BLM) prepared the Draft RMP/EIS in consultation with cooperating agencies and in accordance with the National Environmental Policy Act, as amended; the Federal Land Policy and Management Act, as amended; implementing regulations; the BLM's Land Use Planning Handbook (H-1601-1); and other applicable law and policy. The Draft RMP provides a framework for the future management direction and appropriate use of the planning area. The planning area consists of about 56 million acres, which includes about 13.1 million acres of BLM-managed land, including the Dalton Highway and Central Yukon areas. When approved, this RMP will replace the 1991 Utility Corridor RMP and the 1986 Central Yukon RMP. It will also provide an RMP for a portion of the lands currently covered by the 1981 Southwest Management Framework Plan and for unplanned lands near Fairbanks.

The BLM encourages the public to review and provide comments on the Draft RMP/EIS. We are particularly seeking constructive feedback regarding the adequacy of the alternatives considered, the analysis of its respective management decisions, and any new information that would help us produce the Proposed RMP/Final EIS (which is the next phase of the planning process). In developing the Proposed RMP/Final EIS, the decision-maker may select management decisions from each of the alternatives analyzed in the Draft RMP/EIS to create a management strategy that best meets the needs of the resources and values in this area, under the BLM's multiple use and sustained yield mandate.

Comments will be accepted for 90 calendar days following publication of the United States Environmental Protection Agency's Notice of Availability in the Federal Register. The BLM can best use your comments and resource information submissions if received during the review period.

The Draft RMP/EIS is available for review online on the project website, as follows: https://eplanning.blm.gov/eplanning-ui/project/35315/510.

Paper copies are also available for public review at the following locations:

Fairbanks District Office
222 University Avenue
Fairbanks, AK 99709

Mail or deliver comments to the following address:

Central Yukon Field Office
222 University Avenue
Fairbanks, AK 99709

Fax comments to (907) 474-2282

Your review and comments on the content of this document are critical to the success of this planning effort. If you wish to submit comments on the Draft RMP/EIS, we request that you make your comments as specific as possible. Comments will be most helpful if they include suggested changes, sources, or methods and reference a particular section or page number. comments containing only opinions or preferences and will include them as part of the decision-making process, although we will not respond to them.

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

Public meetings will be held at various locations around the planning area, or via a virtual public meeting, for the public to submit comments and seek additional information. The locations, dates, and times of these meetings will be announced at least 15 days before the first meeting via a press release and on the project website.

Thank you for your continued interest in the Central Yukon RMP/EIS. We appreciate the information and suggestions you contribute to the planning process.

Sincerely,

Chad B. Padgett
State Director

Central Yukon

Draft Resource Management Plan and Environmental Impact Statement

Volume 1: Executive Summary, Chapters 1-3, Glossary, References, and Index

Prepared by:
U.S. Department of the Interior
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$5,087,191

Central Yukon Draft Resource Management Plan and Environmental Impact Statement

1. Responsible Agency: United States Department of the Interior
   Bureau of Land Management
2. Type of Action: Administrative (X) Legislative ( )
3. Document Status: Draft (X) Final ( )
4. Abstract: This Draft Resource Management Plan (RMP) and associated Environmental Impact Statement (EIS) for the Central Yukon planning area has been prepared by the U.S. Department of the Interior, Bureau of Land Management (BLM) Central Yukon Field Office. The planning area consists of 13.1 million acres of BLM-managed land, including the Dalton Highway and Central Yukon areas. When approved, this RMP will replace the 1991 Utility Corridor RMP and the 1986 Central Yukon RMP. It will also provide an RMP for a portion of the lands currently covered by the 1981 Southwest Management Framework Plan and for lands near Fairbanks not previously included in a land use plan.

   The purpose of this RMP is to develop management decisions to guide future land management in the planning area and to provide a framework for subsequent site-specific projects and implementation-level decisions. These planning decisions establish goals and objectives for day-to-day and long-term resource management. To achieve these goals and objectives, the RMP identifies uses (allocations) that are allowed, restricted, or prohibited. The need for the Central Yukon RMP is to provide guidance and to address changes in resources, circumstances, laws, policies, and regulations in the planning area since the existing plans were developed in the 1980s and 1990s.

   In this draft RMP/EIS, the BLM evaluated five alternatives for managing the planning area. Alternative A, the no action alternative, represents existing management described by current land use plans and provides the benchmark against which to compare the other alternatives. Alternative B emphasizes the protection of resource values by identifying key areas for additional management actions. Alternatives C1 and C2 emphasize a blend of resource protection and resource uses. Alternative C2 is the preferred alternative. Alternative D emphasizes management to facilitate resource development more than the other alternatives.

   Alternatives B, C1, C2, and D were developed using input from the public, stakeholders, and cooperating agencies. Major planning issues addressed are access and comprehensive travel; climate; fish and aquatic species habitat; invasive and nonnative species; Alaska Native Claims Settlement Act withdrawals; utility corridor withdrawal; mining; sand and gravel; recreation and visitor services; subsistence; wildlife habitat; water quality, wetlands, and riparian habitat; and wilderness characteristics.
5. Review period: The review period on the Central Yukon Draft RMP and Draft EIS is 90 calendar days. The review period began when the Environmental Protection Agency published a Notice of Availability in the *Federal Register*.
6. For further information, contact the following:

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   Fairbanks District Office
   222 University Avenue
   Fairbanks, AK 99709-3844
   (907) 474-2200
   Website: https://eplanning.blm.gov/eplanning-ui/project/35315/510

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
AAAQS	Alaska Ambient Air Quality Standards
ACEC	areas of critical environmental concern
ADEC	Alaska Department of Environmental Conservation
AHRS	Alaska Heritage Resources Survey
AKLNG	Alaska Liquid Natural Gas
AMS	analysis of management situation
ANCSA	Alaska Native Claims Settlement Act of 1971
ANILCA	Alaska National Interest Lands Conservation Act of 1980
ARM	Aquatic Resource Value Model
AS	Alaska Statute
ASTAR	Arctic Strategic Transportation and Resources
AO	Authorized Officer
AWC	Anadromous Waters Catalog
BCA	backcountry conservation area
BLM	United States Department of the Interior, Bureau of Land Management
BMPs	best management practices
°C	degrees Celsius
CAMA	Central Arctic Management Area
CAH	Central Arctic Herd
CFR	Code of Federal Regulations
cm	centimeters
CO_2e	carbon dioxide equivalent
CSU	conservation system unit
CYRMP	Central Yukon Resource Management Plan
DSHA	Dall Sheep Habitat Area
DSMC	Dall Sheep Movement Corridors
DSSA	Dall Sheep Study Area
EFH	Essential Fish Habitat
EIS	environmental impact statement
ERMA	extensive recreation management area
°F	degrees Fahrenheit
FLPMA	Federal Land Policy and Management Act of 1976
GHG	greenhouse gas
GIS	geographic information system
GMH	Galena Mountain Herd
GPS	global positioning system
HHH	Hodzana Hills Herd
INHT	Iditarod National Historic Trail
LWC	lands with wilderness characteristics

mm	millimeters
MMT	million metric tons
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NNIS	nonnative invasive species
NPS	National Park Service
NSO	no surface occupancy
NWSRS	National Wild and Scenic Rivers System
OHV	off-highway vehicle
ORV	outstandingly remarkable value
PFYC	Potential Fossil Yield Classification
PLO	Public Land Order
$PM_{2.5}$	particulate matter with a diameter less than or equal to 2.5 microns
R&I	relevant and important
R&PP	Recreation and Public Purposes
RFD	reasonably foreseeable development
RFFAs	reasonably foreseeable future actions
RMA	recreation management area
RMH	Ray Mountain Herd
RMP	resource management plan
RMZ	resource management zone
RNA	research natural area
ROD	record of decision
ROW	right-of-way
SOP	standard operating procedure
SRP	special recreation permit
SSS	special status species
SRMA	special recreation management area
TAPS	Trans-Alaska Pipeline System
TL	timing limitation
TCP	Traditional Cultural Property
TMA	travel management area
VRI	visual resource inventory
VRM	visual resource management
U.S.	United States
USFWS	United States Department of the Interior, Fish and Wildlife Service
WCM	Watershed Condition Model
WSA	wilderness study area
WSR	wild and scenic river
WUI	wildland urban interface

Executive Summary

INTRODUCTION

The United States Department of the Interior, Bureau of Land Management (BLM), Central Yukon Field Office has prepared this draft resource management plan (RMP) and environmental impact statement (EIS). Its purpose is to guide management of 13.1 million acres of BLM-managed land, including the Dalton Highway and Central Yukon areas. Management decisions in the planning area are currently based on the Utility Corridor RMP (BLM 1991) and the Central Yukon RMP (BLM 1986a). This new RMP will replace these management plans and provide an RMP for a portion of the lands currently covered by the Southwest Management Framework Plan (BLM 1981) and unplanned lands near Fairbanks.

PURPOSE AND NEED

The purpose of this RMP is to develop management decisions to guide future land management in the planning area and subsequent site-specific projects. These decisions establish goals and objectives for day-to-day and long-term resource management. To achieve these goals and objectives, the RMP identifies uses (allocations) that are allowable, restricted, or prohibited.

The need for the revised Central Yukon RMP is to provide guidance and to address changes in resources, circumstances, laws, policies, and regulations in the planning area since the existing plans were developed in the 1980s and 1990s. The land use plan will review existing land withdrawals and if warranted, recommend revocations or modifications to the Secretary of the Interior. Such withdrawal revocations will make lands available for selection and appropriation, including land allotments by Alaska Native Vietnam-era veterans under Section 1119 of the John D. Dingell, Jr. Conservation, Management, and Recreation Act.

The planning area includes identified corridors for utility and transportation projects that were identified at one time as multiple routes as part of the State of Alaska's Roads to Resources initiative. While these are not funded, many of these routes continue to be considered for individual projects. Additional changes affecting the planning area are increased demand for recreational resources and increased access along the Dalton Highway after it opened to public travel in the 1990s.

ALTERNATIVES

The five alternatives—one no action alternative and four action alternatives—carried forward for detailed analysis in this Draft RMP/EIS were developed in response to issues and concerns identified through internal agency scoping, public scoping, and comments and nominations for areas of critical environmental concern (ACECs). The identified alternatives address current management needs and propose adaptive management strategies to best manage for known and anticipated resource trends. All the alternatives share common goals and objectives; however, they address these goals and objectives to varying degrees, with the potential for different long-range outcomes and conditions. The alternative themes or strategies are discussed below.

Alternative A (No Action)—Alternative A meets the National Environmental Policy Act requirement in 40 Code of Federal Regulations 1502.14, that the BLM consider a no action alternative. It would continue present management direction and practices, based on the Utility Corridor RMP (BLM 1991), Central Yukon RMP (BLM 1986a), Southwest Management Framework Plan (BLM 1981), and other management decision documents. These include special rules published in the *Federal Register* (for off-highway vehicle

and recreation use) and existing public land orders, including Alaska Native Claims Settlement Act 17(d)(1) withdrawals.

Alternative B—Alternative B emphasizes the protection of resource values. Planning for connectivity corridors, adaptability to climate change, and priority species[1] would be considered to a greater degree under this alternative, with less emphasis on resource uses. Thirty-one ACECs and research natural areas (approximately 4 million acres) would be designated, with proposed management to address a wide range of relevant and important values and research opportunities.

Alternative C1—Alternative C1 emphasizes a blend of resource protection and resource development. Connectivity corridors, adaptability to climate change, and priority species would be considered in the context of allowing for more minerals development and other resource uses than under Alternative B. Eight ACECs and research natural areas (approximately 418,000 acres) would be designated. Management to protect relevant and important values would be less restrictive for resource uses than under Alternative B.

Alternative C2 (Preferred Alternative)—Alternative C2 emphasizes management to facilitate resource development more than all the other alternatives, except for Alternative D. This alternative retains the Toolik Lake Research Natural Area (77,000 acres). Management of habitat for non-migratory caribou herds is like Alternative C1 with the exception that there are no proposed Federal Land Policy and Management Act withdrawals.

Alternative D—Alternative D emphasizes management to facilitate resource development more than the other alternatives. This alternative focuses on maximizing the BLM-managed lands for development potential using current federal management guidelines without the use of specific area management actions, such as habitat-specific management or ACEC-specific management. This alternative has the fewest management constraints but does maintain management decisions common to all alternatives related to wildlife, riparian areas, and fish resources. This alternative allows the most management flexibility to maximize energy development opportunities by having the most amount of lands available for energy development with no constraints on rights-of-way location.

ENVIRONMENTAL CONSEQUENCES

The purpose of the environmental consequences' analysis in this RMP/EIS is to determine the potential for significant impacts of the federal action on the human environment. The "federal action" is the BLM's selection of an RMP on which the Central Yukon Field Office will base future land use actions. **Chapter 3** objectively evaluates the likely impacts on the human and natural environment in terms of environmental, social, and economic consequences that are projected to occur from implementing the alternatives. **Section M.8** in **Appendix M** provides a summarized comparison of the environmental consequences for the resources, resources uses, and special designations that could be affected by implementing the alternatives evaluated in this Draft RMP/EIS.

[1]The BLM used the BEACONS benchmark models, which use focal species. The BLM identified its own priority species for planning and matched those with the benchmark units that contained those species.

Chapter 1. Introduction

1.1 Introduction

The United States Department of the Interior, Bureau of Land Management (BLM), Central Yukon Field Office has prepared this draft resource management plan (RMP) and environmental impact statement (EIS). Its purpose is to guide management of 13.1 million acres of BLM-managed land, including the Dalton Highway and Central Yukon areas. Management decisions in the planning area are currently based on two land use plans: the Utility Corridor RMP (BLM 1991) and the Central Yukon RMP (BLM 1986a). This new RMP will replace these management plans and will provide an RMP for a portion of the lands currently covered by the Southwest Management Framework Plan (BLM 1981) and unplanned lands near Fairbanks. Generally, the temporal scope of the analysis in this EIS is the life of the RMP, which encompasses a 20-year planning period.

References to the Council on Environmental Quality regulations throughout this RMP/EIS are to the regulations in effect prior to September 14, 2020. This RMP/EIS does not refer to the revised Council on Environmental Quality regulations effective September 14, 2020, because the National Environmental Policy Act (NEPA) process associated with the proposed action began prior to the effective date of the revised NEPA regulations.

1.2 Purpose of and Need for the Resource Management Plan

The purpose of this RMP is to develop management decisions to guide future land management in the planning area and subsequent site-specific projects. These decisions establish goals and objectives for day-to-day and long-term resource management. To achieve these goals and objectives, the RMP identifies uses (allocations) that are allowable, restricted, or prohibited.

The need for the revised Central Yukon RMP (CYRMP) is to provide guidance and to address changes in resources, circumstances, laws, policies, and regulations in the planning area since the existing plans were developed in the 1980s and 1990s. The land use plan will review existing land withdrawals and if warranted, recommend revocations or modifications to the Secretary of the Interior. Such withdrawal revocations will make lands available for selection and appropriation, including land allotments by Alaska Native Vietnam-era veterans under Section 1119 of the John D. Dingell, Jr. Conservation, Management, and Recreation Act.

The planning area includes identified corridors for utility and transportation projects that were identified at one time as multiple routes as part of the State of Alaska's Roads to Resources initiative. While these are not funded, many of these routes continue to be considered for individual projects. Additional changes affecting the planning area are increased demand for recreational resources and increased access along the Dalton Highway after it opened to public travel in the 1990s.

1.3 Description of the Planning Area

The planning area is approximately 56 million acres, approximately 13.1 million acres of which are managed by the BLM. Other federal lands in the planning area are as follows: portions of the Gates of the Arctic National Park and Preserve; the Koyukuk, Innoko Northern Unit, Nowitna, and Kanuti National Wildlife Refuges; and the U.S. Army Tanana Flats and Donnelly training areas.

The decisions in the RMP will apply only to 13.1 million acres of BLM-managed lands. The BLM generally manages its own subsurface acres, as well as subsurface acres administered by other federal agencies. The

BLM may also manage some privately owned subsurface lands through Native patents[1] where the BLM makes no mineral decisions. Approximately 1,307,000 acres of BLM-managed lands are withdrawn to the military. The Department of Defense retains surface management authority on these lands; therefore, they are not included in the decision area.

The planning area overlaps portions of the Northwest Arctic Borough, the North Slope Borough, the Denali Borough, and the Fairbanks North Star Borough; however, most of the planning area is not within any borough boundary. BLM decisions apply only to BLM-managed lands within the planning area boundary. The planning area boundary includes 24 remote villages, 20 of which have federally recognized tribes, 13 Alaska Native Claims Settlement Act (ANCSA) Village Corporations, and three ANCSA Regional Corporations, including, Doyon Limited, Arctic Slope Regional Corporation, and NANA Regional Corporation (see **Appendix B**, **Table B-2** for a detailed list).

The CYRMP does not change land use management for National Wildlife Refuge lands, National Park Service lands, or their subsurface lands. Planning decisions and descriptions in the RMP will not apply to private lands, lands conveyed through ANCSA, or lands conveyed to the State of Alaska through the Alaska Statehood Act.

BLM-managed lands are scattered and range from parcels of a few acres up to contiguous blocks of 1 million or more acres. To include all BLM-managed lands in the RMP, the planning area boundary is drawn on a large scale. **Map 1.1**, **Appendix A**, illustrates the land status of the planning area, also outlined in **Table 1-1** below; **Map 1.2**, **Appendix A**, illustrates the BLM-managed lands in the decision area.

Table 1-1
Surface Management Responsibilities in the Planning Area

Land Status	Surface Acres	Percentage of Planning Area
State	25,956,000	46.5
BLM	13,302,000	23.8
U.S. Fish and Wildlife Service (USFWS)	7,408,000	13.3
Alaska Native lands patented or interim conveyed	7,053,000	12.6
Department of Defense, Air Force	1,307,000	2.3
Water or undetermined	543,000	<1.0
Private	121,000	0.2
Alaska Native allotment	118,000	0.2
Local government	62,000	0.1
Other federal	1,000	<0.1
Total	**55,871,000**	**100.0**

Source: BLM GIS 2017
Note: Acres are rounded to the nearest 1,000. The total percentage may not equal 100, due to rounding. The Department of Defense's surface and mineral estate are withdrawn and would be retained under all alternatives. As such, this RMP does not make other decisions on Department of Defense land, except for designating the travel management areas.

[1]Subsurface minerals for which ownership has been conveyed to an Alaska Native Village Corporation in accordance with the ANCSA; 43 U.S. Code. 1601 et seq.

The BLM-managed lands in this RMP are referred to as the surface decision area, or 13,302,000 acres. The surface decision area has 219,000 acres of Native patent subsurface not managed by the BLM. The BLM-managed minerals in the RMP are referred to as the subsurface decision area, or 13,083,000 acres.

1.4 Scoping and Issue Identification

The formal public scoping process for the CYRMP revision began with the publication of the Notice of Intent in the *Federal Register* on June 14, 2013. The BLM also posted the Notice of Intent on the project website, https://eplanning.blm.gov/eplanning-ui/project/35315/510, thereby notifying the public of its intent to revise the RMP. The Notice of Intent also provided background information on the CYRMP planning area, applicable documents and reports, a project timeline, information about the planning process, meeting information, news releases, contact information, and other resources. The BLM also notified the public of the scoping process via a postcard mailing, a newsletter, emails, news releases, and public service announcements.

The BLM held 16 public meetings in 15 different communities during the scoping period. Meetings generally consisted of a short open house, followed by a presentation and then public testimony. A total of 291 people signed in at the meetings. Outside of the scoping meetings, approximately 70 individuals, agencies, and organizations provided written comments. An additional 2,900 form letters were submitted via email as of January 28, 2014. The BLM received additional comments and nominations for areas of critical environmental concern between July and early September 2014. Detailed information about the comments received and about the public outreach process can be found in the Scoping Report for the CYRMP, finalized in March 2015 (BLM 2015), at https://eplanning.blm.gov/eplanning-ui/project/35315/510.

1.4.1 Issues Identified for Consideration

The BLM identified the following 13 preliminary planning issues for management: access and comprehensive travel; climate; fish and aquatic species habitat; invasive and nonnative species; ANCSA withdrawal; utility corridor withdrawal; mining; sand and gravel; recreation and visitor services; subsistence; wildlife habitat; water quality, wetlands, and riparian habitat; and wilderness characteristics. Through internal scoping, the BLM generated questions related to these primary issue areas. More detailed information on each planning issue is included in the Scoping Report for the CYRMP (BLM 2015).

1.4.2 Issues Outside the Project Scope

In addition to planning issues, scoping comments also addressed issues that are policy or administrative actions and issues that the BLM has addressed or will address outside of the CYRMP. The comments also involved issues that are outside the scope of the RMP/EIS, either because they involve decisions the BLM does not have authority to make at the planning level or the issues are not appropriate planning decisions. These issues are discussed in more detail in the Scoping Report for the CYRMP (BLM 2015).

1.5 Collaboration and Coordination

1.5.1 Intergovernmental and Interagency

The BLM is the lead agency for the Central Yukon RMP/EIS. At the outset of the planning process, the BLM sent letters of invitation to 10 local, state, federal, and tribal representatives, inviting them to participate as cooperating agencies for the CYRMP/EIS (see **Appendix B**). The Allakaket Village, Native Village of Ruby, Native Village of Tanana, Native Village of Venetie Tribal Government, Nulato Village, State of Alaska, USFWS, and Village of Koyukuk agreed to participate in the RMP/EIS as designated cooperating agencies and signed memorandums of understanding with the BLM. The list of preparers for the CYRMP is also included in **Appendix B**.

1.5.2 Alaska-BLM Resource Advisory Council

Members of the Alaska-BLM Resource Advisory Council received a notice of the scoping meetings. The BLM also gave information about the CYRMP at the Council's 2013, 2014, and 2017 meetings. The BLM will continue to seek input from the Alaska-BLM Resource Advisory Council during future meetings throughout the planning process.

1.5.3 Consultations with Tribes and Alaska Native Corporations

The BLM sent a letter of notification and inquiry to the federally recognized tribes, and ANCSA village and regional corporations listed in **Appendix B**. The BLM offered the opportunity to participate in formal government-to-government consultation, the opportunity to receive information about the project, and the option for tribal governments to participate as cooperating agencies. The BLM has met with all tribes that have requested consultation, including the Alatna Village, Allakaket Village, Doyon Limited, Louden Village (Galena), Native Village of Nuiqsut, Native Village of Ruby, Native Village of Tanana, Native Village of Venetie Tribal Government, Nulato Village, and Village of Koyukuk.

Government-to-government and ANCSA corporation consultation and coordination is not limited to formal public scoping or comment periods but will continue throughout the planning process. This is to ensure that the BLM takes into consideration the concerns of tribes and ANCSA corporations during development of the CYRMP. The BLM will continue to include the corporations and tribes in all outreach during the planning process and will consult on a more formal basis if requested.

1.5.4 Alaska State Historic Preservation Officer Consultation

In 2018 the BLM invited the Alaska State Historic Preservation Officer to review and comment on the CYRMP and will provide a draft RMP/EIS to the State Historic Preservation Officer's office for review. Additional information regarding consultation with the State Historic Preservation Officer will be added to the Proposed RMP/Final EIS, as applicable.

1.5.5 U.S. Fish and Wildlife Service Consultation

To comply with Section 7(c) of the Endangered Species Act of 1973, the BLM consulted with the USFWS early in the planning process. The USFWS provided input on planning issues, data collection and review, and alternatives development. After consultation with the USFWS, the determination of no endangered species in the planning area was made.

1.6 Planning Criteria

The BLM developed preliminary planning criteria for focused planning of the CYRMP and to guide decision-making by topic. The agency introduced these criteria to the public for review in the Notice of Intent published in the *Federal Register* on June 14, 2013, and at all scoping meetings. The public was encouraged to comment on and suggest additions to these criteria. During scoping, individuals, organizations, agencies, and tribes identified planning criteria, as follows:

- The primary purpose of the lands withdrawn by Public Land Order 5150 is the transportation of energy resources; therefore, the BLM will avoid proposing actions or activities with potential adverse impacts on existing and future energy transportation systems on the lands within the corridor.
- The BLM will encourage opportunities for public participation throughout the planning process.
- The BLM will recognize and protect valid existing rights.
- The BLM will consider subsistence uses and will take reasonable steps to minimize adverse impacts, in accordance with Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA).

- The BLM will cooperate with State and federal agencies, Native corporations, tribes, and municipal governments.
- The BLM will consider plans and policies of adjacent conservation system units, landowners, and local governments.
- The BLM will consider Department of the Interior guidance, Alaska Department of Fish and Game objectives, and Federal Subsistence Board requirements and mandates in decisions related to wildlife management.
- The RMP will be consistent with applicable BLM manuals and handbooks.
- The plan will be consistent with the Federal Land Policy and Management Act (FLPMA), NEPA, National Historic Preservation Act, Wild and Scenic Rivers Act, Migratory Bird Treaty Act, ANILCA, and other federal laws, regulations, and policies, as required.
- The plan will be consistent with the BLM Alaska Land Health Standards.
- The BLM will complete designations for off-highway vehicles for all BLM-managed lands in the planning area according to the regulations found in 43 Code of Federal Regulations 8342.
- Within the utility corridor development nodes, the BLM will assess areas it designated in the Utility Corridor RMP and Record of Decision (BLM 1991) for future development, such as for visitor facilities, campgrounds, and rest stops. It will assess the location, size, and boundaries and their appropriate uses and long-range development, State or federal management, and effects on adjacent and nearby lands and their uses.
- The plan will address public access needs.
- The BLM will consider current and potentially new special designations, such as areas of critical environmental concern and research natural areas, using the criteria found in 43 Code of Federal Regulations 1610.7-2 and 43 Code of Federal Regulations 8223.
- The BLM's review and classification of waterways as eligible for inclusion in the National Wild and Scenic Rivers System will be consistent with the guidance in BLM Policy Manual 6400—Wild and Scenic Rivers-Policy and Program Direction for Identification, Evaluation, Planning, and Management (BLM 2012a).
- The BLM will incorporate environmental justice considerations in land use planning alternatives to adequately respond to environmental justice issues facing minority populations, low-income communities, and tribes living near BLM-managed lands and using public land resources.
- The plan will assess all BLM-managed lands in the planning area for wilderness characteristics, using criteria established by BLM Manual 6310—Conducting Wilderness Characteristics Inventory on BLM Lands (BLM 2012b). The RMP will examine options for managing lands with wilderness characteristics and will determine the most appropriate land use allocations for these lands. Considering wilderness characteristics in the land use planning process may result in several outcomes, including the following: (1) emphasizing other multiple uses as a priority over protecting wilderness characteristics; (2) emphasizing other multiple uses, while applying management restrictions, such as conditions of use and mitigation measures, to reduce impacts on wilderness characteristics; and, (3) protecting wilderness characteristics as a priority over other uses.
- The BLM will manage the Central Arctic Management Area Wilderness Study Area, consistent with BLM Manual 6330—Management of BLM Wilderness Study Areas (BLM 2012c) and ANILCA, until Congress acts on the wilderness recommendation.

Members of the public recommended the following new planning criteria, but the BLM adopted neither of them because number 1 was inconsistent with the BLM's multiple-use mandate and number 2 was inconsistent with the intent of the alternatives:

1. The BLM will consider non-road alternatives a priority over road developments to minimize adverse impacts on subsistence and wildlife habitat.
2. All components of an individual alternative must be complementary, in that there will be no internal inconsistencies in a single alternative.

The following edit to a planning criterion was suggested, which the BLM has now adopted as a part of its planning criteria:

- The BLM will consider Department of the Interior guidance, Alaska Department of Fish and Game and USFWS objectives, and Federal Subsistence Board requirements and mandates in decisions related to wildlife management.

The BLM added the following planning criteria during the planning process:

- The RMP/EIS will evaluate public access and recreational opportunities when evaluating land tenure decisions, consistent with Secretarial Order 3373.
- Advance efforts to expand hunting, fishing, and recreational opportunities consistent with Secretarial Orders 3347, 3356, and 3366.
- The planning process will incorporate measures to protect against catastrophic wildfires, consistent with Secretarial Order 3372.

1.7 FLPMA Section 203 and Section 206

The BLM develops most RMPs to guide management of land over 20 or more years. Per FLPMA Section 102(a)(1), lands are to be retained in federal ownership unless it is determined that disposal of a particular parcel will serve the national interest. The Secretary of the Interior's policy is, generally, to not dispose of public lands. However, over the life of an RMP, situations may arise, especially in areas where public land tracts are isolated and difficult or uneconomic to manage and lack unique resources, where the BLM may find it useful to have identified tracts as suitable for leaving public ownership. Therefore, the BLM uses the land use planning process to identify lands that may be suitable for leaving public ownership.

Any decision on whether to dispose of a particular parcel under any authority would require site-specific consideration and analysis. This would include consideration of access (consistent with Secretarial Order 3373), popular recreational uses (consistent with Secretarial Order 3373), and the existence of cultural resources or habitat for species and whether such a parcel, isolated from the rest of the public lands, might be better suited for private ownership as well as BLM Informational Bulletin No. 2020-010, which requires documentation of impacts to recreational access as well as a comparison of acres disposed of and exchanged since 2017.

1.7.1 FLPMA Section 203 Sales

Section 203 of FLPMA specifies that the BLM may sell a tract of public land only if it identifies the tract through the land use planning process, pursuant to Section 202 of FLPMA. To that end, it must meet one or more of the disposal criteria listed in Section 203. To fulfill the regulatory guidance in FLPMA, lands identified to meet these criteria are outlined in only one alternative.

The preferred alternative does not allocate any lands as available for sale.

The BLM determines whether a tract meets the Section 203 disposal criteria based on its ongoing inventory of all public lands and their resources conducted, in accordance with Section 201 of FLPMA. The requirement under Section 203 that this determination be made through land use planning is consistent with the Section 202 requirement to manage public lands under land use plans. Such plans, including RMPs, represent a broader scope, longer-term approach to public lands management in an entire planning area. In the plans, the BLM considers a wide variety of possible uses of the public lands.

1.7.2 FLPMA Section 206 Exchanges

Exchanges of land out of Federal ownership are authorized in Alaska by Section 206 of FLPMA, Section 22(f) of ANCSA, and Section 1302(h) of ANILCA. Section 206(a) of FLPMA provides that the BLM may exchange a land out of Federal ownership if the agency determines that the public interest will be well served by making the exchange. Section 206 of FLPMA and Section 1302(h) of ANILCA require that the value of the land or that the values of the land exchanged be equal unless, the values are equalized by payment of no more than 25 percent of the total value of lands or interests leaving Federal ownership or the Secretary of the Interior (Secretary) determines that it is in the public interest to exchange lands for other than equal value.

Consistent with the requirements of Section 201 of FLPMA to maintain an inventory of all public lands and their resources, this plan identifies parcels of Federal land that meet the criteria for exchange. All action alternatives, including the preferred alternative, provide for exchange of parcels that meet the criteria.

1.7.3 Inventory of Lands Meeting the Criteria

In preparation for this land use planning initiative, and consistent with the requirements of Section 201 of FLPMA, the BLM conducted an inventory of the public land in the planning area to determine whether there are any tracts that meet one or more of the FLPMA Section 203 criteria for disposal out of federal ownership or FLPMA Section 206 criterial for exchange. The agency took into consideration the following:

- Because of its location or other characteristics, the tract is difficult and uneconomic to manage as part of the public lands and is not suitable for management by another federal department or agency.
- The tract was acquired for a specific purpose for which it is no longer required.
- Disposal of the tract would serve important public objectives, including expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public and which outweigh other public objectives and values, such as recreation and scenic values, which would be served by maintaining the tract under federal ownership.

Appendix C provides a list of tracts in the planning area identified as meeting one or more of these criteria, with an explanation of the basis for the BLM's determination.

1.8 ADAPTIVE MANAGEMENT

The goals of the CYRMP are to establish a structure for understanding conditions and trends across multiple scales, adapting to changes in conditions and trends, and facilitating informed decisions to sustain healthy, productive lands that support the BLM's multiple-use mission over the life of the plan. The BLM proposes to fulfill these goals by sustaining landscape connectivity between major conservation units and monitoring representative ecological benchmarks. This will allow it to detect landscape changes and distinguish change associated with permitted land uses from change associated with other change agents. **Appendix G** provides an explanation for the adaptive management framework and maps of the two sets of suitable ecological

benchmarks that serve as reference areas or controls for detecting and understanding the influence of human activity on ecological systems.

1.9 Related Land Use Plans

The BLM planning regulations state that RMPs shall be consistent with officially approved or adopted resource related plans, and the policies and programs contained therein, of other federal agencies and state, local, and tribal governments, so long as the guidance and RMPs are also consistent with the purposes, policies, and programs of federal laws and regulations applicable to public lands. These planning documents are listed in **Appendix D**.

1.10 Update to the Council of Environmental Quality Regulations Implementing the Procedural Provisions of NEPA

Consistent with the revised regulations at 40 Code of Federal Regulations 1506.13, references to the Council of Environmental Quality regulations throughout this Draft RMP and associated EIS refer to the regulations in effect prior to September 14, 2020. This document does not refer to the revised Council of Environmental Quality regulations effective on September 14, 2020, because the NEPA process associated with the proposed action began prior to this date.

Chapter 2. Alternatives

2.1 Management Common to All Alternatives

Allowable uses and management actions from the existing resource management plans (RMPs) that remain valid and do not require revision have been carried forward to all the proposed alternatives. This is because the existing decisions or management actions remain responsive to current issues and comply with all state and federal laws, regulations, policies, and standards, including the multiple use mandates of the Federal Land Policy and Management Act (FLPMA). These decisions are common to all five alternatives because a range of alternative decisions is not necessary for every resource or resource use. Other decisions are common only to Alternative A (no action) and the action alternatives, B, C1, C2, and D.

All action alternatives propose collaboration with adjacent landowners, federal and state agencies, communities, other agencies, and individuals and organizations, as needed, to monitor and implement decisions to achieve desired resource conditions.

Under all alternatives, the Bureau of Land Management (BLM) will apply best management practices (BMPs) and other site-specific mitigation to all resource uses, as appropriate, and will employ adaptive management per U.S. Department of the Interior and BLM policy. The BLM is directed to identify, consider, and, as appropriate, require mitigation to address reasonably foreseeable impacts on resources from public land uses consistent with the mitigation hierarchy, as defined in the Council on Environmental Quality regulations at 40 Code of Federal Regulations (CFR) 1508.20 and with Department of the Interior and BLM policy.

Under all alternatives, the BLM will apply standard operating procedures to all actions on public land, as appropriate, whether the BLM itself implements the action or authorizes it to be implemented by another individual, organization, or agency. The standard operating procedures provided in **Appendix F** were based on the best information available during development of the Central Yukon RMP/Environmental Impact Statement. Covered actions and activities would include FLPMA leases and permits, special recreation permits (SRPs), oil and gas activities, renewable energy activities, mining plans of operation, and authorizations for rights-of-way (ROWs).

The BLM will monitor all resources to determine the success of terms, conditions, stipulations, BMPs, and compliance with applicable state and federal laws.

Where restrictions appear to prohibit or prevent wildlife fire or fuels management, the BLM Authorized Officer (AO) retains the authority to determine whether fire and fuels management can occur in the area.

The Alaska National Interest Lands Conservation Act (ANILCA) designated 104 million acres for conservation by establishing or expanding national parks, wildlife refuges, wild and scenic rivers (WSRs), wilderness areas, forest monuments, conservation areas, recreation areas, and wilderness study areas (WSAs) to preserve them for future generations. ANILCA includes numerous provisions that apply to units that it designates and to public lands in the planning area managed by the BLM, the National Park Service (NPS) and U.S. Fish and Wildlife Service (USFWS). This includes the access provisions in ANILCA Sections 811 and 110(a), which allow for motorized and nonmotorized access for subsistence and general public use on federally managed lands, including designated wilderness. (See **Table 2-8**, **Table 2-9**, **Table 2-12**, **Table 2-15**, **Table 2-20**, **Table 2-22**, **Table 2-23**, and **Table 2-25**. **Appendix E** provides guidance on implementing Sections 811 and 1110(a) of ANILCA).

2.2 General Description of Alternatives

2.2.1 Alternative A: The No Action Alternative

Alternative A satisfies the National Environmental Policy Act requirement at 40 CFR 1502.14, that agencies shall include a "no action," which provides the baseline against which to compare the other alternatives. Alternative A would continue the current management direction and practices, based on the Utility Corridor RMP (BLM 1991), Central Yukon RMP (BLM 1986a), Southwest Management Framework Plan (BLM 1981), and other management decision documents. These include special rules published in the *Federal Register*, such as special rules for off-highway vehicle (OHV) and recreation use. Alternative A would continue the existing public land orders (PLOs), including withdrawals under the Alaska Native Claims Settlement Act (ANCSA) of 1971 17(d)(1).

Under Alternative A, there are 18 existing areas of critical environmental concern (ACECs) and 8 research natural areas (RNAs), for a total of approximately 1.8 million acres, designated to protect relevant and important values and research opportunities. Approximately 6.7 million acres are open to locatable mineral entry. Of these open lands, 3.5 million acres would be encumbered by State or Native selections. These selections segregate the lands from locatable mineral entry (43 CFR 2627.4.b) and federal priority subsistence (ANILCA 102.3 and 804). Under Alternative A, the BLM would maintain all existing withdrawals in the planning area, including PLO 5150.

2.2.2 Alternative B

Alternative B emphasizes resource protection over other uses. Planning for connectivity corridors (**Appendix G**), adaptability to climate change, and protection of priority species would be considered to a greater degree under this alternative than the other alternatives, with less emphasis on resource development. Thirty-one ACECs and RNAs (approximately 4 million acres) would be designated, with special management to address a wide range of relevant and important values and research opportunities.

Alternative B identifies areas suitable as ecological benchmarks. This allows the BLM to establish quantitative planning objectives, to monitor the effectiveness of management decisions in meeting those objectives, and to use that information to inform adaptive management strategies. The experimental control areas would lie mostly on BLM-managed lands, including approximately 5,518,846 acres of Central Yukon Field Office lands (see **Appendix G**).

Alternative B uses a variety of decisions to focus on priority habitats, including closing 4.2 million acres to fluid minerals and 1.4 million acres to locatables. High value watersheds management decisions include ROW exclusion in the 100-year floodplain. Alternative B also proposes 11 suitable WSRs and 363,000 acres of land to be managed for wilderness characteristics as a priority over other resources. Alternative B recommends a partial revocation of PLO 5150—set aside in 1971 for a utility and transportation corridor. This would allow for State of Alaska top-filed[1] lands to become valid selections on 738,000 acres.

Alternative B recommends a revocation of the ANCSA 17(d)(1) withdrawals. If accepted by the Secretary of the Interior, these revocations would make lands available for selection and appropriation. It would include land allotments by Alaska Native Vietnam-era veterans under Section 1119 of the John D. Dingell, Jr. Conservation, Management, and Recreation Act.

[1]Section 906(e) of ANILCA gave the State of Alaska the right to make top-filings (future selection applications) for its land entitlement selections, subject to valid existing rights and Native selection rights under ANSCA. These top-filings would become state-selected lands immediately on revocation of the PLO.

Alternative B also introduces a backcountry conservation area (BCA) in what is commonly known as the "outer corridor" of the Dalton Corridor, focusing on providing semiprimitive recreational hunting opportunities.

In addition, there are two special recreation management areas (SRMAs) and three extensive recreation management areas (ERMAs) under Alternative B; approximately 10.9 million acres would be open to locatable mineral entry, 7.2 million acres of which would be encumbered by State or Native selections.

2.2.3 Alternative C1

Alternative C1 emphasizes a blend of resource protection and resource development. Connectivity corridors (**Appendix G**), adaptability to climate change, and priority species would be considered in the context of allowing for more minerals development and other resource uses than under Alternative B. Eight ACECs or RNAs (approximately 418,000 acres) would be designated. Management to protect relevant and important values would be less restrictive for resource uses than under Alternative B. Like Alternative B, Alternative C1 identifies areas suitable as ecological benchmarks. Benchmarks under Alternative C1 would incorporate 2,457,104 acres of BLM-managed lands in the Central Yukon Field Office (see **Appendix G**).

Alternative C1 has fewer ACEC designations than Alternative B but does propose habitat-specific management for both Dall sheep and caribou (see **Appendix I**). Two FLPMA withdrawals are proposed for locatable minerals under this alternative, relative to caribou and Dall sheep habitats. Management actions for the 100-year floodplain of high value watersheds is emphasized under Alternative C1 as ROW avoidance areas.

Alternative C1 proposes no suitable WSRs and no acres identified as managed for wilderness characteristics as a priority; however, it does apply management restrictions to minimize impacts on wilderness characteristics on 882,000 acres of BLM-managed lands. Similar to Alternative B, Alternative C1 recommends a partial revocation of PLO 5150 for 738,000 acres of land.

Alternative C1 combines the two SRMAs identified in Alternative B into one SRMA with multiple resource management zones (RMZs) and identifies one ERMA. Under this alternative, approximately 12.2 million acres would be open to locatable mineral entry, 7.2 million acres of which would be encumbered by State or Native selections.

2.2.4 Alternative C2 (Preferred Alternative)

Alternative C2 emphasizes a blend of resource protection and resource development, but reduces the acres set aside as ACECs or closed to mineral entry and appropriation, while retaining the Toolik Lake RNA (77,000 acres). Management of habitat for caribou is similar to Alternative C1, except that there are no proposed FLPMA withdrawals. There are no specific management actions for Dall sheep habitat under this alternative.

While Alternative C1 identifies ROW avoidance, Alternative C2 limits ROW avoidance areas to core caribou habitat, clustered pingo locations, and a narrow band of BLM-managed lands that extends toward Venetie that is bordered by State of Alaska lands to the north and USFWS lands to the south.

Alternative C2 proposes no suitable WSRs. Lands with wilderness characteristics (LWCs) would be managed to emphasize other multiple uses as a priority over protecting wilderness characteristics.

Alternative C2 recommends a full revocation of PLO 5150, which would allow 2.1 million acres of State of Alaska top-filed lands to become valid selections. The inner Dalton Utility Corridor would be administratively

designated as a utility corridor. This would emphasize this continuing function as a utility and transportation corridor to support the current and future projects. Alternative C2 contains one SRMA and one ERMA.

Alternative C2 closes 1 million acres to mineral material sales; approximately 13.1 million acres would be open to locatable mineral entry, 7.9 million acres of which are encumbered by State or Native selections.

2.2.5 Alternative D

Alternative D emphasizes management to facilitate resource development more than the other alternatives. This alternative focuses on maximizing the development potential for BLM-managed lands. Management for habitat and resource relies on using current federal management guidelines without the use of habitat-specific or ACEC-specific management.

Climate change adaptability, and priority species are addressed by considering connecting existing conservation system units (CSUs) in the planning area, such as national wildlife refuges and national parks.

Alterative D does not designate any ACECs or RNAs, nor does it include SRMAs or ERMAs. LWCs would be managed to emphasize other multiple uses as a priority over protecting wilderness characteristics. This alternative does not propose any WSRs as suitable.

This alternative does not apply specific management to core caribou or Dall sheep habitat. The only areas not open to ROWs are in the existing Central Arctic Management Area (CAMA) WSA.

Alternative D recommends a full revocation of PLO 5150, which would allow 2.1 million acres of State of Alaska top-filed lands to become valid selections, like Alternative C2. Also, similar to Alternative C2, the inner Dalton Utility Corridor would be administratively designated as a utility corridor to emphasize function as a utility and transportation corridor to support the current and future projects.

Alternative D does not include any recommendations to close lands to mineral entry or appropriation; approximately 13.1 million acres would be open to locatable mineral entry, 7.9 million acres of which are encumbered by State or Native selections.

Table 2-1
Quantitative Summary of Alternatives

Allocation (Acres, Unless Noted)	Alternative A	Alternative B	Alternative C1	Alternative C2 (Preferred Alternative)	Alternative D
BLM-managed surface lands[1]	**13,302,000**	**13,302,000**	**13,302,000**	**13,302,000**	**13,302,000**
Federal mineral estate[1]	**13,083,000**	**13,083,000**	**13,083,000**	**13,083,000**	**13,083,000**
Core Caribou Habitat	**–**	**–**	**Map 2.1**	**Map 2.1**	**–**
Galena Mountain	0	0	174,000	174,000	0
Ray Mountains	0	0	572,000	572,000	0
Total:	**0**	**0**	**746,000**	**746,000**	**0**
Dall Sheep	**–**	**–**	**Map 2.2**	**–**	**–**
Dall Sheep Habitat Areas (DSHA)	0	0	4,600	0	0
Dall Sheep Movement Corridors (DSMC)	0	0	163,000	0	0
Dall Sheep Study Area (DSSA)	0	0	371,300	0	0
SRMAs	**Map 2.3**	**Map 2.4**	**Map 2.5**	**Map 2.6**	**–**
Central Dalton	0	144,000	0	0	0
Dalton	0	0	0	497,000	0
Dalton Highway	801,000	0	0	0	0
Dalton Highway Corridor	0	0	2,437,000	0	0
Dalton Corridor	2,213,000	0	0	0	0
Sukakpak Region	0	353,000	0	0	0
Total:	**3,014,000**	**497,000**	**2,437,000**	**497,000**	**0**
ERMAs	**Map 2.3**	**Map 2.4**	**Map 2.5**	**Map 2.6**	**–**
CAMA	405,000	0	0	0	0
Dalton	0	0	0	1,460,000	0
Nigu-Iteriak ACEC/Recreation Management Area (RMA)	152,000	0	0	0	0
Nigu-Iteriak River (CAMA)	0	136,000	136,000	0	0
Oolamnagavik-Colville	73,000	0	0	0	0
Spooky Valley	0	9,000	9,000	0	0

Allocation (Acres, Unless Noted)	Alternative A	Alternative B	Alternative C1	Alternative C2 (Preferred Alternative)	Alternative D
Total:	**630,000**	**145,000**	**145,000**	**1,460,000**	**0**
BCA	**–**	**Map 2.4**	**–**	**–**	**–**
Dalton Corridor	0	1,605,000	0	0	0
LWC	**Map 2.7**	**Map 2.8**	**Map 2.9**	**Map 2.7**	**Map 2.7**
LWC managed to emphasize other resource values and multiple uses	12,721,000	7,642,000	11,839,000	12,721,000	12,721,000
LWC managed to protect those characteristics as a priority of other multiple uses	–	–	–	–	–
Accomplishment Creek	0	34,000	0	0	0
Alatna	0	5,000	0	0	0
Arms Lake	0	11,000	0	0	0
Ishtalitna Creek Hot Springs	0	1,000	0	0	0
McQuesten Creek	0	4,000	0	0	0
Redlands Lake	0	4,000	0	0	0
Spooky Valley	0	9,000	0	0	0
Upper Teedriinjik (Chandalar) River	0	295,000	0	0	0
Total:	**0**	**363,000**	**0**	**0**	**0**
LWC managed to emphasize other multiple uses, while applying management restrictions to reduce impacts on wilderness characteristics	–	–	–	–	–
Alatna	0	0	4,000	0	0
Galena Mountain	0	62,000	0	0	0
Hogatza River tributaries	0	221,000	0	0	0
Huslia	0	73,000	0	0	0
Klikhtentotza River	0	108,000	0	0	0
Lands covered by PLO 5173	0	1,630,000	0	0	0
Lands covered by PLO 5179 (CAMA outside of the WSA)	0	650,000	878,000	0	0

Allocation (Acres, Unless Noted)	Alternative A	Alternative B	Alternative C1	Alternative C2 (Preferred Alternative)	Alternative D
Sethkokna River	0	299,000	0	0	0
Sulukna River	0	398,000	0	0	0
Tozitna	0	1,043,000	0	0	0
Toolik Lake	0	87,000	0	0	0
Wheeler Creek	0	145,000	0	0	0
Total:	**0**	**4,716,000**	**882,000**	**0**	**0**
Eligible (Alternative A) and Suitable (Alternative B) WSRs (Miles)	**Map 2.10**	**Map 2.10**	**–**	**–**	**–**
Atigun River	31	31	0	0	0
Colville River	29	29	0	0	0
Dietrich River	38	38	0	0	0
Dulbi River	61	61	0	0	0
Hogatza River	157	157	0	0	0
Jim River	67	67	0	0	0
Kanuti-Kilolitna River	70	70	0	0	0
Mathews River	15	15	0	0	0
Sagavanirktok River-Lower (Sag)	19	19	0	0	0
Sulukna River	62	62	0	0	0
Total:	**603**	**603**	**0**	**0**	**0**
Visual Resource Management (VRM)	**Map 2.11**	**Map 2.12**	**Map 2.13**	**Map 2.14**	**Map 2.15**
Class I	259,000	762,000	268,000	259,000	259,000
Class II	0	6,661,000	2,935,000	144,000	0
Class III	2,584,000	261,000	117,000	1,799,000	2,027,000
Class IV	801,000	5,615,300	9,982,000	11,100,000	11,016,000
Unclassified	9,658,000	0	0	0	0
ACECs/RNAs	**Maps 2.16 and 2.17**	**Maps 2.18 and 2.19**	**Maps 2.20 and 2.21**	**Map 2.22**	**–**
Accomplishment Creek	0	41,000	7,000	0	0
Alatna River	0	5,000	4,000	0	0

Allocation (Acres, Unless Noted)	Alternative A	Alternative B	Alternative C1	Alternative C2 (Preferred Alternative)	Alternative D
Arms Lake	11,000	11,000	0	0	0
Dulbi River	54,000	0	0	0	0
Galbraith Lake	53,000	52,000	52,000	0	0
Galena Mountain	19,000	62,000	0	0	0
Hogatza River Tributaries	5,000	221,000	0	0	0
Huslia	0	73,000	0	0	0
Indian River	155,000	173,000	0	0	0
Ishtalitna Creek Hot Springs	1,000	1,000	0	0	0
Jim River	203,000	303,000	30,000	0	0
Kanuti Hot Springs	40	150	0	0	0
Klikhtentotzna Creek	0	108,000	0	0	0
Lake Todatonten Pingos	1,000	1,000	0	0	0
McQuesten Creek	4,000	4,000	0	0	0
Mentanontli River/Lake Todatonten	0	20,000	0	0	0
Midnight Dome/Kalhabuk	0	10,000	0	0	0
Nigu-Iteriak	40,000	0	0	0	0
Nugget Creek	3,000	3,000	0	0	0
Poss Mountain	9,000	25,000	0	0	0
Redlands Lake	4,000	4,000	0	0	0
Sethkokna River	0	299,000	0	0	0
Snowden Mountain	30,000	0	0	0	0
South Fork Koyukuk River	0	415,000	44,000	0	0
South Todatonten Summit	1,000	1,000	0	0	0
Spooky Valley	10,000	9,000	0	0	0
Sukakpak Mountain	3,000	0	0	0	0
Sukakpak/Snowden Mountain	0	124,000	124,000	0	0
Sulukna River	25,000	398,000	51,000	0	0
Toolik Lake	77,000	106,000	106,000	77,000	0

Allocation (Acres, Unless Noted)	Alternative A	Alternative B	Alternative C1	Alternative C2 (Preferred Alternative)	Alternative D
Tozitna	0	1,043,000	0	0	0
Tozitna River	842,000	0	0	0	0
Tozitna Subunits North and South	192,000	0	0	0	0
Upper Kanuti River	0	50,000	0	0	0
Upper Teedriinjik (Chandalar) River	0	295,000	0	0	0
West Fork Atigun	9,000	33,000	0	0	0
Wheeler Creek	0	145,000	0	0	0
Total:	**1,751,000**	**4,035,000**	**418,000**	**77,000**	**0**
WSA	**Map 2.23**	**Map 2.23**	**Map 2.23**	**Map 2.23**	**Map 2.23**
CAMA[2]	259,000	259,000	259,000	259,000	259,000
National Historic Trail (Miles)	**Map 2.23**	**Map 2.23**	**Map 2.23**	**Map 2.23**	**Map 2.23**
Iditarod National Historic Trail (INHT)	2.7	2.7	2.7	2.7	2.7
Forestry	**Map 2.24**	**Map 2.25**	**Map 2.26**	**Map 2.24**	**Map 2.24**
Prohibit commercial timber development; prohibit non-subsistence collection of live vegetation (subsistence use still requires a permit)	259,000	2,903,000	603,000	259,000	259,000
Permit subsistence timber harvest and vegetation removal	13,043,000	10,399,000	12,699,000	13,043,000	13,043,000
Lands and Realty	**–**	**–**	**–**	**–**	**–**
Land Tenure	–	**Map 2.27**	**Map 2.27**	–	–
Meet the criteria for lands available for disposal	0	193,600	193,600	0	0
PLO and ANCSA withdrawals	**Maps 2.28, 2.29, and 2.30**	**Map 2.31**	**Map 2.31**	**Map 2.32**	**Map 2.32**
Lands withdrawn under PLO 5150 to be retained	2,138,000	743,000	743,000	0	0
Lands withdrawn under PLO 5150 to be revoked	0	1,395,000	1,395,000	2,138,000	2,138,000

Allocation (Acres, Unless Noted)	Alternative A	Alternative B	Alternative C1	Alternative C2 (Preferred Alternative)	Alternative D
Lands withdrawn under ANCSA 17 (d)(1) to be retained	5,253,000	0	0	0	0
Lands withdrawn under ANCSA 17 (d)(1) to be revoked	0	5,253,000	5,253,000	5,253,000	5,253,000
Utility and Transportation Corridors	**-**	**Map 2.33**	**Map 2.33**	**Map 2.34**	**Map 2.34**
Ambler	0	65,000	65,000	65,000	65,000
Umiat	0	268,000	268,000	268,000	268,000
Dalton Highway	0	0	0	743,000	743,000
Total:	**0**	**333,000**	**333,000**	**1,066,000**	**1,066,000**
ROWs	**Map 2.35**	**Map 2.36**	**Map 2.37**	**Map 2.38**	**Map 2.39**
ROW exclusion	259,000	2,349,000	265,000	259,000	259,000
ROW avoidance	0	5,360,000	3,253,000	906,000	0
Open to ROW location	13,043,000	5,593,000	9,784,000	12,137,000	13,043,000
Travel Management Areas (TMAs)	**Map 2.40**	**Map 2.41**	**Map 2.41**	**Map 2.41**	**Map 2.41**
CAMA lands outside the WSA		531,000	531,000	531,000	531,000
Within 5 miles of the Dalton Highway	1,365,000	0	0	0	0
Dalton Corridor	0	2,138,000	2,138,000	2,138,000	2,138,000
Fairbanks	1,307,000	1,307,000	1,307,000	1,307,000	1,307,000
Nigu Wilderness and Iteriak ACEC	152,000	0	0	0	0
Interim OHV management (all lands under all alternatives are *limited* for OHV travel)	**Maps 2.42, 2.43, and 2.44**	**Maps 2.45, 2.46, and 2.47**	**Maps 2.48, 2.49, and 2.50**	**Maps 2.51, 2.52, and 2.53**	**Maps 2.51, 2.54, and 2.55**
Seasonal limitations for OHV travel (closed in summer)	0	2,072,000	106,000	77,000	0
Subject to OHV timing limitations (no OHVs May 1–June 30)	0	1,163,000	745,000	745,000	0
Fluid Minerals	**Map 2.56**	**Maps 2.57 and 2.60**	**Maps 2.58, 2.61, and 2.62**	**Map 2.59**	**Map 2.59**
Closed to fluid mineral leasing per PLOs	8,165,000	743,000	743,000	0	0
Closed to fluid mineral leasing and development[4]	30,000	4,220,000	830,000	259,000	259,000

Allocation (Acres, Unless Noted)	Alternative A	Alternative B	Alternative C1	Alternative C2 (Preferred Alternative)	Alternative D
Open to fluid mineral leasing and development	4,888,000	8,120,000	11,510,000	12,824,000	12,824,000
Open, subject to no surface occupancy (NSO) stipulation	0	2,254,000	1,360,000	0	0
Open, subject to controlled surface use stipulation	0	0	1,495,000	0	0
Nonenergy Solid Leasable Minerals	**Map 2.63**	**Map 2.64**	**Map 2.65**	**Map 2.66**	**Map 2.66**
Closed to nonenergy solid mineral leasing per PLOs	8,165,000	743,000	743,000	0	0
Closed to nonenergy solid mineral leasing and development[3]	17,000	5,091,000	833,000	259,000	259,000
Open to nonenergy solid mineral leasing and development	4,901,000	7,249,000	11,507,000	12,824,000	12,824,000
Locatable Minerals	**Map 2.67**	**Map 2.68**	**Map 2.69**	**Map 2.70**	**Map 2.70**
Currently withdrawn from locatable mineral entry and no revocation is recommended	4,670,000	743,000	743,000	0	0
Currently withdrawn, but open to location of metalliferous minerals	1,182,000	0	0	0	0
Recommended for withdrawal from locatable mineral entry	458,000	1,461,000	156,000	0	0
Open to locatable mineral entry	6,773,000	10,879,000	12,184,000	13,083,000	13,083,000
Open, State- or Native-selected, segregated	3,305,000	7,222,000	7,222,000	7,965,000	7,965,000
Mineral Materials	**Map 2.71**	**Map 2.72**	**Map 2.73**	**Map 2.74**	**Map 2.75**
Closed to mineral materials disposal[4]	266,000	5,041,000	1,465,000	1,004,000	259,000
Open to mineral materials disposal	12,817,000	8,042,000	11,618,000	12,079,000	12,824,000

Source: BLM GIS 2017

[1]The difference between BLM-managed surface estate and federal mineral estate in the decision area is due to surface lands managed by the BLM but Native patent subsurface, or minerals.

[2]Acreage differs from the Alaska Statewide Wilderness Study Report due to the use of geographic information system (GIS)-generated acres and rounding for consistency in this document. The use of GIS-generated acres does not change the 260,060 acres identified in the Alaska Statewide Wilderness Study Report.

[3]Seasonal limitations for OHVs is an implementation decision.

[4]259,000-acre mineral closure is CAMA (closed through BLM policy for WSA).

2.3 ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

The following alternatives were considered but eliminated from detailed analysis. This is because they do not meet the purpose of and need for the RMP (see **Section 1.1**) or because they do not fall within technical, legal, or policy constraints for BLM-managed resources and resource uses.

2.3.1 Retain all ANCSA 17(d)(1) Withdrawals

The ANCSA authorized the Secretary of the Interior (Secretary) to withdraw and reserve public lands for study and classification. This was done through a series of PLOs issued between 1972 and 1975. These are referred to as ANCSA 17(d)(1) withdrawals. The withdrawals kept the lands from being selected by ANCSA corporations and prevented the creation of new third-party interests that would interfere with land conveyance. The withdrawals also allowed the BLM time to study and classify the lands.

\The BLM considered an alternative to retaining all existing ANCSA 17(d)(1) mineral withdrawals but eliminated it from detailed analysis. It did this because the selection process is complete and because the land use planning process is being used to determine appropriate classifications of the lands.

2.3.2 Recommending Wilderness Designation by Congress

Although the BLM inventoried wilderness characteristics and will analyze the impacts on those characteristics, it does not intend to make wilderness designation recommendations in this plan. Nonetheless, the plan will provide sufficient detail to support suitability determinations and designation recommendations should the Secretary choose to pursue such options. The BLM has considered a full range of reasonable alternatives addressing how, where practical, it will manage certain LWCs for naturalness, solitude, and outstanding opportunities for primitive and unconfined recreation.

2.3.3 Maintain or Protect Wilderness Characteristics in the Utility Corridor

PLO 5150 withdrew and reserved the public lands as a utility and transportation corridor, consistent with Section 17(c) of ANCSA, in aid of programs for the United States government and the State of Alaska. Managing to protect or maintain LWCs is not consistent with this purpose; therefore, even though most of the Utility Corridor has wilderness characteristics, none of the alternatives would manage these lands to protect or maintain wilderness characteristics. Instead, they would be managed to emphasize resource values and uses consistent with the purpose of PLO 5150.

2.4 ALTERNATIVES COMPARISON

Use the hyperlinks below to access the applicable section for the topics considered in the alternatives.

Air Quality

Areas of Critical Environmental Concern

Backcountry Conservation Areas (See **Appendix K** for further details)

Cultural Resources

Fluid Leasable Minerals

Forestry

Hazardous Materials

Lands and Realty

Lands with Wilderness Characteristics

Locatable Minerals

Mineral Materials (Salable Minerals)

National Historic Trails

Nonenergy Solid Leasable Minerals

Paleontological Resources

Recreation and Visitor Service (See **Appendix K** for further details of recreation management areas)

Soils

Species of Special Concern (including Special Status Species)

Travel and Transportation Management

Travel Management Areas

Vegetation (Including Nonnative Invasive Species)

Visual Resources

Water, Fish, and Riparian Vegetation

Wild and Scenic Rivers

Wilderness Study Areas

Wildland Fire

Wildlife

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Table 2-2
Water, Fish, and Riparian Vegetation

Goals:

- Soil and plant conditions support infiltration, soil moisture storage, and the release of water; ensure that they are in balance with climate and landforms and should maintain or improve water quality, water quantity, and timing and duration of flow.
- Ensure that surface water and groundwater quality comply with federal and State water quality standards.
- Ensure that the hydrologic cycle remains in balance and supports healthy, productive, and diverse biotic populations and communities.
- Ensure that riparian zones are fully functional over the width of the 100-year floodplain.
- Ensure that watersheds closely approximate natural successional processes and hydrologic regimes.
- Ensure that physical, chemical, and biological properties of soil support the full productive capacity of the land and its ecological processes, such as hydrological function of watersheds.
- Ensure that ecosystem services are associated with properly functioning aquatic and riparian habitat.
- Maintain natural input rates into aquatic systems of sediment, organic matter, and nutrients.
- Maintain watersheds to create and sustain functional terrestrial, riparian, aquatic, and wetland habitats that can support diverse populations of native aquatic- and riparian-dependent species
- Ensure the integrated ecological functions of rivers, streams, wetlands, lakes, and the associated riparian areas.
- Retain the many significant values and ecosystem services associated with properly functioning aquatic and riparian habitat: biological diversity, recreation, aesthetics, soil productivity, water quality, food, and raw materials.
- Maintain properly functioning riparian, wetland, and aquatic vegetation at levels appropriate to the watershed's soils, climate, and landform.

Objectives:

- Maintain water quality to prevent the listing of any Clean Water Act, Section 303d, impaired streams on BLM-managed lands, resulting solely from BLM-authorized activities.
- Within 80 percent of any stream reach when practicable, maintain streambank stability greater than 95 percent for A, B, and E channel types and greater than 90 percent for C channel types (see **Appendix H**).
- Maintain sufficient surface water and groundwater flows to keep hot springs beneficial uses and the unique ecosystems.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** Inventory water needs and secure reservations of water for instream flows and water levels, where needed to support BLM programs.	**Action:** • Apply to the State of Alaska for reservations of water for instream flows and water levels on high value streams in the planning area (Accomplishment Creek, Billy Hawk Creek, Indian River, Kanuti-Kilolitna River, Klikhtentotzna Creek, Prospect Creek, Ray River, Section Creek, Sethkokna River, and Sulukna River). • If nonnative invasive species (NNIS) are documented, develop a plan within 1 year for eradicating or controlling nonnative noxious species. • Preserve stream flows necessary to protect fish and wildlife habitat, fish migration, and propagation and maintain and improve recreational and subsistence fisheries; protect for water quality and transportation.		
	Action: No similar action.	**Action:** As it pertains to implementation of a stream channel design: riparian-wetland spatial and areal extent, vegetation density, dominant woody vegetation composition, and age-class distribution would be similar to undisturbed reference condition (e.g., conditions within upper 25th percentile of the Regional Reference Condition) on completion of reclamation. In the rest of the 100-year floodplain, except for canopy cover and age-class distribution, the remaining riparian areas would exhibit spatial and areal extent, vegetation density, and dominant woody vegetation composition, similar to the undisturbed reference condition within 3 years.	**Action:** No similar action.	
	Action: Reclamation for all permitted surface-disturbing activities shall achieve stable channel form, floodplain connectivity, bedform diversity, and riparian vegetation in proper functioning condition, per BLM Handbook H-3809-1, Surface Management. See **Appendix H**.	**Action:** Plan and carry out reclamation for all permitted surface-disturbing activities, so that the affected stream segment will be geomorphically stable, per BLM Handbook H-3809-1, Surface Management, as measured by channel form, floodplain connectivity, bedform diversity, and riparian vegetation. See **Appendix H**.	**Action:** Same as Alternative B.	

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** No similar action.	**Action:** Manage wetlands as ROW avoidance areas.	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** Manage 158,000 acres of the narrow band of BLM-managed lands that extends toward Venetie as ROW avoidance to focus on finding suitable collocations for any proposed ROWs, to mitigate impacts on moose habitat and fish spawning in this narrow corridor.	**Action:** No similar action.
	Action: No similar action.	**Action**: All disturbances greater than 1 acre need a stormwater pollution prevention plan and compliance with the construction general permit.			
	Action: No similar action.	**Action:** Prohibit timber harvest within 100 feet of a water body, with the following exceptions subject to AO discretion: • Subsistence harvest • ROW harvests within designated transportation and utility corridors • Research harvest when the research purpose cannot be otherwise met • Fuels management harvest when the fuels management purpose cannot be otherwise met • Development and maintenance of federal administrative sites Prohibit non-subsistence collection of live vegetation other than timber within 100 feet of a waterbody.	***Alternative C1*** **Action:** Prohibit timber harvest within 66 feet of a waterbody, with the following exceptions, subject to AO discretion: • Subsistence harvest • ROW harvests within areas designated as transportation and utility corridors • Research harvest when the research purpose cannot be otherwise met • Fuels management harvest when the fuels management purpose cannot be otherwise met • Development and maintenance of federal administrative sites • Prohibit non-subsistence collection of live vegetation other than timber within 66 feet of a waterbody	***Alternative C2*** **Action:** Prohibit timber harvest within 50 feet of a waterbody, with the following exceptions, subject to AO discretion: • Subsistence harvest • ROW harvests within designated transportation and utility corridors • Research harvest when the research purpose cannot be otherwise met • Fuels management harvest when the fuels management purpose cannot be otherwise met • Development and maintenance of federal administrative sites • Prohibit non-subsistence collection of live vegetation other than timber within 50 feet of a waterbody	**Action:** Same as Alternative C2.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Hot Springs	**Action:** No similar action.	**Action:** • Prohibit mineral materials disposal within 160-acre area surrounding hot springs. • Close to nonenergy solid mineral leasing and development within the 160-acre area centered on hot springs.			
	Action: No similar action.	**Action:** Prohibit surface-disturbing activities within the 160-acre area centered on hot springs.	**Action:** Minimize surface-disturbing activities within the 160-acre area centered on hot springs.		**Action:** No similar action.
	Action: No similar action.	**Action:** Recommend for withdrawal from locatable entry within the 160-acre area centered on hot springs.	**Action:** No similar action.		
	Action: No similar action.	**Action:** Close to fluid mineral leasing and development within the 160-acre area centered on hot springs.	**Action:** Same as Alternative B.		**Action:** Apply NSO stipulations to fluid mineral leasing (see **Appendix F**) within the 160-acre area centered on hot springs, with an exception for geothermal leases or wells.
	Action: No similar action.	**Action:** Manage the following hot springs as ROW exclusion: • Kanuti • Ishtalitna • Ray River • Kilo	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action**: No similar action.	**Action:** No similar action.
	Action: No similar action.	**Action:** Manage the 160-acre area centered on hot springs as ROW avoidance.	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** In areas within 160 acres surrounding hot springs, open them to ROW location with mitigation for the placement of structures, such as boardwalks, soaking platforms, and building,) to avoid surface disturbance.	**Action:** No similar action.
	Action: No similar action.	**Action:** Prohibit summer OHV use within the 160-acre area centered on hot springs.	**Action:** Limit travel to existing trails within the 160-acre area centered on hot springs.		**Action:** No similar action.
	Action: Leases on undeveloped hot springs would not be issued in the planning area.	**Action:** Make leases available only for previously developed hot springs.	**Action:** No similar action.		
100-Year Floodplain	**Action:** No similar action.	**Action:** Prohibit mineral materials disposal within the 100-year floodplain within high-value watersheds.	**Action:** Avoid, when practicable, mineral materials disposal within the 100-year floodplain within high-value watersheds.		**Action:** No similar action.
	Action: No similar action.	**Action:** Close to nonenergy solid mineral leasing and development within the 100-year floodplain of high-value watersheds.	**Action:** Avoid, when practicable, nonenergy solid mineral leasing and development within the 100-year floodplain of high-value watersheds.		**Action:** No similar action.
	Action: No similar action.	**Action:** Close the 100-year floodplain of high-value watersheds to fluid mineral leasing and development.	**Action:** No similar action.		
	Action: No similar action (standard lease terms and conditions apply).	**Action:** Apply NSO stipulations to fluid mineral leases (see **Appendix F**) within all 100-year floodplains not otherwise closed.	**Action:** No similar action.		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
100-Year Floodplain *(cont.)*	**Action:** No similar action (no restrictions on ROW location).	**Action:** Manage as ROW exclusion within the 100-year floodplain of high-value watersheds. Manage as ROW avoidance within all 100-year floodplains not otherwise managed as ROW exclusion.	***Alternative C1*** **Action:** Manage as ROW avoidance within the 100-year floodplains of high-value watersheds.	***Alternative C2*** **Action:** Mark areas within the 100-year floodplain of high-value watersheds available for ROW location. ROW authorizations would include mitigations for in-stream crossing; any activity that disturbs the in-stream channel and riparian vegetation and causes erosion; surface disturbance associated with construction and maintenance of facilities or structures that are within the 100-year floodplain of high value watersheds.	**Action:** No similar action.
Lentic Areas	**Action**: No similar action.	**Action**: Prohibit surface-disturbing activities within 0.25 miles of lentic areas.	***Alternative C1*** **Action**: Minimize surface-disturbing activities within 0.25 miles of lentic areas.	***Alternative C2*** **Action:** Within 0.25 miles of lentic areas, include in ROW authorizations mitigations for any surface-disturbing activity, as well as disturbance related to construction and maintenance of facilities in the riparian zone.	**Action**: No similar action.
	Action: No similar action.	**Action**: Close areas within 0.25 miles of lentic areas to fluid mineral leasing and development.	**Action**: No similar action.		
	Action: No similar action.	**Action:** Manage the area within 0.25 miles of lentic areas as ROW avoidance.	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** Within 0.25 miles of lentic areas, include in ROW authorizations mitigations for any surface-disturbing activity, as well as disturbance related to construction and maintenance of facilities in the riparian zone.	**Action:** No similar action.

Table 2-3
Soils

Goals:

- Ensure that watersheds are in, or are making significant progress toward, a properly functioning physical condition, which includes their soils in upland, riparian, wetland, and aquatic areas.
- Ensure the infiltration and permeability rates, moisture storage, and stability of soils are appropriate to the watershed's soil, climate, and landform.
- Manage sensitive soils types—permafrost, riparian, wetland, steep slopes (greater than 35 percent), and aquatic areas—so they are adequately protected from degradation, due to land-disturbing activities.
- Increase efforts to inventory and monitor soil resources in the planning area.
- Manage the physical, chemical, and biological properties of soil so that they support the full productive capacity of the land, its ecological processes, such a hydrological function of watersheds, and provide the ecosystem services associated with properly functioning aquatic and riparian-wetland habitat.

Objectives:

- Do not allow mineral soil loss to exceed the average rate of soil accumulation, based on reference conditions.
- Maintain organic matter in amounts sufficient to prevent significant short- or long-term nutrient cycle deficits and to avoid detrimental physical and biological soil conditions.
- Maintain or improve soil productivity by increasing vegetation cover and reducing soil compaction and erosion in disturbed areas.
- Ensure that infiltration and permeability of organic and mineral soils is consistent with the reference condition to the extent practicable.
- Promote maintenance of soil properties and vegetation conditions consistent with the potential of the site.
- Ensure that soils are free from pollutants that could alter ecosystem integrity or affect public health. Work toward remediation of sites in the planning area with soils impacted by oil spills or other hazardous material releases.
- Design disturbance and reclamation activities to minimize the extent of hydrologic heaving, slumping, or thawing of permafrost.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D

General	**Action:** No similar action	**Action:**
		• For all surface-disturbing activities, require stockpiling and protection of all topsoil and organic material for use in reclamation.
		• Promote concurrent reclamation whenever technically feasible; this will not be appropriate to all types of permitted activities.
		• Complete reclamation as soon as practical to avoid loss of topsoil.
		• Monitor highly erodible soils, soils associated with permafrost, and representative soil types for changes in conditions. If monitoring determines that soil properties are becoming degraded due to OHV use or other surface-disturbing activities, then develop and implement appropriate management actions, such as the following:
		  ○ Review OHV use limitations
		  ○ Relocate, harden, or close trails		

	Action: In the Dalton Utility Corridor, require mitigation for all activities that could accelerate soil erosion.	**Action:** No similar action.		
	Action: No similar action.	**Action:** Possibly require soil surveys on permitted surface disturbance activities greater than 5 acres, to determine ecological site potential and establish a baseline. The purpose of the soil survey would help to determine existing soil types on-site and thereby guide the selection of more appropriate reclamation measures and project site selection.	**Action:** Same as Alternative B.	**Action:** No similar action.
	Action: No similar action.	**Action:** If permitted uses break the vegetation mat, require the permittee to make necessary repairs to limit future soil change before continuing use of the route.	**Action:** If permitted uses break the vegetation mat, possibly require the permittee to make necessary repairs or reduce/change use to limit future soil change before continuing use of the route.	**Action:** Same as Alternative C.
	Action: No similar action.	**Action:** For all permitted activities, incorporate necessary design and equipment considerations, including route selection and avoidance of sensitive soil types.	**Action:** Same as Alternative B.	

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action (Nonenergy Solid Leasable Minerals):** No similar action. (No restrictions on nonenergy solid leasable minerals.)	**Action (Nonenergy Solid Leasable Minerals):** Close to nonenergy solid leasable mineral leasing and development on slopes greater than 35 percent.	***Alternative C1*** **Action (Nonenergy Solid Leasable Minerals):** Close to nonenergy solid leasable mineral leasing and development on slopes greater than 35 percent.	***Alternative C2*** **Action (Nonenergy Solid Leasable Minerals):** No similar action. (No restrictions on nonenergy solid leasable minerals.)	**Action (Nonenergy Solid Leasable Minerals):** No similar action. (No restrictions on nonenergy solid leasable minerals.)
	Action (Fluid Leasable Minerals): No similar action. (Standard lease terms and conditions apply.)	**Action (Fluid Leasable Minerals):** • Apply NSO stipulations to fluid mineral leases (see **Appendix F**) on sensitive soils in high-value watersheds. • Apply controlled surface use stipulations to fluid mineral leases on slopes greater than 35 percent and in areas with sensitive soils. • Before sensitive soils are disturbed, require a BLM AO-approved reclamation plan. The plan must demonstrate the following: (1) no other practicable alternatives exist for relocating the activity, (2) the activity would be located to reduce impacts on soil and water resources, (3) site productivity would be maintained or restored, (4) surface runoff and sedimentation would be adequately controlled, (5) on- and off-site areas would be protected from accelerated erosion, (6) no areas susceptible to mass wasting would be disturbed, and (7) surface-disturbing activities would be prohibited during extended wet periods.	**Action (Fluid Leasable Minerals):** • Apply controlled surface use stipulations to fluid mineral leases (see **Appendix F**) on slopes greater than 35 percent and in areas with sensitive soils. • Before sensitive soils are disturbed, require a BLM AO-approved reclamation plan. The plan must demonstrate the following: (1) no other reasonable alternatives exist for relocating the activity, (2) the activity would be located to reduce impacts on soil and water resources, (3) surface runoff and sedimentation would be adequately controlled, (4) on- and off-site areas would be protected from accelerated erosion, (5) no areas susceptible to mass wasting would be disturbed, and (6) surface-disturbing activities would be prohibited or appropriate mitigations applied during extended wet periods		
	Action (ROWs): No similar action. (No restrictions on ROW location.)	**Action (ROWs):** Manage sensitive soils in high-value watersheds and slopes greater than 35 percent as ROW avoidance.	***Alternative C1*** **Action (ROWs):** Manage slopes greater than 35 percent as ROW avoidance.	***Alternative C2*** **Action (ROWs):** No similar action. (No restrictions on ROW location).	**Action (ROWs):** No similar action. (No restrictions on ROW location.)
	Action (ROWs): No similar action. (No design requirements for ROWs.)	**Action (ROWs):** Require ROWs on sensitive soils and slopes greater than 35 percent to incorporate necessary design and equipment considerations, to meet soil resource objectives.	***Alternative C1*** **Action (ROWs):** Require ROWs on slopes greater than 35 percent to incorporate necessary design and equipment considerations, to meet soil resource objectives.	***Alternative C2*** **Action (ROWs):** No similar action. (No design requirements for ROWs.)	**Action (ROWs):** No similar action. (No design requirements for ROWs.)
	Action (Travel and Transportation Management): Confine OHV operations to soils with low erosion potential or times of the year when the surface (down to 12 inches) is frozen and has sufficient snow cover to protect the integrity of on-site vegetation. Within the Dalton Utility Corridor, restrict OHVs to soils with low erosion hazard or to winter use with adequate snow cover.	**Action (Travel and Transportation Management):** No similar action.			

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General *(cont.)*	**Action (Forestry):** No similar action. (Implement provisions in the Alaska Forest Resources and Practices Act [Alaska Statute (AS) 41.17].)	**Action (Forestry):** Prohibit timber harvest on sensitive soils, with the following exceptions, subject to AO discretion: • Subsistence harvest • ROW harvests within designated transportation and utility corridors • Research harvest when the research purpose cannot be otherwise met • Fuels management harvest when the fuels management purpose cannot be otherwise met • Development and maintenance of federal administrative sites Prohibit non-subsistence collection of live vegetation other than timber.	**Action (Forestry):** Same as Alternative A. (No similar action; implement provisions of the Alaska Forest Resources and Practices Act ([AS 41.17].)	

Table 2-4
Wildlife

Goals:
- Manage wildlife habitat to ensure self-sustaining populations and a natural abundance, distribution, and diversity of wildlife.
- Prevent disease transmission between domestic animals and wildlife.
- Meet BLM and Alaska Department of Fish and Game species management objectives.

Objectives:
- Provide habitat of sufficient quantity, quality, and connectivity to allow for stable populations of wildlife, using such metrics as the average recruitment rate or as otherwise defined by the BLM, in collaboration with the Alaska Department of Fish and Game and the USFWS.
- Identify and characterize wildlife habitats.
- Conduct periodic and systematic inventories of wildlife and wildlife habitat.
- Effectively avoid or minimize impacts on wildlife and wildlife habitat.
- Apply mitigation measures that effectively protect wildlife and wildlife habitat.
- Minimize wildlife habitat fragmentation and impacts on wildlife.
- Ensure that implementation-level plans include objectives specific to wildlife habitat provision.
- Collaborate with other agencies and the public to ensure that wildlife and wildlife habitat goals and objectives are met.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General	**Action:** No similar action.	**Action:** • Designate moose, caribou, Dall sheep, and beaver as priority species in the planning area. • When authorizing projects, require that they incorporate design features or stipulations to mitigate impacts on wildlife, wildlife habitat, and wildlife movement. • Follow USFWS national and Alaska guidelines for timing recommendations for land disturbance and vegetation clearing to minimize the potential to disturb nesting birds. See https://www.fws.gov/alaska/pages/nesting-birds-timing-recommendations-avoid-land-disturbance-vegetation-clearing.			
	Action: No similar action.	**Action:** No similar action.	***Alternative C1*** **Action:** No similar action.	***Alternative C2*** **Action:** Manage 158,000 acres of the narrow band of BLM-managed lands that extends toward Venetie as ROW avoidance, in order to focus on finding suitable collocations for any proposed ROWs to mitigate impacts on moose habitat and fish spawning in this narrow corridor. *Note: these lands are covered by other management actions in Alternative B and C1*.	**Action:** No similar action.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Caribou	**Action:** Maintain existing ACECs to protect caribou habitat (see **Appendix J** for management): • Galena Mountain herd • Tozitna Subunits North and South	**Action:** Designate the following ACECs to protect caribou habitat (see **Appendix J** for management): • Galena Mountain herd • Spooky Valley • Tozitna • Upper Kanuti River	**Action:** Manage the Ray Mountains and Galena Mountain caribou herds as core caribou ranges (see **Map 2.1**, **Appendix A**, and **Appendix I**).		**Action:** No similar action.
	Action: No similar action.	**Action:** No similar action (see ACEC management in **Appendix J**).	**Action:** Require operators of aircraft associated with BLM-permitted activities to maintain an altitude of at least 2,000 feet above ground level over core caribou ranges from May 1 to June 30. Aircraft landings associated with BLM permitted activities may be subject to timing limitations or prohibition in core caribou ranges at the discretion of the AO.		**Action:** No similar action.
	Action: No similar action.	**Action:** No similar action.	***Alternative C1*** **Action:** Close Ray Mountain core caribou range to fluid mineral leasing and development.	***Alternative C2*** **Action:** No similar action.	**Action:** No similar action.
	Action: No similar action.	**Action:** No similar action (see ACEC management in **Appendix J**).	***Alternative C1*** **Action:** Recommend Ray Mountain core caribou ranges for withdrawal from locatable mineral entry on lands without State of Alaska selections and on remaining BLM-managed lands, once conveyance of selected lands is complete.	***Alternative C2*** **Action:** No similar action.	**Action:** No similar action.
	Action: No similar action.	**Action:** No similar action (see ACEC management in **Appendix J**).	**Action:** Close core caribou ranges to mineral material disposal.		**Action:** No similar action.
	Action: No similar action.	**Action:** No similar action (see ACEC management in **Appendix J**).	***Alternative C1*** **Action:** Close Ray Mountain core caribou ranges to nonenergy solid mineral leasing and development.	***Alternative C2*** **Action:** No similar action.	**Action:** No similar action.
	Action: No similar action.	**Action:** No similar action (see ACEC management in **Appendix J**).	**Action:** Manage core caribou ranges as ROW avoidance areas.		**Action:** No similar action.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Dall Sheep	**Action (ACECs):** Maintain the following ACECs to protect Dall sheep habitat (see ACEC section for management): • Galbraith Lake • Nugget Creek • Poss Mountain • Snowden Mountain • West Fork Atigun	**Action (ACECs):** Designate the following ACECs to protect Dall sheep habitat: • Galbraith Lake • Midnight Dome/Kalhabuk • Nugget Creek • Poss Mountain • Snowden Mountain • West Fork Atigun	**Action (ACECs):** No similar action; no ACECs would be designated for protecting Dall sheep habitat under this alternative.		
	Action: No similar action.	**Action:** No similar action (see ACEC management in Appendix J).	***Alternative C1*** **Action:** Manage DSHA, DSMC, and DSSA as follows (see **Map 2.2**, **Appendix A**): • DSHA—4,600 acres (permitted activities) • DSMC—163,000 acres • DSSA— 371,300 acres	***Alternative C2*** **Action:** No similar action.	**Action:** No similar action.
	Action (Effects Minimization and Mitigation Requirements): No similar action.	**Action (Effects Minimization and Mitigation Requirements):** No similar action (see ACEC management in **Appendix J**).	***Alternative C1*** **Action (Effects Minimization and Mitigation Requirements; see Appendix I):** 1. Disturbance limit • DSHA (5% disturbance cap on discretionary permitted activities) • DSMC (15% disturbance cap on discretionary permitted activities) • DSSA (no disturbance cap on discretionary permitted activities) 2. Noise restrictions • DSHA (April 15–June 15) motorized intrusions may occur for up to 10% of any hour and as many as 5 motorized noise events over ambient sound may occur per day. Motorized noise would not exceed 50 dBA at identified	***Alternative C2*** **Action (Effects Minimization and Mitigation Requirements):** No similar action.	**Action (Effects Minimization and Mitigation Requirements):** No similar action.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Dall Sheep *(cont.)*	*(see above)*	*(see above)*	DSHA between 7 a.m. and 7 p.m. 3. BMPs • In DSHA, DSMC, and DSSA, while incorporating applicable BMPs, allow activity to occur.	*(see above)*	*(see above)*
	Action (Vegetation): No similar action.	**Action (Vegetation):** No similar action (see ACEC management in **Appendix J**).	***Alternative C1*** **Action (Vegetation; see Appendix I):** Prioritize DSHA for vegetation management and conservation, including land health assessments.	***Alternative C2*** **Action (Vegetation):** No similar action.	**Action (Vegetation):** No similar action.
	Action (Trails and Travel Management—Aircraft Restrictions): No similar action.	**Action (Trails and Travel Management—Aircraft Restrictions):** No similar action (see ACEC management in **Appendix J**).	***Alternative C1*** **Action (Trails and Travel Management—Aircraft Restrictions; see Appendix I):** • DSHA—Require permitted flights to be more than 2,000 feet above ground level over DSHA from April 15 to August 30.	***Alternative C2*** **Action (Trails and Travel Management—Aircraft Restrictions):** No similar action.	**Action (Trails and Travel Management—Aircraft Restrictions):** No similar action.
	Action (Fluid Minerals): No similar action.	**Action (Fluid Minerals):** No similar action.	***Alternative C1*** **Action (Fluid Minerals; see Appendix I):** NSO stipulations would apply to fluid mineral leases within DSHA and DSMC (see **Appendix F**).	***Alternative C2*** **Action (Fluid Minerals):** No similar action.	**Action (Fluid Minerals):** No similar action.
	Action (Locatable Minerals): Recommend withdrawal of eight mineral licks from locatable mineral entry.	**Action (Locatable Minerals):** No similar action (see ACEC management in **Appendix J**).	***Alternative C1*** **Action (Locatable Minerals; see Appendix I):** • DSHA—Recommend for withdrawal from locatable mineral entry.	***Alternative C2*** **Action (Locatable Minerals):** No similar action.	**Action (Locatable Minerals):** No similar action.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Dall Sheep *(cont.)*	**Action (Mineral Materials):** No similar action.	**Action (Mineral Materials):** No similar action. (see ACEC management in **Appendix J**).	***Alternative C1*** **Action (Mineral Materials; see Appendix I):** • DSMC and DSSA—Closed to new mineral material disposal but remain open to the expansion of existing active pits.	***Alternative C2*** **Action (Mineral Materials):** No similar action.	**Action (Mineral Materials):** No similar action.
	Action (Nonenergy Solid Leasable Minerals): No similar action.	**Action (Nonenergy Solid Leasable Minerals):** No similar action (see ACEC management in **Appendix J**).	***Alternative C1*** **Action (Nonenergy Solid Leasable Minerals; see Appendix I):** • DSHA—Close to nonenergy solid mineral leasing and development.	***Alternative C2*** **Action (Nonenergy Solid Leasable Minerals):** No similar action.	**Action (Nonenergy Solid Leasable Minerals):** No similar action.
	Action (ROWs): No similar action.	**Action (ROWs):** No similar action.	***Alternative C1*** **Action (Linear and Site-Type ROWs, Permits, and Leases, excluding wind and solar):** • DSHA—ROW exclusion • DSMC—ROW avoidance	***Alternative C2*** **Action (ROWs):** No similar action.	**Action (ROWs):** No similar action.
	Action (SRPs): No similar action.	**Action (SRPs):** No similar action.	***Alternative C1*** **Action (SRPs):** • DSHA, DSMC, and DSSA—permit only SRPs that are predicted to have neutral or beneficial effects on Dall sheep habitat.	***Alternative C2*** **Action (SRPs):** No similar action.	**Action (SRPs):** No similar action.

Table 2-5
Species of Special Concern (including Special Status Species)

Goals:
- Manage special status resources and habitats to be consistent with the conservation needs of special status species (SSS) (BLM Manual 6840), in a manner that would not contribute to the need to list any species under the Endangered Species Act. Ensure progress toward recovery of any federally listed threatened or endangered species.
- Identify, conserve, and monitor SSS and their respective habitats to ensure that their populations can persist in the planning area without population supplementation or habitat restoration.

Objectives:
- Manage permitted uses to avoid or minimize negative impacts (i.e., activities are likely to result in a significant local or regional decline in species distribution, abundance, or productivity) on SSS habitat.

Golden Eagle Goal:
- Protect priority golden eagle habitat from human disturbances that would significantly alter the distribution or abundance of golden eagles. Provide adequate habitat to ensure that prey abundance for golden eagles does not drop below a threshold that fully supports a healthy population.

Golden Eagle Objective:
- Avoid or minimize disturbance near nests of golden eagles, which is identified as a priority species in the planning area, due to its diversity and remnant character.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** No similar action.	**Action:** Upon designation of SSS, identify distribution, key habitat areas, and special management needs.		
Golden Eagle	**Action:** No similar action.	**Action:** • Support Identification and monitoring of golden eagle nest sites across the decision area, with the purpose of preventing habitat impacts that may destabilize populations in the short term and negatively affect populations over the long term. • Identify areas of high concentrations of golden eagles for increased protection from human disturbance. • Conduct or support studies of prey species importance and abundance. Relate known prey population levels to golden eagle populations. Identify and monitor known prey for golden eagle populations. • Avoid impacts on golden eagles from March 15–August 31, in keeping with the Bald and Golden Eagle Protection Act and in accordance with USFWS guidance.		
	Action: No similar action.	**Action:** Recommend for withdrawal from locatable mineral entry within 0.5 miles of golden eagle nest sites.	**Action:** No similar action.	
	Action: No similar action.	**Action:** Apply NSO stipulations to fluid mineral leasing and development (see **Appendix F**) within 0.5 miles of golden eagle nests.	**Action:** Same as Alternative B.	**Action:** No similar action.
	Action: No similar action.	**Action:** Close area within 0.5-mile radius of golden eagle nests to mineral materials disposal.	**Action:** No similar action.	
	Action: No similar action.	**Action:** Close area within 0.5-mile radius of golden eagle nests to nonenergy solid mineral leasing and development.	**Action:** No similar action.	

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Flora	**Action (Surface-Disturbing Activities):** No similar action.	**Action (Surface-Disturbing Activities):** For BLM-authorized surface-disturbing activities in known habitat for special status flora or unique ecosystems (as determined by the BLM), require applicants to conduct a vegetation and special status plant survey using BLM-approved protocol. Revise the map of known habitat when new information becomes available. In all other areas and for BLM-authorized surface-disturbing activities over 5 acres, require permittees provide to the BLM with a geo-located photo inventory of the site, along with soil samples. If a SSS were identified via the photo inventory, then the permittee may be required to conduct a vegetation and special status flora survey, using BLM-approved protocol. Give permittees reporting instructions if SSS are found. Subject to valid existing rights, for BLM-permitted activities, require permittees to have a 98-foot (30-meter) setback from special status flora populations when such are discovered during surveys for one-time, short-term disturbances.	***Alternative C1*** **Action (Surface-Disturbing Activities):** For BLM-authorized surface-disturbing activity in known habitat for special status flora or unique ecosystems, applicants may be asked to conduct a vegetation and special status plant survey, using BLM-approved protocol. Revise the map of known habitat as new information becomes available. Potentially require permitted activitiesto have a 98-foot (30-meter) setback from special status flora populations when they are discovered during surveys.	***Alternative C2*** **Action (Surface-Disturbing Activities):** If the BLM determines that a permit action has the potential to affect special status flora or if it occurs in a unique vegetation community, the AO may request a survey. Permittees would receive reporting instructions, if special status flora are found as a result of a required survey.	**Action (Surface-Disturbing Activities):** Same as Alternative C2.
	Action (Fluid Minerals—NSO): Apply an NSO stipulation to fluid mineral leases for *Montia bostockii* habitat.	**Action (Fluid Minerals—NSO):** No similar action.			

Table 2-6
Recreation and Visitor Service (See Appendix K for further details of recreation management areas)

Goals:

- Require that the Recreation and Visitor Services Program supports a diverse array of recreation activities that enhance the quality of life for users.
- Facilitate greater well-being and economic benefits within communities. Support sustainable economic growth and assist with diversifying and stabilizing local communities through collaboration with community networks of service providers.
- Promote public health and safety by managing for accessibility of recreation sites and for clean facilities.
- Provide a variety of dispersed and developed recreation opportunities and experiences, while sustaining the recreation resource base and minimizing resource impacts resulting from recreation. Improve access to appropriate recreation opportunities on public lands, including partnered lands and waters.

Objectives:

- Ensure that visitors are not exposed to unhealthy and unsafe human-created conditions that have previously been identified, and improve the condition and accessibility, where appropriate, of recreation sites and facilities.
- Plan for and manage the physical, social, and operational settings in each area and the activities that occur there.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General	**Action:** No similar action.	**Action:** • Limit nonpermitted camping outside of campgrounds to 14 nights per site. Campers must move 5 miles or more after 14 nights. • Educate the public and encourage those engaged in nonpermitted activities to adhere to “leave no trace” principles, as described by the Leave No Trace Center for Outdoor Ethics and Tread Lightly. • Limit firewood collection for recreational purposes to dead or down trees. • Maintain effective separation between domestic animals and Dall sheep (Wild Sheep Working Group 2012; consistent with BLM Manual 1730). Domestic sheep and goats are prohibited in Dall sheep habitat. Use of camelids (including alpacas and llamas) as pack animals would be authorized as appropriate through the normal permitting process. • Consult with subject tribes on potential SRPs in designated traditional cultural property locations.			
SRMAs	**Action:** Manage the following SRMAs (3,014,000 acres, **Map 2.3**, **Appendix A**): • Dalton Highway (801,000 acres) • Dalton Corridor (2,213,000 acres)	**Action:** Manage the following SRMAs to achieve the objectives described in **Appendix K** (497,000 acres, **Map 2.4**, **Appendix A**): • Sukakpak Region (353,000 acres) • Central Dalton (144,000 acres)	***Alternative C1*** **Action:** Manage the following Dalton Highway Corridor SRMA (2,437,000) to achieve the objectives described in **Appendix K** (2,437,000 acres, **Map 2.5**, **Appendix A**).	***Alternative C2*** **Action:** Manage the Dalton SRMA to achieve the objectives described in **Appendix K** (497,000 acres; **Map 2.6**, **Appendix A**).	**Action:** No similar action.
	Action: Continue to manage the Dalton Highway Corridor Development Nodes under the 1991 Recreation Area Management Plan, Dalton Highway.	**Action:** No similar action. (The development nodes are the RMZs of the Central Dalton SRMA and are managed according to prescriptions in **Appendix K**).	***Alternative C1*** **Action:** No similar action. (The development nodes are the RMZs of the Dalton Highway Corridor SRMA and are managed according to prescriptions in **Appendix K**).	***Alternative C2*** **Action:** No similar action.	**Action:** No similar action.
	Action: No similar.	**Action:**Designate OHV use as limited in the Sukakpak Region and Central Dalton SRMAs.	**Action:** Designate OHV use as limited in the Dalton Highway Corridor SRMA.		**Action:** No similar action.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
SRMAs *(cont.)*	**Action:** Manage the Dalton Corridor SRMA as VRM Class III.	**Action:** • Manage the Sukakpak Region SRMA as VRM Class II • Manage the Central Dalton SRMA and Dalton Uplands RMZ as VRM Class III • Manage the following SRMAs as VRM Class IV: ○ Central Dalton, Coldfoot RMZ ○ Central Dalton, Yukon River Crossing RMZ	***Alternative C1*** **Action:** • Manage the following SRMAs as VRM Class II: ○ Dalton Highway Corridor, Chapman Lake RMZ ○ Dalton Highway Corridor, Brooks Range South RMZ ○ Dalton Highway Corridor, Brooks Range North/Galbraith Lake RMZ ○ Dalton Highway Corridor, Outer Corridor RMZ • Manage the followong SRMAs as VRM Class III: ○ Dalton Highway Corridor, Finger Mountain RMZ ○ Dalton Highway Corridor, Arctic Circle RMZ ○ Dalton Highway Corridor, Grayling Lake RMZ • Manage the followong SRMAs as VRM Class IV: ○ Dalton Highway Corridor,Yukon River RMZ ○ Dalton Highway Corridor, Coldfoot RMZ	***Alternative C2*** **Action:** • Manage the Sukakpak Region RMZ within the Dalton SRMA as VRM Class II • Manage the Dalton Uplands RMZ within the Dalton SRMA as VRM Class III • Manage the Coldfoot and Yukon River Crossing RMZs within the Dalton SRMA as VRM Class IV	**Action:** No similar action.
ERMAs	**Action:** Manage the following ERMAs (630,000 acres; **Map 2.3**, **Appendix A**): • CAMA (405,000 acres) • Nigu-Iteriak ACEC/RMA (152,000 acres) • Oolamnagavik-Colville (73,000 acres)	**Action:** Manage the following ERMAs to achieve the objectives in **Appendix K** (145,000 acres, **Map 2.4**, **Appendix A**): • Spooky Valley (9,000 acres) • Nigu-Iteriak River (CAMA; 136,000 acres)	***Alternative C1*** **Action:** Same as Alternative B (**Map 2.5**, **Appendix A**).	***Alternative C2*** **Action:** Manage the Dalton ERMA to achieve the objectives in **Appendix K** (1,460,000 acres; **Map 2.6**, **Appendix A**).	**Action:** No similar action.
	Action: Manage the Oolamnagavik-Colville River ERMA as VRM Class III.	**Action:** Manage the following ERMAs as VRM Class I: • Spooky Valley • Nigu-Iteriak River (CAMA)	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative* C2** **Action:** Manage the Dalton ERMA as VRM Class III.	**Action:** No similar action.

Table 2-7
Backcountry Conservation Areas (See Appendix K for further details)

Goal:
- Maintain a recreational hunting-focused experience for users of the BCA.

Objective:
- While allowing multiple use, manage BCAs for wildlife habitat and backcountry recreation and hunting.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** No BCA is currently designated.	**Action:** Establish Dalton Corridor BCA**.** Manage the BCA for dispersed, wildlife-dependent recreation to achieve objectives described in **Appendix K** (1,605,000 acres; **Map 2.4**, **Appendix A**).	**Action:** No BCA is designed under this alternative.	
	Action: No similar action.	**Action (Locatable Minerals):** Require operators to follow the reclamation standards in **Appendix L** for surface disturbance from mining in the Dalton Corridor BCA.	**Action:** No similar action.	
	Action (Fluid Leasable Minerals): No similar action	**Action (Fluid Leasable Minerals):** Apply NSO stipulations to fluid mineral leases (see **Appendix F**) in Dall sheep priority habitat.	**Action (Fluid Leasable Minerals):** No similar action**.**	
	Action (Mineral Materials): No similar action	**Action (Mineral Materials):** Close to mineral material disposal those portions of the Dalton Corridor BCA that are more than 5 miles from the Dalton Highway.	**Action (Mineral Materials):** No similar action**.**	
	Action: No similar action.	**Action (ROWs):** Manage Dalton Corridor BCA as ROW avoidance.	**Action (ROWs):** No similar action.	
	Action: No similar action.	**Action (Realty):** Retain the Dalton Corridor BCA for long-term management. Identify lands in the BCA for acquisition from willing sellers.	**Action (Realty):** No similar action.	
	Action: No similar action.	**Action (Visual Resources):** Manage Dalton Corridor BCA as VRM Class II.	**Action:** No similar action**.**	

Table 2-8
Lands with Wilderness Characteristics

Goal:
- On lands managed for wilderness characteristics, maintain characteristics of size, naturalness, solitude, and outstanding opportunities for primitive and unconfined recreation.

Objective:
- Consider the following ANILCA-specified uses to be compatible with LWCs in Alaska:
  - Public use cabins and shelters
  - Snowmobiles with adequate snow cover
  - Airplane use, including primitive landing areas
  - Motorboat use
  - Temporary structures/equipment for hunting, fishing, and trapping

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General	**Action:** Maintain an inventory of all lands that possess wilderness characteristics.				
	Action: Manage 12,721,000 acres with wilderness characteristics to emphasize other resource values and multiple uses (**Table 2-1**; **Map 2.7**, **Appendix A**). (No LWC determination has been made for this alternative.)	**Action:** Manage LWCs as follows (**Table 2-1**; **Map 2.8**, **Appendix A**): • 363,000 acres to protect those characteristics as a priority over other multiple uses • 4,716,000 acres to emphasize other multiple uses, while applying management restrictions to reduce impacts on wilderness characteristics • 7,642,000 acres to emphasize other multiple uses as a priority over protecting wilderness characteristics	***Alternative C1*** **Action:** Manage LWCs as follows (**Table 2-1**; **Map 2.9**, **Appendix A**): • 882,000 acres to emphasize other multiple uses, while applying management restrictions to reduce impacts on wilderness characteristics • 11,839,000 acres to emphasize other multiple uses as a priority over protecting wilderness characteristics	***Alternative C2*** **Action:** Manage 12,721,000 acres with wilderness characteristics to emphasize other multiple uses as a priority over protecting wilderness characteristics (**Table 2-1**; **Map 2.7**, **Appendix A**).	**Action:** Manage 12,721,000 acres with wilderness characteristics to emphasize other multiple uses as a priority over protecting wilderness characteristics (**Table 2-1; Map 2.7**, **Appendix A**).
	Action: No similar action.	**Action:** Apply the following management to lands managed to protect wilderness characteristics as a priority over other multiple uses: • VRM Class I • ROW exclusion areas • Close to construction new all-season roads • Close to commercial timber development; prohibit non-subsistence collection of live vegetation (subsistence use still requires a permit), except on ROWs • Close to mineral material disposal • Close to nonenergy solid mineral leasing • Close to fluid mineral leasing • Recommend to the Secretary of the Interior withdrawal from locatable mineral entry • Allow vegetation treatments and prescribed fire, to maintain or improve naturalness in the long term; emphasize prescribed fire over mechanical treatment • Retain in federal ownership the non-selected BLM-managed lands and those not conveyed under the Alaskan Statehood Act and ANCSA	**Action:** No similar action.		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** No similar action.	**Action:** Apply the following management to LWCs to emphasize other multiple uses, while applying management restrictions to reduce impacts on wilderness characteristics: • VRM Class II • ROW avoidance area • Allow mineral material disposal only for authorized ROWs and require VRM mitigation and fewer than 5 acres of disturbance and concurrent reclamation • Apply NSO stipulations to fluid mineral leasing (see **Appendix F**) • Allow vegetation treatments and prescribed fire to maintain or improve naturalness in the long term; emphasize prescribed fire over mechanical treatments • Retain in federal ownership non-selected BLM-managed lands and those not conveyed under the Alaskan Statehood Act and ANCSA		***Alternative C2*** **Action:** No similar action.	**Action:** No similar action.

Table 2-9
Wild and Scenic Rivers

Goal:
- Maintain free-flowing nature and identified outstandingly remarkable values (ORVs).

Alternative A Objective:
- Protect and enhance the free-flowing nature, water quality, ORVs, and preliminary classification of eligible rivers, pending congressional action.

Action Alternatives Objective:
- Protect and enhance the free-flowing nature, water quality, ORVs, and tentative classification of suitable rivers until Congress acts on suitability recommendations.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** Manage the following rivers as eligible for inclusion in the National Wild and Scenic Rivers System (603 miles; **Map 2.10**, **Appendix A**): *Segments classified as wild* • Colville River, with scenic, paleontological, and recreational ORVs • Dietrich River, with scenic and recreational ORVs • Dulbi River, with recreational ORVs • Hogatza River, with recreational and fish ORVs • Jim River, with scenic, recreational, and fish ORVs • Kanuti-Kilolitna River with scenic ORVs • Kanuti River, with scenic, recreational, and hydrologic ORVs • Mathews River, with scenic and wildlife ORVs • Sulukna River, with fish ORVs *Segments classified as recreational* • Atigun River, with scenic, recreational, and cultural ORVs • Sagavanirktok River-Lower (Sag), with scenic, recreational, and cultural ORVs	**Action:** The following rivers are determined suitable for designation under the WSRs Act (603 miles; **Map 2.10**, **Appendix A**): *Segments classified as wild* • Colville River, with scenic, paleontological, and recreational ORVs • Dietrich River, with scenic and recreational ORVs • Dulbi River, with recreational ORVs • Hogatza River with recreational and fish ORVs • Jim River with scenic, recreational, and fish ORVs • Kanuti-Kilolitna River with scenic ORVs • Kanuti River with scenic, recreational, and hydrologic ORVs • Mathews River with scenic and wildlife ORVs • Sulukna River with fish ORVs *Segments classified as recreational* • Atigun River with scenic, recreational, and cultural ORVs • Sagavanirktok River-Lower (Sag) with scenic, recreational, and cultura ORVs *The suitable river segments are not CSUs but would become CSUs under Alternative B if Congress were to designate those segments into the National Wild and Scenic Rivers System.*	**Action:** Determine all 11 eligible stream segments as not suitable for inclusion in the National Wild and Scenic Rivers System and release them from interim management protections afforded eligible segments.	

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D

General *(cont.)*	**Action:** Establish the following interim protective management guidelines for all eligible segments, pending congressional action (all interim protective management is subject to valid existing rights):
	• Approve no action altering the free-flowing nature of eligible segments through impoundments, diversions that have the effect of impounding water, channeling, or riprapping
	• Approve no action that would have an adverse effect on an eligible segment's identified ORVs; enhance identified ORVs, to the extent practicable
	• Approve no action that would modify an eligible segment or its corridor to the degree that its eligibility or preliminary classification would be affected
	• Approve no action that would diminish water quality to the point that the water would no longer support the ORVs
	• Allow activities and uses authorized in ANILCA that apply to congressionally designated WSRs
		Action: Establish the following interim protective management guidelines for all suitable segments, pending congressional action (all interim protective management is subject to valid existing rights):
		• Carry forward the same management of eligible segments as described under Alternative A for suitable segments under Alternative B, plus:
		  ○ Manage wild segments as VRM Class I
		  ○ Manage recreational segments with a scenic ORV as VRM Class II
		  ○ Manage all segments as ROW avoidance
		  ○ Apply NSO stipulations for fluid mineral leasing and development (see **Appendix F**) for wild segments
		  ○ Apply controlled surface use stipulations for fluid mineral leasing and development (see **Appendix F**) for recreational segments
		  ○ Close wild segments to mineral material disposal
		  ○ Close wild segments to nonenergy solid mineral leasing
		  ○ Recommend that the Secretary of the Interior withdraw wild segments from locatable mineral entry
		  ○ Close wild segments to commercial timber harvest; prohibit non-subsistence collection of live vegetation (subsistence use still requires a permit)
		  ○ Acquire land from willing sellers to maintain the ORVs and free-flowing nature
		  ○ Allow activities and uses authorized in ANILCA that apply to congressionally designated WSRs
			Action: No similar action; there are no suitable segments.	

Table 2-10
Visual Resources

Goal:
- Assign, maintain, and manage visual resources by applying BMPs to all surface-disturbing activities, to manage for visual characteristics in all VRM classes.

Objectives:
- **VRM Class I—**Preservation of the landscape. This class provides for natural ecological changes; it does not, however, preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **VRM Class II—**Retain the existing character of the landscape. Activities in or modifications of the environment should not be evident or attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **VRM Class III—**Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not detract from the existing landscape.
- **VRM Class IV—**Provide for management activities that require major modification of the character of the landscape. Changes may attract attention and be dominant landscape features but should reflect the basic elements of the existing landscape. A Class IV rating is generally reserved for areas where the visual intrusions dominate the viewshed but are in character with the landscape.
- Maintain or enhance existing visual resource inventory classes.
- Maintain or enhance viewsheds from high visitation travel routes and travel routes used by village communities, including rivers.
- Maintain or enhance viewsheds from all adjacent NPS lands, USFWS lands, and BLM and State of Alaska special designation areas.
- Manage permitted activities to reduce alteration of natural night sky light and maintain dark, clear skies for aurora borealis viewing, stargazing, and other nighttime activities.

Category	Alternative A (*No Action*)	Alternative B	Alternatives C1/C2		Alternative D
General	**Action:** Allocate BLM-managed lands to the following VRM classifications (**Map 2.11**, **Appendix A**, and **Appendix J**): • Class I: 259,000 acres • Class II: 0 acres • Class III: 2,584,000 acres • Class IV: 801,000 acres • Unclassified: 9,658,000 acres	**Action:** Allocate BLM-managed lands to the following VRM classifications (**Map 2.12**, **Appendix A**, and **Appendix J**): • Class I: 762,000 acres • Class II: 6,661,000 acres • Class III: 261,000 acres • Class IV: 5,615,300 acres	***Alternative C1*** **Action:** Allocate BLM-managed lands to the following VRM classifications (**Map 2.13**, **Appendix A**, and **Appendix J**): • Class I: 268,000 acres • Class II: 2,935,000 acres • Class III: 117,000 acres • Class IV: 9,982,000 acres	***Alternative C2*** **Action:** Allocate BLM-managed lands to the following VRM classifications (**Map 2.14**, **Appendix A**, and **Appendix J**): • Class I: 259,000 acres • Class II: 144,000 acres • Class III: 1,799,000 acres • Class IV: 11,100,000 acres	**Action:** Allocate BLM-managed lands to the following VRM classifications (**Map 2.15**, **Appendix A** and **Appendix J**): • Class I: 259,000 acres • Class II: 0 acres • Class III: 2,027,000 acres • Class IV: 11,016,000 acres
	Action: Designate the following ACECs to protect scenic values (see **Table 2-11** and **Appendix J** for management). • Galbraith Lake • Jim River • Spooky Valley • Sukakpak Mountain	**Action:** Designate the following ACECs to protect scenic values (see **Table 2-11** and **Appendix J** for management). • Galbraith Lake • Jim River • Spooky Valley • Sukakpak/Snowden Mountain	***Alternative C1*** **Action:** Designate the following ACECs to protect scenic values (see **Table 2-11** and **Appendix J** for management). • Galbraith Lake • Sukakpak/Snowden Mountain	***Alternative C2*** **Action:** No similar action; no ACECs would be designated for the purpose of protecting scenic resources under this alternative.	**Action:** No similar action; no ACECs would be designated for the purpose of protecting scenic resources under this alternative.
	Action: Where possible in the Ray Mountains, manage activities to retain the character of the landscape. Manage other areas to lessen impacts on visual resource from other activities.	**Action:** No similar action; all areas are assigned to a VRM class.			

Table 2-11
Areas of Critical Environmental Concern

Goal:

- Provide special management attention needed 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 human life and safety from natural hazards.

Objective:

- Maintain the long-term sustainability of the relevant and important values for which the ACEC is designated, as well as the scientific opportunities.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General	**Action:** Require that surface-disturbing activities associated with mineral exploration and development be conducted under an approved plan of operations (43 CFR 3809). Casual uses, as defined in 43 CFR 3809, are exempt from this requirement.				
	Action: Manage 24 ACECs or RNAs (1,751,000 acres) (**Maps 2.16** and **2.17**, **Appendix A**; see **Appendix J**).	**Action:** Manage 31 ACECs or RNAs (4,035,000 acres) (**Maps 2.18** and **2.19**, **Appendix A**; see **Appendix J**).	***Alternative C1*** **Action:** Manage 8 ACECs or RNAs (418,000 acres) (**Maps 2.20** and **2.21**, **Appendix A**; see **Appendix J**).	***Alternative C2*** **Action:** Manage 1 RNA (77,000 acres) (**Maps 2.22**, **Appendix A**; see **Appendix J**).	**Action:** Manage 0 ACECs or RNAs.

Table 2-12
Wilderness Study Areas

Goal:
- Preserve wilderness characteristics of the CAMA WSA.

Objective:
- Manage the CAMA WSA consistent with BLM Manual 6330, Management of BLM WSAs (BLM 2012a), and ANILCA until Congress acts on the wilderness recommendation.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General	**Action:** • Manage lands in the CAMA WSA in a manner that will protect its wilderness characteristics until Congress acts on the wilderness recommendation (**Map 2.23**, **Appendix A**). • Apply management prescriptions to WSAs according to BLM policy; current BLM policy dictates the following management (BLM Manual 6330): o Manage as VRM Class I o Manage as ROW exclusion o Close to fluid mineral leasing o Close to mineral material disposal o Close to nonenergy solid mineral leasing and development o Close to commercial timber harvest o Limit OHV travel and mechanized travel to existing ways				
	Action: No similar action.	**Action:** Should Congress release the CAMA WSA from wilderness consideration, manage the lands to protect wilderness characteristics as a priority over other multiple uses, as described in **Table 2-8**.	***Alternative C1*** **Action:** Should Congress release the CAMA WSA from wilderness consideration, manage the lands to emphasize other multiple uses, while applying management restrictions to reduce impacts on wilderness characteristics.	***Alternative C2*** **Action:** Should Congress release the CAMA WSA from wilderness consideration, inventory for wilderness characteristics but manage according to adjacent lands.	**Action:** Same as Alternative C2.

Table 2-13
National Historic Trails

Goals:

- The nature and purpose of the INHT (an ANILCA CSU) is to provide the following, while managing the trail consistent with the applicable provisions in ANILCA, including Sections 811, 1110, and the Title XI TUS Process:
  - A rich diversity of climate, terrain, scenery, wildlife, recreation, and resources largely unchanged since the days of the gold rush stampeders
  - An extensive, isolated, primitive, historic landscape unmatched in the National Trail System
  - A setting that demands user durability and skill
  - A setting in which contemporary users can duplicate the experience and challenge of yesteryear
- Per the INHT nature and purpose, as described by Congress in 1978:
  - Conserve today's Iditarod Trail and adjacent landscape so users can experience the wildland setting and challenges faced by gold rush trail travelers and mushers a century ago
  - Provide users with opportunities to view, experience, and appreciate examples of historic human use of the resources along the INHT, demonstrating how these resources are being managed 1) in harmony with the environment, 2) in support of the nature and purposes for which the trail was designated, and 3) without detracting from the overall experience of the trail
  - Maintain the INHT National Trail Management Corridor to provide high-quality winter, trail-based use opportunities; conserve natural, historic, and cultural resources along the trail; use of the INHT would minimally affect adjacent natural and cultural environments and harmonize with the management objectives of land and resource uses that are, or may be, occurring on the lands through which the trail passes
  - Preserve and protect the historic remains and historic settings of the INHT and associated historic sites for public use and enjoyment
- Provide opportunities for users to meet subsistence needs and outdoor recreation needs and promote the preservation of public access and enjoyment of the open air, outdoor areas, and historic resources of the nation, in a manner that supports the nature and purpose of the congressionally designated trails.
- The proposed INHT Management Corridor was determined with the goal of harmonizing with and complementing any established multiple use plans for the areas where it is located. In selecting the ROWs for the Management Corridor, fully consider minimizing any potential adverse impacts on adjacent landowners and users or their operations.
- The INHT Management Corridor includes both BLM-managed lands and State and private lands. The BLM manages those segments of the INHT on BLM-managed lands and administers the INHT for those segments located on non-BLM-managed lands. Manage trails and maintain historic preservation on the BLM-managed lands. Administering involves coordinating trail management and historic preservation efforts with these landowners for these segments on non-BLM lands.

Objectives:

- Inventory, maintain, and enhance the significant qualities of high-potential INHT segments and sites, as defined in the National Trails System Act
- Avoid or mitigate adverse effects on intact INHT segments, their settings, and associated sites and interference with the resources associated with the nature and purpose of the trail
- Work with adjacent landowners to maintain the continuity of the trail across all landownership, as identified in the INHT Comprehensive Management Plan (BLM 1986b)

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action**: Establish the INHT National Trail Management Corridor within the planning area. The purpose of the corridor is to conserve the resources, qualities, values, associated settings, and the primary uses that support the nature and purpose of the INHT.			
	Action: If the INHT is on any lands where a withdrawal is revoked and if the State of Alaska, through the Statehood Act, or an ANCSA corporation, through the ANCSA, desires conveyance of the parcels, exempt the INHT from the withdrawal or conveyance, as required under the National Trails System Act.			

Table 2-14
Vegetation (Including Nonnative Invasive Species)

Goals:

- Manage BLM-permitted and casual use activities to maintain functional ecosystems composed of healthy and diverse native communities for the following reasons:
  - To attain the "desired future condition" of a landscape free of NNIS of Concern
  - To prevent alteration of and/or damage to intact native ecosystems in relation to NNIS of concern infestation
  - To prevent NNIS of concern introduction and spread into intact native ecosystems
  - To contain, control, or eradicate existing NNIS of concern infestations
  - To effectively integrate NNIS of concern prevention, control, and management into all BLM programs and functions within the planning area
  - To coordinate with neighboring agencies, tribes, landowners, and communities to implement early detection rapid response methods

Objectives:

- Coordinate with the State of Alaska and other landowners to build consistency in reclamation standards whenever possible, while meeting objectives for overall ecosystem function on BLM-managed lands.
- Manage for ecosystem health by maintaining or achieving potential natural conditions, as defined in **Appendix L**, for the following reasons:
  - To prevent introduction of NNIS of concern, by means of heightened awareness via education and outreach programs and adherence to early detection rapid response methods
  - To prioritize NNIS of concern species for eradication or containment via early detection rapid response methods (in accordance with the current BLM Alaska State Invasive Species Policy)
  - To prioritize the eradication or containment of NNIS of concern infestations occurring in material extraction sites to minimize the probability of spread to uninfested areas
  - To prioritize the implementation of early detection rapid response methods for aquatic NNIS of concern detected in surface waters used by floatplanes or watercraft

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** No similar action	**Action**: • All actions implemented or authorized by the BLM would, as appropriate, include measures to prevent the introduction and spread of NNIS of concern. For all permitted activities, adhere to standard operating procedures designed to prevent the introduction and spread of NNIS of concern. Collaborate with permittee to develop project-specific BMPs where needed. • Include the following high priority areas for early detection rapid response method application: anadromous streams, lakes, lichen-rich habitats, moose habitat, and berry picking areas. • Monitor vegetation communities for cumulative effects of wildland fire, suppression activities, and effects of excluding fire. Vegetation management may be used to remedy or restore forest health damage. *BLM-permitted Activities* • Hold authorized BLM permit holders responsible for all costs and logistical coordination related to eradicating infestations of NNIS of concern that are demonstrated to result from their permitted activity. Before granting a permit, require applicants to implement an NNIS survey or coordinate with the BLM to determine if an infestation is present. Annual reports from all permitted operations must include an update on NNIS presence and extent. • Require that all BLM-permitted activities must comply with current BLM Alaska NNIS Management Policy. • At the discretion of the AO, potentially require permittees of proposed and existing authorized activities to work with other permitted public land users to establish cooperative weed management practices or plans. • Allow methods of chemical control authorized by the BLM Vegetation Treatments using Herbicides in Thirteen Western States Record of Decision (ROD) (BLM 2007) or successor document. Hold permittees responsible for upholding the requirements for the use of those herbicides. Treatment monitoring and reporting requirements are outlined in the vegetation treatments ROD (BLM 2007). Additionally, use all other methods of chemical control authorized by subsequent BLM National Environmental Policy Act decisions, as appropriate. Approve beforehand any use of chemical control on BLM-managed lands and require that its requirements be followed, including in pesticide use proposals and reporting. • Coordinate with other applicable agencies to implement the Arctic Invasive Alien Species Action Plan, and Safeguarding America's Lands and Waters from Invasive Species: A National Framework for Early Detection and Rapid Response. Coordinate with the Alaska Committee for noxious and invasive plan management. *Wildland Fire* • The BLM would provide NNIS of concern awareness educational materials and/or training to the responsible fire protection agency/organization. • Require the responsible fire protection agency/organization to adhere to BMPs for preventing the introduction and/or spread of NNIS of concern. • Prioritize monitoring for NNIS of concern in burned areas, based on risk of NNIS of concern infestation (e.g., where ground-disturbing activities have occurred or where motorized equipment has been used) and/or resource value of burned area.		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	*(see above)*	*Weed-Free Material* • Promote through the permitting process the use of organic-based materials that are "certified weed-free," including feed, mulch, and erosion-control materials. *Casual Use* • Post signs on commonly used points of entry to BLM-managed lands (e.g., trailheads, airports, roads, and boat landings) to promote citizen awareness and responsibility in relation to NNIS of concern introduction and spread. Cooperate with rural communities and regional land managers to establish and implement hazard analysis critical control points, cooperative weed management areas, and outreach and educational programs. • Cooperate with the State of Alaska on NNIS prevention related to use of navigable waterways by motorboats and floatplanes for casual and subsistence use.			
	Action (Restoration—Uplands, non-riparian): No similar action.	**Action (Restoration—Uplands, non-riparian):** Require natural revegetation of disturbed sites, unless it can be demonstrated that natural revegetation is unlikely to be successful or does not meet resource objectives.	***Alternative C1*** **Action (Restoration—Uplands, non-riparian):** Same as Alternative B.	***Alternative C2*** **Action (Restoration—Uplands, non-riparian):** Promote rapid revegetation methods for the site, for example, seeding with native vegetation or importing topsoil.	**Action (Restoration—Uplands, non-riparian):** Same as Alternative C2
	Action (ROWs—Avoidance): No similar action. (No restrictions on ROW location).	**Action (ROWs—Avoidance):** Manage the following unique ecosystems as ROW avoidance: • Alpine vegetation • Lichen • Pingos	***Alternative C1:*** **Action (ROWs—Avoidance):** Manage the following unique ecosystems as ROW avoidance: • Pingos	***Alternative C2:*** **Action (ROWs—Avoidance):** Manage the following unique ecosystems as ROW avoidance: • Pingo cluster south of Lake Todatonten and adjacent to Kanuti Hot Springs	**Action (ROWs—Avoidance):** No similar action. (No unique ecosystems are managed as ROW avoidance.)
	Action (Surface-Disturbing Activities—Reclamation Standards): No similar action.	**Action (Surface-Disturbing Activities—Reclamation Standards):** Subject to reclamation standards described in **Appendix L**.	**Action (Surface-Disturbing Activities—Reclamation Standards):** Same as Alternative B.		

Table 2-15
Forestry

Alternative A Goal:
- Manage forest resources for sustained yield of forest products, watershed protection, wildlife habitat, and other uses.

Alternative A Objective:
- Maximize opportunities for harvesting forest resources, where feasible and practical.

Action Alternatives Goals:
- Manage to sustain forest health.
- Manage to provide sustained yield of firewood, house logs, and other forest products.
- Maintain ecosystem function by managing for a diverse species assemblage capable of providing ecosystem services such as carbon storage and water and nutrient flows.

Action Alternatives Objectives:
- Provide woody biomass consistent with other resource uses, as part of an ecologically healthy system and consistent with the principles of multiple use.
- Provide forest resources to meet subsistence and personal use needs.
- Address forest health issues, as needed.
- Allow for commercial timber harvest where demand exists and is consistent with other resource objectives.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** • Permit the use of timber resources, such as firewood and house logs, through the normal permitting process.			
	Action: • Allow commercial harvest of timber resources in the Utility Corridor for salvage purposes, such as after clearing operations along ROWs or of fire-killed timber. • Cutting trees is prohibited within 200 feet of either side of the centerline of a road, except for the removal of danger trees or for road construction. • If monitoring indicates any intensive firewood use areas where demand may be exceeding supply, develop a forestry management activity plan. • Accumulate and maintain data on forest lands until identified needs require a more intensive forest inventory. • All forest lands in this planning area open to subsistence and commercial timber harvest, except crucial wildlife habitat and the eight RNAs. • Timber may be harvested on subsistence study/exchange withdrawals under a subsistence or personal use type permit. No commercial sales would be permitted on these withdrawals. • Data on forest lands would be accumulated and maintained until identified needs require a more intensive forest inventory.	**Action:** • Harvest would be in compliance with the Alaska Forest Resources and Practices Act BMPs, AS 41.17.119: Minimum Riparian Standards for Other Public Land, and any other applicable regulations established by the State Forester pursuant to AS 41.17.115. Harvest may include the following: ○ Subsistence harvest (harvest by qualified subsistence users for purposes allowable under ANILCA) ○ Commercial harvest (any harvest, other than subsistence harvest, for the purpose of sale or barter of forest products) ○ ROW harvest (permitted harvest for the purposes of clearing a ROW authorized under regulations at 43 CFR 2800; ROW harvest is a category of commercial harvest) ○ Personal use (harvest for the purpose of removing and using the forest products, such as for firewood; personal use harvest requires a permit and is generally limited to standing dead or down wood) ○ Research harvest (harvest of timber for research or scientific purposes) ○ Fuels management harvest (harvest of timber for the purpose of managing fuels to mitigate wildland fire risk) ○ Incidental timber harvest (collection of small amounts of forest products for use in campfires on public lands, in accordance with 43 CFR 8365.1-5(b)) ○ Timber harvest (used with no qualifier means all the above) • Any commercial harvest within the 100-year floodplain must demonstrate that it would meet aquatic, riparian, and floodplain objectives. • Unless specifically authorized, no green timber may be cut within 300 feet of a highway or public road. • If monitoring indicates any intensive firewood use areas, where demand may exceed supply, then develop a forestry activity management plan.		
	Action: Provide for the use of special forest products on all lands.	**Action:** No similar action.	**Action:** Allow harvest of special forest products for personal use on all lands.	

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D

General *(cont.)*	**Action:**
	• **CAMA** (259,000 acres) closed to commercial harvesting of forest products in the following areas none of which is forested (**Map 2.24**, **Appendix A**) (see **Appendix J**).
	• Implement provisions in the Alaska Forest Resources and Practices Act (AS 41.17).
	• No prohibition on commercial harvest, except in crucial wildlife habitat (e.g., RNAs).
	• Stream buffers (50 feet) in the Utility Corridor; prohibit disturbance of vegetation within 300 feet of Jim River.
	• Cutting trees within 50 feet of either side of a stream would be prohibited unless the trees are a danger to human safety or are adversely affecting stream flow.
		Action:
		• On 2,903,000 acres, prohibit commercial timber harvest; prohibit non-subsistence collecting of live vegetation (subsistence use still requires a permit; **Map 2.25**, **Appendix A**) (see **Appendix J**).
		• Prohibit harvest of timber and woody vegetation in the Sukapak/Snowden Mountain ACEC, with the following exceptions, subject to AO discretion:
		  ○ ROW harvest in designated transportation and utility corridors
		  ○ Development and maintenance of federal administrative sites
		• Prohibit subsistence harvest of timber and woody vegetation in the Kanuti Hot Springs ACEC.
			Alternative C1
			Action: On 603,000 acres, prohibit commercial timber harvest; prohibit non-subsistence collecting of live vegetation (subsistence use still requires a permit; **Map 2.26**, **Appendix A**) (see **Appendix J**).
				Alternative C2
				Action: On 259,000 acres, prohibit commercial timber harvest; prohibit non-subsistence collecting of live vegetation (subsistence use still requires a permit; **Map 2.24**, **Appendix A**) (see **Appendix J**).
					Action: Same as Alternative C2.

	Action: No similar action.	**Action:** Prohibit timber sales more than negotiated sales cap (250,000 board feet), unless associated with a ROW.	**Action:** No similar action.		

Table 2-16
Wildland Fire

Goals:
- Protect human life and property from wildland fire.
- Protect and enhance economic and ecological resource values.

Objectives:
- Improve or maintain habitat for important wildlife, such as moose, caribou, and grouse using wildfire, prescribed fire, and vegetation management.
- Reduce suppression costs and increase suppression effectiveness through fire and fuels management.
- Maintain and enhance relationships with partners and the public.
- Reduce negative effects of environmental change with wildland fire and fuels management.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D

General	**Action:**
	• Use the principles of active management to facilitate wildfire prevention, suppression, and recovery planning measures designed to protect people, communities, landscapes, and water quality and to mitigate the severe flooding and erosion caused by wildfire.
	• Cooperate and collaborate with other federal, State, Native, and local land managers and with other stakeholder groups to manage wildland fire effectively and efficiently in Alaska in accordance with interagency and BLM plans and agreements.
	• Use good neighbor authority[2] agreements or contracts and pursue long-term land stewardship contracts.
	• Identify sites needing protection including structures, cultural and paleontological sites, small areas of high resource value, and priority species habitat (as needed). Communicate these values to protection agencies.
	• Use prescribed burning and mechanical and manual fuels treatments to achieve resource objectives, in support of scientific research or in support of BLM cooperators and partners.
	• Allow fire use for resource benefit throughout the planning area, provided conditions are appropriate.
	• Consider multiple incident objectives for individual wildfires, including the protection of human life, communities, and property and the enhancement of ecological resource values, when managing wildfires throughout the planning area. Implement management strategies that consider value, risk, probability of success, and cost.
	• Work with fire management partners to annually review and adjust initial response options as necessary, using the Alaska Interagency Wildland Fire Management Plan.
	• Clearly communicate to the public how fire management policies and practices work to balance the natural role of wildland fire with the protection of human life, communities, and other values.
	• Prevent unauthorized human ignitions through collaborative prevention efforts with interagency partners and other affected groups and individuals.
	• Prioritize fuel treatments to achieve the following:
	  ○ Reduce the risk to human life and inhabited property; the highest priority of fuel treatment would be those communities surrounded by hazardous fuels
	  ○ Reduce the risk and cost of wildland fire suppression in areas of hazardous fuels buildup, such as critical, full, and modified fire management option areas, where fire suppression historically occurred
	  ○ Achieve other resource objectives, such as habitat needs
	• Manage wildland fire in a manner that avoids impacts that damage resources and other values, including the introduction and spread of nonnative and invasive species, introduction of suppression chemicals into waterways, disturbances of erodible soils or ecologically sensitive systems, and the degradation of air quality; use minimum impact suppression techniques wherever possible; repair or mitigate damage that occurs			

[2]A cooperative agreement or contract (including a sole source contract) entered between the Secretary and a Governor to carry out authorized restoration services under Section 8206 of the Agricultural Act of 2014 (PL 113-79).

Table 2-17
Cultural Resources

Goals:
- Identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations.
- Seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration or potential conflict with other resource uses by ensuring that all authorizations for land use and resource use will comply with Section 106 of the National Historic Preservation Act.
- Increase the number of inventoried sites and traditional cultural properties, traditional land uses areas, and place names in the planning area.
- Promote collaboration and advancement of scientific or cultural knowledge for sites in the planning area.
- Increase public knowledge and awareness of cultural resources.

Objectives:
- Increase the number of known sites, traditional cultural properties, traditional land uses, and place names in the planning area through survey and inventory.
- Maintain National Register of Historic Places eligibility of significant cultural resources through monitoring and conservation.
- Protect cultural resource sites from degradation through monitoring and mitigation to reduce impacts resulting from public access.
- Assess the impacts of climate change and protect cultural resources from natural degradation.
- Foster research and collaboration through partnerships with other agencies, tribes, and academic institutions.
- Increase general knowledge of cultural resources in the planning area through outreach, interpretation, and education.
- Assign cultural resources to uses and assess and establish thresholds for determining cultural property significance.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D

General	**Action:** No similar action.	**Action:**
		• Prioritize proactive National Historic Preservation Act cultural resources surveys in the following:
		  ○ Areas of development or high traffic, including all-terrain vehicle/OHV trails, recreation sites, campgrounds, boat launches, or similar areas
		  ○ Areas of high mineral potential or mining claims
		  ○ Areas threatened by climate change or other natural phenomena, such as thawing permafrost, soil erosion, water erosion, or changes in vegetation cover
		  ○ Areas threatened by wildland fire
		  ○ Areas of high potential, where no previous cultural resource inventories have occurred
		• Stabilize or excavate threatened unique or significant cultural sites.
		• Monitor sites to ensure they are not being adversely impacted.
		• Support partnerships with other federal agencies, State of Alaska, tribes, and private landowners for documentation, stewardship, and protection of cultural resources.
		• Promote collaboration and advancement of scientific and cultural knowledge through partnerships with other agencies, tribes, and academic institutions.
		• Increase public awareness of the scientific and cultural value of archaeological sites and traditional cultural places through proactive surveys, oral histories, and public outreach.
		• Continue archaeological management activities associated with the Mesa site under Public Law 7823; recommend continuation of the Mesa site withdrawal.
		• Manage cultural resources in a stewardship role for public benefit; the purposes of this program are to analyze the scientific and socio-cultural values of cultural resources, to provide a basis for allocating cultural resources, to make cultural resources an important part of the planning system, and to identify information needed when existing documentation is inadequate to support a reasonable cultural resource-based land use allocation.
		• For permitted activities, attach the following stipulation, updated as needed, to all permits, leases, and ROWs, except those that have already incorporated into the project development phase Section 106 compliance through cultural resources identification and mitigation efforts:
		  ○ Require all operations to be conducted so as not to damage or disturb any historic or archaeological sites and artifacts. The Antiquities Act (1906), Archaeological Resources Protection Act (1979), FLPMA (1976), and general United States property laws and regulations all prohibit the appropriation, excavation, injury, or destruction of any historic or prehistoric ruin or monument or any other object of antiquity on lands owned or controlled by the United States (54 USC 300101 et seq.; 54 USC 320302; 43 USC 1733(a); 18 USC 1361; 18 USC 641; 43 CFR 8365.1). This includes both prehistoric and historic sites and associated artifacts, including stone tools, modified bone, antler, ivory, or wood material, campfire rings, stone cairns, cabins and other structures and their ruins, mining equipment, and refuse dumps. Should any site be discovered during field operations, require the permittee to avoid impacting such materials and to immediately notify the BLM AO and provide global positioning system coordinates and photographs of the identified resource.		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** Manage cultural resources for a balance of current and future scientific use, socio-cultural use, and public interpretation. Allow consumptive use of archaeological and historic sites for scientific use and interpretation.	**Action (Criteria for Cultural Resource Allocation and Allowable Uses):** Assess all recorded cultural resources according to the following six use categories for prehistoric and historic resources: • **Scientific use—**This category applies to any cultural property determined to be available for consideration as the subject of scientific or historical study at the present time, using currently available research techniques. Study includes methods that could result in the property's physical alteration or destruction. Due to the limited amount of archaeological research that has occurred in interior Alaska, relative to the landmass, all cultural properties in the planning area are allocated to scientific use but may be designated as conservation for future use or traditional use through consultation with tribes, the State Historic Preservation Officer, or other entities. Permitted study methods would include standard or newly developed techniques that may involve destructive analysis. • **Public use—**This category may be applied to any cultural property found to be appropriate for use as an interpretive exhibit in place, or for related educational and recreational uses by members of the general public. Sites designated for public use in the planning area are any sites that could significantly contribute to the knowledge and understanding of the history and culture of the region. No sites in the decision area are designated for public use at this time. • **Conservation for future use—**This category is reserved for any unusual cultural property that is not currently available for consideration as the subject of scientific or historical study that would result in its physical alteration. Its lack of consideration would be because of scarcity, a research potential that surpasses the current state of the art, singular historic importance, cultural importance, architectural interest, or comparable reasons. No sites in the decision area are designated for conservation for future use at this time. • **Experimental use—**This category may be applied to a cultural property judged well-suited for controlled experimental study, to be conducted by the BLM or others concerned with the techniques of managing cultural properties. This could result in the property's alteration, possibly including loss of integrity and destruction of physical elements. No properties in the decision area have been designated as experimental use. • **Traditional use—**This category is to be applied to any cultural resource perceived by a specified social or cultural group as important in maintaining their cultural identity, heritage, or well-being. Cultural properties assigned to this category are to be managed in ways that recognize the importance ascribed to them and seek to accommodate their continuing traditional use. No properties in the decision area have been identified as traditional use, but they may be identified in the future through consultation with tribes, the state historic preservation officer, or other entities. • **Discharged from management—**This category is assigned to cultural properties that have no remaining identifiable use. Properties discharged from management remain in the inventory, but they are removed from further management attention and do not constrain other land uses. Sites allocated as discharged from management have been determined to be ineligible for listing on the National Register of Historic Places and are completely physically removed from the original location. No properties in the decision area have been identified for discharge from management.			
	Action: Maintain and expand the inventory of cultural resources to enable the BLM to respond with compliance requirements for surface-disturbing activities.	**Action:** Increase the inventory of known sites throughout the planning area.	**Action:** Conduct cultural resource inventories in high priority areas or places that have had no previous inventory.		
	Action: No similar action, but currently the BLM assesses the impacts of thawing permafrost or erosion on sites during Section 106 compliance or through Section 110 inventory, as time and funding allow.	**Action:** Assess the effects of climate change on cultural sites with inventory, research, monitoring, and remote sensing techniques throughout the planning area. Excavate threatened sites.	***Alternative C1*** **Action:** Assess the impacts of climate change on sites that are particularly vulnerable to thawing permafrost or soil erosion, whenever possible, in conjunction with other Section 110 surveys. Excavate significant sites, as time and funding allow.	***Alternative C2*** **Action:** Assess the impacts of thawing permafrost or erosion on sites during Section 106 compliance or through Section 110 inventory, as time and funding allow.	**Action:** Same as Alternative C2.
	Action: Designate the following ACECs to protect cultural resources (see **Table 2-11** and **Appendix J** for management): • Galbraith Lake • Jim River • Nigu-Iteriak	**Action:** Designate the following ACECs to protect cultural resources (see **Table 2-11** and **Appendix J** for management): • Galbraith Lake • Jim River • Upper Kanuti River	***Alternative C1*** **Action:** Designate the following ACECs to protect cultural resources (see **Table 2-11** and **Appendix J** for management): • Galbraith Lake • Jim River	***Alternative C2*** **Action:** No similar action; no ACECs would be designated to protect cultural resources under this alternative.	**Action:** Same as Alternative C2.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** No similar action.	**Action:** Monitor all known sites on an established schedule to ensure preservation and protection of the resource.	***Alternative C1*** **Action:** Monitor all National Register of Historic Places-eligible sites on a regular basis.	***Alternative C2*** **Action:** Monitor sites when potential conflicts with proposed undertakings arise.	**Action:** Same as Alternative C2.
	Action: No similar action.	**Action:** If it is determined to be eligible for listing on the National Register of Historic Places, apply the following management to the Allakaket and Alatna Traditional Cultural Property: • Consult Allakaket and Alatna Traditional Councils, when considering any permit applications for proposed actions in the traditional cultural property areas, including SRPs. • Send a notification letter and written description of any proposed actions to the tribes and, minimally, discuss the proposed action with the tribal councils via phone. Allow, minimally, 30 days for the tribal councils to consider the proposed action and to provide proposed mitigation measures and equally consider those mitigation measures in any agency decisions.			
	Action: No similar action, though eligible historic properties are nominated for listing on the National Register of Historic Places, as time and funding allow.	**Action:** Nominate eligible historic properties to the National Register of Historic Places, as time and funding allow.	**Action:** Complete National Register of Historic Places nominations as a mitigation measure for adverse impacts on eligible historic properties.		

Table 2-18
Paleontological Resources

Goal:
- Identify, preserve, and protect significant paleontological resources and ensure that they are available to present and future generations for appropriate uses, such as scientific study and public education.

Objectives:
- Inventory, identify, record, evaluate, manage, and protect significant paleontological resources for scientific research, education, and public outreach.
- Protect significant paleontological resources from surface-disturbing activities by focusing any inventory in high probability paleontological areas.
- Develop education/interpretation related to important paleontological resources.
- Develop an updated potential fossil yield classification system for the planning area.
- Complete and maintain an inventory of fossil localities and monitor known occurrences of any significant paleontological resources that are under possible threat from natural or human causes.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** No similar action.	**Action**: • Prioritize for BLM survey all potential fossil yield classification areas classified as 4 or 5 (high and very high potential). • Prioritize fuels and vegetation management projects in areas with known vertebrate fossils or high potential fossil yield classification values for vertebrate fossils. • Promote collaborative research by permitting the collection, removal, excavation, or casting of vertebrate fossils in the decision area, including dinosaur tracks, by qualified researchers. • Evaluate lands identified for disposal to determine whether significant fossils would be removed from federal ownership, the impacts of such removal, and any applicable mitigation strategies. • Promote the stewardship, conservation, and appreciation of paleontological resources through educational and public outreach programs.		

Table 2-19
Lands and Realty

Goals—Land Tenure and Withdrawals

- Retain public lands with high resource values to the extent practicable; adjust land to consolidate public land holdings, acquire lands with high public resource values, and meet public and community needs.
- Make recommendations on revoking land withdrawals that no longer meet the intended purpose.
- Comply with the Dingell Act (Public Law 116-9) to make all vacant, unappropriated, and unreserved BLM-managed lands available. Any lands conveyed under the act will be subject to valid existing rights.
- Encourage implementation and conveyance of lands pursuant to legislative mandates. These mandates include the Alaska Statehood Act, ANCSA, and the 1906 Native Allotment Act.

Alternative A Objectives—Land Tenure and Withdrawals

- Pursue exchanges, acquisitions, or land disposals, when in the national interest.
- Request the Secretary of the Interior to implement recommendations in the RMP to open or close lands to mineral entry.
- Middle Yukon Subunit Objective: Identify federal lands for exchange, when in the national interest, to provide manageable land patterns and lower administrative costs.
- Provide opportunities for FLPMA sales, where environmentally feasible and where compatible with management objectives.

Action Alternatives Objectives—Land Tenure and Withdrawals

- Once conveyances to the State of Alaska are complete, to the extent practicable, landownership patterns in the planning area result in efficient and effective management of the public lands that minimize the number of small, isolated BLM parcels that are difficult to manage.
- Update public land records when the Secretary acts on recommendations to revoke outdated withdrawals that no longer meet the intended purpose.
- Consolidate land management that sustains natural resources necessary for meeting subsistence needs.
- Attain a BLM land pattern that blends multiple resource values and brings about better manageability to the extent practicable. Consistent with Secretarial Order 3373, ensure that public access and recreational opportunities are important considerations of any land tenure adjustment. Consistent with Secretarial Order 3373, ensure that public access and recreational opportunities are important consideration of any land tenure adjustment, pursuant to BLM Informational Bulletin No. 2020-010 Evaluating Public Access in BLM Public Land Disposals and Exchange (see land tenure criteria listed in **Appendix C**).
- Land exchanges would be considered at the implementation level to benefit public interests. Exchanges would focus on efficient management of public lands and objectives including protection of fish and wildlife habitats, cultural resources, wilderness and aesthetic values, enhancing recreational opportunities, and community expansion. Exchanges generally would not be pursued until final State and Native entitlement is reached.

Action Alternative Goals—Land Use Authorizations

- Meet public needs for use authorizations, such as ROWs, alternative energy sources, and permits, while minimizing adverse impacts on resource values.
- Minimize the proliferation of linear ROW authorizations out of the Utility Corridor (e.g., access to mining claims, private parcels, and roads to resources).

Alternative A Objective—Land Use Authorizations

- Minimize conflicts between future Mineral Leasing Act ROWs and mining claims in the Utility Corridor, while maximizing lands available for mineral development.

Action Alternatives Objectives—Land Use Authorizations

- Allow the Utility Corridor to continue to support existing and future anticipated transportation and utility projects, while maintaining visual, recreational, and ecological values, including connectivity between conservation units adjacent to the corridor, to the extent practicable.
- Continue managing ANCSA 17(b) easements that have been reserved in patents or interim conveyances to ANCSA Corporations for continued access to public lands, in accordance with Instruction Memorandum-AK 2007-037, ANCSA 17(b) Easement Management Handbook (including any future instruction memorandum updates or policy replacements).
- Identify ROW corridors that promote appropriate infrastructure development.
- Establish development nodes to minimize sprawl and to concentrate development along roadways, particularly intersections, within the Utility Corridor to the extent practicable.
- Identify ROW exclusion and avoidance areas needed to protect resources.

Category	Alternative A (*No Action*)	Alternative B | Alternative C1/C2 | Alternative D
General	**Action:** Small tracts of public land, just west of the upper reaches of the Middle Fork Chandalar River, would be available for disposal through exchange or conveyance under the Alaska Statehood Act. Make lands available for disposal to qualified applicants, under the Recreation and Public Purposes (R&PP) Act, to accommodate future public purpose needs in Wiseman, Coldfoot, and Yukon Crossing/7-Mile area. Lands within the original ANCSA withdrawal boundary in the vicinity of Kaltag, Nulato, Allakaket, Alatna, and Hughes, which are not conveyed to village or regional corporations, would be made available for exchange. All lands open to FLPMA sales, except for Purcell Mountain Special Management Unit (Hughes Subunit), RNAs, and lands within 300 feet of mean high water line of Tozitna, Indian, and Hogatza River tributaries.	**Action—Land Tenure and Withdrawals:** 1,307,000 acres of Department of Defense lands are withdrawn through Executive Order, PLO, and Public Law. No changes are recommended to these Department of Defense withdrawals. All prescriptions listed below apply where the BLM has authority. Recommend that the Secretary of the Interior revoke ANCSA 17(d)(1) withdrawals. Where appropriate for carrying out management decisions under Alternatives B and C1, recommend new FLPMA withdrawals or modifications to existing withdrawals to meet the current and future management needs. The lands that meet the criteria to be retained, acquired, or disposed of are identified as Zone 1, 2, or 3, in **Appendix C**. These decisions have no effect on the ongoing State of Alaska land conveyance process or valid selections. • Lands in Zone 1 would be retained under BLM management; inholdings would be considered for acquisition on a willing seller basis (ACECs, RNAs, designated important habitat, high priority riparian habitat, lands managed for wilderness character, BCAs, and recreation assets, including SRMAs and ERMAs). • Lands in Zone 2 would generally be retained but would be available for acquisition or exchange, whichever is appropriate, to enhance public resource values, improve management capabilities, or reduce the potential for land use conflict. • Lands in Zone 3 meet the criteria for lands available for disposal or exchange (all Fairbanks Subunit parcels). • Lands in Zones 2 and 3 would be reassigned to Zone 1, if the USFWS includes them in future designations of important habitat under the Endangered Species Act. The BLM would consider mutually benefiting public interest land exchanges. Exchanges are authorized in Alaska by FLPMA Section 206, Section 22(f) of ANCSA, and Section 1302(h) of ANILCA. When considering public interest, the BLM would consider efficient management of public lands and to securing resource management objectives. Reserved federal interests in split-estate lands anywhere in the planning area may be considered for conveyance out of federal ownership. When and where appropriate, acquire lands by purchase, exchange, or donation, from willing owners/sellers to further the programs of the Secretary of the Interior. The BLM may acquire less than fee title to property if management goals can be achieved by doing so (acquisition of a conservation easement is an example of acquiring less than fee title). Consider acquiring land from willing sellers in Zone 1 areas (inholdings) and in Zone 2 areas for consolidation of land patterns. R&PP Act (43 USC 869 et seq.)—Consider R&PP disposals on Zone 2 and 3 lands throughout the planning area, in accordance with the following: • Selected lands that meet the criteria for disposal under the R&PP Act would have to be fully adjudicated before the BLM would entertain an R&PP application. If these selections were rejected or relinquished within the life of this plan, then the BLM could accept an application under the R&PP Act. • In most instances, the BLM would first lease lands under the R&PP Act and would convey the lands only after the project is constructed, in compliance with an approved development and management plan; tracts proposed as sanitary landfills would not be leased, only sold. R&PP Act patents in which the United States has reserved a reversionary interest would be evaluated and addressed at the implementation level, based on BLM management needs. The United States may renounce the reversionary interest on any patents issued with this limited reversion clause if the AO determines that the use of the lands were for solid waste disposal (sanitary landfill) or any other use that results in the disposal, placement, or release of any hazardous substance, such as a wastewater treatment facility, a shooting range, or a firefighting training facility, in accordance with 43 CFR 2743.

	Action (Land Use Authorizations): No similar action.	**Action (Land Use Authorizations):**
		• Provide access to non-federally owned lands, adequate enough to ensure the landowner's reasonable use and enjoyment of such lands, as required by Section 1323(b) of ANILCA; access across lands within ACECs (not present for all alternatives) is not precluded by ACEC designation, unless the ACEC is designated as a ROW exclusion area. Evaluate proposals for access across ACEC lands to private lands for their environmental impacts.
		• Provide access to inholdings in CSUs and WSAs, as required by ANILCA Section 1110(a) and 43 CFR 36.
		• Consider proposed transportation and utility projects affecting CSUs (e.g., INHT), pursuant to the Title XI TUS Process in ANILCA and 43 CFR 36.
		• Consider applications for renewable energy projects.
		• Consider FLPMA leases and permits throughout the planning area, except where prohibited by law or PLOs:
		  ○ Consider not authorizing cabins or permanent structures used for private recreation.
		  ○ Consider proposals for commercial use authorizations of cabins (trapping).
		• Make lands available to federal and state agencies and research organizations for needed administrative and support facilities, where environmentally feasible and compatible with management objectives.
		• Do not authorize motorized vehicle use in association with permits supporting trapping activity where State of Alaska law or regulation prohibits the use of OHVs to transport game or parts of game or otherwise restricts activities necessary to conduct trapping.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Land Tenure and Withdrawals	**Action:** Encourage exchanges with appropriate landowners to provide for federal ownership of a corridor surrounding the Killik River. This corridor would be a multiple-use management area, focusing on protecting the riverine environment connecting the Gates of the Arctic National Park with the Colville River. Also, encourage the acquisition of lands for multiple-use management on the western and eastern sides of the Oolamnagavik block, to consolidate federal landownership.	**Action:** Acquire private parcels in Zone 1 lands on a willing seller basis or through exchange. • Consider exchange of isolated parcels surrounded by State or Native corporation lands for high priority parcels in or next to lands identified as priority areas for LWC.			
	Action (Disposal Criteria): No similar action.	**Action (Disposal Criteria):** 193,600 acres are identified for potential disposal based on the following criteria (**Appendix C**) (see **Map 2.27**, **Appendix A**): • Isolated parcels (e.g., those near Fairbanks) typically smaller than a township • An acquired tract that no longer serves the purpose for which it was acquired • A tract whose disposal would serve the public objectives, such as expansion of communities and economic development, or an R&PP Act, or other lands action with a reversion clause or any other reversionary interests • A tract of land that, because of its location or other characteristics, is difficult or uneconomical to manage and is not suitable for management by another federal agency • Where disposal would promote management consolidation and ownership • A tract of land that does not provide the only practicable source of recreational access to other public lands • Consider minor adjustments around CSU boundaries allowed under ANILCA, 103(b) (23,000-acre limit)	**Action:** No similar action. FLPMA section 203 sales would not be permitted. Lands in Zone 3 would only be considered for exchange not disposal. (**Appendix C**).		
	Action: No similar action.	**Action:** No similar action.	***Alternative C1*** **Action:** No similar action.	***Alternative C2*** **Action:** Identify 0 acres in Category 3 for disposal.	**Action:** Same as Alternative C2.
Withdrawals	**Action:** • BLM administrative sites are authorized under a ROW and that ROW is retained. • Multiple withdrawals to other agencies occur in the planning area. These withdrawals would continue as appropriate, in accordance with applicable laws and regulations, unless relinquished by the agency.	**Action:** • Retain all BLM administrative site withdrawals. • Retain other federal agency withdrawals, for example, for the National Oceanic and Atmospheric Administration, the military, the General Services Administration, and the Federal Aviation Administration, until relinquished by the agency; then revoke or modify them, as appropriate, in accordance with applicable laws and regulations.			
	Action: PLO 5150 withdrew and reserved the public lands as a utility and transportation corridor within the meaning of Section 17(c) of ANCSA, in aid of programs for the United States government and the State of Alaska. The PLO identifies an outer corridor and an inner corridor. The inner corridor does not allow metalliferous minerals or any appropriation. The outer corridor is withdrawn from appropriation. See **Maps 2.28–2.30**, **Appendix A**.	**Action:** Recommend a partial revocation of PLO 5150 to include the "outer corridor" lands (**Map 2.31**, **Appendix A**).	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** Recommend a full revocation of PLO 5150 (**Map 2.32**, **Appendix A**).	**Action:** Same as Alternative C2.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Withdrawals *(cont.)*	**Action:** Do not open the Prospect Unit (55,000 acres) to state selection by modifying PLO 5150.	**Action:** No similar action.	**Action:** No similar action.		**Action:** No similar action.
	Action: Seven ANCSA 17(d)(1) withdrawals are in place; generally, close lands to all forms of appropriation under public laws, including mining and mineral leasing.	**Action:** Recommend revoking all seven ANCSA 17(d)(1) withdrawals (see **Appendix J**).			
Administrative Utility Corridor Designations	**Action:** Access corridors would be opened to facilitate the Ambler Mining District Transportation Corridor (Section 201[4][b-e]) ANILCA) and from Coldfoot node east to State lands. ROWs would be allowed to accommodate appropriate access to state and private lands, as needed.	**Action:** Require collocation of new linear ROWs with existing infrastructure or designated corridors.	**Action:** Collocate new linear ROWs with existing infrastructure, to the extent practical.		
	Action: No other corridors identified.	**Action:** Designate the following additional utility and transportation corridors (**Map 2.33**, **Appendix A**): • Ambler (Dalton East-West Corridor) 5-mile corridor • Umiat Corridor (North Slope East-West Corridor; the block of State-selected lands to the west of the Toolik Lake RNA)	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** Designate the following additional utility and transportation corridors (**Map 2.34**, **Appendix A**): • Ambler (Dalton East-West Corridor) 5-mile corridor • Umiat (North Slope East-West Corridor; the block of State-selected lands to the west of the Toolik Lake • Dalton Highway	**Action:** Same as Alternative C2.
Development Nodes	**Action:** Current development nodes: • Yukon Crossing • Coldfoot • Chandalar	**Action:** Designate the following areas as development nodes: • Yukon Crossing • Chandalar **Development node criteria:** • Industrial demand • Compatibility with other uses • Distance • Proximity to fuel • Proximity to food • Proximity to airstrips • Health and safety concerns	***Alternative C1*** **Action:** Designate the following areas as development nodes: • Yukon Crossing • Kanuti/Old Man • Chapman • Prospect • Dietrich • Chandalar Shelf **Development node criteria:** • Industrial demand • Compatibility with other uses • Distance • Proximity to fuel • Proximity to food • Proximity to airstrips • Health and safety concerns	***Alternative C2*** **Action:** No similar action; development nodes would not be designated.	**Action:** No similar action; development nodes would not be designated.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Development Nodes *(cont.)*	**Action:** No similar action.	**Action:** Require industrial development to be in a development node.	***Alternative C1*** **Action:** Focus industrial development (e.g., work camps and airport leases) in development nodes, when possible.	***Alternative C2*** **Action:** No similar action; industrial development would not be focused in specific areas.	**Action:** Same as Alternative C2.
	Action: Governmental units and energy transportation facilities are allowed outside of nodes if the needs or purposes of the facility are better met. Commercial activities not directly related to roads are considered for permit approval in areas outside of nodes. Such activities would be screened from the Dalton Highway, where appropriate, by vegetation and distance.	**Action:** No similar action.			
	Action: No home site development is allowed in development nodes.	**Action:** Same as Alternative A.			
Permits and ROWs	**Action (Maintenance Camps):** State road maintenance camps are allowed at Yukon Crossing, Coldfoot, Chandalar Shelf, and Slope Mountain.	**Action (Maintenance Camps):** Allow State road maintenance camps.			
	Action (ROW Grants): Allow ROW grants on a case-by-case basis.	**Action (ROW Grants):** Allow ROW grants through the normal permitting process. Locate near other ROWs or on already disturbed areas, whenever practical and reasonable to do so.			
	Action (Communication Site Development): Make public lands available for the development of electronic communication facility sites.	**Action (Communication Site Development):** Allow for additional communication site development on public land, to support resource development and ancillary needs.			
	Action: Manage the CAMA WSA as a ROW exclusion area (259,000 acres; **Map 2.35**, **Appendix A**) (see **Appendix J**).	**Action:** Manage 2,349,000 acres as ROW exclusion areas (**Map 2.36**, **Appendix A**) (see **Appendix J**).	***Alternative C1*** **Action:** Manage 265,000 acres as ROW exclusion areas (**Map 2.37**, **Appendix A**) (see **Appendix J**).	***Alternative C2*** **Action:** Manage 259,000 acres as ROW exclusion areas (**Map 2.38**, **Appendix A**) (see **Appendix J**).	**Action:** Same as Alternative A (**Map 2.39**, **Appendix A**) (see **Appendix J**).
	Action: No similar action; no ROW avoidance areas are identified.	**Action:** Manage 5,360,000 acres as ROW avoidance areas (**Map 2.36**, **Appendix A**) (see **Appendix J**).	***Alternative C1*** **Action:** Manage 3,253,000 acres as ROW avoidance areas (**Map 2.37**, **Appendix A**) (see **Appendix J**).	***Alternative C2*** **Action:** Manage 750,000 acres as ROW avoidance areas (**Map 2.38**, **Appendix A**) (see **Appendix J**).	**Action:** No similar action; no ROW avoidance areas are identified.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
ROW Provisions for Wildlife/Soil, Water, and Air Resources	**Action:** No similar action.	**Action:** Require ROWs for linear projects to incorporate design features or stipulations to mitigate impacts on caribou passage in migration corridors for all priority wildlife species.			
	Action: No similar action.	**Action:** No similar action. *ROW exclusion management actions that affect the habitat in the narrow band of BLM-managed lands that extends toward Venetie are a result of ACEC and LWC management actions that overlap this area.*	***Alternative C1*** **Action:** No similar action. *ROW avoidance management actions that affect the habitat of the narrow band of BLM-managed lands that extends toward Venetie are a result of ACEC and LWC management actions that overlap this area.*	***Alternative C2*** **Action:** Manage 158,000 acres of the narrow band of BLM-managed lands that extends toward Venetie as ROW avoidance to focus on finding suitable collocations for any proposed ROWs to mitigate impacts on moose habitat and fish spawning in this narrow corridor.	**Action:** No similar action.

Table 2-20
Travel and Transportation Management

Goals:
- Manage and provide for motorized, nonmotorized, and mechanized access that would be in balance with resource protection and uses.
- Support intercommunity access to public lands.

Objectives:
- Avoid or minimize impacts from travel and OHV activities by managing for soil, water, air, vegetation, and riparian management objectives and indicators.
- Maintain and improve land health, while promoting responsible use through active travel management; in each TMA, designate a comprehensive travel management system that achieves resource management objectives, provides appropriate, sustainable public and administrative access, communicates with the public about opportunities, and monitors the effects of use.
- Collocate trails with ROWs, where feasible.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D

General		**ANILCA Provisions**
		ANILCA provides specific guidance on access for the following:
		• The use of snowmachines, motorboats, and other means of surface transportation traditionally used for subsistence purposes by local residents on all federal public lands (Section 811). See ANILCA Section 102 (3) for the definition of "public lands"; and
		• The use of snowmachines, motorboats, airplanes and nonmotorized surface transportation methods for traditional activities and travel to and from villages and homesites, on CSUs, national recreation areas, and national conservation areas, and those public lands designated as wilderness study (Section 1110).
		
		Pursuant to ANILCA Section 811, such uses are subject to reasonable regulation. The NPS and USFWS have developed regulations to implement Section 811 of ANILCA. While the BLM has not developed similar regulations, a process similar to those promulgated by the NPS (36 CFR 13.460) and USFWS (50 CFR 36.12) would be followed.
		
		The BLM would ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on the public lands (ANILCA Section 811(a)) and would implement restrictions on and closures to snowmachines, motorboats, and other means of surface transportation traditionally employed for subsistence purposes by local rural residents (ANILCA Section 811(b)). This would happen only if the BLM AO determines that such use is causing or is likely to cause an adverse impact on public health and safety, resource protection, protection of historic or scientific values, subsistence uses, conservation of endangered or threatened species, or other purposes, values, and uses for which the lands are being managed under FLPMA or designated by ANILCA. (Closure criteria pursuant to NPS regulations at 36 CFR 13.460(b) and USFWS regulations at 50 CFR 36.12(b)).
		
		The BLM would follow the regulations implementing Section 1110 of ANILCA, as found in 43 CFR 36. It would implement restrictions and closures to use of snowmachines, motorboats, aircraft, and nonmotorized surface transportation methods (e.g., domestic dogs, horses, and other pack or saddle animals) for traditional activities and travel to and from villages and homesites, only if the BLM AO makes a finding, pursuant to 43 CFR 36.11(h), that such use would be detrimental to the resource values of the area.
		
		To meet the requirements of ANILCA, decisions in this RMP/environmental impact statement that are covered by Sections 811 and 1110 of ANILCA would be listed as "proposed" supplemental rules in the ROD. Where transportation and travel management planning is deferred, interim rules would be identified. After the RMP/Environmental Impact Statement ROD and travel management decision record are signed, the BLM would undertake the following process for both interim and final decisions:
		• Provide notice of proposed supplemental rules in the *Federal Register* and other formats and locations reasonably calculated to inform residents in the affected vicinity.
		• Allow a minimum of 60 days for the public comment period on the proposed supplemental rules.
		• Hold public hearings in the affected vicinity and other locations, as deemed appropriate by the BLM.
		• Respond to comments and publish the final supplemental rules in the *Federal Register*.
		• Make the final supplemental rules known by the following methods (at a minimum):
		  ○ Make available those supplemental rules and maps with relevant information for public inspection at the BLM office and at other places convenient to the public in formats reasonably calculated to inform residents in the affected vicinity.
		  ○ Post signs at appropriate sites.
		  ○ List the supplemental rules and show relevant maps in BLM brochures and websites.
		
		If the decision in the ROD is to develop a step-down transportation and travel management plan, follow the Supplemental Rule process described above to address any travel management plan decisions that are covered by Sections 811 and 1110 of ANILCA. Complete this rule process after the decision record on the transportation and travel management plan.		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General *(cont.)*	**Interim Management:** No similar action.	**Interim Management** • Roads to resources-type decisions would remain ROW decisions (**see Table 2-19**). • Adequate snow cover and freeze (6 inches of snow and 12 inches of freeze) would be present for snowmobile use, unless otherwise authorized by the BLM AO. • Recreational and administrative use of registered unmanned aerial systems (drones) would be allowed, in conformance with Federal Aviation Administration and State regulations; use of unmanned aerial systems for commercial purposes would need an authorization; administrative sites would be closed to takeoffs, landings, and operation of unmanned aerial systems, including the Arctic Interagency Visitor Center, Marion Creek Administrative Site, and 7-Mile Administrative Site. • Fixed-wing aircraft use would be allowed, except when otherwise restricted in this plan; associated hand clearing in support of landing areas with, for example, handsaws, axes, and chainsaws, clearing of rocks, downed logs, and brush would be allowed; other associated clearing would require approval from the BLM AO. Fixed-wing aircraft use is authorized in ANILCA CSUs and WSAs (INHT and CAMA WSA). • OHVs would be limited to 1,500 pounds curb weight for winter and summer use without a permit.		
	Implementation Level Decisions: No similar action.	**Implementation Level Decisions:** The BLM would complete the final OHV limitations and management decisions in a subsequent travel management plan for each TMA (indicated below by alternative; see **Table 2-21**), implemented through a supplemental rule process after the ROD is signed. Management would be consistent with Alternative A until those plans are in place. See also ANILCA Provisions above. Consideration for additional limitations may include designated trails, travel routes or corridors specifically in highly erodible soils, and wetlands or soils associated with permafrost.		
	Action: Allow access through RNAs for vehicles over 1,500 pounds gross vehicle weight by permit (BLM 1986a p. 12). Utility Corridor—Restrict OHVs to soils with low erosion hazard or to winter use, with adequate snow cover. Confine OHV operations to soils with low erosion potential or times of the year when the surface 1 foot (30 centimeters) is frozen and has sufficient snow cover to protect the integrity of vegetation ground cover.	**Action:** See ANILCA provisions and interim management listed above.		

Table 2-21
Travel Management Areas

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General	**Action:** Manage the following as TMAs (all TMAs are LIMITED for OHV use) (**Maps 2.40** and **2.42–2.44**, **Appendix A**): • Within 5 miles of the Dalton Highway • Nigu Wilderness and Iteriak ACEC (Upper Nigu) • Remainder of Dalton Plan Area	**Action:** Manage the following as TMAs (all TMAs are LIMITED (43 CFR 8340.0-5[g]) for OHV use (**Map 2.41**, **Appendix A**): • Dalton Corridor • CAMA lands • Yukon/rest of planning area • Fairbanks/military lands			
OHV Use (Proposed Interim Management)	**Action:** No similar action.	**Action:** • Manage 2,072,000 acres as subject to seasonal limitations for OHV travel (closed in summer) (**Maps 2.45–2.47**, **Appendix A**, and see **Appendix J**). • Manage 1,163,000 acres as subject to seasonal limitations for OHV travel (no OHV use from May 1–June 30) (**Maps 2.45–2.47**, **Appendix A**, and see **Appendix J**).	***Alternative C1*** **Action:** • Manage 106,000 acres as subject to seasonal limitations for OHV travel (closed in summer) (**Maps 2.48–2.50**, **Appendix A**, and see **Appendix J**). • Manage 745,000 acres as subject to seasonal limitations for OHV travel (no OHV use from May 1–June 30) (**Maps 2.48–2.50**, **Appendix A**, and see **Appendix J**).	***Alternative C2*** **Action:** • Manage 77,000 acres as subject to seasonal limitations for OHV travel (closed in summer) (**Maps 2.51–2.53**, **Appendix A**, and see **Appendix J**). • Manage 745,000 acres as subject to seasonal limitations for OHV travel (no OHV use from May 1–June 30) (**Maps 2.51–2.53**, **Appendix A**, and see **Appendix J**).	**Action:** No similar action.
	Action: Limit use of vehicles greater than 1,500 pounds gross vehicle weight to the winter, with adequate snow cover, and to existing trails, where practical.	**Action:** No similar action; see below for TMAs.			
	Action: Dalton Corridor TMA Limited type 2: Casual use of vehicles less than 1,500 pounds gross vehicle weight when ground is frozen and there is adequate snow cover. All other times of year, a permit for casual use is required. Commercial use by permit only. Cross Trans-Alaska Pipeline System (at designated points only). Applies to the remainder of the Utility Corridor planning area.	**Action: Dalton Corridor TMA** Limit summer OHV use to existing trails by vehicles with a curb weight of 1,500 pounds or less; do not allow cross-country travel.			
	Action: CAMA TMA Designate as limited, with OHV travel limited to existing ways in the CAMA WSA.	**Action: CAMA TMA** Same as Alternative A.			

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
OHV Use (Proposed Interim Management) *(cont.)*	**Action: Middle Yukon/Rest of Planning Area TMA** Under the 1986 Central Yukon RMP, the entire decision area is designated as limited. Use of vehicles of less than 1,500 pounds gross vehicle weight is allowed without a permit. Subsistence use of snow machines is allowed. Some parts of the planning area are unplanned and do not have OHV designations. Allow OHV use only for subsistence purposes at Nigu-Iteriak.	**Action: Middle Yukon/Rest of Planning Area TMA** Limit summer cross-country OHV use to vehicles with a curb weight of 1,500 pounds or less. Allow summer OHV use only for subsistence purposes at Nigu-Iteriak.		
	Action: Fairbanks/Military Lands TMA No similar action. (Previously unplanned)	**Action: Fairbanks/Military Lands TMA** Limit summer cross-country OHV use to vehicles with a curb weight of 1,500 pounds or less.		
Over Snow Travel Limitations for BLM-Permitted Activities (Proposed Interim Management)	**Action: Dalton Corridor TMA** Designated as limited type 2: Casual use of vehicles less than 1,500 pounds gross vehicle weight when ground is frozen and there is adequate snow cover. All other times of the year, require a permit for casual use. Commercial use by permit only. Cross Trans-Alaska Pipeline System at designated points only. Applies to the remainder of the Utility Corridor planning area. OHV access for research at Toolik Lake allowed through permit.	**Action: Dalton Corridor TMA** Allow winter cross-country use by snow machines with a curb weight of 1,500 pounds or less.		
	Action: CAMA TMA Designated as limited, with OHV travel limited to existing ways in CAMA WSA.	**Action: CAMA TMA** Allow winter cross-country use on snow machines with a curb weight of 1,500 pounds or less.		
	Action: Middle Yukon/Rest of Planning Area TMA Under the 1986 Central Yukon RMP, the entire decision area is designated as limited. Use of vehicles of less than 1,500 pounds gross vehicle weight is allowed without a permit. Subsistence use of snow machines is allowed. Some parts of the planning area are unplanned and do not have OHV designations.	**Action: Middle Yukon/Rest of Planning Area TMA** Allow winter cross-country use on snow machines with a curb weight of 1,500 pounds or less.		
	Action: Fairbanks/Military Lands TMA No similar action (previously unplanned).	**Action: Fairbanks/Military Lands TMA** Allow winter cross-country use on snow machines with a curb weight of 1,500 pounds or less.		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
Aircraft Use	**Action:** Aircraft associated with all BLM-authorized land use activities would be required to fly a minimum of 2,000 feet above ground level, from May 1 to August 31, unless doing so would endanger human life or be an unsafe flying practice. • ACECs ○ Nugget Creek ○ Poss Mountain ○ Snowden Mountain ○ West Fork Atigun	**Action:** The following areas are subject to the requirement that aircraft associated with all BLM-authorized land use activities would be required to fly a minimum altitude above ground level, unless doing so would endanger human health and safety or be an unsafe flying practice or unless otherwise authorized or permitted, as follows: • 2,000 feet in caribou calving areas from May 1–June 30 • 2,000 feet in Dall sheep habitat, from May 1 through August 31 • ACECs ○ Galbraith Lake—2,000 feet, from May 1 through August 31 ○ Galena Mountain herd—2,000 feet during calving ○ Jim River—2,000 feet during calving ○ Midnight Dome/Kalhabuk—2,000 feet, from May 1 through August 31 ○ Nugget Creek—2,000 feet, from May 1 through August 31 ○ Poss Mountain—2,000 feet, from May 1 through August 31 ○ Ray Mountains—2,000 feet during calving ○ Sukakpak/Snowden Mountain—2,000 feet, from May 1 through August 31 ○ Upper Kanuti River—2,000 feet during calving ○ West Fork Atigun—2,000 feet, from May 1 through August 31	***Alternative C1*** **Action:** The following areas are subject to requirement that aircraft associated with all BLM-authorized land use activities would be required to fly no lower than a minimum altitude above ground level, unless doing so would endanger human health and safety or be an unsafe flying practice or unless otherwise authorized or permitted: • 2,000 feet in caribou calving areas from May 1–June 30 • 2,000 feet in Dall sheep priority habitat, from May 1 through June 30	***Alternative C2*** **Action:** No similar action.	**Action:** No similar action.
	Action: Prohibit normal landings, except in an emergency or for scientific purposes, from May 5 to June 30.	**Action:** Prohibit normal landings, except in an emergency or for scientific purposes, from May 1 to June 30 in the following areas: • ACECs ○ Galena Mountain ○ Jim River ○ Tozitna ○ Sulukna River ○ Upper Kanuti River	**Action:** No similar action.		

Table 2-22
Fluid Leasable Minerals

Alternative A Goal:
- Provide opportunities for mineral leasing and development.

Action Alternatives Goals:
- Make the public lands and federal mineral estate available for orderly and efficient exploration, development, and production of fluid leasable mineral resources (includes oil, natural gas, tar sands, coal bed natural gas, and geothermal steam), unless closure or other administrative action is necessary to protect other resource values.
- Where authorizing fluid leasable mineral actions, to the extent possible, ensure that objectives to protect other resource values in the planning area are met.

Objective:
- If demand arises, provide opportunities for environmentally responsible exploration and development of leasable mineral and energy resources, subject to appropriate laws, regulations, and policies.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General	**Action:** No similar action.	**Action:** • Apply the following controlled surface use stipulation to fluid mineral leases: The operator would construct drill pads at least 500 feet and compressor stations at least 1,500 feet from occupied structures. • Prior to final abandonment, require that land used for fluid mineral infrastructure—including but not limited to well pads, production facilities, access roads, and airstrips—be reclaimed to ensure eventual return of ecosystem function. The BLM may grant exceptions to satisfy stated environmental purposes or community needs.			
	Action: Approximately 8,165,000 acres are withdrawn from fluid mineral leasing, per ANCSA 17(d)(1) withdrawals and PLO 5150.	**Action:** Approximately 743,000 acres of the Dalton Corridor are withdrawn from fluid mineral leasing, per PLO 5150.	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** No similar action (no acres are withdrawn from fluid mineral leasing per PLOs).	**Action:** Same as Alternative C2.
	Action: 30,000 acres are closed to fluid mineral leasing due to resource concerns (**Map 2.56**, **Appendix A**, and see **Appendix J**).	**Action:** 4,220,000 acres are closed to fluid mineral leasing, due to resource concerns (**Map 2.57**, **Appendix A,** and see **Appendix J**).	***Alternative C1*** **Action:** 830,000 acres closed to fluid mineral leasing, due to resource concerns (**Map 2.58**, **Appendix A**, and see **Appendix J**).	***Alternative C2*** **Action:** 259,000 acres closed to fluid mineral leasing, due to resource concerns (**Map 2.59**, **Appendix A**, and see **Appendix J**).	**Action:** Same as Alternative C2.
	Action: Manage 4,888,000 acres as open to fluid mineral leasing (**Map 2.56**, **Appendix A**, and see **Appendix J**).	**Action:** Manage 8,120,000 acres as open to fluid mineral leasing (**Map 2.57**, **Appendix A**, and see **Appendix J**).	***Alternative C1*** **Action:** Manage 11,510,000 acres as open to fluid mineral leasing (**Map 2.58**, **Appendix A**, and see **Appendix J**).	***Alternative C2*** **Action:** Manage 12,824,000 acres as open to fluid mineral leasing (**Map 2.59**, **Appendix A**, and see **Appendix J**).	**Action:** Same as Alternative C2.
	Action: Per the Utility Corridor RMP, NSO stipulations would apply to the inner corridor, eight identified mineral licks, Ivishak River and Kanuti Hot Springs ACECs, and streams closed to mineral location; these are the floodplains of the Jim River and Prospect Creek downstream of the eastern boundary of the Inner corridor and the Kanuti River downstream of the western boundary of the Inner corridor. Rodo River, Kateel River, South Fork Huslia River, Ray River, and the three tributaries of Squaw Creek (northwest of Rampart) would be subject to a 300-foot NSO setback zone along either side of the water.	**Action:** Manage 2,254,000 acres open to fluid mineral leasing, subject to NSO (**Map 2.60**, **Appendix A**) (see **Appendix F** and **Appendix J**).	***Alternative C1*** **Action:** Manage 1,360,000 acres open to fluid mineral leasing, subject to NSO (**Map 2.61**, **Appendix A**) (see **Appendix F** and **Appendix J**).	***Alternative C2*** **Action:** Manage 0 acres open to fluid mineral leasing, subject to NSO (see **Appendix F** and **Appendix J**).	**Action:** Manage 160 acres open to fluid mineral leasing, subject to NSO (see **Appendix F** and **Appendix J**).

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** No similar action.	**Action:** No similar action.	***Alternative C1*** **Action:** Manage 1,495,000 acres as open to fluid mineral leasing, subject to controlled surface use (**Map 2.62**, **Appendix A**) (see **Appendix F** and **Appendix J**).	***Alternative C2*** **Action:** Manage 0 acres as open to fluid mineral leasing, subject to controlled surface use (see **Appendix F, Appendix J,** and **Table 2-3**). *Note: While no areas are mapped as controlled surface use, such a stipulation would be applied on slopes greater than 35 percent.*	**Action:** Manage 0 acres as open to fluid mineral leasing, subject to controlled surface use (see **Appendix F, Appendix J,** and **Table 2-3**). *Note: While no areas are mapped as controlled surface use, such a stipulation would be applied on slopes greater than 35 percent.*
	Action: Manage the Utility Corridor—Seasonal closures may be applied to areas crucial to federally listed threatened or endangered species.	**Action:** Manage the following areas as open to fluid mineral leasing, subject to timing limitations: Within 0.5 miles of any known priority raptor nests, from April 15 through August 15 (from March 15 through July 20 for gyrfalcon nests) (see **Appendix F** and **Appendix J**).			**Action:** No similar action.

Table 2-23
Nonenergy Solid Leasable Minerals

Alternative A Goal:
- Provide opportunities for mineral leasing and development.

Action Alternatives Goal:
- Provide for the extraction of solid leasable minerals to meet public national, regional, and local demand, while minimizing adverse impacts on other resources.

Objective:
- If demand arises, provide opportunities for environmentally responsible exploration and development of leasable mineral and energy resources, subject to appropriate laws, regulations, and policies.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General	**Action:** No similar action.	**Action:** • Before they conduct any operations for nonenergy solid leasable minerals, operators would prepare and submit a mining plan, a reclamation plan, and a monitoring plan, pursuant to 43 CFR 3507 and 3592. Before being issued a coal lease, operators would prepare and submit a resource recovery and protection plan, pursuant to 43 CFR 3482. As part of these plans, operators would generally be expected to submit the following in conjunction with the current regulations and at the discretion of the BLM AO: o Annual water quality monitoring report, as required by the Alaska Department of Environmental Conservation o Annual invasive species inventory o Annual status report of reclamation activities and progress • Also, operators would be required to take the following actions: o Designate a specific global positioning system photo point that is clearly marked on the ground and in an area that will not be mined through; submit photos of the operation from this point to the BLM in the end of year report; these photos would be taken in the spring and fall of each mining season o Describe how concurrent reclamation will be implemented o In locations where topography and water volume allow, operations are required to be a zero-discharge facility, unless authorized otherwise by the BLM, due to site-specific considerations or restraints that would make zero-discharge economically or technically infeasible • All operators would comply with reclamation requirements described below: o Soil and vegetation reclamation ▪ When practicable, mine operators must remove, segregate, and preserve all topsoil or other suitable growth media to minimize erosion and sustain revegetation when reclamation begins. Soil must be stockpiled to preserve soil viability and promote concurrent reclamation. ▪ When practicable, mine operators must revegetate disturbed lands by establishing a stable and long-lasting vegetation cover that is self-sustaining. Reclamation and revegetation must demonstrate that they are trending toward conditions that would provide for the rehabilitation of wildlife habitat. The BLM may develop site-specific revegetation criteria, based on site-specific analysis, as part of the baseline condition measurements. ▪ Mine operators will take all reasonable steps to minimize the introduction of noxious weeds and to limit any existing infestations through the use native species, when available, to the extent technically feasible. Where site conditions demonstrate revegetation is not achievable, then other techniques to minimize erosion and stabilize the project area must be used, subject to BLM approval. o Riparian and stream disturbance/reclamation and fisheries rehabilitation ▪ Refer to the reclamation standards for riparian, floodplains, and fish habitat			
	Action: Approximately 8,165,000 acres are withdrawn from nonenergy solid mineral leasing, per ANCSA 17(d)(1) withdrawals and PLO 5150.	**Action:** Approximately 743,000 acres are withdrawn **from** nonenergy solid mineral leasing, per PLO 5150 (**Map 2.64**, **Appendix A**, and see **Appendix J**).	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** No similar action (no acres are withdrawn from nonenergy solid mineral leasing per PLOs).	**Action:** Same as Alternative C2.
	Action: 17,000 acres are closed to nonenergy solid mineral leasing (**Map 2.63**, **Appendix A**, and see **Appendix J**).	**Action:** 5,091,000 acres are closed to nonenergy solid mineral leasing (**Map 2.64**, **Appendix A**, and see **Appendix J**).	***Alternative C1*** **Action:** 833,000 acres are closed to nonenergy solid mineral leasing (**Map 2.65**, **Appendix A**, and see **Appendix J**).	***Alternative C2*** **Action:** 259,000 acres are **closed** to nonenergy solid mineral leasing (**Map 2.66**, **Appendix A**, and see **Appendix J**).	**Action:** Same as Alternative C2.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** Manage 4,901,000 acres as open to nonenergy solid mineral leasing (**Map 2.63**, **Appendix A**, and see **Appendix J**).	**Action:** Manage 7,249,000 acres as open to nonenergy solid mineral leasing (**Map 2.64**, **Appendix A**, and see **Appendix J**).	***Alternative C1*** **Action:** Manage 11,507,000 acres as open to nonenergy solid mineral leasing (**Map 2.65**, **Appendix A**, and see **Appendix J**).	***Alternative C2*** **Action:** Manage 12,824,000 acres as open to nonenergy solid mineral leasing (**Map 2.66**, **Appendix A**, and see **Appendix J**).	**Action:** Same as Alternative C2.

Table 2-24
Locatable Minerals

Alternative A Goal:
- Provide opportunities for mineral exploration, location, development, and extraction.

Action Alternatives Goals:
- Provide land use opportunities contributing to economic benefits, while protecting or minimizing adverse impacts on other resources.
- Process all plans and notices in accordance with 43 CFR 3809 and 3715, with a focus on quality product delivery to applicants, within a reasonable time frame, to support Alaska's unique and seasonally dependent mining industry.

Objectives:
- Require and provide guidance regarding plans and notices that have sufficient quality and detail to process in a timely manner.
- Ensure adequate and timely reclamation of mine sites, both placer and hard rock, to comply with laws, regulations, and BLM policy.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** No similar action	**Action:** • Operators would include the following as part of their monitoring plan, per 43 CFR 3809.401, and level operations would include the following as part of compliance with 43 CFR 3809.301(b): ○ Annual water quality monitoring report, as required by the Alaska Department of Environmental Conservation ○ Annual invasive species inventory ○ Annual status report of reclamation activities and progress ○ Designate a specific global positioning system photo point that is clearly marked on the ground and in an area that will not be mined through; photos of the operation will be taken from this point and submitted to the BLM in the end of year report; these photos will be taken in the spring and fall of each mining season • Also, operators would be required to take the following actions: ○ Describe how concurrent reclamation will be implemented ○ All lode/hard rock tailings ponds that retain deleterious material will be double-lined and will incorporate sensors and best management/industry practices and standards, including backup/alternative water treatment systems that will allow controlled discharge of the treated effluent to avoid overtopping or uncontrolled release of the material/water to the environment ○ All tailings dam operators that are required to submit a third-party engineering stability/measurement report to meet the State of Alaska Dam Safety Control Criteria will submit a copy of the report to the BLM by September 30 of every other year • All notice and plan placer operators would comply with reclamation requirements described below: ○ Soil and vegetation reclamation ▪ When practicable, mine operators must remove, segregate, and preserve all topsoil or other suitable growth media to minimize erosion and sustain revegetation when reclamation begins. Soil must be stockpiled to preserve soil viability and promote concurrent reclamation. ▪ When practicable, mine operators must revegetate disturbed lands by establishing a stable and long-lasting vegetation cover that is self-sustaining. Reclamation and revegetation must demonstrate that they are trending toward conditions that will provide for the rehabilitation of wildlife habitat. The BLM may develop site-specific revegetation criteria, based on site-specific analysis, as part of the baseline condition measurements. ▪ Mine operators will take all reasonable steps to minimize the introduction of noxious weeds and to limit any existing infestations using native species, when available, to the extent technically feasible. Where site conditions demonstrate revegetation is not achievable, then other techniques to minimize erosion and stabilize the project area, subject to BLM approval, must be used. ○ Riparian and stream disturbance/reclamation and fisheries rehabilitation ▪ Refer to the reclamation standards for riparian, floodplains, and fish habitat • All operators have the option to use the Alaska Statewide Bond Pool, unless excluded by provisions outlined in the BLM-Alaska Department of Natural Resources Bond Pool Agreement. • Use and occupancy qualifications for all operations in the planning area: ○ Criteria for use and occupancy: ▪ The applicant must demonstrate the need for the cabin or structure commensurate with the level of mining proposed ▪ The applicant must use minimal occupancy facilities ○ Structures and conditions: ▪ Related pit privies must be constructed in accordance with State of Alaska regulations; if a privy cannot meet Alaska regulations, all human waste must be carried out ○ No permanent structures are allowed in riparian areas		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** Approximately 4,670,000 acres are withdrawn from locatable mineral entry, including metalliferous minerals, per ANCSA 17(d)(1) withdrawals and PLO 5150 (Dalton Corridor) selection (**Map 2.67**, **Appendix A**). Mineral licks (160 acre parcels) and the Upper Nigu are currently withdrawn from locatable mineral entry. Kanuti Hot Springs ACEC is currently withdrawn from locatable mineral entry as part of PLO 399.	**Action:** Approximately 743,000 acres of the inner PLO 5150 are withdrawn from locatable mineral entry (**Map 2.68**, **Appendix A**).	***Alternative C1*** **Action:** Same as Alternative B (**Map 2.69**, **Appendix A**).	***Alternative C2*** **Action:** No similar action (all PLOs would be revoked, so nothing would remain withdrawn).	**Action:** No similar action (all PLOs would be revoked, so nothing would remain withdrawn).
	Action: 3,305,000 acres are selected and thus segregated from locatable mineral entry until conveyence or release of the selection (**Map 2.67**, **Appendix A**). The BLM's action is to consider these selections open to locatable mineral entry.	**Action:** 7,222,000 acres are selected and thus segregated from locatable mineral entry until conveyence or release of the selection (**Map 2.68**, **Appendix A**). The BLM's action is to consider these selections open to locatable mineral entry.	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** 7,965,000 acres are selected and thus segregated from locatable mineral entry until conveyence or release of the selection (**Map 2.70**, **Appendix A**). The BLM's action is to consider these selections open to locatable mineral entry.	**Action:** 7,965,000 acres are selected and thus segregated from locatable mineral entry until conveyence or release of the selection (**Map 2.70**, **Appendix A**). The BLM's action is to consider these selections open to locatable mineral entry.
	Action: 1,182,000 acres open to location of metalliferous minerals and closed to location of non-metalliferous minerals (PLO 5180, PLO 5186).	**Action:** No similar action (these PLOs would be recommended for lifting).			
	Action: 458,000 acres recommended for withdrawal from locatable mineral entry (**Map 2.67**, **Appendix A**, and see **Appendix J**).	**Action:** 1,461,000 acres recommended for withdrawal from locatable mineral entry (**Map 2.68**, **Appendix A**, and see **Appendix J**). The BLM would only recommend for closure to the mining laws for locatable exploration and development lands not selected by valid selections or remaining BLM-managed lands upon full conveyance of selected lands.	***Alternative C1*** **Action:** 156,000 acres recommended for withdrawal from locatable mineral entry (**Map 2.69**, **Appendix A**, and see **Appendix J**). The BLM would only recommend for closure to the mining laws for locatable exploration and development lands not selected by valid selections or remaining BLM-managed lands upon full conveyance of selected lands	***Alternative C2*** **Action:** 0 acres recommended for withdrawal from locatable mineral entry.	**Action:** 0 acres recommended for withdrawal from locatable mineral entry.
	Action: Manage 6,773,000 acres as open to locatable mineral entry (**Map 2.67**, **Appendix A**).	**Action:** Manage 10,879,000 acres as open to locatable mineral entry (**Map 2.68**, **Appendix A**).	***Alternative C1*** **Action:** Manage 12,184,000 acres as open to locatable mineral entry (**Map 2.69**, **Appendix A**).	***Alternative C*** **Action:** Manage 13,083,000 acres as open to locatable mineral entry (**Map 2.70**, **Appendix A**).	**Action:** Same as Alternative C.
	Action: No similar action.	**Action:** Specific areas are closed to mineral extraction or collection (i.e., casual use and prospecting) (see **Appendix J** for list of areas).	**Action:** No similar action.		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** Casual use limited to list in Dalton Highway Recreation Area Management Plan.	**Action:** Designate recreational mining area for non-mechanized gold panning to Sheep Creek at Mile Post 196.4 Dalton Highway, extending 2.45 miles to the east and South Fork Koyukuk at Mile Post 156.2 Dalton Highway, extending 1.37 miles to the east of the Highway.	***Alternative C1*** **Action:** Same as Alternative B.	***Alternative C2*** **Action:** No similar action.	**Action:** No similar action.

Table 2-25
Mineral Materials (Salable Minerals)

Alternative A Goal:
- Provide opportunities for mineral material sales, where environmentally feasible.

Action Alternatives Goals:
- Provide for the extraction of mineral materials to meet public national, regional, and local need, while minimizing adverse impacts on other resources.
- Provide mineral materials to meet the purposes of the Utility Corridor (e.g., Trans-Alaska Pipeline System and liquid natural gas transport), while minimizing adverse impacts on other resources.

Objectives:
- Outside of closed areas, require operators of any new salable mineral sites to conduct feasibility studies (e.g., sampling and testing) before they are authorized.
- Ensure that existing gravel pits in areas identified as closed under the alternatives remain open and eligible for expansion.
- Ensure adequate and timely reclamation of salable mineral sites to comply with BLM policy and BMPs.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D

General	**Action:**
	• Allow mineral material permits and sales throughout the planning area, with safeguards for the following specific areas: New sites would be approved if not in conflict with crucial wildlife habitat, other important resources, recreation opportunities, or purposes of proposed ACECs. Of special concern are portions of the streambeds and floodplains of Prospect Creek, Jim River, and Ivishak River near the highway. Because of additional resource values (e.g., recreational fishing and salmon spawning) along these streams in the entire Utility Corridor, extracting mineral materials through permit or sale would be approved in the floodplains only if it were demonstrated that no other economically feasible sites were available.
		Action:
		• Prioritize salable mineral extraction along the Utility Corridor where there are existing or previous salable mineral authorizations.
		• Identify potential areas that could be used to meet future needs of mineral materials along the Utility Corridor where existing authorizations do not exist.
		• Require applications for new material sties to contain exploration data demonstrating that the site meets grade and volume specifications. Do not authorize new material sites without this data.
		• Before authorizing mineral materials extraction, require operators to prepare and submit a mining plan, a reclamation plan, and a monitoring plan, pursuant to 43 CFR 3601.40–44. As part of these plans, operators would submit the following:
		  ○ Annual water quality monitoring report, as required by the Alaska Department of Environmental Conservation
		  ○ Annual submission of an invasive species inventory
		  ○ Annual status report of reclamation activities and progress
		• Also, operators would be required to take the following actions:
		  ○ Designate a specific global positioning system photo point that is clearly marked on the ground and in an area that will not be mined through; photos of the operation will be taken from this point and submitted to the BLM in the end of year report; these photos will be taken in the spring and fall of each mining season
		  ○ Describe how concurrent reclamation will be implemented
		  ○ Justify why the new site is needed in addition to existing sites
		• In locations where topography and water volume allow, operations are required to be a zero-discharge facility, unless authorized otherwise by the BLM, due to site-specific considerations or restraints that would make zero discharge economically or technically infeasible.
		• All operators would comply with reclamation requirements described below:
		  ○ Soil and vegetation reclamation
		  ▪ When practicable, remove, segregate, and preserve all topsoil or other suitable growth media to minimize erosion and sustain revegetation when reclamation begins. Soil must be stockpiled to preserve soil viability and promote concurrent reclamation.
		  ▪ When practicable, revegetate disturbed lands by establishing a stable and long-lasting vegetation cover that is self-sustaining. Reclamation and revegetation must demonstrate that they are trending toward conditions that will provide for the rehabilitation of wildlife habitat. The BLM may develop site-specific revegetation criteria, based on site-specific analysis, as part of the baseline condition measurements.
		  ▪ Take all reasonable steps to minimize the introduction of noxious weeds and to limit any existing infestations through the use native species, when available, to the extent technically feasible. Where site conditions demonstrate that revegetation is not achievable, then other techniques to minimize erosion and stabilize the project area, must be used, subject to BLM approval.
		  ○ Riparian and stream disturbance/reclamation and fisheries rehabilitation
		  ▪ Refer to the reclamation standards for riparian, floodplains, and fish habitat
		• Existing, authorized sites would remain open for future salable mineral actions, to allow for authorized expansion of currently authorized mineral material sites, and to allow for future needs, except in areas with overriding resource concerns.		

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2		Alternative D
General *(cont.)*	**Action:** Manage 266,000 acres as closed to mineral material disposal (**Map 2.71**, **Appendix A**, and see **Appendix J**). Seasonal closures or other appropriate restrictions may also be applied to areas crucial to species covered by the Threatened and Endangered Species Act, e.g., the Toolik Lake RNA.	**Action:** Manage 5,041,000 acres as closed to mineral material disposal (**Map 2.72**, **Appendix A**, and see **Appendix J**).	***Alternative C1*** **Action:** Manage 1,465,000 acres as closed to mineral material disposal (**Map 2.73**, **Appendix A**, and see **Appendix J**).	***Alternative C2*** Manage 1,004,000 acres as closed to mineral material disposal (**Map 2.74**, **Appendix A**, and see **Appendix J**).	**Action:** Manage 259,000 acres as closed to mineral material disposal (**Map 2.75**, **Appendix A**, and see **Appendix J**).
	Action: Manage 12,817,000 acres as open to mineral material disposal (**Map 2.71**, **Appendix A**).	**Action:** Manage 8,042,000 acres as open to mineral material disposal (**Map 2.72**, **Appendix A**).	***Alternative C1*** **Action:** Manage 11,618,000 acres as open to mineral material disposal (**Map 2.73**, **Appendix A**).	***Alternative C2*** **Action:** Manage 12,079,000 acres as open to mineral material disposal (**Map 2.74**, **Appendix A**).	**Action:** Manage 12,824,000 acres as open to mineral material disposal (**Map 2.75**, **Appendix A**).
	Action: Encourage extraction of gravel from already disturbed sites. Any new site would be approved if judged not in conflict with crucial wildlife habitat, other important resource values, recreation opportunities, or the purposes of the proposed ACECs.	**Action:** Same as Alternative A.			

Table 2-26
Air Quality

Goal:
- Ensure that authorizations and management activities do not degrade air quality and related resource values in the planning area.

Objectives:
- Ensure that authorizations and management activities comply with National Ambient Air Quality Standards and all applicable federal, tribal, State, and local air quality laws, statutes, regulations, standards, and implementation plans.
- Reduce air quality and air quality-related impacts by including management actions to reduce emissions of criteria and hazardous air pollutants.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D
General	**Action:** • Cooperate with State and other agencies in monitoring air quality to verify compliance with lease or permit requirements (BLM 1986a, pg.13).	**Action:** • Implement wildland fire smoke mitigation measures adopted by the Alaska Wildland Fire Coordinating Group and consider public health and safety in all fire management activities. • Ensure that prescribed burns adhere to smoke management requirements set by the Alaska Department of Environmental Conservation. • Require all permittees to mitigate any activity that may result in unacceptable air quality. • Require design features or mitigation measures to reduce fugitive dust emissions from construction activities and, as appropriate, sites with surface disturbance. • Require design features or mitigation measures to reduce fugitive dust emissions from travel on unpaved roads.		
	Action: No similar action.	**Action:** From November 1 to April 1, do not authorize any activity that contributes $PM_{2.5}$ to the Fairbanks North Star Borough nonattainment area.	**Action:** No similar action; activities would be authorized so long as they meet the $PM_{2.5}$ standards.	

Table 2-27
Hazardous Materials

Goals:
- Require that the use of hazardous materials in the planning area be managed in accordance with all applicable federal, State, and local laws and regulations.
- Protect human health and safety and environmental safety by minimizing environmental contamination from chemical, biological, and radiological sources on federal property or BLM-operated facilities.
- Integrate environmental protection and compliance into all BLM-permitted and conducted activities.

Objectives:
- Prevent new spills from occurring and prevent the creation of new contaminated sites.
- Successfully clean up all contamination that occurs or is discovered from past land use, to a degree that meets regulatory requirements and BLM future land uses.

Category	Alternative A (*No Action*)	Alternative B	Alternative C1/C2	Alternative D

General	**Action:** Inventory and provide for management of hazardous sites.	**Action:**
		• Identify contaminated sites by location to initiate assessment, cleanup, and restoration to maintain or improve the health of affected ecosystems.
		• Prioritize cleanup of hazardous materials sites with imminent or existing discharge of hazardous materials, based on the following criteria (not in ranked order):
		  ○ Threatens human health and safety
		  ○ Adversely impacts drinking water sources
		  ○ Would impact aquatic resources
		  ○ Would impact cultural resources
		  ○ Are on lands selected for conveyance to Native corporations or the State of Alaska
		• Project operators would be responsible for cleanup associated with any activities caused by their actions
		  • Prevent or mitigate the effects of spills of hazardous materials by requiring the following:
		  ○ Notice of any spill shall be given to the BLM AO as soon as possible but no later than 24 hours after occurrence.
		  ○ All spills shall be cleaned up immediately and to the satisfaction of the BLM AO and all agencies with regulatory authority over spills.
		  ○ Sufficient oil spill cleanup materials, such as sorbent pads and containment devices, shall be stored at all fueling points and maintenance areas. Drip basins and/or sorbent pads would be placed under all non-dry disconnect type fuel line couplings and valves during fueling.
		  ○ All fuel and oil or petroleum product containers, including barrels and propane tanks, shall be marked with the permittee's name and the product type. Duck ponds shall be marked with the permittee's name.
		  ○ Fuel containers and hazardous materials containers of any size shall be stored in secondary containment.
		• Fuel storage and refueling of equipment within 100 feet of any lake shoreline or top of streambank is prohibited. On a site-specific basis at the permitting stage, the BLM AO may expand this distance to include the 100-year floodplain (defined as an elevation of three times maximum bankfull depth), based on the site condition specified in the permit conditions.
		• Hazardous materials may be off-loaded from aircraft onto the ice but may not be stored on lakes or river ice.
		• All withdrawals relinquished to the BLM would be subject to a phase 1 environmental site assessment conducted pursuant to ASTM E1527–13.
		• Standard practice for environmental site assessments: Phase I environmental site assessment process (or current version), documenting potential environmental liabilities; if such are identified, the holder of the withdrawal would be required to complete the cleanup before relinquishing the site to the BLM; an updated phase I environmental site assessment would be completed to document cleanup and that there are no known environmental liabilities remaining on the property.
		• On-site compliance inspections required for all BLM-permitted activities before permit closeout.
		• Manage naturally occurring asbestos sites as follows, unless otherwise approved by the BLM AO:
		  ○ Close to all surface-disturbing activities, unless specific mitigations are developed during permitting
		  ○ Close to mineral material disposal
		  ○ Close to summer OHV use
		  ○ Allow no camping or competitive events that may disturb the site surface		

Chapter 3. Affected Environment and Environmental Consequences

3.1 INTRODUCTION

This chapter describes the affected environment and environmental consequences of the alternatives being evaluated in this Draft Resource Management Plan (RMP)/Environmental Impact Statement (EIS). Though these two aspects are often in separate chapters in an EIS, they are combined here to facilitate continuity for the reader from baseline conditions to potential impacts on each resource. In 2014, as part of the planning process, the Bureau of Land Management (BLM) released the analysis of management situation (AMS), which describes the baseline conditions in the planning area (BLM 2016a).

Because the AMS describes the planning area in detail, this chapter incorporates it by reference and provides updates, as necessary. Following the description of baseline conditions, the discussion of potential direct, indirect, and cumulative impacts under each resource provides the scientific and analytic basis for evaluating the potential impacts of each of the alternatives described in **Chapter 2**. The approach to impact analysis is discussed further in **Appendix M**, and **Appendix N** contains the reasonably foreseeable development (RFD) scenarios. **Appendix Q** provides more detailed impact analyses for subsistence, and **Appendix F** contains standard operating procedures (SOPs) that would be implemented under all the action alternatives.

3.1.1 Description of Lands Selected by the State of Alaska or Alaska Native Claims Settlement Act (ANCSA) Corporations

Within the Central Yukon Resource Management Plan (CYRMP) range of alternatives are a variety of recommendations for revoking withdrawals in the planning area. They range from a full revocation of the ANCSA 17(d)(1) withdrawals to a partial and full revocation of the Public Land Order (PLO) 5150 withdrawal. These recommendations for the ANCSA 17(d)(1) withdrawals are consistent with the direction in ANCSA section 17(d)(1) "to classify or reclassify any lands so withdrawn and to open such lands to appropriation under the public land laws in accordance with his classifications" and the BLM priority of revoking many of these withdrawals. The review of PLO 5150 is consistent with land use planning policy to review existing withdrawals to determine if the need to reserve the land for the purpose by which it was set aside is still valid.

If the Secretary of the Interior acts on these recommendations, the revocation of the existing PLO would result in changes in land status such that additional lands would become available for selection as allotments by Alaska Native Vietnam-era veterans under Section 1119 of the John D. Dingell, Jr. Conservation, Management, and Recreation Act of March 12, 2019. Also, the top-filings for the State of Alaska would become valid selections, particularly, in the case of PLO 5150.

Currently, 5,253,000 acres of BLM-managed lands in the planning area are withdrawn from appropriation under the public land laws. Pursuant to the PLOs issued under Section 17(d)(1) of ANCSA and Executive Order 10355, this includes, generally, location and entry under the mining laws and leasing under the Mineral Leasing Act of 1920.

Additionally, PLO 5150 reserved 2,138,000 acres of land for a utility and transportation corridor under Section 17(c) of ANCSA in the aid of programs for the U.S. Government and the State of Alaska. Paragraph 1 of the PLO identifies lands withdrawn from all forms of appropriation under the public land laws, except for location

for metalliferous minerals, and that are also withdrawn from mineral leasing, selection by the State of Alaska, any native group, village, or regional corporations. Paragraph 2 of the PLO identifies a subset of lands withdrawn under paragraph 1, commonly referred to as the inner corridor. These lands are also withdrawn from prospecting, location, and purchase under U.S. mining laws, which represent 743,000 acres in this plan (**Maps 2.28**, **2.29**, **2.30** and **3.20**, **Appendix A**).

Section 906(e) of the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) allows the State to top-file lands that are otherwise unavailable, because, for example, they are BLM-managed lands withdrawn by a PLO. Currently, the State of Alaska has top-filed 2,717,000 acres of withdrawn BLM-managed lands in the planning area, including 2,066,000 acres in PLO 5150. If the PLOs that withdrew these lands are revoked, then the State's top-filings become valid selections under the Alaska Statehood Act and any Priority 1[1] top-filings would become Priority 1 selections. Once these lands become selected, they would be segregated from locatable mineral entry (43 Code of Federal Regulations [CFR] 2627.4(b)) and would no longer be available for federal priority subsistence (ANILCA 102.3; ANILCA Section 804); therefore, for the purpose of land status, once the land is selected, it is considered encumbered.

Valid selections can be conveyed, relinquished, or rejected at any time; therefore, BLM management actions are considered in the context of both the encumbrance and whether the selected lands are likely to leave federal ownership. There is no established timeline for conveying or relinquishing selections; however, the BLM believes it is likely that the State of Alaska would pursue the Priority 1 selections in the planning area for conveyance within 10 years of the Record of Decision (ROD) being signed; therefore, the BLM has identified those parcels for impacts analysis.

Approximately 5,856,000 acres of BLM-managed lands in the planning area contain lands that have been selected by the State of Alaska or ANCSA corporations. If a PLO is revoked and it has not been top-filed, or if a State or Native selection is relinquished, those lands would become unencumbered. This means that they would be open to appropriation under the public land laws, as well as location and entry under the mining laws and leasing under the Mineral Leasing Act of 1920. These lands would also become available for the selection of allotments by Alaska Native Vietnam-era veterans under Section 1119 of the John D. Dingell, Jr. Conservation, Management, and Recreation Act of March 12, 2019.

In order to clarify the quantitative and qualitative the impacts of these changes on land status, the BLM has developed the **Table 3-1**, below, to provide the reader with a sequencing of how the effects of proposed changes could affect the status of a given acre of land, as withdrawals are revoked, selections relinquished or rejected, and conveyances completed, resulting in the indicated status of locatable mineral entry and BLM-managed lands available for federal priority subsistence. The effects analysis will take these variations into consideration for any potential result of BLM-managed lands.

[1]The State of Alaska has applied priorities to its selections as part of its entitlement. Priority 1 is the highest priority, with the rankings descending in lower priority.

Table 3-1
Selection Sequencing

Lands without ANCSA or State of Alaska Selections				
Initial Land Status	**Potential RMP Action**	**Assumptions for Analysis**	**Locatable Minerals Entry Status**	**Effect on Availability of the Land for Priority Subsistence Use under ANILCA**
Unencumbered BLM-managed public lands, currently open to locatable entry.	No BLM proposed change in land status.	Unencumbered and open for the life of the plan.	Open	Available for federal priority subsistence use for the life of the plan.
Unencumbered BLM-managed public lands, currently withdrawn from locatable entry.	No BLM proposed change in land status.	Unencumbered and closed for life of the plan.	Closed	Available for federal priority subsistence use for the life of the plan.
Unencumbered BLM-managed public lands, currently withdrawn from locatable entry.	BLM recommends revocation of mineral withdrawal.	Unencumbered and closed until the Secretary of the Interior acts on the recommendation and withdrawal is revoked, then unencumbered and open for the life of the plan.	Closed until withdrawal is revoked, then open for the life of the plan.	Available for federal priority subsistence use for the life of the plan.
Unencumbered BLM-managed public lands currently withdrawn from selection that have been top-filed per ANILCA 906 (e).*	BLM recommends revocation of withdrawal.	Unencumbered until the Secretary of the Interior acts on the recommendation and withdrawal is revoked, then top-filing attaches as a selection and the land is encumbered.	Withdrawn until revocation is signed, then segregated once revocation is signed.	Available for federal priority subsistence use until the revocation is signed, then not available for federal priority subsistence use once revocation is signed.

Lands with ANCSA or State of Alaska Selections				
Initial Land Status	**Potential RMP Action**	**Assumptions for Analysis**	**Locatable Minerals Entry Status**	**Effect on Availability of the Land for Priority Subsistence Use under ANILCA**
State of Alaska selected lands identified as Priority 1.	Not a BLM RMP action; State of Alaska seeks conveyance.	Encumbered until conveyance; conveyance assumed to occur within 10 years after the ROD, then State of Alaska managed upon conveyance.	Segregated until conveyed, then management determined by the State of Alaska.	Not available for federal priority subsistence. Management determined by the State of Alaska once conveyed.
ANCSA or State of Alaska Priority 2 and lower selected lands.	Not a BLM RMP action.	Encumbered for the life of the plan.	Segregated for the life of the plan.	Not available for federal priority subsistence use for the life of the plan.
ANCSA or State of Alaska selected lands for which the selection is relinquished or rejected.	Not a BLM RMP action; State of Alaska and ANCSA corporations can relinquish, or the BLM can reject, a selection at any time.	No assumptions for time frame in the RMP; however, relinquishments or rejection of selected lands could happen at any time. Encumbered lands would become unencumbered upon relinquishment or rejection of the selection, unless the ANCSA selection is top-filed, in which case the state top-filing would attach, and the lands would remain selected.	Segregated until selection relinquished or rejected then open, unless ANCSA selection is top-filed, in which case the lands would remain selected.	Not available for federal priority subsistence use until relinquished or rejected, then available for federal priority subsistence use unless ANCSA selection is top-filed.

Top-filed Lands within PLO 5150				
Initial Land Status	**Proposed RMP Action**	**Assumptions for Analysis**	**Locatable Minerals Entry Status**	**Effect on Availability of the Land for Priority Subsistence Use under ANILCA**
State of Alaska top-filed lands per ANILCA 906 (e).*	Proposed revocation of PLO 5150.	Unencumbered until PLO is revoked, then top filing changes to selection and the land is encumbered.	As specified in PLO 5150 until PLO is revoked, then segregated once revocation is signed.	Available for priority subsistence use until PLO is revoked, then not available for federal priority subsistence once revocation is signed.

Top-filed Lands within PLO 5150				
Initial Land Status	**Proposed RMP Action**	**Assumptions for Analysis**	**Locatable Minerals Entry Status**	**Effect on Availability of the Land for Priority Subsistence Use under ANILCA**
Inner corridor PLO 5150 lands currently closed to mineral entry				
Top-filed lands, currently closed to locatable entry that become Priority 1 selections.	Proposed revocation of PLO 5150.	Unencumbered until PLO is revoked, then top-filed lands become selected. Lands are considered encumbered until conveyance. Conveyance assumed to occur within 10 years after the ROD is signed, then State of Alaska-managed upon conveyance.	Closed until revocation is signed, then segregated until conveyed, then management determined by the State of Alaska.	Not available for federal priority subsistence once revocation is signed.
Top-filed lands, currently closed to locatable entry that become Priority 2 or lower selections.	Proposed revocation of PLO 5150 that applies to the inner corridor.	Unencumbered until PLO is revoked, then top-filed lands become selected. Encumbered for the life of the plan.	Closed until revocation is signed, then segregated by State selection.	Available until revocation is signed, then not available for federal priority subsistence.
Top-filed lands, currently closed to locatable entry, that convert to selections, then the selection is relinquished or rejected.	Not a BLM RMP action; the State of Alaska can relinquish, or the BLM can reject a selection at any time.	No assumptions for time frame in the RMP; however, top-filed or selected lands could be relinquished at any time. Encumbered lands would become unencumbered upon relinquishment or rejection of the selection.	Closed until PLO revocation is signed, then segregated until selection is relinquished or rejected, then open; if the State of Alaska removes a top-file on a particular acre before the PLO is revoked, then the lands are open upon the PLO revocation action.	Available for federal priority subsistence use until the PLO revocation is signed, then not available for federal priority subsistence use while selected, then available for federal priority subsistence use after selection is relinquished; if the State of Alaska removes a top-file on a particular acre before the PLO is revoked, there would be no change in federal priority subsistence status.

Top-filed Lands within PLO 5150				
Initial Land Status	**Proposed RMP Action**	**Assumptions for Analysis**	**Locatable Minerals Entry Status**	**Effect on Availability of the Land for Priority Subsistence Use under ANILCA**
Outer corridor PLO 5150 lands currently open to mineral entry				
Top-filed lands, currently open to locatable entry that become Priority 1 selections.	Recommended revocation of PLO 5150 that applies to the outer corridor.	Unencumbered until the Secretary of the Interior acts on the recommendation and the PLO is revoked, then top-filings become selected lands. Lands are considered encumbered until conveyance. Conveyance is assumed to occur within 10 years after the ROD is signed, then State of Alaska-managed upon conveyance.	Open until revocation is signed, then segregated until conveyed, then management determined by the State of Alaska.	Available until revocation is signed, then not available for federal priority subsistence.
Top-filed lands, currently open to locatable entry that become Priority 2 or lower selections.	Recommended revocation of PLO 5150 that applies to the outer corridor.	Unencumbered until the Secretary of the Interior acts on the recommendation and the PLO is revoked, then top-filings become selected lands. Encumbered for the life of the plan.	Open until revocation is signed, then segregated for the life of the plan.	Available until revocation is signed, then not available for federal priority subsistence for the life of the plan.

Top-filed Lands within PLO 5150				
Initial Land Status	**Proposed RMP Action**	**Assumptions for Analysis**	**Locatable Minerals Entry Status**	**Effect on Availability of the Land for Priority Subsistence Use under ANILCA**
Top-filed lands *currently open to locatable entry* that convert to selections, then the selection is relinquished or rejected.	Not a BLM RMP action; the State of Alaska can relinquish, or the BLM can reject a selection at any time.	No assumptions for time frame in the RMP; however, top-filings or selections could be relinquished or rejected at any time. Encumbered lands would become unencumbered upon relinquishment or rejection of the selection.	Open until the PLO revocation is signed, then segregated until the selection is relinquished or rejected, then open; if the State of Alaska removes a top-file on a particular acre before the PLO is revoked, then the lands remain open.	Available for federal priority subsistence use until the PLO revocation is signed, then not available for federal priority subsistence use until the selection is relinquished or rejected, then available for federal priority subsistence use; if the State of Alaska removes a top-file on a particular acre before the PLO is revoked, then there is no change in federal priority subsistence status.

*ANILCA 906(e) FUTURE “TOP FILINGS.” Subject to valid existing rights and Native selection rights under the ANCSA, the State, at its option, may file future selection applications and amendments thereto, pursuant to §6(a) or (b) of the Alaska Statehood Act or subsection (b) of this section, for lands which are not, on the date of filing of such applications, available within the meaning of §6(a) or (b) of the Alaska Statehood Act, other than lands within any conservation system unit or the National Petroleum Reserve Alaska. Each such selection application, if otherwise valid, shall become an effective selection without further action by the State upon the date the lands included in such application become available within the meaning of subsection (a) or (b) of §6 regardless of whether such date occurs before or after expiration of the State's land selection rights. Selection applications heretofore filed by the State may be refiled so as to become subject to the provisions of this subsection; except that no such refiling shall prejudice any claim of validity which may be asserted regarding the original filing of such application. Nothing contained in this subsection shall be construed to prevent the United States (U.S.) from transferring a federal reservation or appropriation from one federal agency to another federal agency for the use and benefit of the federal government.
Note that there are instances where top-filings and selections overlap. In these cases, the GIS calculations assume that Native corporation selections would be offered first.

3.2 RESOURCES

3.2.1 Air Quality and Climate

Air quality throughout most of the planning area is unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) and Alaska Ambient Air Quality Standards (AAAQS). Natural impacts on air quality include smoke from wildland fire and windblown dust from gravel sources, such as riverbeds, gravel roads, and airstrips. Wildland fire smoke emissions of fine particulate matter is the main pollutant of concern in the planning area, affecting visibility and human health during wildland fires. Human-caused impacts on air quality include road dust on gravel or sanded road surfaces and emissions from vehicle and airplane traffic and small population centers. Air pollution emission sources in urban areas are concentrated along the southeast border of the planning area.

A portion of the Fairbanks North Star Borough, including the cities of Fairbanks and North Pole, is a $PM_{2.5}$ (particulate matter with a diameter less than or equal to 2.5 microns) nonattainment area. Elevated $PM_{2.5}$ concentrations occur primarily during the winter, from October through March, when strong temperature inversions trap localized emissions from wood stoves, burning oil, industrial sources, and mobile sources (ADEC 2019).

State-operated air quality monitoring stations are only in Fairbanks; however, data provided by the federally operated Interagency Monitoring for the Protection of Visual Environments stations near the planning area can be used to assess air quality. Trends data at Denali National Park, approximately 20 miles south of the planning area, show consistently good visibility on the clearest and haziest days and ozone concentrations below NAAQS and AAAQS. Wet nitrogen deposition is in good condition and wet sulfur deposition warrants moderate concern but is improving (2011–2015 5-year average). Gates of the Arctic (Bettles Field), in the north-central portion of the planning area, shows good visibility, with improved visibility on the haziest days and no changes in visibility on the clearest days, but has a short data record period available. Wet nitrogen deposition is in good condition; wet sulfur deposition warrants moderate concern but is improving (2011–2015 5-year average).

In addition to the State and federal monitors described above, the Louden Tribal Council Office and Allakaket Tribal Office operate air quality sensors through the PurpleAir network to monitor particulate matter. While the data from these sensors do not undergo quality assurance and control as does data collected through State and federal networks, they can give a sense of air quality conditions in these locations. Values collected for the prior year at the Louden Tribal Council Office show $PM_{2.5}$ levels primarily in the good and moderate categories (0 to 100) on the Environmental Protection Agency's air quality index scale, while values from the Allakaket Tribal Office were all in the good category (0 to 50) (PurpleAir 2020). An air quality index of 100 generally corresponds to an ambient air concentration that equals the level of the short-term NAAQS for protecting public health (EPA 2020).

The Alaska Department of Environmental Conservation (ADEC) reports monitoring values for short-term, project-specific air quality monitors used in the air permitting process. There are ten monitors on the North Slope from which data have been collected and verified since 2009, usually for 1 year. None of the data from any of these monitors have shown concentrations above the NAAQS or AAAQS (ADEC 2018).[2]

Climate

The planning area has a continental subarctic climate south of the Brooks Range and a northern polar climate north of the Brooks Range. The continental subarctic climate is characterized as semiarid, with low annual

[2] Industrial Data Summary-05/22/2018 (XLSX)

precipitation (17 inches), short hot summers, and severe winters, with snow from October through April. The northern polar climate is arid, with low annual precipitation (7 inches), short cool summers, and long cold winters, with snow present from October through May (BLM 2016a).

Gallant et al. (1995) characterized the ecoregions of Alaska. From north to south, the planning area falls within the Arctic Coastal Plan, Arctic Foothills, Brooks Range, Interior Forested Lowlands and Uplands, Interior Highlands, Interior Bottomlands, and Alaska Range Ecoregions. The distinctive features and climate of these ecoregions are described in **Table 3-2**.

Table 3-2
Ecoregions in the Planning Area

Ecoregion	Description	Climate
Arctic Coastal Plain	Bounded on the north and the west by the Arctic Ocean and stretching eastward, nearly to the international boundary with the Yukon Territory	Arctic climatic conditions, with very low mean annual temperatures and very low annual precipitation. Winds are persistent and strong. Average daily minimum winter temperatures are about -30°C (degrees Celsius; -22° Fahrenheit [F]), and average daily maximum winter temperatures are about -21°C (-6°F). Daily minimum summer temperatures average just above freezing, and daily maximum summer temperatures average 8°C (46°F). Cloud cover or fog prevails during the summer; fog decreases (and temperature rises) with increasing distance from the coast. The ecoregion receives approximately 140 millimeters (mm; 5.5 inches) of precipitation annually. Average annual snowfall varies among weather stations, ranging from 30 centimeters (cm) to 75 cm (12 to 30 inches).
Arctic Foothills	Consists of a wide swath of rolling hills and plateaus that grades from the coastal plain on the north to the Brooks Range on the south	Arctic climate conditions are prevalent. Foothills are somewhat warmer in winter than the adjacent regions to the north and south. Weather stations are rare. Annual precipitation mirrors that of the Arctic Coastal Plain. As much as 50 mm (2 inches) of additional precipitation is intercepted near the boundary with the Brooks Range Ecoregion. Snowfall patterns are similar to overall annual precipitation patterns in that more snow falls near the Brooks Range than in the rest of the region. Average daily winter temperatures range from a minimum of -29°C (-20°F) to a maximum of -20°C (-4°F). Average daily summer temperatures range from a minimum of 1°C (34°F) to a maximum of 11°C to 15°C (52°F to 59°F), although maximum temperatures of 24°C (75°F) are not uncommon in some areas.
Brooks Range	Consists of several groups of rugged, deeply dissected mountains. Traverses much of the east-west extent of northern Alaska. Elevation of peaks ranges from 800 to 2,400 meters (2,625 to 7,875 feet)	The ecoregion is influenced by arctic climate. The weather station at Anaktuvuk Pass sits at an elevation of 770 meters (2,526 feet), where winter temperatures average a daily minimum of -30°C (-22°F) and a daily maximum of -22°C (-8°F) and summer temperatures average lows of 3°C (37°F) and highs of 16°C (61°F). In general, temperatures decrease with elevation, but hillslope aspect, strong and persistent winds, and convective currents result in climate that is highly variable. Mean annual precipitation at Anaktuvuk Pass is 280 mm (11 inches), with 160 cm (63 inches) of annual snowfall. Precipitation is heaviest on south-facing slopes and near mountain summits.

Ecoregion	Description	Climate
Interior Forested Lowlands and Uplands	Consists of a patchwork of ecological characteristics; regionwide unifying features include a lack of Pleistocene glaciation and a continental climate	The ecoregion has a continental climate, with short, warm summers and long, very cold winters, with variation in temperature and precipitation from west to east. Mean annual precipitation ranges from 250 to 550 mm (10 to 22 inches), with snowfall averaging from 125 to 205 cm (49 to 80 inches). Most precipitation falls during summer. Average minimum winter temperatures vary from -18°C (-0.4°F) in the west to -35°C (-31°F) in the east; average maximum winter temperatures vary from -11°C (12°F) in the west to -22°C (-8°F) in the east. Strong, stable temperature inversions are common in winter. Summer temperatures, averaging a minimum of 8°C (46°F) to 11°C (52°F) and a maximum of 17°C (63°F) to 22°C (72°F), have less regional variation than winter temperatures.
Interior Highlands	Consists of rounded, low mountains surmounted by rugged peaks (1,200 to over 1,500 meters [3,900 to 4,900 feet])	The ecoregion has a continental climate. Highlands receive more precipitation than the surrounding lower elevation areas. Summer temperatures probably decrease with elevation. Because of steep and persistent winter temperature inversions at lower elevations, it is difficult to generalize the relative pattern of winter temperatures in the highlands versus in the surrounding areas.
Interior Bottomlands	Consists of flat to nearly flat bottomlands along larger rivers of interior Alaska; bottomlands are dotted with thaw and oxbow lakes	The ecoregion has a continental climate. The bottomlands in the west receive more annual precipitation than those in the east. Annual precipitation ranges from 280 to 400 mm (11 to 16 feet), and annual snowfall ranges from 95 to 205 cm (3 to 7 feet). Average daily minimum temperatures in winter range from -33°C to -26°C (-27°F to -15°F). Average daily maximum winter temperatures range from -22°C to -17°C (-8°F to 1°F). Summer temperatures have lows of about 7°C (45°F) and highs of about 22°C (72°F). Summer maximum temperatures generally increase from west to east.
Alaska Range	Mountains of the Alaska Range are very high and steep. The ecoregion is covered by rocky slopes, icefields, and glaciers.	The ecoregion has a continental climatic regime, but because of the extreme height of many of the ridges and peaks, annual precipitation at higher elevations is similar to that measured for some ecoregions with maritime climate. Weather data for the region are from lower elevation stations. Daily winter low temperatures average about -25°C (-13°F) and daily highs about -3°C (27°F) at these stations. Daily summer low temperatures for the same areas average about 2°C (36°F) and daily highs average about 18°C (64°F). Mean annual precipitation in the lowlands is approximately 380 mm (15 inches), with snowfall ranging from 150 to 305 cm (60 to 120 inches) at various stations. Estimated average annual precipitation for the higher mountains peaks is 2,030 mm (80 inches), with estimated snowfall of 1,015 cm (400 inches).

Source: Gallant et al. 1995

As reported in the Fourth National Climate Assessment, Alaska has been warming twice as fast as the global average since the middle of the twentieth century. Statewide annual average temperatures from 1925 to the late 1970s were variable, with no clear pattern of change; beginning in the late 1970s and continuing at least through the end of 2016, Alaska statewide annual average temperatures began to increase at an average rate of 0.7ºF per decade. Temperatures have been increasing faster in Arctic Alaska than in the southern part of the state. The North Slope is warming at 2.6 times the rate of the continental (U.S., while the west coast, central interior, and Bristol Bay areas are warming at more than twice the rate of the continental U.S. (Markon et al. 2018).

The long-term temperature trends vary considerably from decade to decade and are in part consistent with those in large-scale patterns of climate variability in the Pacific Ocean. In particular, Arctic warming in the early twentieth century was intensified by Pacific variability (warm and cold anomalies of the Pacific sea surface temperatures). Precipitation changes have varied significantly across the state from 1920 to 2012, with long-term trends generally showing no clear pattern of change. Using downscaled global climate models and the higher scenario (Representation Concentration Pathway 8.5), more warming is projected in the Arctic and interior areas than in the southern areas of Alaska; average annual precipitation increases are projected for all areas of the state, with greater increases in the Arctic and interior and the largest increases in the northeastern interior (Markon et al. 2018).

Greenhouse Gas (GHG) Emissions

The primary GHGs associated with activities in the planning area are carbon dioxide, methane, and nitrous oxide. GHG emissions are reported in units of carbon dioxide equivalent (CO_2e) emissions to account for the varying global warming potential of pollutants. The most recent GHG inventory report for the state shows total GHG emissions of 41.3 million metric tons (MMT) CO_2e in 2015, an 8 percent decrease since 1990. Alaska's GHG emissions are 63percent of nationwide emissions and 9 percent of global emissions. The industrial sector, including the oil and gas industries, produces the most GHG emissions in the state, followed by the transportation, residential and commercial, and electric generation sectors. The waste, agriculture, and industrial process sectors each produce relatively small quantities of GHG in Alaska (ADEC 2018).

GHG emission sinks (carbon that is captured in soils and vegetation) were estimated at 1.74 MMT CO_2e in 2015. The estimates of carbon sinks are imprecise; factors that affect these estimates include changes in the landscape due to wildland fire. In the low wildfire year of 2014, carbon sinks captured an estimated 29.8 MMT CO_2e, while in the high wildfire year of 2015 a much lower rate of carbon was captured (ADEC 2018).

In November 2018, the U.S Geological Survey published a report on GHG emission sinks on federal lands in the U.S. From 2005 to 2014, average carbon storage in live vegetation and soils on federal lands in Alaska was estimated at 131,675 MMT CO_2e, with 92 percent stored in soils and 8 percent stored in live vegetation. The amount of carbon stored on federal lands in Alaska was approximately 62 percent of the total carbon stored on all federal lands in the U.S. When ecosystem respiration, land use and land cover, and disturbances were considered, Alaska was the third largest net sink of carbon on federal lands, sequestering 18 MMT CO_2e per year. It produced the largest average annual carbon emissions from wildfire, at 46 MMT CO_2e per year (USGS 2018).

Climate Change

Climate-driven increases in air pollution in Alaska are primarily linked to increases in wildfire frequency and intensity (Markon et al. 2018). The annual area burned by wildfires in Alaska varies greatly year-to-year, but the frequency of big fire years (larger than 2 million acres) has been increasing, with three out of the top four fire years (in terms of acres burned) occurring since 2000. Projections of burned area for 2006–2100 are estimated at 98 million acres under a lower scenario (Representation Concentration Pathway 4.5) and 120 million acres under a higher scenario (Representation Concentration Pathway 8.5) (Markon et al. 2018). Longer fire seasons and increases in the number of large fires impair both human health and visibility (Nolte et al. 2018). Fires also release carbon into the atmosphere and thus contribute to climate change.

About half of Alaska is underlain by permafrost. The general warming of the Arctic has increased the rate of permafrost thaw. Multiple studies of permafrost in Alaska have shown that the gradual warming of the ground has resulted in the warming and thawing of permafrost in the Arctic and boreal regions over the past 30 years.

Spatial modeling predicts that near-surface permafrost could disappear on up to a quarter of this landscape by the end of the twenty-first century (Markon et al. 2018).

Ground temperature is expected to remain below freezing at most sites in the near term (2020s), but projections show a notable shift to above-freezing temperatures in the southern half of the region over the long term (2060s). The complex interactions of climate warming and permafrost thawing contribute to a feedback loop, whereby warming causes permafrost to thaw and release large amounts of stored carbon; this in turn leads to more warming (Fresco et al. 2016).

Studies described in the Rapid Ecological Assessment suggest that the release of organic carbon from peat due to permafrost thaw in boreal Alaska is likely to accelerate ongoing atmospheric warming. A 2018 study, led by University of Alaska Fairbanks researchers, showed that permafrost is thawing much faster under thermokarst lakes in interior Alaska than predicted; this process releases excess amounts of methane and could significantly speed up the effects of climate change (Fresco et al. 2016).

Additional information on air quality, climate, and climate change in the planning area is available in Section 2.1.1, Air Quality and Climate, of the AMS at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to air quality and the analytical methods used in this analysis. **Table 3-3** summarizes the types of air quality effects, while **Table 3-4** provides a comparison of impacts for each alternative by indicator.

Comparative Summary Tables

Table 3-3
Summary of Potential Impacts on Air Quality

Types of Potential Impacts	Management Actions	Indicators
Emissions of criteria pollutants (including particulates), hazardous air pollutants, and GHGs from development and operation of gravel pits for mineral materials	• Air quality management actions • Mineral materials management actions	• NAAQS and AAAQS (qualitative analysis of how management actions would be likely to affect concentrations in the planning area) • Change in acres of disturbance
Emissions of criteria pollutants (including particulates), hazardous air pollutants, and GHGs from exploration, development, and extraction of locatable minerals	• Air quality management actions • Locatable minerals management actions	• NAAQS and AAAQS (qualitative analysis of how management actions would be likely to affect concentrations in the planning area) • Change in acres of allowable development in high potential areas
Emissions of criteria pollutants (including particulates), hazardous air pollutants, GHGs from exploration, development, and extraction of fluid minerals	• Air quality management actions • Fluid minerals management actions	• NAAQS and AAAQS (qualitative analysis of how management actions would be likely to affect concentrations in the planning area) • Change in acres of allowable development in high potential areas
Emissions of particulates and GHGs from prescribed fire	• Air quality management actions • Wildland fire management actions	• NAAQS and AAAQS (qualitative analysis)

Types of Potential Impacts	Management Actions	Indicators
Indirect effects from development in rights-of-way (ROWs)	• Lands and realty management actions	• Acres open or closed to ROWs
Increased GHG emissions due to permafrost degradation from surface-disturbing activities	• Mineral materials management actions	• Change in acres of disturbance

Table 3-4
Resources that Could Impact Air Quality

Resource Indicator	Alternative (Acres)				
	A	B	C1	C2	D
Open to mineral materials disposal	12,817,000	8,042,000	11,618,000	12,079,000	12,824,000
Open to locatable minerals development	6,763,000	10,879,000	12,184,000	13,083,000	13,083,000
Open in areas of high potential	174,000	224,000	227,000	268,000	268,000
Open to fluid minerals development	4,888,000	8,120,000	11,510,000	12,824,000	12,824,000
Open in areas of high potential	0	361,000	437,000	603,000	603,000
Wildland fires (qualitative discussion)	Specified management actions would not minimize the extent or frequency of wildland fires; however, air quality and wildland fire management actions could help to ensure maintenance of air quality, including visibility.				
Open to ROWs	13,043,000	5,593,000	9,784,000	12,137,000	13,043,000
Degradation of permafrost areas (qualitative discussion)	Surface-disturbing actions could degrade permafrost, leading to increases in GHG emissions under all alternatives. The primary BLM-authorized surface-disturbing activities would be at mineral materials sites used for constructing and maintaining roads and pipeline corridors. Because mineral materials development in the decision area is restricted by local needs and transportation costs, levels and locations of development are not expected to vary by alternative.				

Source: BLM Geographic Information System (GIS) 2017

Alternative A

Under Alternative A, the BLM would continue to open 12,817,000 acres to mineral materials development. Mineral materials include gravel, riprap, sand, and common fill and are used in pipeline and road construction and reinforcement. There are numerous mineral material sites in the decision area, and the RFD scenario predicts that over 50 new mineral material sites would be developed on BLM-managed lands over the life of the RMP (see **Appendix N**). Existing and new mineral material sites would supply road maintenance and construction needs along the Dalton Highway and proposed pipeline projects that are likely to be constructed during the life of the RMP, including the Alaska standalone and liquified natural gas pipelines.

Infrastructure and gravel pit development would be sources of local fugitive particulate matter emissions, both during construction of these features and during use of the roads and operation of the gravel pits, such as blasting, loading, and hauling. These impacts would be localized and intermittent. Construction equipment, heavy trucks, and vehicles would also emit criteria pollutants, small amounts of hazardous air pollutants, and GHGs.

The primary locatable minerals in the planning area are gold, silver, copper, nickel, and chromite. The RFD scenario analyzes high-potential mineral occurrence to determine future locatable mineral development for the duration of this RMP. In the decision area, 268,000 acres are ranked as high potential for locatable minerals (BLM GIS 2017). Including federal mineral estate, approximately 174,000 acres are identified as high potential for locatable minerals and open for development under Alternative A (BLM GIS 2017). An estimated average of 30 to 50 new federal permits would be issued per year; historically, most permits have been issued for 20-acre tracts (see **Appendix N**).

The areas of high potential are near Wiseman and Coldfoot and south of the Kanuti River. Locatable mineral extraction would affect air quality in the vicinity of surface disturbances. Such impacts are from particulates generated from blasting, excavating, loading, and hauling. Construction equipment also would be a source of criteria and hazardous air pollutants and GHG emissions from combustion of fuels.

For commercial mining, a claimant must submit plans of operation for the BLM to review. Integral to these plans are requirements that all applicable federal and state regulations for air pollution control are met, including obtaining air quality permits and implementing fugitive dust control plans.

Under Alternative A, 4,888,000 acres would be open to fluid mineral development, with fewer than 500 acres being in high potential areas. Potential impacts from oil and gas exploration and development are from short-term and long-term, direct fugitive dust emissions from surface-disturbing activities and NAAQS/AAAQS and hazardous air pollutants and GHG emissions from drill rigs, construction equipment, vehicles and aircraft, and well pumps. Although there are areas of high potential for fluid minerals development in the decision area, no actual oil and gas development is projected to occur over the life of the RMP (see **Appendix N**); therefore, fluid mineral development impacts on air quality would be negligible for the decision area.

Under Alternative A, particulate emissions from wildland fire would continue to be a primary air quality concern for most of the planning area. Fires, particularly if uncontrolled, can emit into the atmosphere large quantities of particulate matter and of carbon monoxide, nitrogen oxides, sulfur oxides, and organic compounds, affecting visibility and human health. Fires also emit GHGs and organic carbon. The degree and extent of the impact depends on the severity of the fire and the meteorological conditions at the time.

Fires can result in exceedances of NAAQS or AAAQS and burned areas can be susceptible to wind erosion until they are revegetated, and the exposed soils are stabilized.

Under Alternative A, the BLM would continue to use wildland fire to meet resource objectives, including the objective of meeting state air quality standards (BLM 2005a, p. 2-8). The BLM would continue to adhere to ADEC guidance for prescribed fires and would follow the most current Alaska Enhanced Smoke Management Plan for Planned Fire Procedures Manual (ADEC 2015). This would minimize effects of planned fire management actions in the airshed.

Designating ROWs does not have direct impacts on air quality; however, it does have indirect impacts by allowing or excluding development in certain locations. In the planning area there are about 315 authorized long-term (20 years or more) ROWs. Of these, 301 permits allow the permit holder to conduct surface-disturbing activities and cover approximately 14,000 acres.

Under Alternative A, 13,043,000 acres would be open to ROW location. Development in these ROWs, which could include portions of the Alaska standalone pipeline project, the Alaska Liquid Natural Gas (AKLNG) project, Ambler Road, the Arctic Strategic Transportation and Resources (ASTAR) network, and the Western

Alaska Access Road, would have short- and long-term effects on air quality over the life of the RMP. This would come from constructing and operating roads and pipelines in these ROWs.

Finally, BLM-authorized surface-disturbing actions that disturb permafrost would release stored carbon, contributing to climate change trends described under *Climate Change*, above.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

The types of impacts on air quality would be similar among the action alternatives. Under all action alternatives, applicable air quality regulations and air quality permits issued by ADEC would control and prevent the increase of emissions of criteria pollutants (including particulates), hazardous air pollutants, and GHGs.

Impacts on air quality and air quality related values (primarily visibility) from wildland fires and prescribed burns described for Alternative A would be the same under all action alternatives. To minimize these impacts, the BLM would adhere to ADEC guidance for prescribed fires and would follow the most current Alaska Enhanced Smoke Management Plan for Planned Fire Procedures Manual (ADEC 2015).

Under all action alternatives, SOP AIR-1 for air requires the BLM to consider smoke effects on human health, communities, recreation, and tourism in all wildland and prescribed fire management activities. In addition, under all alternatives the BLM would manage wildland fire in a manner that avoids degradation of air quality. Using this SOP, following this management action, and adhering to ADEC guidance and the Alaska Enhanced Smoke Management Plan would minimize the impacts on air quality from wildland fire to a similar degree as Alternative A.

Differing areas would be open to fluid minerals under each action alternative, as described in **Table 3-4**; however, as described for Alternative A, while there is potential for oil and gas development in the planning area, none is projected to occur over the life of the RMP (see **Appendix N**); therefore, fluid mineral development impacts on air quality would be negligible for the decision area under all action alternatives.

Under all action alternatives, SOP LR-1 for lands and realty would require the BLM to consider previously disturbed sites before allowing uses on undisturbed sites. This would reduce the potential for new surface disturbance and new sources of windblown dust.

Also, under all action alternatives, implementing SOPs, required design features, and mitigation measures for construction, sites with surface disturbance, and travel on unpaved roadways would reduce particulate emissions; this is the primary pollutant of concern in the planning area. Implementing SOPs, required design features, and mitigation measures and adhering to air regulations and permit requirements would reduce the potential for violating the NAAQS or AAAQS for any pollutants from BLM-authorized activities on decision area lands.

The impacts under all action alternatives from actions that disturb permafrost would be the same as described under Alternative A.

Alternative B

Under Alternative B, 8,042,000 acres would be open to mineral material disposal (4,775,000 fewer acres than under Alternative A). Existing and new mineral material sites would supply construction needs along the proposed Umiat utility and transportation corridor, which would remain mostly open to mineral material development (see **Map 2.72**, **Appendix A**). The area along the proposed Ambler utility and transportation corridor would be mostly closed to mineral material development; mineral materials may be acquired from

sites outside the decision area. Impacts from mineral material site development would be from fewer closed areas, compared with Alternative A. The types of impacts associated with infrastructure and gravel pit development would be as described under Alternative A.

Approximately 224,000 acres of high potential locatable minerals would be open to locatable minerals entry, approximately 50,000 more acres than under Alternative A. Disturbed surfaces would locally affect air quality and would be generated from the same activities discussed under Alternative A. All operations would be required to submit plans to the BLM that ensure that claimants meet the federal and state regulations for air pollution control, including obtaining air quality permits and implementing fugitive dust control plans. Overall, impacts on air quality would be greater than under Alternative A.

Impacts from wildland fire management would be the same as those described under *Impacts Common to All Action Alternatives*.

Under Alternative B, 8,120,000 acres would be open to fluid mineral development, 361,000 of which would be in high potential areas. As described for Alternative A, while there is potential for oil and gas development in the planning area, none is projected to occur over the life of the RMP (see **Appendix N**); therefore, fluid mineral development impacts on air quality would be negligible for the decision area.

Under Alternative B, the BLM would not authorize activities from November 1 to April 1 that contribute PM2.5 to the Fairbanks North Star Borough nonattainment area. This would minimize the impact of BLM-authorized actions on air quality more than under Alternative A or the other action alternatives.

Approximately 5,593,000 acres would be open to new ROW location in the decision area, approximately 7,450,000 fewer acres than under Alternative A. In particular, the Ambler utility and transportation corridor would be a ROW exclusion area. Development activities that would emit pollutants would be limited in these areas, potentially resulting in fewer air pollutant emissions than described under Alternative A. Under Alternative B, the BLM would require new linear ROWs to be collocated with existing infrastructure or designated corridors. These actions would reduce the potential for surface-disturbing activities and associated emissions, compared with Alternative A.

Alternative C1

Under Alternative C1, 11,618,000 acres would be open to mineral material disposal, 1,199,000 fewer acres than under Alternative A. Existing and new mineral material sites would supply road maintenance and construction needs along the proposed Ambler and Umiat utility and transportation corridors, both of which would remain open to mineral material development (see **Map 2.73**, **Appendix A**). Much of the area along Dalton Highway between the Ambler and Umiat utility and transportation corridors would be closed to mineral material development; impacts from mineral material development would be fewer in this area, compared with Alternative A.

Approximately 227,000 acres of high potential locatable minerals would be open to locatable mineral entry, approximately 53,000 more acres than under Alternative A. Disturbed surfaces would locally affect air quality, generated from the same activities discussed under Alternative A. All operations would be required to submit plans to the BLM that ensure that claimants meet the federal and state regulations for air pollution control, including obtaining air quality permits and implementing fugitive dust control plans. Overall, there would be more impacts on air quality under Alternative C1.

Under Alternative C1, 11,510,000 acres would be open to fluid mineral development, 437,000 of which would be in high potential areas. As described for Alternative A, while there is potential for oil and gas development

in the planning area, none is projected to occur over the life of the RMP (see **Appendix N**); therefore, fluid mineral development impacts on air quality would be negligible for the decision area.

Impacts from wildland fire management would be the same as those described under *Impacts Common to All Action Alternatives*.

Approximately 9,784,000 acres would be open to new ROWs in the planning area, approximately 3,259,000 fewer acres than under Alternative A. Types of impacts would be the same as discussed under Alternative A. While the Ambler and Umiat utility and transportation corridors would remain open to ROW location under Alternative C1, the overall impacts on air quality would be fewer than under Alternative A. This is because more ROW avoidance designations would be applied.

Alternative C2 (Preferred Alternative)

Under Alternative C2, 12,079,000 acres would be open to mineral material disposal, 738,000 fewer acres than under Alternative A. Impacts would be the same as those described for Alternative C1 along the Ambler and Umiat utility and transportation corridors, which would remain open to mineral material development (see **Map 2.74**, **Appendix A**). A small area at the intersection of the Dalton Highway and Umiat utility and transportation corridor would be closed to mineral material development; impacts would be fewer in this area, compared with Alternative A. Overall impacts would be similar to those under Alternative A, given the similar level of sites likely to be developed.

Approximately 268,000 acres of high potential locatable minerals would be open to locatable mineral entry, approximately 94,000 more acres than under Alternative A. Disturbed surfaces would locally affect air quality, generated from the same activities discussed under Alternative A. All operations would be required to submit plans to the BLM that ensure that claimants meet the federal and state regulations for air pollution control, including obtaining air quality permits and implementing fugitive dust control plans. Overall, impacts on air quality would be greater than under Alternative A.

Under Alternative C, 12,824,000 acres would be open to fluid mineral development, 603,000 acres of which would be in high potential areas. As described for Alternative A, while there is a potential for oil and gas development in the planning area, no oil and gas development is projected over the life of the RMP (see **Appendix N**); therefore, fluid mineral development impacts on air quality would be negligible for the decision area.

Approximately 12,137,000 acres would be open to new ROWs in the planning area, approximately 906,000 fewer acres than under Alternative A. The types of impacts would be the same as discussed under Alternative A. While the Ambler and Umiat utility and transportation corridors would remain open to ROW location under Alternative C2, the overall impacts on air quality would be fewer than under Alternative A. This is because more ROW avoidance designations would be applied.

Alternative D

Under Alternative D, 12,824,000 acres would be open to mineral material disposal, 7,000 more acres than under Alternative A. Impacts on air quality would be the same as those described for Alternative C1 along the Dalton Highway, Ambler, and Umiat utility and transportation corridors, which would remain open to mineral material development (see **Map 2.75**, **Appendix A**). Overall impacts from mineral material disposal would be similar to those under Alternative A, given the similar level of sites likely to be developed.

Approximately 268,000 acres of high potential locatable minerals would be open to locatable mineral entry, approximately 94,000 fewer acres than under Alternative A. Impacts on air quality would be the same as those described for Alternative C2.

Also, under Alternative D, 12,824,000 acres would be open to fluid mineral development, 603,000 acres of which would be in high potential areas. As described for Alternative A, while there is potential for oil and gas development in the planning area, no oil and gas development is projected over the life of the RMP (see **Appendix N**); therefore, fluid mineral development impacts on air quality would be negligible for the decision area.

Impacts from wildland fire management would be the same as those described under *Impacts Common to All Action Alternatives*.

Under Alternative D, the same amount of acreage would be open to new ROWs in the planning area as under Alternative A; the type and magnitude of impacts on air quality would be the same.

Conclusion

Over the course of the RMP, the air quality in the planning area is not expected to substantially change. There may be temporary impacts from wildland fires, and this would continue as the primary air quality concern for most of the planning area. There would be additional localized impacts from mineral development and roads and pipelines in ROW corridors. Implementing SOPs, required design features, and mitigation measures and adhering to air regulations and permit requirements would reduce the potential for violating the NAAQS or AAAQS. Air quality would be maintained over the life of the project under all action alternatives, with more potential for improvement under Alternative B. That alternative also would likely have the fewest GHG emissions because of restrictions on mineral development and ROW location, followed by Alternative C1 and then Alternatives C2, A, and D.

Air Quality Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

About half of Alaska is underlain by permafrost. The general warming of the Arctic has increased the rate of permafrost thaw. Multiple studies of permafrost in Alaska have shown that the gradual warming of the ground has resulted in the warming and thawing of permafrost in the Arctic and boreal regions over the past 30 years. Spatial modeling predicts that near-surface permafrost could disappear on up to a quarter of this landscape by the end of the twenty-first century (Markon et al. 2018).

Most of the planning area is unclassified/attainment for the NAAQS and AAAQS, while a portion of the Fairbanks North Star Borough is in nonattainment for $PM_{2.5}$. Past and present actions that have contributed to poor air quality in the borough include urban development along the southeast border of the planning area (including Delta Junction, North Pole, and Fairbanks), vehicle emissions along the Parks, Dalton, Elliot, and Richardson Highways, and emissions from wood stoves, burning oil, industrial sources, and other mobile emissions. Elevated $PM_{2.5}$ concentrations occur primarily during winter, when strong temperature inversions trap localized emissions from wood stoves, burning oil, industrial sources, and mobile sources.

Wildfire is the largest natural factor influencing air quality in the planning area. In some years, visibility and air quality in the interior of Alaska are affected by smoke and particulate matter from wildland fires during the summer. Particulate matter and smoke created by these fires reduce visibility and affect air quality. Wildland fire is anticipated to increase due to climate change, which would increase particulate matter and smoke emissions. In the northern portion of the planning area, haze is periodically observed on the North

Slope, due primarily to air pollutant emissions originating in northern Europe and Asia, and to a lesser extent, northern Alaska. Impacts from windblown dust from exposed gravel sources, such as riverbeds, airstrips, and roads, are usually found close to these areas, but these impacts can seasonally affect large areas.

Past and present actions described above have also been minor contributors of hazardous air pollutants in the planning area, mostly through the combustion of fuels.

Because much of the cumulative effects analysis area described above is rural, GHG emissions from human-caused sources have been relatively low. Natural events, such as wildland fires, contribute larger amounts of GHG emissions, particularly in high fire years. Federal lands in Alaska sequester over half of the carbon stored on all federal lands in the U.S. The amount of carbon stored annually in soils and vegetation largely depends on the level of wildland fires in a given year and the rate of permafrost thawing and its associated release of stored carbon. Permafrost thawing and wildland fires are anticipated to increase due to climate change, exacerbating the effects of climate change described under *Affected Environment*, above.

Reasonably foreseeable future actions (RFFAs) would increase criteria pollutants, hazardous air pollutants, and GHG emissions in the cumulative effects analysis area. Such actions are the buildout of road corridors, such as Ambler Road, the ASTAR transportation network, Bettles Road, and the Umiat utility and transportation corridor. Some ROW authorizations have been granted already for these projects and more would likely be granted over the life of the RMP. These actions would increase the amount of public and private roadways and associated surface-disturbing and vehicle-related emissions in undeveloped portions of the planning area. These actions, primarily Ambler Road, would open up areas to mining-related uses and would increase the potential for emission-generating activities on BLM- and non-BLM-managed lands.

In addition to road corridors, oil and gas-related actions have been proposed, primarily on the North Slope; these are projects in the National Petroleum Reserve, proposed leasing on the Coastal Plain of the Arctic National Wildlife Refuge, development on state lands, offshore development, and major oil and gas pipeline projects along the eastern boundary of the planning area. The projects are subject to individual National Environmental Policy Act (NEPA) review and permitting conditions, to minimize the effects from individual projects. Taken together, however, these projects would have a cumulative effect on air quality, air quality-related values, and climate change. This would come about through the emissions of criteria pollutants, hazardous air pollutants, and GHGs.

Impacts on air quality from management actions under this RMP are described under *Direct and Indirect Impacts*. Resource use allocations and ROW authorizations would result in actions that contribute air pollutant emissions from mineral material and locatable mineral development and from roadway and pipeline construction in ROWs. In particular, road, pad, and pipeline construction and supporting gravel pit development and operations may contribute to higher particulate matter concentrations.

Actions on BLM-managed lands and mineral estate in the planning area are expected to be a minor contributor of $PM_{2.5}$ to the Fairbanks North Star Borough nonattainment area; however, they would combine with other RFFAs and increased vehicle and home heating sources caused by population growth in this area. Cumulative impacts would be similar across all alternatives, except for Alternative B, in which the BLM would not authorize activities from November 1 to April 1 that contribute $PM_{2.5}$ to the Fairbanks North Star Borough nonattainment area.

Actions on BLM-managed lands and mineral estate in the planning area would also contribute GHG emissions under all alternatives, but to a much lesser amount than RFFAs, population growth, and natural events, such

as wildland fires. Cumulative GHG emissions would contribute to global climate change. Cumulative effects would be similar across all alternatives but may be slightly fewer under Alternative B. This is because of restrictions on mineral development and ROW location, compared with the other alternatives.

3.2.2 Soil Resources

Most of the soils in the planning area are in undisturbed condition; however, soils next to major roadways, such as the Dalton Highway, have been altered and are no longer in undisturbed condition. Soils in the planning area are characterized as thin, fragile, and prone to erosion. Detailed soil surveys have been conducted only around the Fairbanks area and are available through Natural Resources Conservation Service publications (USDA 2004).

Permafrost underlies much of the planning area and creates a relatively impermeable layer that impedes soil drainage. Additional information is available in Section 2.1.2, Soil Resources, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Where human activity is present, erosion is observed along steep slopes and where the disturbance has removed ground vegetation cover, especially on thaw-sensitive permafrost (see **Maps 3.1**, **3.2**, and **3.3**, **Appendix A**). Plants and the organic layer absorb solar energy, providing an insulation layer that protects permafrost. Removing vegetation exposes permafrost to increased thawing (NSIDC 2019), which leads to subsidence in low-lying areas and mass wasting on steeper slopes. Subsidence occurs when ice in the permafrost thaws and contracts, causing the ground to develop a depression, which would remain on the landscape for the duration of the planning period.

When permafrost thaws on hillslopes, there is a loss in soil volume, structure, and strength that results in greater susceptibility to erosion and mass wasting (BLM 2016a). Mass wasting occurs when soils that have lost their structure start slumping down slopes due to gravity. Frozen debris lobes have been observed on steep slopes next to the Dalton Highway and the Trans-Alaska Pipeline System (TAPS) and remain permanent features on the landscape (Daanen et al. 2012). In addition, the soils are highly unstable once the permafrost thaws, and this poses a risk to all activities.

Maps 3.1, **3.2**, and **3.3** (**Appendix A**) show sensitive soils in the planning area, including steep slopes, thaw-sensitive permafrost, and wetland soils.

Climate Change

The magnitude and scope of climate change effects on soil resources in the planning area are expected to be widespread, with potentially greater impacts than from all other resource programs or permitted activities. The planning area is projected to become warmer and drier over the next century (Rupp and Springsteen 2009). Climate change predictions include increased wildland fire frequency, longer frost-free seasons, and continued thawing of permafrost soils, with formation of thermokarst topography as areas of ice rich permafrost thaw (BLM 2016a). Permafrost degradation would accelerate around disturbed areas where the insulating vegetation layer has been damaged or altered. This would lead to increased subsidence and slumping and would disrupt winter travel due to a longer frost-free season (Markon et al. 2018). Low-lying areas would be more prone to slumping and steep slopes would be more susceptible to mass wasting.

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to soil resources and the analytical methods used in this analysis. The impact indicators for the different resource uses are sensitive soils, which include sensitive soils

in high value watersheds and steep slopes, thaw-sensitive permafrost, and wetlands soils. Impacts on soil resources would be from mass wasting, subsidence, erosion, permafrost thaw, thermokarsting, sedimentation, and slumping.

Comparative Summary Tables

Table 3-5 and **Table 3-6** provide a summary of quantitative effects on soil resources by alternative.

Impacts Common to All Alternatives

Surface Disturbance

Construction and surface disturbances affect soils by compaction from heavy equipment, sedimentation of local waterways, soil removed for construction, and soils drying, once the vegetation and organic layers are removed. Removing the vegetation and organic layer exposes permafrost to increased thawing and increases the potential for subsidence. Surface disturbance on steep slopes exposes the soil to mass wasting and slumping.

Surface Mining

There are active, ongoing placer mining operations on BLM-managed lands. Surface mining alters vegetation, soils, and subsurface materials, the impacts of which could persist for the planning period (20 years). Conventional placer mining can strip overburden materials and remove the riparian/wetland vegetation cover, which disrupts the soil layer, causes permafrost to thaw, changes wetland and riparian soil layers, and increases sedimentation downstream of the mine (Madison 1981).

In addition, operators need to access the mine sites typically by off-highway vehicles (OHVs) to bring in supplies and equipment. The BLM issues permits that allow operators to access their mining claims by designated travel routes throughout the life of the placer mine. These routes receive more traffic due to mining needs and impacts on sensitive soils, including potential for vegetation removal, mass wasting on steeper slopes, and sediment entering local waterways. To mitigate these effects, **Appendix F** includes SOPs that surface mining permittees would apply before, during, and after mining is complete to minimize short- and long-term impacts on soil resources.

Mineral Materials

Gravel pits and other mineral materials extraction sites have localized impacts around the site with the potential for soil layer disruption, permafrost thaw, and subsidence. Sites in riparian areas or wetland soils could increase sedimentation to nearby waterways after pit construction, until reclamation stabilizes the soil surface. Typically, gravel pits would be next to existing roads, primarily the Dalton Highway, and would not require long access routes; however, access routes would compact soils and increase sedimentation next to the route. Construction of access routes would increase the potential for erosion and permafrost thaw, with impacts as described above for *Surface Disturbance*.

Table 3-5
Locatable and Fluid Minerals Acreages Analyzed for Potential Impacts on Sensitive Soils

Sensitive Soil Layer		Acres open to locatable mineral development[1]			Acres open to fluid mineral development[1, 2]		
		High Potential	Medium Potential	Low Potential	High Potential	Low Potential	Very Low Potential
Alternative A	Steep slopes (> 35 percent)	45,000	103,000	99,000	0	13,000	94,000
	Thaw sensitive permafrost	112,000	362,000	504,000	0	21,000	2,046,000
	Wetland soils	11,000	26,000	34,000	0	4,000	269,000
Alternative B	Steep slopes (> 35 percent)	51,000	144,000	170,000	4,000	14,000	564,000
	Thaw sensitive permafrost	145,000	559,000	835,000	19,000	22,000	3,135,000
	Wetland soils	14,000	38,000	58,000	16,000	4,000	352,000
Alternative C1	Steep slopes (> 35 percent)	52,000	155,000	181,000	8,000	14,000	1,011,000
	Thaw sensitive permafrost	148,000	613,000	866,000	41,000	26,000	4,868,000
	Wetland soils	14,000	40,000	61,000	0	6,000	10,000
Alternative C2	Steep slopes (> 35 percent)	58,000	178,000	223,000	13,000	14,000	1,236,000
	Thaw sensitive permafrost	171,000	708,000	1,025,000	63,000	26,000	5,864,000
	Wetland soils	18,000	51,000	74,000	50,000	8,000	676,000
Alternative D	Steep slopes (> 35 percent)	58,000	178,000	223,000	13,000	14,000	1,236,000
	Thaw sensitive permafrost	171,000	708,000	1,025,000	63,000	26,000	5,864,000
	Wetland soils	18,000	51,000	74,000	50,000	8,000	676,000

[1]Development potential described in the RFD Scenario (see **Appendix N**).
[2]Includes land open to development with standard stipulations, no surface occupancy (NSO), or controlled surface use stipulations.

Table 3-6
Acreages Analyzed for Potential Impacts on Sensitive Soils

Sensitive Soil Layer		Management Action (Acres)											
		OHV Classification			ROW Designation			Salable Minerals		Special Designations		Forestry	
		Seasonal OHV Limitations[1]	Winter OHV Travel Only	Limited OHV Travel[2]	Exclusion	Avoidance	Utility and Transportation Corridors[3] (Ambler, Umiat, and Dalton Highway)[2]	Open	Closed	Areas of Critical Environmental Concern (ACECs)	Wild and Scenic Rivers (WSR)	Open	Closed
Alternative A	Steep slopes (> 35 percent)	0	0	1,336,000	49,000	0	0	1,259,000	52,000	211,000	8,000	1,286,000	49,000
	Thaw sensitive permafrost	0	0	6,063,000	67,000	0	0	5,952,000	71,000	1,051,000	117,000	5,996,000	67,000
	Wetland soils	0	0	769,000	18,000	0	0	734,000	274,000	93,000	38,000	751,000	18,000
	sensitive soils in high value watersheds[4]	0	0	1,814,000	5,000	0	0	1,802,000	8,000	492,000	71,000	1,810,000	5,000
Alternative B	Steep slopes (> 35 percent)	352,000	106,000	879,000	284,000	1,029,000	6,000	625,000	687,000	585,000	8,000	917,000	419,000
	Thaw sensitive permafrost	1,196,000	791,000	4,076,000	1,182,000	3,521,000	39,000	3,066,000	2,957,000	2,334,000	117,000	4,417,000	1,646,000
	Wetland soils	122,000	54,000	593,000	316,000	173,000	22,000	336,000	368,000	242,000	38,000	462,000	307,000
	Sensitive soils in high value watersheds[4]	695,000	207,000	913,000	671,000	976,000	29,000	507,000	1,304,000	1,095,000	71,000	811,000	1,003,000
Alternative C1	Steep slopes (> 35 percent)	2,000	109,000	1,224,000	52,000	1,235,000	6,000	1,014,000	298,000	101,000	0	1,278,000	57,000
	Thaw sensitive permafrost	13,000	602,000	5,448,000	72,000	2,649,000	39,000	5,100,000	922,000	216,000	0	5,772,000	291,000
	Wetland soils	11,000	27,000	730,000	19,000	296,000	22,000	618,000	653,000	89,000	0	617,000	152,000
	Sensitive soils in high value watersheds[4]	1,000	193,000	1,621,000	6,000	1,009,000	29,000	1,468,000	343,000	71,000	0	1,586,000	228,000

Sensitive Soil Layer		Management Action (Acres)											
		OHV Classification			ROW Designation			Salable Minerals		Special Designations		Forestry	
		Seasonal OHV Limitations[1]	Winter OHV Travel Only	Limited OHV Travel[2]	Exclusion	Avoidance	Utility and Transportation Corridors[3] (Ambler, Umiat, and Dalton Highway)[2]	Open	Closed	Areas of Critical Environmental Concern (ACECs)	Wild and Scenic Rivers (WSR)	Open	Closed
Alternative C2	Steep slopes (> 35 percent)	1,000	109,000	1,225,000	49,000	131,000	156,000	1,153,000	158,000	1,000	0	1,286,000	49,000
	Thaw sensitive permafrost	9,000	602,000	5,451,000	67,000	761,000	492,000	5,353,000	669,000	9,000	0	5,996,000	67,000
	Wetland soils	8,000	27,000	734,000	18,000	37,000	81,000	706,000	45,000	8,000	0	751,000	18,000
	Sensitive soils in high value watersheds[4]	1,000	193,000	1,621,000	5,000	0	163,000	690,000	45,000	0	0	1,810,000	5,000
Alternative D	Steep slopes (> 35 percent)	0	0	1,336,000	49,000	0	156,000	1,263,000	49,000	0	0	1,286,000	49,000
	Thaw sensitive permafrost	0	0	6,063,000	67,000	0	492,000	5,956,000	67,000	0	0	5,996,000	67,000
	Wetland soils	0	0	769,000	18,000	0	81,000	734,000	18,000	0	0	751,000	18,000
	Sensitive soils in high value watersheds[4]	0	0	1,814,000	5,000	0	163,000	1,806,000	5,000	0	0	1,810,000	5,000

Source: BLM GIS 2017

[1]OHV travel would be prohibited from May 1 through June 30 for caribou calving.

[2]Cross-country OHV travel with weight restrictions; Alternative A restricts OHV weight to less than 1,500 pounds gross vehicle weight. Action alternatives restrict OHV weight to less than 1,500 pounds curb weight.

[3]Alternative D includes the Dalton Highway, while Alternatives B and C include only the Ambler and Umiat utility and transportation corridors.

[4]High value watersheds are explained in *Water Resources* and are defined in **Appendix H**.

Dalton Utility Corridor

All alternatives would maintain management of a utility and transportation corridor along the Dalton Highway. Alternatives A, B, and C1 would retain PLO 5150 as per ANCSA 17(c) for the purposes of establishing a utility and transportation corridor. Alternatives C2 and D recommend a full revocation for PLO 5150 and would establish an administrative utility and transportation corridor designation in its place. Current uses include multiple utility lines, including TAPS, and infrastructure. Impacts from development are vegetation removal, local waterways sedimentation, subsidence, mass wasting, and soil loss from new construction and existing structure maintenance, primarily the Dalton Highway and TAPS. Active gravel pits affect soils, as described above.

OHV Travel

OHV use affects soil resources by denuding vegetation cover and organic soil layers, increasing active-layer depth (thawing permafrost), compacting soil, and causing subsidence (Racine and Johnson 1988). These impacts typically lead to trail widening and braiding; as the widening continues it expands the zone of damage and would persist after the planning period (Arp and Simmons 2012). Trail braiding occurs when there are multiple tracks in areas where the original trail is less passable, due to deep rutting and water ponding. The trail braids are more prone to soil erosion and thawing permafrost, due to vegetation removal and the creation of multiple paths for water to flow through an area (Arp and Simmons 2012). Impacts were observed across a wide spectrum of vegetation communities and soil conditions, including tundra, lowlands, and forest (Arp and Simmons 2012). Impacts are more pronounced on poorly drained organic soils atop permafrost, such as wetland soils.

Forestry

Expanded commercial forestry is not expected in the planning area; however, if it occurs, it would include the use of heavy equipment, which leads to vegetation removal and soil compaction. Soil compaction decreases infiltration and percolation rates, which increases surface water and the potential for accelerated runoff and surface erosion in the short term, as reclamation stabilizes the soil surface (Lewis 1998). For sensitive soils in high value watersheds, the increased potential for erosion could lead to sedimentation of sensitive waterways. Alternatives differ in the number of acres open to commercial forestry, but impacts would be similar under all alternatives due to the lack of anticipated forestry in the planning area.

Hazardous Materials

Transportation of fuel and other hazardous materials along Dalton Highway carries the risk for spills of diesel fuel and other contaminants. These spills have the potential to contaminate localized areas of soil requiring removal during remediation with the potential of contaminants entering local waterways. Impacts include removal of the soil layers, increased potential for permafrost thawing, and subsidence or mass wasting depending on location. SOPs in **Appendix F** for hazardous materials would provide containment for hazardous materials and spill cleanup protocols.

Alternative A

ROW exclusion decisions in Alternative A include areas on the northwestern boundary of the planning area (see **Map 2.35**, **Appendix A**) where development is unlikely. It provides no exclusion or avoidance areas along the Dalton Utility Corridor where development is most likely. Thaw sensitive soils and steep slopes along the Dalton Utility Corridor would continue to be susceptible to mass wasting and subsidence, as described under *Impacts Common to All Alternatives*.

Surface mining, primarily placer mining, is ongoing on BLM-managed lands in the planning area, the most concentrated activity is along the Dalton Highway and the Hogatza River watershed. Placer mining also occurs on State and private lands in many locations in the planning area. Impacts would continue to be similar to those described in *Impacts Common to All Alternatives*. Mining operations along Gold and Marion Creeks have increased sedimentation into the creeks and affected wetland soils next to the creeks (BLM 2016a). Wetland soils would also continue to be susceptible to impacts from further development. Repeated use of permitted access routes by operators of OHVs carrying supplies or mining equipment have caused trail braiding, subsidence, and sedimentation of local waterways and would continue to affect sensitive soils.

Gravel pits are localized along the Dalton Highway. Impacts from gravel pits would continue to be localized and include soil layer disruption and increased potential for subsidence described under *Impacts Common to All Alternatives*. Currently, there is no oil and gas development on BLM-managed lands in the planning area. No well pads have been developed and no oil and gas-related surface disturbance has occurred.

The BLM manages 1,751,000 acres of ACECs, 13 percent of the planning area (see **Appendix J**). This includes a variety of surface disturbance restrictions, depending on the ACEC, including developing construction plans before construction, NSO stipulations for fluid mineral leases, and seasonal use and surface occupancy restrictions based on monitoring results. These restrictions would continue to protect soil resources from disturbance in the planning area.

Cross-country OHV travel is permitted through the planning area. There is a State of Alaska Statute (AS) Sec. 19.40.210 that prohibits OHV use within a 5-mile buffer off of the Dalton Highway, except for OHV use associated with mining claims. The BLM enforces a 1,500-pound gross vehicle weight on OHVs for summer use. Most of the planning area is too remote for OHV travel outside of the restricted corridor around the Dalton Highway. Impacts from cross-country OHV travel are limited to social trails developed next to villages and a few isolated trails. These trails primarily stay on high ground, with some stream crossings, and impacts are as those described under *Impacts Common to All Alternatives*.

The BLM also approves permits in the restricted Dalton Utility Corridor for permittees to access their ROWs. These travel routes receive higher use than most routes in the planning area and an increased change of impacts, as described under *Impacts Common to All Alternatives*.

Alternative A would manage 603 miles of rivers in the planning area as eligible for inclusion in the National Wild and Scenic Rivers System (NWSRS), including the Sagavanirktok River, Atigun River, Dietrich River, Mathews River, Jim River, and Kanuti River in the Dalton Utility Corridor (see **Map 2.10**, **Appendix A**). Management of the outstandingly remarkable values (ORVs) in these eligible segments would continue to protect soil resources by limiting surface disturbances on 38,000 acres of wetland soils next to the river segments.

Commercial forestry is rare, as most of the planning area is composed of black spruce or tundra shrub. There are 1,810,000 acres open to commercial forestry on sensitive soils in high value watersheds (14 percent of the planning area). Potential impacts are described under *Impacts Common to All Alternatives*.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

All action alternatives require monitoring during permitted construction activities on thaw-sensitive permafrost or slopes greater than 35 percent. If monitoring shows that soils are degrading, then the operator would develop and implement the appropriate management actions. In addition, all action alternatives require permittees to repair any breaks in the vegetation mat to limit future soil change. Summer access to permitted

activities over permafrost would require incorporating any necessary design and equipment modifications. These measures would reduce the potential for erosion and mass wasting on thaw-sensitive permafrost and steep slopes.

Utility Corridors

All action alternatives would include the Ambler and Umiat utility and transportation corridors. Designating these administrative corridors allows the BLM to collocate ROW, access, and utility infrastructure. This would reduce dispersed impacts from multiple transportation and utility corridors and reduce overall surface disturbance. The potential for hazardous material spills would increase, compared with Alternative A, by opening additional administrative designations of utility and transportation corridors; however, it would concentrate use and allow for efficient placement of spill cleanup materials.

Construction for projects within the corridors would require building materials and development of gravel pits (see **Map 2.33** and **Map 2.34**, **Appendix A**). Outside of the riparian areas, impacts would be as described under *Impacts Common to All Alternatives*, with 6,000 acres on steep slopes and 39,000 acres of thaw-sensitive permafrost open to development in the Ambler and Umiat utility and transportation corridors (0.6 percent of steep slopes and thaw-sensitive permafrost in the planning area; see **Table 3-6**). 22,000 acres of wetland soils would be open to development, with the potential for sedimentation to local waterways.

Fluid Mineral Development

Fluid mineral development potential is low in the planning area, but any development would have impacts on soil resources during exploration, drilling, production, and abandonment. Effects could include removal of vegetation, increased permafrost thawing, subsidence, and mass wasting, with effects ongoing until reclamation practices stabilize soils; however, the RFD scenario does not foresee any development on BLM-managed land in the next 20 years (see **Appendix N**). Alternatives differ in what stipulations are proposed, but impacts would not differ between the alternatives due to the lack of foreseeable development.

Alternative B

ROW exclusion decisions under Alternative B include 284,000 acres of steep slopes and 1,182,000 acres of thaw-sensitive permafrost (20 percent of steep slopes and thaw-sensitive permafrost in the planning area). This would reduce the potential for mass wasting and subsidence as described in *Impacts Common to All Alternatives*. In addition, ROW exclusion areas would protect 316,000 acres of wetland soils (41 percent of wetland soils in the planning area). The outer corridor would be classified as ROW avoidance, allowing the BLM to review disturbance to sensitive soils in areas where development is probable. Alternative B would classify steep slopes and sensitive soils in high value watersheds as ROW avoidance areas and would require permittees to incorporate design and equipment considerations to protect soil resources.

Alternative B would allow locatable mineral development on 1,020,000 acres located on steep slopes and 4,672,000 acres on thaw-sensitive soils in areas of high development potential (see **Table 3-5**). This would include areas along the Dalton Utility Corridor and the Ray Mountains, where development is likely to occur. This is similar to sensitive soils available under Alternative A, and impacts are as described under *Impacts Common to All Alternatives*.

Placer mining could affect up to 14,000 acres of wetland soils in areas of high development potential, 3,000 acres more than under Alternative A (see **Table 3-5**). This would have impacts on wetland soils and riparian areas and would increase sedimentation. Additional mine sites would require OHV access for supplies and equipment. Operators would use these routes multiple times in a year, developing established trails that would result in OHV impacts, as described under *Impacts Common to All Alternatives*.

Of the 365,000 acres open to locatable mineral entry and with high, medium, or low potential for mineral development on slopes over 35 percent under Alternative B, 325,000 are segregated and would not be available until conveyed, relinquished, or rejected. Similarly, of the 1,539,000 acres open to locatable mineral entry and with the potential for mineral development on thaw-sensitive soils under Alternative B, 1,393,000 are segregated and would not be available until conveyed, relinquished, or rejected. In addition, of the 110,000 acres open to locatable mineral entry and with the potential for mineral development on wetlands soils under Alternative B, 99,000 are segregated and would not be available until conveyed, relinquished, or rejected.

Alternative B would apply NSO stipulations to fluid mineral leases on sensitive soils in high value watersheds and controlled surface use stipulations on fluid mineral leases on steep slopes and in areas with sensitive soils. The BLM would also require a reclamation plan approved by its Authorized Officer (AO) before any permittee could begin disturbing the surface. These stipulations would minimize impacts on soil resources if oil and gas resources are developed.

Under Alternative B, the BLM proposes 4,035,000 acres of ACECs (30 percent of the decision area). Alternative B would protect 3,140,000 acres of sensitive soils, 2.3 times more than under Alternative A (38 percent of sensitive soils in the decision area; see **Table 3-6**). Management prescriptions for the ACECs (see **Appendix J**) include closed to mineral materials entry and fluid mineral leasing, recommended withdrawal from locatable minerals entry, either ROW avoidance or exclusion, timing restrictions for surface disturbance, and OHV summer use restrictions.

Alternative B would prohibit OHV travel during the summer or from May 1 to June 30 in core caribou areas during calving. This timing limitation (TL) would be placed on 1,196,000 acres of thaw-sensitive permafrost, 352,000 acres of steep slopes, and 122,000 acres of wetland soils (16 percent of sensitive soils in the planning area; see **Table 3-6**). In addition, Alternative B would restrict summer OHV use on 951,000 acres in ACECs for resource protection; in ACECs managed under Alternative A there are no OHV restrictions. The combination of OHV summer travel restrictions and designated ACECs would limit the potential OHV impacts described under *Impacts Common to All Alternatives*; however, the overall decrease would be minimal given the remote nature of the majority of ACECs and caribou calving areas.

Eligible WSR segments in the Dalton Utility Corridor would be the same as listed under Alternative A; however, Alternative B would include additional protection, including ROW avoidance for all segments and controlled surface use for fluid mineral leasing on recreational segments (Sagavanirktok River and Atigun River). Wild WSR segments—Dietrich River, Mathews River, Jim River, and Kanuti River—would be managed as NSO for fluid mineral leasing, closed to mineral material disposal, and recommended as withdrawn for locatable mineral entry. These restrictions would increase protection, compared with Alternative A, and would protect wetland soils from impacts described in *Impacts Common to All Alternatives*.

Alternative B would allow commercial forestry on 811,000 acres of sensitive soils in high value watersheds, which is a 55 percent reduction compared with Alternative A (see **Table 3-6**). Impacts would be as described under *Impacts Common to All Alternatives*.

Alternative C1

Under Alternative C1, ROW exclusion decisions would be made on 52,000 acres of steep slopes, 72,000 acres of thaw-sensitive permafrost, and 19,000 acres of wetland soils. The impacts would be as described under *Impacts Common to All Alternatives* (see **Table 3-6**). This would minimize development and potential impacts on sensitive soils. Under Alternative C1, 1,009,000 acres of sensitive soils would be designated as ROW avoidance, which is 12 percent of sensitive soils in the planning area. This would include a proportion of the

Dalton Utility Corridor north of Coldfoot; it would allow the BLM to locate ROWs in areas of non-sensitive soils, where feasible, or would require additional mitigation measures for development on sensitive soils.

Alternative C1 would open 52,000 acres on steep slopes and 148,000 acres on thaw-sensitive permafrost to locatable minerals development in areas of high development potential (see **Table 3-5**), with impacts described under *Impacts Common to All Alternatives*. There would be 14,000 acres on wetland soils open to locatable minerals development in areas of high development potential, with increased potential impacts on riparian areas and local waterways. Alternative C1 includes the potential for additional travel routes developed in undisturbed areas to access new mine sites.

Of the 388,000 acres open to locatable mineral entry and with high, medium, or low potential for mineral development on slopes over 35 percent under Alternative C1, 325,000 are segregated and would not be available until conveyed, relinquished, or rejected. Similarly, of the 1,627,000 acres open to locatable mineral entry and with the potential for mineral development on thaw-sensitive soils under Alternative C1, 1,393,000 are segregated and would not be available until conveyed, relinquished, or rejected. In addition, of the 115,000 acres open to locatable mineral entry and with the potential for mineral development on wetlands soils under Alternative C1, 99,000 are segregated and would not be available until conveyed, relinquished, or rejected.

Alternative C1 would apply controlled surface use stipulations on fluid mineral leasing on steep slopes and in areas with sensitive soils. As with Alternative B, a BLM AO-approved reclamation plan would be required before the surface is disturbed. These stipulations would minimize impacts on soil resources if the area were to be developed for oil and gas.

Under Alternative C1, the BLM proposes 418,000 acres of ACECs (3 percent of the planning area). Alternative C1 would protect 381,000 acres of sensitive soils, 28 percent of the sensitive soils protected under Alternative A (5 percent of sensitive soils in the planning area; see **Table 3-6**). Management prescriptions for the ACECs (see **Appendix J**) are ROW avoidance, NSO for fluid mineral leasing, closed to mineral material disposal, and OHV restrictions. ACECs under Alternative C1 would protect 76 percent less acreage than under Alternative A and would open more acres of sensitive soils to development and OHV travel. Impacts would be as described under *Impacts Common to All Alternatives*.

Alternative C1 would restrict or prohibit OHV travel in the summer during caribou calving on 13,000 acres of thaw-sensitive permafrost, 2,000 acres of steep slopes, and 11,000 acres of wetland soils (see **Table 3-6**). Alternative C1 would restrict summer use on 738,000 acres of sensitive soils for resource protection. These restrictions would limit the potential OHV impacts described under *Impacts Common to All Alternatives*; however, the remote location of most ACECs and the caribou calving areas would reduce the offsetting impacts of the OHV timing restrictions.

Alternative C1 proposes no WSR segments in the planning area and provides no additional protection for wetland soils, as described for Alternatives A and B.

Alternative C1 would allow commercial forestry on 1,586,000 acres with sensitive soils in high value watersheds, which is a 12 percent reduction from Alternative A. Impacts would be similar to those described under *Impacts Common to All Alternatives*.

Alternative C2 (Preferred Alternative)

Under Alternative C2, ROW exclusion decisions would be made on 49,000 acres of steep slopes, 67,000 acres of thaw-sensitive permafrost, and 18,000 acres of wetland soils. The impacts would be as described under *Impacts Common to All Alternatives* (see **Table 3-6**). This would minimize development and potential impacts

on sensitive soils; however, the ROW exclusion areas are in the extreme northwest section of the planning area where development is not anticipated during the life of the plan (see **Map 2.38**, **Appendix A**).

Under Alternative C2, 929,000 acres of steep slopes, thaw-sensitive permafrost, and wetland soils would be designated as ROW avoidance, which is 11 percent of sensitive soils in the planning area. Alternative C2 would not classify any of the Dalton Utility Corridor as ROW avoidance exposing an area of likely development to surface disturbance without any ROW restrictions. Impacts would be as described in *Impacts Common to All Alternatives* and would be fewer than under Alternative A. This is because Alternative A does not include any ROW avoidance areas.

Alternative C2 would open to locatable mineral entry 58,000 acres of steep slopes, 171,000 acres of thaw-sensitive permafrost, and 18,000 acres of wetland soils in areas of high development potential (see **Table 3-5**). Alternative C2 includes 1.5 times more sensitive soils open to development in areas of high development potential, compared with Alternative A. Alternative C2 would open most of the Dalton Utility Corridor to mineral entry, which increases the risk of sedimentation and water quality degradation for local waterways. It also increases the number of routes to access new mine sites, which includes riparian vegetation removal and potential changes to channel morphology at stream crossings.

Of the 459,000 acres open to locatable mineral entry and with a high, medium, or low potential for mineral development on slopes over 35 percent under Alternative C2, 382,000 are segregated and would not be available until conveyed, relinquished, or rejected. Similarly, of the 1,904,000 acres open to locatable mineral entry and with the potential for mineral development on thaw-sensitive soils under Alternative C2, 1,613,000 are segregated and would not be available until conveyed, relinquished, or rejected. In addition, of the 143,000 acres open to locatable mineral entry and with the potential for mineral development on wetlands soils under Alternative C2, 124,000 are segregated and would not be available until conveyed, relinquished, or rejected.

Under Alternative C2, the BLM proposes to designate Toolik Lake as an ACEC (77,000 acres; 0.6 percent of the decision area). Alternative C2 would protect 18,000 acres of sensitive soils in the Toolik Lake ACEC, 1 percent of the sensitive soils protected under Alternative A (0.1 percent of sensitive soils in the decision area; see **Table 3-6**). Management prescriptions for the Toolik Lake ACEC (see **Appendix J**) include closure to mineral material disposal and summer OHV restrictions. The ACEC under Alternative C2 would protect 96 percent less acreage than under Alternative A and would open more acres of sensitive soils to development and OHV travel. Impacts would be as described under *Impacts Common to All Alternatives*.

Alternative C2 would restrict or prohibit OHV travel in the summer during caribou calving on 9,000 acres of thaw-sensitive permafrost, 1,000 acres of steep slopes, and 8,000 acres of wetland soils (see **Table 3-6**). Alternative C2 would restrict summer use on 738,000 acres of steep slopes, thaw-sensitive permafrost, and wetland soils to protect resources in the planning area. Alternative A does not include timing restrictions for OHV travel and provides no protection for these sensitive soils. These restrictions would limit the potential OHV impacts described under *Impacts Common to All Alternatives*; however, the remote location of the caribou calving areas would reduce the offsetting impacts of the OHV timing restrictions.

Alternative C2 would designate the same oil and gas stipulations and would propose no WSR segments, as under Alternative C1.

Alternative C2 would allow commercial forestry on 1,810,000 acres with sensitive soils in high value watersheds, which is nearly identical to Alternative A. Impacts would be similar to those described under *Impacts Common to All Alternatives*.

Alternative D

Alternative D would have the same ROW exclusions on steep slopes and thaw-sensitive permafrost as Alternative A and with similar impacts (see **Table 3-6**). As with Alternative A, Alternative D would classify no lands as ROW avoidance, exposing tracts to surface disturbance, including the entire Dalton Utility Corridor. Impacts would be as described in *Impacts Common to All Alternatives*.

Alternative D would open the same acres of sensitive soils in areas of high development potential to locatable mineral entry as Alternative C2. Impacts would be as described in *Impacts Common to All Alternatives*.

Alternative D would designate the same oil and gas stipulations and would propose no WSR segments, which is the same as under Alternative C1. It would maintain the same acres open to commercial forestry as would Alternative A.

The acreage of sensitive soils open to OHV travel and the impacts would be the same as under Alternative A.

Under Alternative D, the BLM proposes no lands for ACECs.

Alternative D would allow commercial forestry on the same acres of sensitive soils in high value watersheds as Alternative C2, with impacts similar to those described under *Impacts Common to All Alternatives*.

The potential for increased surface disturbance under Alternative D could increase the impacts of climate change by removing vegetation and increasing the risk of permafrost degradation.

Conclusion

Surface mining, development in the Dalton Utility Corridor, and designation of the Ambler and Umiat utility and transportation corridors pose risks to soil resources in the planning area. Under Alternative A, locatable minerals with high development potential would be on 45,000 acres of steep slopes, 112,000 acres of thaw-sensitive permafrost, and 11,000 acres of wetland soils. Surface disturbance would occur primarily in the Dalton Utility Corridor, which includes 16 percent of the planning area.

Alternative B would designate ROW exclusion areas along the Jim River and ROW avoidance for the outer corridor of PLO 5150, while Alternative C1 would designate ROW avoidance areas north of Coldfoot. All action alternatives would designate the Ambler and Umiat transportation and utility corridors. Alternatives C2 and D would designate the Dalton Utility Corridor, which would collocate utilities and transportation corridor. This would concentrate development and surface disturbance, rather than allow for dispersed development that would affect greater areas.

Overall, much of the planning area would remain in near-undisturbed condition, with little to no anthropogenic impacts; 84 percent of BLM-managed lands in the planning area are outside of the Dalton Utility Corridor, except for designation of the Ambler and Umiat utility and transportation corridors. Along the Dalton Utility Corridor, Alternative B would provide the most protection from locatable minerals and surface disturbance, compared with Alternatives A, C2, and D.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

In the planning area, human-caused impacts on soil resources primarily occur within the Dalton Utility Corridor. Past, present, and future ROW projects include the Ambler and Umiat utility and transportation corridors, various utility improvements in the Dalton Utility Corridor (fiber optic, cell towers, and additional

natural gas pipelines), and transportation improvements along the Dalton, Elliott, and Park Highways and other regional roads.

ROW exclusion decisions under Alternative A would include 134,000 acres of sensitive soils, 1 percent of the planning area, and no ROW avoidance areas would be designated. When combined with past and present surface disturbance, Alternative A would cumulatively increase the potential for subsidence and mass wasting to local waterways, as described under *Impacts Common to All Alternatives*.

ROW exclusion decisions under Alternative B include 1,782,000 acres of sensitive soils, 1,648,000 more acres than that of Alternative A (see **Table 3-6**). ROW exclusion decisions under Alternative C1 and C2 include 143,000 and 134,000 acres of sensitive soils, respectively, which is almost the same acreage as under Alternative A (see **Table 3-6**). ROW exclusion decisions under Alternative D include the same acreage as under Alternative A. Alternative B would cumulatively decrease the potential for subsidence and mass wasting, compared with Alternative A, while Alternatives C1, C2, and D would have a cumulative increase similar to Alternative A.

Surface mining would continue, mostly along the Dalton Utility Corridor and the Hogatza River watershed, with some mining potential along the Ambler Road corridor. Past and current mining in the planning area is in the Livengood, True North, and Fort Knox Mines. Rare earth elements are in the Ray Mountains and have mining potential, possibly expanding mining to a previously undisturbed area. The State of Alaska top-filed 740,000 acres of lands withdrawn by PLO 5150 in the Inner corridor and 1,326,000 acres in the outer utility corridor. These lands become valid selections once those portions of the PLO are revoked.

A total of 503,000 acres and 447,000 acres are identified as Priority 1 selections for the inner and outer utility corridors, respectively, and they are expected to be conveyed to the State ten years after revocation. These lands include 12,000 acres of high development potential for locatable minerals. Some level of surface mining is anticipated on those acres identified as high development potential during the planning period. This would increase impacts on sensitive soils from surface mining in the planning area.

Alternative A allows locatable mineral development on 168,000 acres of sensitive soils in areas of high potential. When combined with previous and ongoing surface mines, Alternative A would cumulatively increase the potential for impacts from permafrost thawing, subsidence, mass wasting, sedimentation to local waterways, and designated travel routes, as described in *Impacts Common to All Alternatives*.

Alternative B would open 210,000 acres of sensitive soils in areas of high development potential, 42,000 acres more than under Alternative A. Alternative C1 would open 214,000 acres of sensitive soils in areas of high development potential; Alternatives C2 and D would open 247,000 acres of sensitive soils in areas of high potential; this is 79,000 acres more than that of Alternative A. Alternatives B, C1, C2, and D would have increased cumulative effects on sensitive soils from surface mining, compared with Alternative A.

There are approximately 40 active gravel pits along the Dalton Highway. In addition to Dalton Highway construction and maintenance and TAPS construction and maintenance, material has been taken for use on the North Slope and to construct offshore islands. Demand for mineral materials will continue, with road building material needs for the proposed Ambler and Umiat Roads, the potential Alaska Stand Alone Pipeline and AKLNG Pipelines, and several new oil and gas developments along the North Slope.

Most mineral materials would be extracted along the Dalton Utility Corridor, the two proposed utility and transportation corridors (Ambler and Umiat), and mineral materials for the two proposed natural gas pipelines. The ROD was recently signed for the Alaska Stand Alone Pipeline, which would require millions of cubic

yards of materials from the Dalton Utility Corridor. The Ambler and Umiat utility and transportation corridors include 67,000 acres of sensitive soils (0.8 percent of sensitive soils in the decision area), and the Dalton Utility Corridor includes 662,000 acres (8 percent of sensitive soils in the decision area).

Combined with past and current mineral materials extraction in the planning area, Alternatives A, C2, and D would open the entire Dalton Utility Corridor to mineral materials extraction, except for the Toolik Lake ACEC under Alternative C2. Alternatives B and C1 would close portions to extraction, as shown in **Maps 2.72** and **2.73**, **Appendix A**. When combined with previous and ongoing gravel pits, Alternatives A, C2, and D would cumulatively increase the potential for subsidence and sedimentation to local waterways, as described in *Impacts Common to All Alternatives*; Alternatives B and C1 would cumulatively decrease the potential because the Dalton Utility Corridor would be closed to mineral materials extraction.

Oil and gas development is expected to continue on the North Slope with several new projects planned during the next 5 to 10 years, including in the south Colville Basin on State or tribal lands. These projects would increase traffic along the Dalton Highway, would require additional maintenance of the road, and would increase the demand for mineral materials. In addition, the extra highway traffic could increase OHV and other recreational uses along the Dalton Utility Corridor. No oil and gas development is expected on BLM-managed lands in the planning area, so no additional cumulative effects are expected under any alternatives.

Special designations provide protection against surface disturbance and impacts described under *Impacts Common to All Alternatives*. The BLM manages 1,751,000 acres of acres of ACECs and 603 miles of WSR segments in the planning area. When combined with previous and ongoing surface-disturbing projects, these special designations would cumulatively decrease the potential impacts of surface disturbance on sensitive soils.

Alternative B would manage 4,035,000 acres of ACECs, 2.3 times more than under Alternative A. The same six WSR segments as under Alternative A would be managed, but with more restrictive management prescriptions. This would further decrease cumulative impacts from surface disturbance, compared with Alternative A. Alternative C1 would designate 418,000 acres of ACECs and no WSR segments along the Dalton Highway. This would open more acres of sensitive soils to surface disturbance and would cumulatively increase the potential impacts of surface disturbance on sensitive soils due. Alternative C2 would designate the Toolik Lake ACEC (77,000 acres), and Alternative D would not designate any acres of ACECs along the Dalton Highway; Alternatives C1 and D would not designate any WSR segments. This would cumulatively increase the impacts of surface disturbance on sensitive soils for Alternatives C2 and D.

Recreational, industrial, and subsistence OHV use has affected soil resources along the Dalton Utility Corridor and has dispersed trails in the planning area through vegetation removal, trail braiding, and subsidence. AS Sec. 19.40.210 prohibits OHV travel within 5 miles of the Dalton Highway. This statute removes the most accessible portion of the planning area from OHV travel and prevents trail development on those lands and limits OHV use on adjacent BLM-managed lands in the immediate vicinity.

Alternative A would allow cross-country OHV travel with no summer OHV restrictions. Alternatives B, C1, and C2 include summer OHV restrictions for ACECs and caribou calving areas. Cumulative impacts from OHV travel are expected to remain similar to current impacts. This would be due to the restrictions within 5 miles of the Dalton Highway ROW.

Climate change is expected to alter travel patterns by moving travel routes to higher and drier ground and away from low-lying areas. This would reduce vegetation removal and subsequent permafrost thawing in these areas and could decrease impacts from OHV travel on sensitive soils in low-lying areas.

There are no large-scale commercial timber harvest projects in the planning area, and none are anticipated during the planning period. There are several portable sawmills operated intermittently for specific projects and a larger mill at Ruby that has not been operational for a while. Within the planning period, all forest products would be used for local projects. While acres open to commercial harvest vary by alternative, no alternative would reduce the acres available for local needs; therefore, all alternatives would have the same cumulative impact from sedimentation of waterways in high value watersheds.

The Ambler and Umiat utility and transportation corridors, continued development along the Dalton Utility Corridor, new oil and gas developments on the North Slope, and the potential for two new natural gas pipelines in the planning area would increase the use and transportation of hazardous materials there, with a corresponding increase for spills. Alternative A and all the action alternatives would cumulatively increase the potential for oil spills in the planning area.

3.2.3 Water Resources

Most water resources in the planning area are forecast to remain in proper functioning condition. Currently no waterways in the planning area are listed as Clean Water Act Section 303(d) impaired waters; however, there are some degraded waterways. The BLM long-term evaluations described in the Riparian-Wetland Resources section of the AMS show a declining trend in watershed condition on BLM-managed lands within the planning area due to authorization of surface-disturbing activities. Areas most prone to contributing to water pollution are where vegetation next to water bodies has been removed.

Activities known to degrade water quality are historical and ongoing mining, ROWs for such functions as utility corridors, pipelines, and fiberoptic cables, and increased OHV use plus increased sediment input related to permafrost thaw and climate change. BLM strategies for preventing water quality degradation are to manage riparian vegetation, stream and floodplain function, and to manage to land health standards. Water bodies of particular importance are those used for human water consumption and those required for spawning, rearing, and feeding diadromous and other economically important fish species. Additional information is available in Section 2.1.3, Water Resources, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Most water resources in the planning area are in a natural condition and have no human impacts on water quantity, quality, riparian function, and stream stability. Because there has been no surface disturbance in most of the watersheds, riparian vegetation is assumed to be intact and in proper functioning condition (BLM 2016a). **Map 3.4** (**Appendix A**) shows the 100-year floodplain for waterways, a one-quarter-mile buffer around lentic areas, and hot springs in the planning area.

The BLM used a ranking system to determine high value watersheds. The agency considered priority fish species presence and their diversity, habitat conditions, and productivity (see **Appendix H**). Those watersheds with a high ranking contain the highest fisheries resource values in the planning area and are mapped in **Maps 3.5** through **3.7** (**Appendix A**). The Watershed Condition Model (WCM) that the BLM developed as an indicator for human influence on watersheds includes three rankings: functioning properly, functioning at risk, and impaired function (see **Map 3.8**, **Appendix A**). **Appendix H** includes a full description of the physical and biological attributes used to develop the WCM rankings.

Climate Change

Interior Alaska is projected to become warmer and drier over the next century (Rupp and Springsteen 2009). Potential impacts from increased temperatures include lake drying and decreased water availability for transpiration. Expected permafrost degradation could change surface hydrology, cause frozen stream banks to slump, and increase erosion. Overall impacts on water resources are uncertain, but a decrease in permafrost would affect levels of groundwater and river runoff and water chemistry (BLM 2016a).

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to water resources and the analytical methods used in this analysis.

Comparative Summary Tables

Table 3-7 and **Table 3-8** provide a summary of quantitative effects on water resources by alternative for the impact indicators identified in **Appendix M**.

Impacts Common to All Alternatives

Areas of concern in the planning area are those where vegetation next to water bodies has been removed or degraded (BLM 2016a). Riparian vegetation functions as a buffer for waterways by providing streambank stability, floodwater storage, and contaminant filtering and storage. Riparian vegetation stabilizes streambanks by root structures binding soil together, vegetation cover that resists flow and dissipates flow energy against the plants rather than soil, and decreases water velocity that allows sediment deposition along the stream margins (Coles-Ritchie 2009).

Removing riparian vegetation decreases bank stability and leads to bank erosion, increased sediment in the stream, changes to stream morphology, and loss of pools and other wildlife and fishery habitat features (Coles-Ritchie 2009). When increased sediment washes into streams, the associated turbidity and deposition of sediment on the streambed alter the channel bottom and impact fish habitat (see *Fish and Aquatic Species* for more detail). Without adequate reclamation, impacts on streambanks and channel morphology could persist through the planning period.

All alternatives would require reclamation to achieve stable channel form, floodplain connectivity, bedform diversity, and riparian vegetation in proper functioning condition (see **Appendix H**). All alternatives would require the use of BLM Handbook H-3809-1, Surface Management, when planning activities along stream channels (BLM 2012d). While not providing management direction for riparian function and stream channel design, these reclamation requirements would restore riparian vegetation and stream function after surface disturbance.

Roads cross waterways and the adjacent riparian vegetation. Erosion and sedimentation are two impacts of road crossings. Sediment enters waterways from road surface runoff and alters downstream substrate and channel characteristics (Jackson 2003). In addition, bridges and culverts may have hydraulic effects on stream systems. Bridges and culverts potentially cause ponding and sediment accumulation above the crossings. Below the crossings, increased velocity from constricting the stream or river may scour streambeds, creating scour pools and removing finer sediments from the streambed that would persist past the planning period (Jackson 2003). Impacts on channel morphology from road crossings are permanent and would persist through the planning period.

Table 3-7
Locatable and Fluid Mineral Potential Impacts on Sensitive Water Resources

Sensitive Water Resources		Acres Open to Locatable mineral Development[1]			Acres Open to Fluid mineral Development[1, 2]		
		High Potential	Medium Potential	Low Potential	High Potential	Low Potential	Very Low Potential
Alternative A	100-year floodplains	26,000	54,000	65,000	0	6,000	511,000
	High value watersheds[3]	114,000	250,000	246,000	0	22,000	1,352,000
	¼-mile buffer of lentic areas	10,000	20,000	10,000	0	0	8,000
	160-acre buffer of hot springs	0	0	0	0	0	0
	Functioning properly[4]	59,000	273,000	525,000	0	73,000	2,348,000
	Functioning at risk[4]	38,000	157,000	216,000	0	7,000	67,000
	Impaired function[4]	75,000	80,000	24,000	0	0	11,000
Alternative B	100-year floodplains	34,000	86,000	112,000	59,000	7,000	596,000
	High value watersheds[3]	130,000	301,000	385,000	123,000	35,000	1,264,000
	¼-mile buffer of lentic areas	0	0	1,000	11,000	2,000	61,000
	160-acre buffer of hot springs	0	0	0	0	0	0
	Functioning properly[4]	92,000	513,000	831,000	30,000	72,000	3,171,000
	Functioning at risk[4]	40,000	181,000	286,000	0	7,000	49,000
	Impaired function[4]	0	0	24,000	0	0	0
Alternative C1	100-year floodplains	35,000	90,000	117,000	114,000	17,000	1,137,000
	High value watersheds[3]	132,000	303,000	434,000	199,000	47,000	3,094,000
	¼-mile buffer of lentic areas	0	2,000	3,000	30,000	7,000	264,000
	160-acre buffer of hot springs	0	0	0	0	0	0
	Functioning properly[4]	93,000	542,	878,000	30,000	74,000	4,425,000
	Functioning at risk[4]	40,000	184,000	300,000	0	7,000	130,000
	Impaired function[4]	2,000	5,000	0	0	0	7,000
Alternative C2	100-year floodplains	45,000	113,000	134,000	7,000	19,000	587,000
	High value watersheds[3]	167,000	386,000	521,000	254,000	47,000	3,467,000
	¼-mile buffer of lentic areas	0	2,000	3,000	36,000	6,000	315,000
	160-acre buffer of hot springs	0	0	0	0	0	0
	Functioning properly[4]	94,000	560,000	935,0000	430,000	98,000	10,052,000
	Functioning at risk[4]	46,000	248,000	406,000	146,000	12,000	1,339,000
	Impaired function[4]	126,000	135,000	66,000	0	0	369,000
Alternative D	100-year floodplains	45,000	113,000	134,000	170,000	17,000	1,280,000
	High value watersheds[3]	167,000	386,000	521,000	254,000	47,000	3,467,000
	¼-mile buffer of lentic areas	0	2,000	3,000	36,000	7,000	331,000
	160-acre buffer of hot springs	0	0	0	0	0	1,000
	Functioning properly[4]	94,000	560,000	935,000	30,000	74,000	4,0572,000
	Functioning at risk[4]	46,000	248,000	406,000	0	7,000	138,000
	Impaired function[4]	126,000	135,000	66,000	0	0	7,000

Source: BLM GIS 2017
[1]Development potential described in the RFD Scenario (see **Appendix N**).
[2]Includes land open to development with standard stipulations, NSO, or controlled surface use stipulations.
[3]Definition of high value watersheds in **Appendix H**.
[4]WCM rankings described in **Appendix H**.

Table 3-8
Acres Open Under Management Actions for Sensitive Resources

	Water Resource	OHV Classification			ROW Designation			Salable Minerals		Special Designations	
		Seasonal OHV Limitations[1]	Winter OHV Travel Only	Limited OHV Travel[2]	Exclusion	Avoidance	Utility and Transportation Corridors (Ambler, Umiat, and Dalton)[3]	Open	Closed	ACECs/Research Natural Areas (RNAs)	WSRs
Alternative A	100-year floodplains	0	0	1,590,000	64,000	0	0	1,466,000	65,000	202,000	123,000
	High value watersheds[4]	0	0	3,827,000	21,000	0	0	3,760,000	28,000	756,000	87,000
	¼-mile buffer of lentic areas	0	0	45,000	3,000	0	0	373,000	13,000	2,000	14,000
	160-acre buffer of hot springs	0	0	1,000	0	0	0	0	0	0	0
	Functioning properly[5]	0	0	10,855,000	207,000	0	0	10,580,000	208,000	1,499,000	98,000
	Functioning at risk[5]	0	0	1,529,000	31,000	0	0	1,495,000	33,000	176,000	56,000
	Impaired function[5]	0	0	369,000	0	0	0	365,000	5,000	46,000	7,000
Alternative B	100-year floodplains	260,000	105,000	1,225,000	745,000	341,000	6,000	645,000	886,000	511,000	123,000
	High value watersheds[4]	1,215,000	353,000	2,259,000	1,358,000	1,532,000	196,000	1,431,000	2,357,000	1,976,000	87,000
	¼-mile buffer of lentic areas	9,000	1,000	36,000	30,000	9,000	1,000	7,000	34,000	16,000	14,000
	160-acre buffer of hot springs	0	0	1,000	1,000	1,000	0	0	0	1,000	0
	Functioning properly[5]	1,543,000	1,149,000	8,164,000	1,990,000	3,987,000	257,000	6,765,000	4,023,000	3,339,000	98,000
	Functioning at risk[5]	389,000	14,000	1,125,000	256,000	935,000	61,000	747,000	782,000	556,000	56,000
	Impaired function[5]	137,000	0	232,000	81,000	236,000	10,000	156,000	213,000	140,000	7,000
Alternative C1	100-year floodplains	39,000	51,000	1,500,000	66,000	728,000	6,000	1,171,000	360,000	201,000	0
	High value watersheds[4]	6,000	271,000	3,550,000	23,000	1,375,000	196,000	3,269,000	519,000	111,000	0
	¼-mile buffer of lentic areas	0	0	45,000	3,000	28,000	1,000	31,000	11,000	6,000	0
	160-acre buffer of hot springs	0	0	1,000	0	0	0	0	0	0	0
	Functioning properly[5]	27,000	730,000	10,099,000	209,000	2,544,000	257,000	9,575,000	1,213,000	144,000	0
	Functioning at risk[5]	79,000	8,000	1,442,000	33,000	410,000	61,000	1,139,000	389,000	227,000	0
	Impaired function[5]	0	0	369,000	2,000	219,000	10,000	186,000	183,000	47,000	0

	Water Resource	OHV Classification			ROW Designation			Salable Minerals		Special Designations	
		Seasonal OHV Limitations[1]	Winter OHV Travel Only	Limited OHV Travel[2]	Exclusion	Avoidance	Utility and Transportation Corridors (Ambler, Umiat, and Dalton)[3]	Open	Closed	ACECs/Research Natural Areas (RNAs)	WSRs
Alternative C2	100-year floodplains	1,000	21,000	535,000	64,000	68,000	231,000	1,370,000	109,000	29,000	0
	High value watersheds[4]	2,000	271,000	3,554,000	21,000	331,000	429,000	3,496,000	292,000	2,000	0
	¼-mile buffer of lentic areas	0	4,000	280,000	12,000	10,000	89,000	353,000	14,000	0	0
	160-acre buffer of hot springs	0	0	0	0	0	0	0	0	0	0
	Functioning properly[5]	27,000	730,000	10,099,000	207,000	887,000	324,000	9,850,000	937,000	27,000	0
	Functioning at risk[5]	50,000	8,000	1,471,000	31,000	8,000	571,000	1,490,000	39,000	50,000	0
	Impaired function[5]	0	0	369,000	0	0	166,000	369,000	0	0	0
Alternative D	100-year floodplains	0	0	1,590,000	64,000	0	231,000	1,467,000	64,000	0	0
	High value watersheds[4]	2,000	0	3,824,000	21,000	0	429,000	3,765,000	21,000	0	0
	¼-mile buffer of lentic areas	0	0	399,000	3,000	0	10,000	374,000	12,000	0	0
	160-acre buffer of hot springs	0	0	1,000	1,000	0	0	0	0	0	0
	Functioning properly[5]	27,000	0	10,829,000	207,000	0	324,000	10,580,000	207,000	0	0
	Functioning at risk[5]	50,000	0	1,479,000	31,000	0	571,000	1,497,000	31,000	0	0
	Impaired function[5]	0	0	369,000	0	0	166,000	369,000	0	0	0

Source: BLM GIS 2017

[1]OHV travel would be prohibited from May 1 through June 30 for caribou calving.

[2]Cross country OHV travel with weight restrictions; Alternative A restricts OHV weight to less than 1,500 pounds gross vehicle weight. Action alternatives restrict OHV weight to less than 1,500 pounds curb weight.

[3]Alternative D includes the Dalton Utility Corridor, while Alternatives B and C include the Ambler and Umiat utility and transportation corridors only.

[4]Definition of high value watersheds in **Appendix H**.

[5]WCM rankings described in **Appendix H**.

Historical and ongoing placer mining in the planning area, especially along the Dalton Utility Corridor and Hogatza River watershed, has led to localized degradation of water quality and riparian conditions. Conventional placer mining removes riparian vegetation and disturbs the talik zone, increasing the risk of aufeis formation (Madison 1981). Removing riparian vegetation increases the potential for sediment to enter the waterway. In addition, the stability of the bank is decreased, resulting in impacts on channel morphology (Wanty et al. 1999).

Sediment deposition changes channel morphology and decreases the average particle size of the stream bottom (Weber 1986). The effects of sedimentation are most pronounced directly below the active mining zone. The addition of sediment to streams appears to be one of the primary impacts of placer mining on hydrologic systems in the planning area (Madison 1981).

Operators require access to their mine sites for hauling supplies and equipment. As part of the mine approval process, the BLM permits designated travel routes to the mine site from existing roads that would cross streams and likely be located in floodplains. These routes receive consistent use through the life of the mine and increase the potential for sedimentation and stream crossing impacts, as described above. **Appendix F** includes SOPs that surface mining permittees would apply before, during, and after mining is complete to minimize short- and long-term impacts on riparian vegetation and channel morphology.

As described in **Section 3.2.2**, impacts on water resources from gravel pits are localized and are not likely to reach local waterways, except for gravel pits that are in riparian areas. Those that are in floodplains or in the one-quarter-mile buffer of lentic areas could remove riparian vegetation, with impacts on water quality and channel morphology, as described above.

All alternatives would maintain the Dalton Utility Corridor. Alternatives A, B, and C1 would retain the current PLO 5150 inner corridor withdrawal that reserves these lands from appropriation and selection. Under Alternatives C2 and D, PLO 5150 would be recommended for a full revocation. An administrative designation of a utility and transportation corridor would continue the management intent without reserving the lands under a withdrawal.

The Dalton Utility Corridor includes the Dalton Highway, multiple utility corridors, including TAPS, and most of the infrastructure in the planning area. Impacts from development would be riparian vegetation removal, sedimentation entering local waterways and water quality degradation from runoff from the Dalton Highway and other roads, and impacts from existing culverts and bridges. Active gravel pits affect water resources, as described above.

Fluid mineral development potential is low in the planning area, but any development would have impacts on riparian vegetation and waterways. Effects would include removal of riparian vegetation, sedimentation, and changes to channel morphology from surface disturbance and road crossings; however, the RFD scenario does not include any fluid mineral development on BLM-managed land in the planning area in the next 20 years. Impacts would not differ between alternatives, even though stipulations and acres open to fluid mineral development would change due to the lack of anticipated development in the next 20 years.

OHV use in the planning area affects waterways and adjacent riparian communities by removing vegetation cover, increasing runoff and sedimentation, and having impacts at stream crossings. Increases in OHV use have caused site-specific water quality and riparian function degradation due to erosion and increased sedimentation, especially in and around stream crossings (BLM 2016a). Trail braiding creates multiple paths for water to flow, increases runoff, and typically occurs near stream crossings (Arp and Simmons 2012). OHV

stream crossings affect the channel bed by adjusting the channel up and downstream (Rinella and Bogan 2003). Such stream crossings also release a localized pulse of sediment downstream (Arp and Simmons 2012). For channels with gravel or cobble beds, impacts at the stream crossings are generally minor and localized, but for channels with softer materials (silt or peat with additional stability from riparian vegetation) or steep banks, impacts are greater and can migrate upstream or downstream (Arp and Simmons 2012).

Transportation of fuel and other hazardous materials along Dalton Highway increases the risk for spills of diesel fuel and other contaminants. These spills could contaminate local waterways and adjacent floodplains. Other sources of hazardous material spills are ROW movement, fueling for recreation and commercial activities, and over-ice transport. Impacts are localized degradation of water quality and vegetation and soil removal in floodplains to remove contaminants. The impacts from surface disturbance would be as described above. The SOPs in **Appendix F** for hazardous materials would provide containment for hazardous materials and spill cleanup protocols. The TAPS runs through the Dalton Utility Corridor, with the potential for large oil spills if the pipeline is breached. A large oil spill along a waterway has the potential for contamination and would require a cleanup effort. There would be impacts on floodplains and channel morphology during the cleanup and long-term impacts on water quality.

Alternative A

Alternative A provides no exclusion or avoidance areas along the Dalton Utility Corridor where development is most likely. Riparian vegetation and waterways along the Dalton Utility Corridor would continue to be susceptible to vegetation removal, changes to channel and floodplain morphology, and water quality impacts, as described under *Impacts Common to All Alternatives*.

Surface mining, primarily placer mining, is ongoing in the planning area, with 26,000 acres of floodplains, 114,000 acres of high value watersheds, and 10,000 acres within a quarter-mile of lentic areas open to mining in areas of high development potential. Impacts would continue to be similar to those described in *Impacts Common to All Alternatives* for riparian vegetation, channel morphology, and water quality. Mining operations along Gold and Marion Creeks have increased sedimentation into the creeks, with impacts on channel morphology, including sediment deposition (BLM 2016a). Operators use designated access routes for the duration of a mine site, with repeated passes each operating season. The BLM has observed sedimentation of local waterways and impacts at stream crossings, as described for OHV travel in *Impacts Common to All Alternatives*.

Of the 26,000 acres of floodplains with high mineral potential that are open to mineral entry under Alternative A, 6,000 are segregated and would not be available until conveyed, relinquished, or rejected. Of the 114,000 acres of high value watersheds with high mineral potential that are open to mineral entry under Alternative A, 19,000 are segregated and would not be available until conveyed, relinquished, or rejected.

The one gravel pit next to Dietrich River would have impacts on water quality and channel morphology, as described under *Impacts Common to All Alternatives*.

Currently, there is no oil and gas development on BLM-managed lands in the planning area. No well pads have been developed and no surface disturbance has occurred. As a result, under Alternative A, waterways in the planning area would not experience any direct or indirect impacts associated with this type of development.

The BLM manages 1,751,000 acres of ACECs (see **Maps 2.16** and **2.17**, **Appendix A**), that encompass 13 percent of the planning area. ACECs under Alternative A include 958,000 acres of floodplains, high value watersheds, and a quarter-mile of lentic areas (16 percent of sensitive water resources in the planning area;

see **Table 3-8**). Current management is described in **Appendix J**. These restrictions would continue to protect water resources from disturbance in the planning area.

Cross-country travel occurs throughout the planning area, with some impacts on water resources from commonly used routes between villages. Most of trails are on high ground for ease of travel, but the abundance of streams and low-lying areas require stream crossings, with impacts described under *Impacts Common to All Alternatives*. Along the Dalton Utility Corridor, where there is the best access in the planning area, AS Sec. 19.40.210 prohibits most OHV use within 5 miles of the Dalton Highway ROW, north of the Yukon River.

Alternative A would manage 603 miles of rivers in the planning area as eligible for inclusion in the National WSR System, on the Sagavanirktok River, Atigun River, Dietrich River, Mathews River, Jim River, and Kanuti River in the Dalton Utility Corridor (see **Map 2.10**, **Appendix A**). The management actions associated with WSR management would continue to protect water resources by limiting surface disturbances and protecting free flow on 224,000 acres of sensitive water resources (4 percent of sensitive water resources in the planning area; see **Table 3-8**).

Currently, there are eight hot springs identified in the planning area. Melozi, Tolovana, and Hutlinana Hot Springs have some development for recreation, while Ray River, Kilo, Ishtalitna, Kanuti, and Mcquesten Hot Springs are undeveloped. At Kanuti Hot Spring there have been some slight modifications to soaking pools and some redirection of hot water. Currently, no resources have affected the integrity of the hot springs or impeded access to them. This trend would continue under the management actions of Alternative A.

Transportation of hazardous materials continues along the Dalton Highway for oil and gas development on the North Slope and for activities in the Dalton Utility Corridor, namely surface mining, development, and road maintenance. The potential for contaminant spills would continue, with impacts the same as those described under *Impacts Common to All Alternatives*.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

All action alternatives would require a stormwater pollution prevention plan for surface-disturbing activities in all floodplains or for disturbance greater than 1 acre that address the parameters required in Alaska's Construction General Permit. This would prevent sedimentation from entering local waterways from activities greater than 1 acre by implementing best management practices.

All action alternatives would include the Ambler and Umiat utility and transportation corridors. Designating these administrative corridors allows the BLM to collocate ROW, access, and utility infrastructure. This would reduce dispersed impacts from multiple transportation and utility corridors and would reduce overall surface disturbance. The potential for hazardous material spills would increase, compared with Alternative A, by opening additional administrative designations of utility and transportation corridors; however, it would concentrate use and allow for efficient placement of spill cleanup materials.

Construction for projects within the corridors would require building materials and development of gravel pits (see **Map 2.33** and **Map 2.34**, **Appendix A**). The areas open to gravel pits would be 74,000 acres of floodplains and 2,000 acres within a quarter-mile of lentic areas; the impacts would be the same as those described under *Impacts Common to All Alternatives* (4 percent of floodplains and lentic area buffers in the planning area). In addition to needing building materials, the Ambler and Umiat utility and transportation corridors would cross multiple watersheds and waterways, including 196,000 acres of high value watersheds during construction. This would require stream crossings for roads and utility corridors. Impacts from

sedimentation, stream morphology changes, and flow changes from culverts and bridges would be as described under *Impacts Common to All Alternatives*.

The effects of climate change, described above, could influence the rate or degree of the potential direct and indirect impacts.

Alternative B

ROW exclusion allocations under Alternative B would affect 1,086,000 acres of floodplains (68 percent of floodplains in the planning area) and 39,000 acres within a quarter-mile of lentic areas (9 percent of lentic area buffers in the planning area). ROW exclusion decisions also would affect 1,358,000 acres in high value watersheds (see **Table 3-8**). In addition, Alternative B would manage wetlands as ROW avoidance areas. This would reduce the potential for the nature and type of impacts described under *Impacts Common to All Alternatives* related to surface disturbance.

Alternative B would open to surface mining 34,000 acres of floodplains, no acres within a quarter-mile of lentic areas and 130,000 acres of high value watersheds in areas of high development potential. This would include areas along the Dalton Utility Corridor and the Ray Mountains, where there is potential for development (see **Table 3-7**). Alternative B would open 10 percent more sensitive water resources to placer mining, compared with Alternative A. The impacts on riparian vegetation, water quality, and channel morphology would be as described under *Impacts Common to All Alternatives*. New placer mining sites would require BLM-designated access routes that would include stream crossings and multiple passes each operating season; the impacts would be the same as those described for OHV travel in *Impacts Common to All Alternatives*.

Of the 34,000 acres of floodplains with high mineral potential that are open to mineral entry under Alternative B, all are segregated and would not be available until conveyed, relinquished, or rejected. Of the 130,000 acres of high value watersheds with high mineral potential that are open to mineral entry under Alternative B, all are segregated and would not be available until conveyed, relinquished, or rejected.

Alternative B would close floodplains of high value watersheds to fluid mineral leasing, would apply NSO stipulations on remaining floodplains, and would close areas within a quarter-mile of lentic areas to fluid mineral leasing. These stipulations would reduce impacts on floodplains of high value watersheds and for the remaining floodplains, impacts on riparian vegetation, channel morphology, and water quality described under *Impacts Common to All Alternatives* if oil and gas development was to occur.

Under Alternative B, the BLM proposes 4,035,000 acres of ACECs (30 percent of the decision area). ACEC protections protect 2,496,000 acres of sensitive water resources, 2.6 times more sensitive water resources than under Alternative A (42 percent of sensitive water resources in the planning area; see **Table 3-8**). Management prescriptions for the ACECs are included under Alternative B in *Soil Resources* (see **Appendix J**). These ACECs would include measures that protect sensitive water resources from surface disturbance impacts, as described under *Impacts Common to All Alternatives*.

Alternative B includes OHV travel limitations for resource protection in ACECs and areas that contain core caribou calving. This includes limitations on 365,000 acres of floodplains, 10,000 acres within a quarter-mile of lentic areas, and 1,568,000 acres of high value watersheds (33 percent of sensitive water resources in the planning area; see **Table 3-8**). These OHV restrictions would limit impacts from OHV travel, as described under *Impacts Common to All Alternatives*.

Eligible WSR segments in the Dalton Utility Corridor would be same as those listed under Alternative A; however, Alternative B would include additional protection for water resources, as described under Alternative B in *Soil Resources*. These restrictions would increase protection, compared with Alternative A, and would protect riparian vegetation, channel morphology, and water quality from the impacts described in *Impacts Common to All Alternatives*.

Alternative B would apply management actions in 160 acres of hot springs that would prohibit surface disturbance, would recommend withdrawal from locatable entry, would close the areas to fluid mineral development, would manage them as ROW avoidance, and would prohibit summer OHV travel. This would protect the surface and subsurface flow to the springs from potential impacts and would protect the springs from surface disturbance. In addition, leases for development would be available for previously developed hot springs, which would minimize new areas of surface disturbance around these water resources.

Alternative C1

ROW exclusion decisions in Alternative C1 include 66,000 acres of floodplains (4 percent of floodplains in the planning area) and 3,000 acres within a quarter-mile of lentic areas (less than 1 percent of lentic area buffers in the planning area). It would designate ROW avoidance areas on 728,000 acres of floodplains and 28,000 acres within a quarter-mile of lentic areas (see **Table 3-8**). The ROW avoidance areas include portions of the Dalton Utility Corridor north of Coldfoot, which would allow the BLM discretion when approving ROWs and would minimize impacts on riparian vegetation, water quality, and channel morphology, where feasible. Similar to Alternative B, Alternative C1 would manage wetlands as ROW avoidance areas. ROW exclusion decisions also include 23,000 acres of high value watersheds (see **Table 3-8**). The nature and type of impacts on water resources from surface disturbance are described under *Impacts Common to All Alternatives*.

Alternative C1 would open 35,000 acres of floodplains and 132,000 acres of high value watersheds to surface mining in areas of high development potential (see **Table 3-7**). This is 11 percent more than those sensitive water resources available under Alternative A. The nature and type of impacts on riparian vegetation, water quality, and channel morphology would be the same as those described under *Impacts Common to All Alternatives*. The additional acreage could allow for more mine sites requiring access routes, with sedimentation of local waterways, removal of riparian vegetation, and potential changes to channel morphology at stream crossings.

Of the 35,000 acres of floodplains with high mineral potential that are open to mineral entry under Alternative C1, 34,000 are segregated and would not be available until conveyed, relinquished, or rejected. Of the 132,000 acres of high value watersheds with high mineral potential that are open to mineral entry under Alternative C1, 130,000 are segregated and would not be available until conveyed, relinquished, or rejected.

Alternative C1 would not apply stipulations to restrict oil and gas development in floodplains. If oil and gas development were to occur, impacts would be as described under *Impacts Common to All Alternatives*.

Under Alternative C1, the BLM proposes 418,000 acres of ACECs (see **Maps 2.20** and **2.21**, **Appendix A**), or 3 percent of the planning area. Alternative C1 ACEC management would protect 273,000 acres of sensitive water resources, 72 percent fewer than the sensitive resources protected under Alternative A (5 percent of sensitive water resources in the planning area; see **Table 3-8**). Management prescriptions associated with the ACECs are included in **Appendix J**. ACEC measures under Alternative C1 would protect fewer acres than Alternative A and would open a larger portion of the planning area to surface disturbance. The impacts would be the same as those described in *Impacts Common to All Alternatives*.

Alternative C1 would prohibit OHV travel in core caribou calving areas and for resource protection in ACECs on 90,000 acres of floodplains and 277,000 acres of high value watersheds (6 percent of sensitive water resources in the planning area; see **Table 3-8**). Summer OHV restrictions under Alternative C1 would provide protection for riparian vegetation, stream crossings, and water quality, as described under *Impacts Common to All Alternatives*.

Alternative C1 proposes no WSR segments in the planning area and provides no additional protection for riparian vegetation, channel morphology, and water quality, as described for Alternatives A and B. Alternative C1 would minimize surface disturbances, would close areas to fluid minerals extraction, would manage areas as ROW avoidance, and would limit OHV travel to existing trails within 160 acres of hot springs. While not closing the 160-acre hot spring buffer to locatable mineral entry, Alternative C1 would protect the surface and subsurface flows of the spring and would protect springs from surface disturbance; Alternative A would provide no surface protection measures for hot springs in the planning area, except for Ishtalitna, which is a research natural area. Alternative C1 would manage the Kanuti, Ishtalitna, Ray River, and Kilo Hot Springs as ROW exclusion areas.

Alternative C2 (Preferred Alternative)

ROW exclusion decisions under Alternative C2 include 64,000 acres of floodplains (4 percent of floodplains in the planning area) and 12,000 acres within a quarter-mile of lentic areas (3 percent of lentic area buffers in the planning area). It would designate ROW avoidance areas on 331,000 acres of floodplains and 10,000 acres within a quarter-mile of lentic areas (see **Table 3-8**). Impacts from ROW avoidance areas would be fewer than under Alternative A, which does not include any ROW avoidance areas. Alternative C2 would not classify any of the Dalton Utility Corridor as ROW avoidance, exposing an area of likely development to surface disturbance without any ROW restrictions. Exclusion decisions also include 21,000 acres of high value watersheds (see **Table 3-8**). The nature and type of impacts on water resources from surface disturbance are described under *Impacts Common to All Alternatives*.

Alternative C2 would open 45,000 acres of floodplains and 167,000 acres of high value watersheds to surface mining in areas of high development potential (see **Table 3-7**). This is 40 percent more sensitive water resources available than under Alternative A. The nature and type of impacts on riparian vegetation, water quality, and channel morphology would be the same as those described under *Impacts Common to All Alternatives*. The additional acreage could allow for more mine sites requiring access routes, with sedimentation of local waterways, removal of riparian vegetation, and potential changes to channel morphology at stream crossings. Alternative C2 would not apply stipulations to restrict oil and gas development in floodplains. If there were oil and gas development, impacts would be as described under *Impacts Common to All Alternatives*.

Of the 45,000 acres of floodplains with high mineral potential that are open to mineral entry under Alternative C2, 44,000 are segregated and would not be available until conveyed, relinquished, or rejected. Of the 167,000 acres of high value watersheds with high mineral potential that are open to mineral entry under Alternative C2, 165,000 are segregated and would not be available until conveyed, relinquished, or rejected.

Under Alternative C2, the BLM proposes to designate Toolik Lake as an ACEC (77,000 acres; see **Map 2.22**, **Appendix A**), or 0.6 percent of the planning area. ACEC management would protect 2,000 acres of high value watersheds in the Toolik Lake ACEC, which would be more than 99 percent fewer acres than the sensitive resources protected under Alternative A (see **Table 3-8**). Management prescriptions associated with the ACECs are included in **Appendix J**. The management from the single ACEC under Alternative C2 would

protect fewer acres than Alternative A and would open a larger portion of the planning area to surface disturbance. The impacts would be the same as those described under *Impacts Common to All Alternatives*.

Alternative C2 would prohibit OHV travel in core caribou calving areas for 2 months and for resource protection on 22,000 acres of floodplains, 4,000 acres within a quarter-mile of lentic areas, and 273,000 acres of high value watersheds (8 percent of sensitive water resources in the planning area; see **Table 3-8**). Summer OHV restrictions under Alternative C2 would provide protection for riparian vegetation, stream crossings, and water quality, as described under *Impacts Common to All Alternatives*; however, the remote nature of the OHV restriction areas would lessen the potential off-setting impacts. Alternative A does not include TLs for OHV travel, so Alternative C2 provides additional protection to sensitive water resources.

Alternative C2 proposes no WSR segments in the planning area and provides no additional protection for riparian vegetation, channel morphology, and water quality, as described for Alternatives A and B.

Similar to Alternative C1, Alternative C2 would minimize surface disturbances, would close areas to fluid minerals extraction, and would limit OHV travel to existing trails within 160 acres of hot springs. While not closing the 160-acre hot spring buffer to locatable mineral entry, Alternative C2 would protect the surface and subsurface flows of the spring and would protect springs from surface disturbance. Similar to Alternative A, Alternative C2 would not manage any hot springs as ROW exclusion areas, but it would require that any placement of structures avoid surface disturbance where possible.

Alternative D

The ROW exclusions under Alternative D for floodplains, lentic areas, and high value watersheds would be identical to those under Alternative A. Alternative D would not designate ROW avoidance areas. Impacts on waterways from surface disturbance would be as described under *Impacts Common to All Alternatives*.

Alternative D would open the same number of acres of sensitive water resources to surface mining in areas of high development potential as Alternative C2. The impacts would be similar to those described under Alternative C2 (see **Table 3-7**).

Alternative D would not apply stipulations to restrict oil and gas development in floodplains. If oil and gas development were to occur, impacts would be as described under *Impacts Common to All Alternatives*.

Under Alternative D, the BLM does not propose any acres for ACECs, resulting in fewer management protections for water resources than those described under Alternative A.

Alternative D applies OHV weight limitations and not timing or seasonal limitations on 1,590,000 acres of floodplains and 399,000 acres of lentic areas. Impacts on waterways from OHV travel would be as described under *Impacts Common to All Alternatives*.

Alternative D proposes no WSR segments in the planning area and provides no additional protection for riparian vegetation, channel morphology, and water quality, as described for Alternatives A and B.

Within the 160-acre hot spring buffers, Alternative D would apply NSO stipulations. It would prohibit nonenergy solid mineral leasing and mineral material disposal. It would provide none of the other protections proposed under Alternatives B and C1: however, the hot springs are not in medium or high locatable mineral development areas. Hot springs are also not in areas open to mineral materials extraction, and OHV travel is limited to existing routes. As a result, even though the areas are open to possible surface-disturbing activities,

impacts on hot springs are not anticipated under Alternative D; however, impacts from recreation, lease development, and access routes are still possible.

Conclusion

Surface mining, stream crossings associated with ROW development, and designation of the Ambler and Umiat utility and transportation corridors pose potential impacts on water resources in the planning area. Locatable minerals with high development potential include 26,000 acres of floodplains, 10,000 acres within a quarter-mile of lentic areas, and 114,000 acres of high value watersheds.

Stream crossings associated with ROW development would occur primarily along the Dalton Utility Corridor, where development is most likely. All action alternatives would designate the Ambler and Umiat utility and transportation corridors, which would collocate utility and transportation infrastructure. This would concentrate development and surface disturbance rather than allow for dispersed development that would affect greater areas. Surface disturbance within the corridors would affect up to 203,000 acres of sensitive water resources (3 percent of sensitive water resources in the planning area). Overall, most of the planning area would remain in near undisturbed condition, with little to no human impacts on water resources; 84 percent of BLM-managed lands in the planning area are outside of the Dalton Utility Corridor. Along the Dalton Utility Corridor, Alternative B provides the most protection from surface mining and road crossings associated with ROW development, while Alternatives A, C2, and D would provide the least protection to water resources.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis. The WCM is an indicator of human activity in a watershed and is used to as an indicator of impacts for past and present projects for cumulative impact analysis.

In the planning area, human impacts on sensitive water resources primarily occur within PLO 5150. Past and present activities include construction of the TAPS and the associated infrastructure, including the Dalton Highway, continued oil and gas development on the North Slope, placer mining, maintenance on the Dalton Highway, and general community development. These activities resulted in localized degradation of waterways and riparian vegetation next to placer mining and OHV trails, increased potential for oil and other contaminant spills, and riparian vegetation removal and channel morphology changes from surface disturbance, as described in *Impacts Common to All Alternatives*. All impaired function watersheds under the WCM are along the Dalton Highway, near Wiseman and Coldfoot, indicating the level of cumulative impacts in the area (see **Map 3.8**, **Appendix A**).

Activities projected in the Dalton Utility Corridor include new oil and gas developments on the North Slope, two potential natural gas pipelines, continued placer mining, potential expansion of mining into the Ray Mountains, mineral materials extraction for the Ambler and Umiat utility and transportation corridors and the two potential natural gas pipelines, fiber optic and cell tower improvements, and transportation improvements along the Dalton, Elliott, and Park Highways.

Cumulative impacts on water resources in the cumulative effects study area include localized impacts on water quality from placer mining, removal of riparian vegetation and resulting impacts on channel morphology and water quality, and localized impacts on riparian vegetation and stream crossings from increased OHV travel. Also included is an increased risk of oil or contaminant spills due to new oil and gas developments, two potential natural gas pipelines, and the Ambler and Umiat utility and transportation corridors, with impacts the same as those described under *Impacts Common to All Alternatives*.

ROW decisions for Alternatives A and D do not include ROW avoidance areas, and ROW exclusion decisions include 88,000 acres of sensitive water resources; ROW decisions for Alternatives B, C1, and C2 include ROW avoidance areas and exclusion areas on 1,086,000 acres, 825,000 acres, and 506,000 acres of sensitive water resources, respectively. For placer mining, Alternative A would open 388,000 acres of sensitive water resources to development in areas of medium or high potential; Alternatives B, C1, C2, and D would open fewer acres of sensitive water resources to development (49,000, 50,000, 74,000, and 74,000 acres, respectively).

Alternatives B, C1, C2, and D would include the Ambler and Umiat utility and transportation corridors, which include 203,000 acres of sensitive water resources. Impacts from OHV travel would be minimal in the planning area under all alternatives. This would be due to the remote nature of most of the planning area and the exclusion of OHV travel within 5 miles of the Dalton Highway ROW.

Three of the eight hot springs in the planning area are developed, and no resource uses affect them. Some impacts have been observed from dispersed recreation and access to the hot springs, especially at stream crossings. Four hot springs are accessed by recreationists on OHVs in the summer: Tolovana, Hutlinana, Kanuti, and Melozi; these can be accessed in the winter on snowmobiles. The rest are accessed only in the winter by recreationists on snowmobiles. The alternatives have varying degrees of protection for the 160-acre hot spring buffer, but no impacts are expected within those buffers during the planning period; therefore, no cumulative effects are anticipated under any of the alternatives.

Overall, cumulative impacts on water resources would be greatest under Alternatives C2 and D, due to the contribution to impacts from the increased acreage open to placer mining and ROW development. Alternative B would have the fewest cumulative impacts on water resources by decreasing acreage of sensitive water resources open to placer mining and ROW development.

Alternative A would open fewer acres to placer mining and would open more areas to ROW development, compared with the action alternatives. Alternatives C2 and D would cumulatively increase impacts on functioning at risk and impaired function watersheds along the Dalton Utility Corridor, while Alternative B would cumulatively decrease impacts on these watersheds. Alternatives A and C1 would maintain the current level of human disturbance in functioning at risk and impaired function watersheds.

The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts.

3.2.4 Vegetation Communities and Plants

The following information about the affected environment is summarized from the AMS for the CYRMP (BLM 2016a: Section 2.1.4), unless otherwise noted. Vegetation communities in the planning area are largely in natural states due to small human populations and remoteness resulting in overall low human-caused disturbances. Exceptions to this include areas with river and road corridors (such as Dalton Highway), existing mining operations, subsistence use areas, wildland fire suppression, villages, and other private inholdings. Although relatively less affected by humans, vegetation is highly disturbed in the planning area and is shaped by, and requires, a level of natural disturbances such as avalanches, flooding, permafrost prevalence, freeze and thaw cycles, wildfire, and so forth to maintain natural states.

BLM-managed lands in the planning area fall in the following ecoregions: Ray Mountains (41 percent), Kuskokwim Mountains (20 percent), Kobuk Ridges and Valleys (17 percent), Brooks Range (8 percent), Brooks Foothills (7 percent), Yukon River Lowlands (5 percent), Nulato Hills (1 percent), and Tanana-

Kuskokwim Lowlands (1 percent). The most widespread vegetation communities are upland boreal forest and tundra types, but a wide range of other communities are present, reflecting the variation in climate (continental to coastal) and terrain (mountainous to level).

The portion of the planning area for which the BLM has authority to make land use and management decisions (hereafter referred to as the decision area) consists mostly of Upland Low and Tall Shrub (5,103,000 acres or 38 percent of the total decision area), Upland Mesic Spruce Forest (3,081,000 acres or 23 percent), Alpine Dwarf Shrub Tundra (1,535,000 acres of 12 percent), and Upland Mesic Spruce-Hardwood Forest (1,122,000 acres or 8 percent). The remaining areas include Perennial Ice/Snow, Developed, Barren Land, wetland vegetation classes, and open water (see **Attachments 2–7** in **Appendix O** and **Maps 3.9** through **3.11**, **Appendix A**). This section focuses on upland vegetation communities; wetland resources are discussed in the next section.

Vegetation communities were mapped primarily based on seven Coarse-filter Conservation Elements landcover classes (83 percent of the decision area) as defined in the Central Yukon Rapid Ecoregional Assessment (Boucher et al. 2016); the remaining 17 percent uses National Land Cover Dataset classes for the decision area. Brief descriptions of the vegetation classes are provided in **Attachment 1** in **Appendix O**. Additional information on vegetation communities is available in Section 2.1.4, Vegetation Communities, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Several special status species (SSS) plants are known or have potential to occur in the planning area. The BLM Alaska list of SSS plants is derived from the Alaska Rare Plant database compiled and maintained by the Alaska Center for Conservation Science, and is revised every few years. Because the list is expected to change over the life of the CYRMP, SSS plants are addressed generally without specific references to individual species. Additional information is available in Section 2.1.9, SSS, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Populations of nonnative invasive species (NNIS) plants, including some considered invasive, are established in the Central Yukon region (Carlson et al. 2016). The Alaska Center for Conservation Science has developed a ranking system to evaluate the potential invasiveness and impacts of NNIS plants to natural areas in Alaska to be used for NNIS management (Carlson et al. 2008). Additional information, including a list of invasive plant species, is available in Section 2.1.5, NNIS, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

Although vegetation in the planning area is subject to some level of disturbance, effects of climate change could move vegetation communities away from their natural states. Natural events are expected to continue and increase alterations to vegetation communities through changes in hydrology, permafrost characteristics, wildland fire regime, warming trends, encroachment of NNIS, changes in species range and distribution, and increased severe weather patterns (BLM 2013, Euskirchen et al. 2009, Haufler et al. 2010).

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to vegetation communities, NNIS, and SSS plants and the analytical methods used in this analysis.

The majority of the decision area is characterized by upland vegetation communities and therefore, these vegetation communities are open to the highest proportion of potential impacts across the landscape. Sensitive

and rare plant communities such as pingos, bluffs, and special status plant habitat may be affected to a greater extent from even minor disturbances due to their small-scale locations, reduced recovery abilities, and small prevalence in the region compared with widespread and abundant vegetation communities. Potential impacts on vegetation communities in the decision area include, but are not limited to, direct loss or degradation of vegetated areas, including habitat for SSS; changes in plant community diversity and structure; and introduction and spread of NNIS.

Direct impacts would result from surface disturbance activities or removal of vegetative material. Indirect impacts could include modification of vegetation communities through dust accumulation, erosion, compaction of soils, hazmat spills, modification of hydrology, changes to water quality, permafrost dynamics, alteration of grazing animal populations, and spread or introduction of NNIS.

At the planning level it is difficult to foresee the extent of potential impacts. Even though large areas of the decision area are open to land uses that may affect vegetation, RFD scenarios indicate that certain uses are unlikely, such as oil and gas development or mining of nonenergy solid minerals. Timber harvest was not included in RFD scenarios but would be dependent on feasibility and economic interest, in addition to spatial extent open to forest harvest under the alternatives. The level and duration of impacts on vegetation communities, including SSS plants, depends on where and what type of land use authorizations are granted, the methods of project implementation, site-reclamation techniques, and further environmental compliance requirements at the permitting-level or project-level or both.

The effectiveness of reclamation depends on the type of disturbance, vegetation communities, reclamation method, and time frame. These could prevent vegetation from being reestablished.

Alternative A

Since there are no measures currently in place that specifically address NNIS, increased spread and introduction of NNIS is the most likely impact on vegetation communities in the decision area in future management scenarios under Alternative A. NNIS establishment and spread could be caused by surface disturbance activities and transport of seeds by vehicles (such as cars, heavy equipment, snowmobiles, boats, and aircraft), ROW development and maintenance, and new accessibility into remote areas. Current management under Alternative A includes several mechanisms limiting human impacts in specific areas; some limitations to permitted activities in ACECs is required to meet stated management objectives, depending on the purpose of the ACECs. Alternative A includes 1,751,000 acres in ACEC/RNAs (see **Attachment 7** in **Appendix O**).

Alternative A does not include plan components, beyond a NSO stipulation to fluid mineral leases for *Montia bostockii*, to address surface disturbance impacts on SSS plants or unique ecosystems. Without plan direction to survey for SSS plants or unique ecosystems there is a potential that unidentified SSS plants could be affected by BLM-authorized surface disturbing activities under current management.

Currently, 6,763,000 acres of the decision area are open to entry for locatable minerals (see **Table 2-1** in **Chapter 2**). Most activity related to locatable minerals is expected to occur in areas of high mineral potential; currently, a total of 172,000 acres of which 120,000 acres comprise upland vegetation communities (see **Attachment 3** in **Appendix O**). Areas open to locatable minerals entry with high mineral potential under Alternative A consist primarily of Upland Low and Tall Shrub (54 percent), while the proportions of Alpine Dwarf Shrub Tundra (19 percent), Upland Mesic Spruce Forest (11 percent), and Upland Mesic Spruce-Hardwood Forest (5 percent) are lower; therefore, impacts associated with locatable mineral development

could potentially impact a higher proportion of Upland Low and Tall Shrub communities than other vegetation classes in the decision area.

Mineral development, such as that done with placer mining, would occur in limited areas, with impacts constrained to certain lowland vegetation types. **Map 2.67** (**Appendix A**) illustrates the areas that would be open to locatable mineral entry with high mineral potential. Most mineral development would occur in or near streams in lowland areas, where upland and tundra vegetation does not occur. **Attachment 3** in **Appendix O** provides additional details on acreages of specific lowland vegetation types that could be impacted.

Almost all of the decision area is currently open to ROW location with approximately 10,726,000 acres, composed mainly of Alpine Dwarf Shrub Tundra (12 percent), Upland Low and Tall Shrub (41 percent), Upland Mesic Spruce Forest (25 percent), and Upland Mesic Spruce Hardwood Forest (9 percent) (see **Attachment 4** in **Appendix O**). ROW development, especially in remote and sensitive locations (such as pingos or bluffs) or rare plant communities, could alter vegetation communities primarily through spread of NNIS.

Similarly, almost all of the decision area (12,817,000 acres) is open to mineral materials disposal (see **Table 2-1** in **Chapter 2**). Most of this area consists of the upland vegetation types Alpine Dwarf Shrub Tundra (10 percent), Upland Low and Tall Shrub (40 percent), Upland Mesic Spruce Forest (24 percent), and Upland Mesic Spruce Hardwood Forest (9 percent) (see **Attachment 5 in Appendix O**). Activities associated with mineral materials disposal could modify vegetation communities through surface disturbance, covering of plants, and site-reclamation methods as well as indirect impacts described above.

Alternative A includes 1,751,000 acres in ACEC/RNAs (see **Table 2-1** in **Chapter 2**). These areas, which would provide some protection from impacts related to resource development, are composed mainly of Alpine Dwarf Shrub Tundra (18 percent), Upland Low and Tall Shrub (44 percent), and Upland Mesic Spruce Forest (14 percent) (see **Attachment 7** in **Appendix O**).

Impacts Common to All Action Alternatives (B, C1, C2, and D)

The BLM would apply SOPs to its actions and to activities that it authorizes under all alternatives. Vegetation and NNIS SOPs (see **Section F.2.4** in **Appendix F**) directly address potential impacts on vegetation communities and apply to all actions on BLM-managed public land, whether they are implemented by the BLM or authorized by the BLM and implemented by another individual, organization, or agency. SOPs relating to soils (**Section F.2.2**), watersheds and fisheries (**Section F.2.3**), wildlife (**Section F.2.5**), wildland fire management (**Section F.2.7**), and connectivity corridors (**Section F.2.17**) would also contribute to the preservation or rehabilitation of vegetation communities.

Most current infestations of invasive plants in the planning area occur within the Dalton Highway Corridor Management Area (BLM 2013). Commonly occurring nonnative species include invasive species of high management concern *Melilotus alba*, *Vicia cracca*, and *Hordeum jubatum*, as well as less invasive species of management concern (BLM 2013, Carlson et al. 2016). The predicted increase in traffic along the Dalton Highway is expected to contribute to the spread of invasive plants in the planning area under all alternatives (Taylor et al. 2011, Von der Lippe and Kowarik 2007, Zwaenepol et al. 2005).

Further development activities, particularly projects with associated surface disturbances through remote areas, would result in larger portions of the planning area becoming accessible to invasive plants. Alternatives B, C1, C2, and D include goals, objectives, and actions to limit the introduction and spread of NNIS to reduce NNIS impacts on vegetation communities and SSS plants compared with current management. For example,

all BLM-permitted activities must comply with current BLM Alaska NNIS Management Policy and develop a NNIS Management Plan.

Increased human activity may impact vegetation communities under all alternatives; areas with the highest potential for impacts on vegetation would include existing and new transportation corridors, areas near human population developments, and high use recreation areas. All alternatives would allow some degree of OHV travel, with limitations varying between alternatives. A large proportion of remote BLM-managed areas are most frequently accessed by OHV where cross-country use is allowed. This traffic can result in impacts on all vegetation communities, and particularly to rare plant communities and SSS habitat. Direct effects of OHV use include the widening of existing trails, trail proliferation, soil compaction, damage to above-ground vegetation, and changes in plant community species composition.

Travel in remote areas by OHVs may also be a vector for the introduction and establishment of NNIS. Aircraft landing on remote airstrips or river gravel bars may also introduce seeds or other propagules of NNIS that are adapted to disturbed or early successional habitats, such as *Melilotus albus* (Conn et al. 2008, 2011, Graziano et al. 2014). Access to remote areas by floatplanes or boats poses a risk of spreading aquatic NNIS such as *Elodea* spp. (Carlson et al. 2016, Moses 2016, Schwoerer 2017, State of Alaska 2019).The action alternatives incorporate plan components that would reduce recreation impacts on vegetation communities, such as weight limits on over-snow travel, OHV use limitations, recreationist education, and designated areas management .

All alternatives have areas open to locatable mineral entry, but these differ in their spatial extent and potential for locatable mineral development. Locatable mineral mining could directly remove, degrade, or modify vegetation communities, including SSS plants if present, through surface disturbing activities including, but not limited to, excavation of pits, removal of topsoil, facility and access development, and use of heavy equipment. Indirect impacts could modify vegetation habitat through changes in hydrology, inadvertent pollution of topsoil or water sources, compaction of soils preventing seed germination, establishment or spread of NNIS, alteration of permafrost dynamics, and erosion.

Similar to locatable minerals, some areas would be open for mineral materials disposal under all alternatives, but the spatial extent available for development would vary. Potential impacts on vegetation communities are similar to those associated with locatable minerals.

ROW maintenance and development could increase the spread and establishment of NNIS in the decision area, through surfacing disturbance activities and other indirect impacts described above. ROWs may provide opportunities for NNIS to colonize new locations within the planning area; seeds or other propagules can be transported by construction or maintenance vehicles and many NNIS are well adapted to colonizing disturbed habitats. ROW authorizations could range from temporary trails to installation of utility corridors as well as collocation with existing ROW disturbed areas. Although the alternatives differ in amount open for ROW location and management of ROWs (see below), all alternatives provide for some ROW exclusion areas, including the Central Arctic Management Area (CAMA) Wilderness Study Area (WSA).

Vegetation communities in ROW exclusions would not be subject to ROW related impacts and areas managed as ROW avoidance areas would have reduced potential associated impacts. Under all action alternatives, the areas open for ROWs would consist primarily of the upland shrub and forest classes that also dominate the planning area as a whole.

PLO 5150 would be partially or fully revoked under all the action alternatives. The effect of the revocation would allow top-filed lands to become State of Alaska selected lands. Nearly 43 percent of these top-filed

lands have a Priority 1; these lands are anticipated to be conveyed to the State of Alaska within 10 years after the revocation of the PLO, and they would no longer managed by the BLM. All selected lands are segregated from new locatable mineral entry until they are either conveyed or the selections are removed. Selected lands that are Priority 2 or lower would remain segregated until the selection is relinquished or rejected, at which time they would be open for locatable mineral entry.

Under all action alternatives, most of the upland vegetation communities in the decision area would be open to forest harvest; however, impacts from forest harvest on vegetation communities are expected to be minor since minimal development of commercial forestry is anticipated.

Alternative B

Alternative B emphasizes resource preservation over other land uses compared with other alternatives. There are more OHV seasonal limitations and restrictions and management of recreation areas as primitive which would minimize human activity impacts on vegetation communities. Backcountry Conservation Areas (BCAs) designated under Alternative B would indirectly reduce potential human disturbances and development impacts on vegetation communities in these areas. Alternative B has more acres closed to summer OHV travel, to preserve sensitive soils, vegetation habitat, and caribou calving during higher risk seasons than Alternative A (see **Table 2-20** in **Chapter 2**).

Alternative B would designate 4,035,000 acres in ACEC/RNAs, compared with 1,751,000 acres under Alternative A (see **Table 2-1** in **Chapter 2**; see **Attachment 7** in **Appendix O**). Although one ACEC (Galbraith ACEC) was established with plant species as a noted resource value, the limited development restrictions provided to conserve other resources in ACECs may reduce potential impacts on vegetation communities, including rare plant communities and SSS plants.

Alternative B incorporates more guidance to preserve SSS flora and unique ecosystems than other alternatives including Alternative A. For example, for BLM-authorized surface-disturbing activities in known SSS habitat, vegetation and SSS plant surveys using BLM-approved protocols would be required. In other areas, surface disturbing activities over 5 acres would require a photo inventory of the site. Setbacks of 100-feet for identified SSS occurrences, reporting instructions, limited or seasonal OHV restrictions, and ROW avoidance in alpine vegetation, lichen, and pingos, would reduce potential impacts on rare vegetation communities and SSS plants compared with Alternative A (see **Table 2-5** in **Chapter 2**).

Under Alternative B, 223,000 acres would be open to locatable mineral entry in areas of high mineral potential (see **Attachment 3** in **Appendix O)**; these would consist primarily of Upland Low and Tall Shrub (52 percent). The proportions of Alpine Dwarf Shrub Tundra (17 percent), Upland Mesic Spruce Forest (12 percent), and Upland Mesic Spruce-Hardwood Forest (5 percent) are lower; therefore, impacts associated with locatable mineral development would be similar to Alternative A. There would be a slight increase in potential locatable mineral development impacts on Alpine Dwarf Shrub Tundra (5,000 acres more), Upland Low and Tall Shrub (22,000 acres more), Upland Spruce Forest (8,000 acres more), and Upland Mesic Spruce-Harwood Forest (3,000 acres more).

Of the 223,000 acres of lands with high mineral potential and open to mineral entry under Alternative B, all are segregated and would not be available until conveyed, relinquished, or rejected.

Upland vegetation communities open to, and therefore potentially impacted by, mineral material disposal would be approximately 3.9 million fewer acres than Alternative A (see **Attachment 5** in **Appendix O)**; 694,000 fewer acres of Alpine Dwarf Shrub Tundra, 2,055,000 fewer acres of Upland Low and Tall Shrub,

860,000 fewer acres of Upland Mesic Spruce Forest, and 261,000 fewer acres of Upland Mesic Spruce-Hardwood Forest. There would be a decrease in potential mineral material disposal impacts on shrub communities compared with Alternative A.

The area open to ROW location under Alternative B would be 5,593,000 acres; less than half the area open under Alternative A (see **Table 2-1** in **Chapter 2**). Fewer acres of the upland vegetation classes Alpine Dwarf Shrub Tundra (1,087,000 fewer acres), Upland Low and Tall Shrub (3,061,000 fewer acres), Upland Mesic Spruce Forest (1,462,000 fewer acres), and Upland Mesic Spruce-Hardwood Forest (524,000 fewer acres) would be open to ROW location. They also would be subject to potential impacts, compared with Alternative A (see **Attachment 4** in **Appendix O**).

In addition, Alternative B manages areas as ROW exclusion or avoidance areas for sensitive soils, floodplains, hot springs, lentic areas, BCAs, WSR segments, and alpine vegetation, which would avoid or minimize potential ROW impacts on vegetation communities, including SSS habitat. Utility corridors require collocation with existing infrastructure or designated corridors under Alternative B reducing potential areas impacted by utility development and maintenance, including spread of NNIS.

A total of 10,399,000 acres would be open for commercial timber harvest under Alternative B, compared with 13,043,000 acres under Alternative A (see **Table 2-1** in **Chapter 2**). Fewer acres would be open to timber harvest for all upland vegetation classes (see **Attachment 6** in **Appendix O**), including Upland Mesic Spruce Forest (554,000 fewer acres), Upland Mesic Spruce-Hardwood (174,000 fewer acres), Alpine Dwarf Shrub Tundra (325,000 fewer acres), and Upland Low and Tall Shrub (1,044,000 fewer acres).

Alternative C1

Alternative C1 emphasizes a blend of resource protection and resource uses. There are more OHV limitations and restrictions which would reduce human activity impacts on vegetation communities compared with Alternative A. Alternative C1 provides a variety of recreation opportunities from semi primitive to rural recreation management zones (RMZs).

Alternative C1 would designate 418,00 acres in ACEC/RNAs, compared with 1,751,000 acres under Alternative A (see **Table 2-1** in **Chapter 2**). Similar to Alternative B, limited development restrictions provided to conserve other resources in ACEC/RNAs may reduce potential impacts on vegetation communities, including rare plant communities and SSS plants, compared with Alternative A.

Alternative C1 includes plan actions to preserve SSS flora and unique ecosystems, in contrast to Alternative A (see **Table 2-5** in **Chapter 2**). For BLM-authorized surface-disturbing activities vegetation and protocol SSS plant surveys for known habitat are required. Setbacks of 98-feet for identified SSS populations, limited or seasonal OHV restrictions, and ROW avoidance in pingos, would reduce potential impacts on some rare vegetation communities and known SSS plants compared with Alternative A.

Under Alternative C1, 226,000 acres would be open to locatable mineral entry in areas of high mineral potential (see **Attachment 3** in **Appendix O)**. These would consist mainly of Upland Low and Tall Shrub (52 percent), while the proportions of Alpine Dwarf Shrub Tundra (17 percent), Upland Mesic Spruce Forest (12 percent), and Upper Mesic Spruce-Hardwood Forest (5 percent) are lower; therefore, impacts associated with locatable mineral development would be similar to those described under Alternative A. There would be an increase in potential locatable mineral development impacts on Alpine Dwarf Shrub Tundra (6,000 acres more), Upland Low and Tall Shrub (24,000 acres more), Upland Mesic Spruce Forest (8,000 acres more), and Upland Mesic Spruce-Hardwood Forest (3,000 acre more).Of the 226,000 acres of lands with high mineral

potential and open to mineral entry under Alternative C1, 223,000 are segregated and would not be available until conveyed, relinquished, or rejected.

Areas of upland vegetation communities open to, and therefore potentially impacted by, mineral material disposal would be fewer, compared with Alternative A, for the following (see **Attachment 5** in **Appendix O**):

- Upland vegetation classes of Alpine Dwarf Shrub Tundra (290,000 acres fewer)
- Upland Low and Tall Shrub (490,000 acres fewer)
- Upland Mesic Spruce Forest (149,000 acres fewer)
- Upland Mesic Spruce-Hardwood Forest (47,000 acres fewer)

The area open to ROW location under Alternative C1 would be 9,784,000 acres, fewer than the 13,043,000 acres open under Alternative A (see **Attachment 4** in **Appendix O**). Areas of Alpine Dwarf Shrub Tundra (727,000 fewer acres), Upland Low and Tall Shrub (1,252,000 fewer acres), Upland Mesic Spruce Forest (422,000 fewer acres), and Upland Mesic Spruce-Hardwood Forest (208,000 fewer acres) potentially subject to impacts from ROW location would all be lower, compared with Alternative A. ROWs avoidance areas (3,253,000 acres) would include pingos, and utility corridors would collocate with existing infrastructure or designated corridors to the extent possible under Alternative C1 thereby reducing or avoiding potential ROW impacts on vegetation communities (see **Table 2-2** in **Chapter 2**).

A total of 12,698,000 acres would be open for commercial timber harvest under Alternative C1, compared with 13,043,000 acres under Alternative A (see **Table 2-1** in **Chapter 2**). Fewer acres of Upland Mesic Spruce Forest (57,000 acres fewer), Upland Mesic Spruce-Hardwood (22,000 acres fewer), Alpine Dwarf Shrub Tundra (13,000 acres fewer), and Upland Low and Tall Shrub (69,000 acres) would be open to timber harvest compared with Alternative A (see **Attachment 6** in **Appendix O**).

Alternative C2 (Preferred Alternative)

Alternative C2 emphasizes a blend of resource protection and resource uses. There would be more limitations and restrictions on OHV use, compared with Alternative A, which would reduce impacts on vegetation communities associated with human activity.

No ACECs would be designated under Alternative C2, but the Toolik RNA (77,000 acres) would be retained (see **Table 2-1** in **Chapter 2**). Under Alternative C2, a survey may be required if BLM-authorized surface-disturbing activities are determined to have the potential to impact SSS plants.

Under Alternative C2 269,000 acres would be open to locatable mineral entry in areas of high mineral potential (see **Attachment 3** in **Appendix O**); these would consist mainly of Upland Low and Tall Shrub (52 percent), while the proportions of Alpine Dwarf Shrub Tundra (15 percent), Upland Mesic Spruce Forest (13 percent), and Upland Mesic Spruce-Hardwood Forest (5 percent) are lower; therefore, impacts associated with locatable mineral development would be similar to those described under Alternative A. There would be a slight increase in potential locatable mineral development impacts on Alpine Dwarf Shrub Tundra (7,000 acres more), Upland Low and Tall Shrub (47,000 acres more), Upland Mesic Spruce Forest (17,000 acres more), and Upland Mesic Spruce-Hardwood Forest (5,000 acre more), compared with Alternative A. Of the 269,000 acres of lands with high mineral potential and open to mineral entry under Alternative C2, 264,000 are segregated and would not be available until conveyed, relinquished, or rejected.

The total area open to and potentially impacted by mineral materials disposal under Alternative C2 would be 8,042,00 acres, lower than the total of 12,817,000 acres under Alternative A (see **Table 2-1** in **Chapter 2**).

The areas potentially affected by mineral materials disposal would be lower for all upland vegetation types (see **Attachment 5** in **Appendix O**): Alpine Dwarf Shrub Tundra (151,000 acres fewer), Upland Low and Tall Shrub (348,000 acres fewer), Upland Mesic Spruce Forest (113,000 acres fewer), and Upland Mesic Spruce-Hardwood Forest (39,000 acres fewer).

A total of 12,137,000 acres would be open to ROW location under Alternative C2 (see **Table 2-1** in **Chapter 2**), fewer than under Alternative A (13,043,000 acres). Acres of all upland vegetation types would be reduced (see **Attachment 4** in **Appendix O**): Alpine Dwarf Shrub Tundra (171,000 acres fewer), Upland Low and Tall Shrub (426,000 acres fewer), Upland Mesic Spruce Forest (132,000 acres fewer), and Upland Mesic Spruce-Hardwood Forest (72,000 acres fewer). ROW avoidance areas (906,000 acres) would include the Lake Todatonten pingo cluster and areas within 160 acres surrounding hot springs. This might reduce impacts on rare vegetation communities and habitat for SSS plants, compared with Alternative A.

The total area open for commercial timber harvest under Alternative C2 would be approximately 13,043,000 acres; this is essentially the same as under Alternative A (see **Table 2-1** in **Chapter 2**, **Attachment 6** in **Appendix O**).

Alternative D

Alternative D facilitates resource uses in the decision area. Alternative D would manage 13,302,000 acres as limited for OHV travel without any seasonal limitations; the same as Alternative A.

Alternative D does not manage any areas as ROW avoidance (see **Table 2-1** in **Chapter 2**); therefore, ROW impacts would be same as Alternative A. Alternative D provides a variety of recreation opportunities from semi primitive to rural RMZs. Higher-use recreational areas would have more human-caused impacts on vegetation communities than primitive and backcountry zones.

Alternative D would not designate any ACECs or RNAs, compared with 1,751,000 acres of multiple ACEC/RNAs under Alternative A (see **Table 2-1** in **Chapter 2**). Areas no longer designated as ACEC/RNAs could be subject to more authorized resource use impacts that could modify vegetation communities depending on the type and extent of activities authorized.

Under Alternative D if the BLM determines that a permit action has the potential to impact special status flora or occurs in a unique vegetation community, a survey would be required (see **Table 2-5** in **Chapter 2**). Permittees would receive reporting instructions if special status plants are found. This would provide slightly more protection for SSS plants and unique vegetation communities compared with Alternative A where there is no similar action for surface disturbing activities.

Alternative D would have the same number of lands open to locatable mineral entry in areas with high mineral potential for each vegetation class as Alternative C2 (see **Attachment 3** in **Appendix O)**. Impacts on vegetation communities from locatable mineral entry would be the same as those described in Alternative C2.

Additionally, the same as under Alternative C2, of the 269,000 acres of lands with high mineral potential and open to mineral entry under Alternative D, 264,000 are segregated and would not be available until conveyed, relinquished, or rejected.

The total area open to mineral material disposal under Alternative D would be 12,824,000 acres, approximately the same as under Alternative A (see **Table 2-1** in **Chapter 2**); therefore, the acres of individual vegetation classes potentially impacted by mineral materials disposal are similar for Alternatives A and D (see **Attachment 5** in **Appendix O**).

The area open to ROW location and forest harvest under Alternative D would be the same as Alternative A (see **Table 2-1** in **Chapter 2** and **Attachment 4** and **Attachment 6** in **Appendix O**.

Conclusion

BLM-authorized activities with potential for alteration of non-wetland vegetation communities (including habitat for SSS plants) and increased spread of NNIS are surface disturbing activities including locatable mineral extraction (primarily in areas of high potential), mineral materials disposal, and ROW location and maintenance, and recreational access. Potential impacts on SSS are difficult to predict as habitat requirements are species-specific and the list of species is expected to be revised every few years. Alternative B requires a protocol survey and has the highest potential to preserve SSS flora for known SSS habitat and photo inventories for surface disturbing activities of 5 or more acres, while Alternative D requires vegetation surveys in known SSS habitat; Alternative A does not include similar action.

Alternative D would likely result in the greatest impacts on vegetation; most BLM-managed lands in the decision area would be open to entry for locatable minerals, ROW location, mineral materials disposal, and forest harvest, and there are fewer plan components or acres allotted to avoid or reduce resource use impacts on vegetation communities and SSS. For example, Alternative D does not include ROW avoidance areas like the other action alternatives and manages 0 acres for seasonal limitation OHV use; thus, Alternative D would be the most likely to result in spread of NNIS within the planning area, and would also present the highest potential for removal, degradation, or modification to vegetation communities, including SSS plant habitat.

Full revocation of PLO 5150 is recommended under Alternative D. The top-filed lands would become State selected lands. The assumption is that those with a Priority 1 selection will be conveyed to the State of Alaska within 10 years of the revocation and will no longer be managed under the BLM's SOPs. The remaining selected lands would be segregated from mineral entry until the selections are relinquished or rejected, at which time the lands would be open to mineral entry.

Alternative C2 would be similar to Alternative D with respect to potential impacts on upland vegetation communities; no ACECs would be designated, and almost the entire decision area would be open to ROW location. ROW avoidance areas around pingos and hot springs would reduce impacts on rare vegetation communities and habitat for SSS plants, compared with Alternative A. Full revocation of PLO 5150 would be recommended. Potential impacts on upland vegetation communities from locatable mineral development would be minimal, compared with Alternative A.

Alternative B would be expected to have the least potential impacts on vegetation communities and SSS plants. The total acres open to entry for locatable minerals would be slightly higher than under Alternative A, but the acres open to entry in areas with high potential for locatable minerals, where most impacts would be expected, would be lower than under any other alternative.

Partial revocation of PLO 5150 would be recommended, with fewer acres identified as a Priority 1, compared with Alternatives C2 and D. The total acres open to ROW location, mineral materials disposal, and forest harvest would also be lowest under Alternative B. Thus, this alternative would be the least likely to result in additional spread of NNIS within the planning area and would also present the lowest potential for alterations to vegetation communities. Alternative C1 would be intermediate between Alternatives B and C2 with respect to potential impacts on vegetation communities.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

Cumulative effects on vegetation communities from development and land use activities in the past, present, and reasonably foreseeable future include construction and maintenance of ROWs, transportation, infrastructure, continued and new mining and oil and gas operations, recreational uses, subsistence uses, military projects, as well as natural events (such as wildfire, flooding, and changes in climate). These actions or events occurring in the planning area could affect vegetation communities similar to impacts described above and in the AMS (BLM 2016a) when combined with the alternatives. The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts.

In more remote areas natural events (such as floods, permafrost dynamics, avalanches, freeze/thaw cycles, insect and disease outbreak, alteration to wildfire regime and changes in climate) would have the most effect on vegetation communities, while areas near existing or future developments would be more subject to human-caused impacts (such as infrastructure development, OHV travel, fluid and mineral mining, recreation, etc.). Cumulative impacts from these types of actions would be reduced or avoided through future environmental compliance requirements (NEPA, the Clean Water Act, and the Endangered Species Act) at the leasing or project design levels; however, due to the sensitivity and low overall human-disturbance of vegetation communities in the planning area, most projects are likely to contribute to impacts on vegetations communities. This is especially true for SSS plants and sensitive, long-to recover ecosystems like sand dunes, permafrost soils, hot springs, and wetlands (see also **Section 3.1.1**).

Cumulative impacts would potentially occur under all proposed action alternatives where Alternative D could contribute to the greatest impacts and Alternative B the least based on land use allocations, RMP goals, objectives and actions, revocation of PLO 5150, and RFD scenarios.

3.2.5 Wetland Resources

Most of the wetlands in the planning area were assessed to have physical attributes adequate to maintain or improve biological integrity and thus were classified as "functioning properly" at the watershed level (BLM 2016a; **Section 2.1.6**). BLM long-term evaluations described in the AMS show a declining trend in watershed condition and the associated functioning status of wetlands on BLM-managed lands within the planning area due to authorization of surface-disturbing land use activities. The rate at which the downward trend is likely to continue would be influenced by the changes in climate, type and amount of land use, and vulnerability of the watershed to disturbance. Brief descriptions of the vegetation classes and associated wetland types are provided in **Attachment 1** in **Appendix O**. Additional information is available in Section 2.1.6, Riparian-Wetland Resources, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

As noted in the AMS (BLM 2016a: Section 2.1.6), wetland structure and function remain largely intact throughout the planning area except along the existing transportation routes; however, critical function is predicted to decline, primarily due to climate change (Fresco et al. 2016). As the overall temperatures rise, permafrost melts, which promotes drainage and drying of wetlands. Higher overall temperatures also increase the risk of fire in remote areas, which can remove varying degrees of the organic layer, resulting in a potential drying effect on wetlands (Fresco et al. 2016).

In general climate change is likely to have an effect on wetlands through drying and loss of critical wetland functions; however, the Rapid Ecological Assessment predicts an increase in precipitation in some areas of the planning area. This may be helpful, particularly for riverine wetlands (Fresco et al. 2016). The most abundant wetlands in the planning area are permafrost wetlands, which are at risk due to climate change.

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to wetland resources and the analytical methods used in this analysis. The effects of climate change described above, could influence the rate or degree of the potential direct and indirect impacts.

Direct impacts include actions that result in removal of wetland structure and function or a total loss of wetlands, primarily in cases of placement of fill or excavation of surface layers into the water table. Permanent loss of wetlands due to placement of fill or excavation is the impact directly regulated under Section 404 of the Clean Water Act and corresponds to direct impacts. Documentation for mitigation for unavoidable permanent losses is defined under Section 404(b)(1) Guidelines of the Clean Water Act, and it may be accomplished via avoidance and minimization during project design or compensatory mitigation. Avoidance and minimization are considered when comparing proposed alternatives. Indirect impacts are those that develop over time as a result of an initial disturbance, such as accumulation of dust or development of thermokarst features.

Alternative A

Permanent loss of wetlands through placement of fill is an impact on wetlands within BLM-managed lands in the planning area (decision area) in future management scenarios under Alternative A. This impact would be caused by such activities as locatable mineral development, ROW development, mineral materials disposal, OHV use, and forest harvest. The management actions that conserve wetlands in their natural state would therefore effect wetland preservation. Under Alternative A, the CAMA WSA areas have ROW exclusions, which could reduce permanent wetland loss.

Alternative A currently has 6,763,000 acres open to locatable mineral entry. Wetlands account for 885,000 acres, or 13.2 percent, open to locatable mineral entry in the decision area; waters account for 24,000 acres (less than 0.2 percent of the total area open to locatable mineral entry in the decision area) (see **Attachment 2** in **Appendix O**). Much of the area does not have high mineral potential. Most mining activities of any variety would include new ROW-related impacts for transportation of material and access for construction, including effects of both traffic and mineral materials disposal (or gravel mining). Areas currently managed as open to ROWs account for 13,042,000 acres; 15.6 percent and 0 percent (2,029,000 and 58,000 acres) of the total area open to ROW location are estimated to be within wetland and waters types, respectively (see **Attachment 4** in **Appendix O**).

ROW exclusion areas, which would limit wetland impacts by minimizing permanent wetland loss due to fill placement, are limited to the CAMA WSA. The CAMA WSA areas are exclusively within the Arctic Foothills and Arctic Coastal Plain ecoregions where the dominant wetland types are freshwater emergent wetlands. In the CAMA WSA area the freshwater emergent wetlands are dominated by saturated permafrost wetlands but do include smaller proportions of riparian wetlands and lentic buffers. Hot springs, which provide valuable wetland habitat by supporting unique plant assemblages, do not have any special protection under ROW exclusions in ACECs.

Under Alternative A, 12,815,000 acres are open to mineral materials disposal, which is 96 percent of the entire BLM decision area. Potential jurisdictional wetlands or waters account for 15 percent of the area open to mineral material disposal, which is subject to potential permanent loss (see **Attachment 5** in **Appendix O**). Under Alternative A, OHV use would be limited, and forest harvest would be open for essentially the entire BLM decision area (see **Attachment 6** in **Appendix O**). Permanent wetland loss due to placement of fill is a

less common impact for OHV use, unless trail hardening is proposed, but degradation of wetland function does occur through damage to the soil profile.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Increased human activity may affect wetlands in all alternatives. Land uses, such as ROW construction and mining, typically lead to unavoidable losses of wetlands due to placement of fill; they indirectly affect wetlands through increased erosion, development of thermokarst, riparian zone and river channel alterations, fuel spills, airborne dust deposition, alterations to the wetland plant community, and changes in water quality. All the direct and indirect impacts on wetlands and waters that are described below would occur to some extent under all management alternatives.

PLO 5150 would be partially or fully revoked under all action alternatives. The effect of the revocation would allow top-filed lands to become State of Alaska selected lands. Nearly 43 percent of these top-filed lands have a Priority 1, and these lands are anticipated to be conveyed to the State of Alaska within 10 years after the revocation of the PLO and would no longer managed by the BLM. All selected lands are segregated from new locatable mineral entry until they are either conveyed or selections are removed. Selected lands that are Priority 2 or lower would remain segregated until the selection is relinquished or rejected, at which time they would be open for locatable mineral entry.

All alternatives would have areas open to locatable mineral entry; ongoing and future locatable mineral activities comprise a direct and indirect effect on wetlands in the decision area. Locatable minerals extraction could result in permanent loss of wetlands due to excavation of open pits, dredging in placer operations, and placement of fill for drill pads and access roads (Wolff and Thomas 1982). Some of these activities, including planning for access roads and pads, could mitigate wetland impacts by avoidance and minimization; however, mine sites generally are located wherever the deposit is found. In the case of placer mining, wetlands are at increased risk because the mineral deposits are typically found in low-lying floodplains where wetlands are likely to occur (Chevreux and Clarkson 2015).

Indirect impacts from various potential mining activities include disruption of wetland hydrology, sedimentation downstream of the mine site, vegetation composition alterations downstream of the mine site, the possibility of acid mine drainage from tailings, water quality changes, increased erosion, and habitat fragmentation (Madison 1981; Wolff and Thomas 1982).

ROW exclusions within the CAMA WSA lands (259,000 acres, 2 percent of BLM decision area) would be included in all action alternatives, unless Congress releases them from wilderness consideration. WSA goals would provide protection from permanent wetland losses within potentially sensitive arctic wetlands; however, most of the planning area would remain open to ROW location under all action alternatives. Specific types of impacts expected to occur during construction and operation of a ROW project, beyond projects that involve loss of wetlands or waters, due to placement of fill or excavation include dust deposition leading to changes to plant species' composition, changes to the soil chemical and physical properties, hydrologic changes and impoundments, increasing thermokarst, wildlife habitat loss or change, and NNIS infestations. The potential for oil spills may be another potential impact depending on the type of ROW.

Dust deposition initiates many of the wetland impacts listed above and has been shown to be more harmful to acidic wetland communities, such as moist acidic tundra, sphagnum bogs, or black spruce taiga (Walker and Everett 1987, Auerback et al. 1997, Myers-Smith et al. 2006, Ives and Schick 2016). These acidic wetland communities, which are included in freshwater emergent and freshwater shrub wetlands, are not concentrated in any particular zone in the decision area. ROWs could be selected, where possible, to use already affected

utility and transportation corridors. Vectors for transmission and existing NNIS infestations are discussed in **Section 3.2.4**.

Most of the area managed by the BLM within the planning area would be open to mineral materials disposal under all action alternatives. Mineral materials sites are typically collocated with developments requiring gravel sources; the direct and indirect impacts would be similar.

Many of the remote areas of BLM-managed land in the planning area are not located on the road system. Motorized use in the summer is most frequently by OHVs, which can result in a number of impacts on wetland structure and function. All alternatives would be subject to some degree of limited OHV travel. OHV travel would have a weight limit of 1,500 pounds; with the exception of specific areas associated with core caribou habitat, some ACECs in Alternative B, and the Dalton Highway, cross-country use would be allowed. TLs would be applied to avoid impacts on caribou (May 1 through June 30) or damage to vegetation (limited during summer) in specific areas as they apply to the resource.

Impacts from OHV use in remote locations in the decision area would be expected to be low due to low traffic, whereas the BLM would expect impacts to increase near already established trails near transportation corridors and communities. Direct effects of OHV use include the widening of existing trails (particularly in wetland areas), soil compaction, aboveground vegetation damage, increased erosion, degraded water quality, and plant community species composition changes caused by damage to living plant material or changes in hydrology within trail ruts.

Freshwater Emergent wetland types (corresponding to the Alpine-Arctic Tussock Tundra vegetation class) are the most susceptible to multiple OHV passes. If the tussocks and aboveground woody stems prevalent in those communities are damaged, the deep ruts gradually increase permafrost thaw, and the trail surface begins to subside and become flooded in low-lying areas.

Freshwater Emergent wetlands in the Emergent Herbaceous and Sedge/Herbaceous vegetation classes are more resistant than Alpine-Arctic Tussock Tundra to multiple OHV passes. This is because the surface organic layer may not become damaged as readily as in tussock-dominated communities, and subsidence as a result of an increase in thaw depth does not progress as rapidly (Slaughter 1990, McKee 2002, Racine and Johnson 1988). OHV trails crossing wetlands tend to have wider surface disturbance areas because OHV operators abandon an existing trail after a few passes and begin another route, whereas the trail remains a single track in well-drained, non-wetland settings. The total acreage in the decision area subject to limited OHV travel would be equivalent among all management alternatives. Damage prevention may require additional limitations, such as trail closures or trail hardening projects, particularly in wetlands.

All action alternatives would allow timber harvest on the majority of the BLM-managed lands in the planning area. Allowable forestry practices include subsistence harvest, commercial harvest, ROW clearing, personal use, research, and fuels management; none of these are typically actions that would require a Section 404 wetland permit, unless fill is used for ROW access. Additionally, harvest within the 100-year floodplain would require special consideration to demonstrate alignment with the floodplain objectives.

On BLM-managed lands in the planning area, forested wetlands are most likely to occur in floodplain areas. Alternatively, they could occur as sloping/north-facing slopes supporting black spruce unsuitable for most commercial forestry practices but potentially useful for biomass. They also could be valuable in place as a source of ecological services. Prevalent impacts of vegetation removal in wetlands are the alteration of wildlife habitat and reduction in wetland function (Ives and Schick 2016).

The impacts common to all alternatives described in this section apply to the discussion of specific acreages affected on all action alternatives compared below.

Alternative B

While additional FLPMA withdrawals are proposed under Alternative B, the total area open to locatable mineral entry (assuming PLOs recommended for removal and withdrawals are approved) would be 10,879,000 acres, which is an approximately 61 percent increase from Alternative A. Of this area, wetlands comprise 1,604,000 acres, 1,538,000 acres of which are segregated and would not be available until conveyed, relinquished, or rejected.

Among wetland types, the largest increase in areas open to locatable mineral entry would occur for freshwater emergent wetlands on Alpine-Arctic Tussock Tundra, 354,000 acres more than Alternative A (see **Attachment 2** in **Appendix O**).

There would be an increase in acreage available for mineral entry of nearly 400 percent, corresponding to Alpine-Arctic Tussock Tundra. Potential impacts on wetlands associated with Riparian Forest and Shrub vegetation type would also increase (see **Attachment 2** in **Appendix O**). In areas open to locatable mineral entry in the high mineral potential areas, 25,000 acres of wetlands could be impacted under Alternative B, compared with 14,000 acres under Alternative A. This includes Riparian Forest and Shrub and Open Water segregated lands. Alternative B would have an increased potential to impact more acres of freshwater emergent and freshwater shrub wetlands, compared with Alternative A (see **Attachment 3** in **Appendix O**). There would be a reduction in potential impacts on wetlands in the high potential areas under Alternative B from closing areas in the Dalton Utility Corridor (see **Map 2.67** and **Map 2.68**, **Appendix A**).

Mineral development, such as placer mining, would occur in limited areas, with effects constrained to certain lowland vegetation types. **Map 2.68** (**Appendix A**) illustrates the areas that would be open to locatable mineral entry, with high mineral potential. Most mineral development would occur in or near streams in lowland areas. **Attachment 3** in **Appendix O** provides additional details on acreages of specific lowland vegetation types that could be impacted.

Under Alternative B, 5,594,000 acres would be open to ROW projects, and 2,349,000 acres would be managed as ROW exclusion (see **Table 2-1** in **Chapter 2**). Alternative B also would have an additional 5,360,000 acres designated as ROW avoidance areas, which is not included under Alternative A. Areas that would be managed for ROW exclusion include the CAMA WSA areas and 20 ACECs, with particular emphasis on floodplains; this would increase the proportion of riverine wetlands under protection. ROW avoidance areas would encompass wetlands in general, buffers surrounding lentic areas, floodplains not covered in the exclusion areas, pingos, and hot springs; these areas would provide additional coverage to the range of wetland types occurring in the planning area (as noted in **Tables 2-2** and **2-3** in **Chapter 2)**.

The greatest reduction in potential wetland impacts due to ROW location would occur within the freshwater emergent wetlands, where 1,066,000 acres would be open under Alternative A and 533,000 would be open under Alternative B (see **Attachment 4** in **Appendix O**). This wetland type includes Emergent Herbaceous, Sedge/Herbaceous, Grassland/Herbaceous and Alpine-Arctic Tussock Tundra vegetation classes, which are most dominant in the northern portions of the planning area.

Under Alternative B, the area open to mineral materials disposal would be less than under Alternative A, with 8,041,000 acres, or 63 percent of the area open to mineral materials disposal under Alternative A. Restrictions that would reduce the potential for permanent wetland loss under Alternative B would occur primarily in the

CAMA WSA and also in sensitive watersheds throughout. Freshwater Shrub wetlands, which include riparian wetlands, would have the greatest reduction in area open to mineral materials disposal, reducing 924,000 acres under Alternative A to 531,000 acres under Alternative B (see **Attachment 5** in **Appendix O**).

Under Alternative B, 10,398,000 acres would be open for commercial timber harvest, which is 80 percent of the area open for timber harvest under Alternative A (see **Attachment 6** in **Appendix O**). Closed areas, which are not likely to contain forested wetlands due to their location north of the tree line, would occur primarily in the CAMA WSA. Some sensitive watersheds would also be closed, resulting in reductions in potential impact acreages for Freshwater Shrub wetlands in the Riparian Forest and Shrub (221,000 acres fewer than Alternative A) vegetation classes; this represents a 52 percent decrease, compared with Alternative A.

Under Alternative B, ACEC protections in the decision area would be increased compared with Alternative A, with an emphasis on Freshwater Shrub wetlands, which would increase from 105,000 acres to 288,000 acres (see **Attachment 7** in **Appendix O**). Freshwater Shrub wetlands are a common component of floodplain wetlands; their protected area under Alternative B would increase with the addition of new or larger ACECs. These would be designated in areas with high wetland value, including floodplains, hot springs, pingos, and lentic systems (see **Table 2-1** in **Chapter 2** and **Map 2.18** and **Map 2.19**, **Appendix A**).

Alternative C1

Alternative C1 would open 12,184,000 acres to locatable mineral entry (80 percent more than Alternative A; see **Map 2.69**, **Appendix A**). In this area, wetlands comprise 1,825,000 acres, 1,153,000 acres of which are segregated and would not be available until conveyed, relinquished, or rejected. Under Alternative C1, the increase could affect Freshwater Emergent wetlands, such as Alpine-Arctic Tussock Tundra, to the greatest degree; 468,000 acres would be open to locatable mineral entry (380,000 acres more than Alternative A; see **Attachment 2** in **Appendix O**).

In areas open to locatable mineral entry in the high mineral potential areas, 25,000 acres of wetlands could be impacted under Alternative C1, compared with 13,000 acres under Alternative A. This includes both Freshwater Shrub and Freshwater Emergent Wetlands on segregated lands. Alternative C would have an increased potential to impact freshwater emergent and freshwater shrub wetlands, compared with Alternative A (see **Attachment 3** in **Appendix O**).

Areas open to ROW location under Alternative C1 would account for 9,783,000 acres, which is 75 percent of the acres open under Alternative A (see **Attachment 4** in **Appendix O**). Alternative C1 would manage portions of the BLM decision area as both ROW exclusion (265,000 acres) and ROW avoidance (3,253,000 acres) areas, with the CAMA WSA being the only exclusion area. ROW avoidance areas would encompass a variety of natural resource features commonly associated with wetlands, including floodplains and hot springs; the greatest decrease in ACEC-managed lands would fall within the Freshwater Emergent Wetlands type. This would decrease by (73,000 acres [62 percent], compared with Alternative A (see **Attachment 7** in **Appendix O**).

Areas under Alternative C1 open to mineral materials disposal and timber harvest would decrease (3 percent for timber harvest [**Attachment 6** in **Appendix O**] and 9 percent for mineral materials disposal [see **Attachment 5** in **Appendix O**]), compared with Alternative A . Wetlands protected by ACEC designations would decrease by 76 percent in comparison with Alternative A (see **Attachment 7** in **Appendix O**). The remaining ACECs under Alternative C1 would focus on specific watersheds south of the Brooks Range; protections for Freshwater Shrub Wetlands would be reduced by 59 percent (105,000 acres under Alternative A and 43,000 acres under Alternative C1). Freshwater Emergent Wetlands protections would be reduced by

61 percent (188,000 acres under Alternative A and 73,000 acres under Alternative C1) (see **Attachment 7** in **Appendix O**).

Alternative C2 (Preferred Alternative)

Alternative C2 would be managed to balance both resource protection and resource uses. Areas closed to ROW exclusion are the same as under Alternative A (259,000 acres), and an additional 906,000 acres would be managed as ROW avoidance not provided in Alternative A (see **Table 2-1** in **Chapter 2**). ROW avoidance is focused on special areas, including hot springs, lentic areas, and pingos (see **Table 2-2** in **Chapter 2**). Toolik Lake is the one ACEC managed under Alternative C2 (see **Map 2.22**, **Appendix A**).

Under Alternative C2, 13,083,000 acres would be open to locatable mineral entry, which is a 93 percent increase over Alternative A. In this area, wetlands comprise 1,990,000 acres, 1,311,000 acres of which are segregated and would not be available until conveyed, relinquished, or rejected. Freshwater Emergent Wetlands could be affected to the greatest extent, with 557,000 acres of Alpine-Arctic Tussock Tundra open to locatable mineral entry, compared with 98,000 acres under Alternative A (see **Attachment 2** in **Appendix O**).

In areas open to locatable mineral entry in the high mineral potential areas, 32,000 acres of wetlands could be impacted under Alternative C2, compared with 13,000 acres under Alternative A. This includes both Freshwater Shrub and Freshwater Emergent Wetlands on segregated lands. Alternative C2 would have an increased potential to impact a greater number of acres of freshwater emergent and freshwater shrub wetlands, compared with Alternatives A and B (see **Attachment 3** in **Appendix O**).

Areas open to mineral materials disposal under Alternative C2 would total 12,079,000 acres, which is a 6 percent decrease from the 12,815,000 acres open under Alternative A. Small decreases in potential impacts occur in all wetland types, totaling 71 acres, or 4 percent of wetlands under Alternative A (see **Attachment 5** in **Appendix O**). The decreases in potential wetland impacts are due to the inclusion of several special resource zones in the closed areas (see **Map 2.74**, **Appendix A**).

Alternative D

Alternative D would open the same amount of acreage to locatable mineral entry as Alternative C2. Potential impacts from locatable mineral development would the same as described under Alternative C2 (see **Attachment 2** and **Attachment 3** in **Appendix O**).

There would be virtually no change to areas open to ROW location, mineral materials disposal, and forest harvest between Alternative D and Alternative A. There would be no protective mechanisms in the form of ACEC designations under Alternative D; however, Alternative D would provide the same protections for wetlands as Alternative A in its management of the CAMA WSA as a ROW exclusion area.

Conclusion

Locatable mineral extraction, ROWs, and mineral materials disposal are the actions that pose potential risks for permanent loss of wetlands, and degradation of function due to indirect effects. Since Alternative D has the highest overall potential direct impacts, it would result in the greatest impact on wetlands in the decision area. Alternative C2 is similar to Alternative D, with few protections provided through preservation. The lack of designated special areas under Alternative C2 is, in some cases, mitigated by the introduction of ROW avoidance areas that protect specific high value wetland habitats.

The BLM would expect Alternative A to have the fewest impacts on wetlands from locatable mineral entry. The total area open to locatable mineral entry would be lower under Alternative A than under all other alternatives in areas with high potential for locatable minerals, where most of the impacts would be expected.

Beyond the protections provided by various preservation efforts, described above, further reductions in overall wetland impacts could be in the form of avoidance and minimization practices in project design. A large majority of the decision area remains remote and inaccessible by road, which is the reason that wetlands are currently intact. Nevertheless, the health and function of wetlands in the area is expected to slowly decline, primarily from climate change.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

The administrative trigger for permitting and mitigation under the Clean Water Act is the permanent loss of wetlands or Waters of the U.S. through placement of fill. This is an unavoidable effect of the majority of past, present, and reasonably foreseeable future impacts in the planning area, as described in the RFD Scenario in **Appendix N**. Even though the planning area primarily consists of unaltered wetlands, the trends point toward a net wetland loss and degradation of wetland function over time, which was attributed primarily to climate change (BLM 2016a).

The specific development categories expected to result in wetland loss in the reasonably foreseeable future include continued and new mining projects, ROW construction and maintenance, existing oil and gas production and development on the North Slope, proposed gas pipeline development, further OHV damage on existing and new recreational trails throughout the area, and the potential for oil spills from operations of the existing TAPS pipeline. All the cumulative impacts in the reasonably foreseeable future would potentially occur under all proposed alternatives, with Alternative D contributing the greatest potential impacts and Alternative B the least.

The cumulative impacts from these types of actions are reduced through mitigation strategies, including basic avoidance and minimization techniques during the project design and permitting phase; however, in Alaska, most projects are likely to have unavoidable impacts. The activities with the greatest potential for wetland degradation or loss are locatable mineral entry, ROW location, and mineral materials disposal. As noted above, the high probability areas for locatable mineral entry and mineral materials disposal are typically in high elevation or well-drained areas that do not support extensive wetlands. ROW location poses the greatest threat to wetlands in the planning area; because impacts are unavoidable, this would best be mitigated by collocating future ROW projects with existing ones.

The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts. As noted, wildland fire and permafrost thaw are primary impacts that are likely to result in unavoidable and permanent loss of jurisdictional wetlands in a warming climate.

3.2.6 Fish and Aquatic Species

Most of the aquatic habitats in the planning area are in natural or near natural condition and fish populations appear to be sustaining themselves. Riparian and aquatic habitat health in the planning area was evaluated at the watershed level (6th level hydrologic units) through development of a WCM. The model includes four process categories (aquatic physical, aquatic biological, terrestrial physical, and terrestrial biological) that are evaluated based on a set of model attributes, including, but not limited to, water quality conditions, aquatic

and terrestrial habitat conditions, aquatic species diversity, riparian function, soil conditions, and invasive species presence/absence.

A weighted scoring system is applied to each watershed based on the presence or absence of the model attributes. Fish resources were ranked by watershed through development of an Aquatic Resource Value Model (ARM). These fish resource rankings were accomplished by analyzing various metrics for each watershed, including fish species presence (diversity), salmon and non-salmon diadromous species occurrence, and the presence of rare or unique fishery resources or habitats. Fishery resources were scored using a combination of GIS modeling and professional judgment. The results of the WCM and ARM models/indices are available on the project website.

Fish resources have been impacted to varying degrees in watersheds subject to anthropogenic disturbance, in particular, placer mining, TAPS, and associated development. Sedimentation and in-channel stream alterations from current and future actions within disturbed watersheds would continue to contribute to the degradation of aquatic habitats. Additional information is available in Section 2.1.7 (pp. 46–52), Fish and Aquatic Species, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

The planning area supports 25 fish species, representing 9 families (see **Table 2.6** in the **AMS**). In this document, SSS include federally listed, state-listed, and BLM Alaska sensitive species. Management objectives include conserving habitat and ensuring that approved activities do not contribute to the need to list any SSS. SSS lists were developed from State lists and the NatureServe global ranking system. None of the fish species present in the planning area are listed as threatened, endangered, or sensitive; however, the Alaskan brook lamprey is a BLM Alaska sensitive species (BLM 2019a). In the planning area, one stock, Yukon River Chinook salmon, are currently designated by the Alaska Board of Fisheries as a stock of yield concern (ADFG 2013). All habitat within the planning area in which Pacific salmon are present is considered Essential Fish Habitat (EFH) for these federally managed stocks. Additional information is available in Section 2.1.9 (pp. 71–81), SSS, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

Along with increased air temperatures, precipitation, and ground temperatures across the planning area, Scenarios Network for Alaska and Arctic Planning models predict that surface water temperature may increase in some watersheds and decrease in others, where more ice melt is occurring (Jafarov et al. 2012). Other climate-change induced changes may include increases or decreases in water flow, sedimentation from melting permafrost, coastal erosion, lakebed drying, and invasive species introduction (Streever et al. 2011, Toniolo et al. 2017). All of these factors may result in changes to the occurrence, quantity, distribution, movement, and quality of water, thereby affecting fish production and survival. For example, recent temperature increases have had trophic level effects that probably contributed to population declines or breeding failures observed among several predators in the Gulf of Alaska (von Biela et al. 2019).

Thawing permafrost in Interior Alaska will lead to dramatic changes in stream discharge, bank stability, and water chemistry (Jones et al. 2005; Jorgenson et al. 2006; Trammell et al. 2016), all of which have potential to affect fish and other aquatic species.

Lakes will experience similar changes to water chemistry, and in most places the surface cover by lakes will decrease; however, climate impacts on fish are complex and difficult to predict from the interrelated effects of increased water temperatures, longer ice-free seasons, and changing hydrologic regimes (Reist et al. 2006).

Generally longer and warmer open-water seasons could advance juvenile fish emergence and enhance growth and survival, assuming productivity and prey availability also increase (von Biela et al. 2020). The timing and success of spawning may be affected, as well as distribution of fish species because of thermal or oxygen-limited barriers to movement (Hobbie et al. 1999, Ficke et al. 2007). The cumulative effects of climate change in freshwater; high spawning abundance, heavy fall rains, and hot, dry summers were shown to have contributed to recent declines in Chinook salmon populations across south-central Alaska (Jones et al. 2020).

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to fish and aquatic species and the analytical methods used in this analysis. The effects of climate change described above, could influence the rate or degree of the potential direct and indirect impacts.

Comparative Summary Tables

Table 3-9 through **Table 3-12** provide a summary of quantitative effects on fish and aquatic species by alternative.

Alternative A

Under Alternative A, 6 miles of streams in the Anadromous Waters Catalog (AWC) are in habitat with a high fluid mineral potential, and 34 miles are in habitat with a high locatable mineral potential (see **Table 3-9** and **Table 3-10**). If resource extraction is permitted near these waterbodies, fish and aquatic species could experience impacts, such as habitat degradation or potential for injury or mortality similar to that described in *Impacts Common to All Action Alternatives*; however, there are special State and federal protections for these waters, and EFH consultation would be required.

Under Alternative A, 1,429,000 acres of high value watersheds are withdrawn from locatable mineral entry, which would protect fish and aquatic species. Approximately 193,000 acres of buffered stream miles for anadromous fish species are available for locatable mineral entry. Of these, 85,000 acres are segregated and would not be available until conveyed, relinquished, or rejected (**Table 3-10**). Additionally, 6,598,000 acres of watersheds from the ARM would be open to locatable mineral entry, and 4,324,000 of these acres are in high value watersheds; 3,205,000 acres of all watersheds from the ARM and 875,000 of these acres of high value watersheds are selected lands and would not be available until conveyed, relinquished, or rejected (**Table 3-11**). Of the segregated acres of high value watersheds, 65,000 acres are Priority 1 and would likely be conveyed to the State of Alaska and leave federal management within 10 years.

Withdrawals under Federal Land Policy and Management Act (FLPMA) and locatable mineral entry could reduce the impacts of resource extraction, such as habitat degradation or the potential for injury or mortality, by protecting habitats for fish and aquatic species. Approximately 6,598,000 acres across all watersheds under Alternative A are unavailable to locatable mineral entry, and an additional 458,000 acres are recommended for withdrawal (see **Table 3-11**). Withdrawal of lands from locatable mineral entry likely provides the single most meaningful protection for fish and aquatic species and their habitats.

Most mining activities of any variety would include associated ROW-related impacts, including effects of both traffic and mineral materials disposal (or gravel mining). Mining would likely result in additional sedimentation into waterbodies, which impacts fish and aquatic species through changes in water quality parameters. This is due to reducing vegetation cover (affecting temperature and nutrient input), changing water chemistry through input of previously sequestered materials (affecting pH), or if sedimentation rates are high enough, physically inhibiting fish oxygen uptake.

Table 3-9
Miles of Anadromous Stream by Alternative for Fluid Mineral Leasing and Development Actions

Fluid Minerals-Related Management Action	A	B	C1	C2	D
Total closed to leasing and development	0	1071	31	15	15
High fluids potential areas closed	0	92	15	0	15
Total open to leasing and development	491	67	1107	1170	1248
High fluids potential areas open	6	16	93	0	112
Total withdrawn from leasing and development	773	126	126	0	0
High fluids potential areas withdrawn	122	20	20	0	0
Total controlled surface use	0	0	967	0	0
High fluids potential areas subject to controlled surface use	0	0	55	0	0
Total NSO	0	41	195	0	0
High fluids potential areas subject to NSO	0	0	15	0	0

Source: BLM GIS 2017
Notes:
Areas designated NSO and controlled surface use to fluid mineral leasing and development are in areas open to fluid mineral leasing and development (not in areas closed or withdrawn), but controlled surface use and NSO areas may overlap with each other.
Withdrawn from fluid minerals includes ANCSA 17(d)1 withdrawals.

Table 3-10
Miles of Anadromous Stream by Alternative for Locatable Mineral Actions

Locatable Minerals-Related Management Action	A	B	C1	C2	D
Total withdrawn from locatable mineral entry	465	125	125	0	0
High potential areas withdrawn	36	30	30	0	0
Total withdrawn but open to metalliferous*	0	0	0	0	0
Total recommended for withdrawal from locatable mineral entry	67	358	10	0	0
High potential areas recommended for withdrawal	8	0	0	0	0
Total open to locatable mineral entry	698	780	1,128	1,263	1,263
Open, State or Native selection, segregated	309	691	691	817	817
High potential areas, open	34	47	47	78	78
High potential areas, open, State or Native selection, segregated	0	47	47	78	78
High potential area, open, State or Native selection, segregated, Priority 1 selections	0	38	38	69	69

Source: BLM GIS 2017
*Open to metalliferous, closed to other locatables occurs only under Alternative A. It comprises PLO 5180 and PLO 5184 lands and includes the Dalton Utility Corridor, Nulatto Hills, and other large blocks of BLM-managed lands (PLO 5180), as well as checkerboard land around villages (PLO 5184).

Table 3-11
Acres of Land with Anadromous Waters[1] by Alternative for Fluid Mineral Leasing and Development Actions, Locatable Mineral Actions, and Mineral Materials Disposal

Fluid Minerals-Related Management Action	A	B	C1	C2	D
Total withdrawn from leasing and development	210,000	35,000	35,000	0	0
Total closed to leasing and development	0	249,000	9,000	4,000	4,000
Total open to leasing and development	127,000	52,000	292,000	344,000	332,000
Locatable Minerals-Related Management Action					
Total withdrawn from locatable mineral entry	131,000	37,000	37,000	0	0
Total recommended for withdrawal	19,000	92,000	3,000	0	0
Total withdrawn but open to metalliferous*	7,0000	0	0	0	0
Total open to locatable mineral entry	192,000	219,000	308,000	348,000	348,000
Open, State or Native selection, segregated	85,000	195,000	195,000	232,000	232,000
High potential areas, open	10,000	14,000	14,000	23,000	23,000
High potential areas, open, State or Native selection, segregated	10,000	14,000	14,000	23,000	23,000
High potential area, open, State or Native selection, segregated, Priority 1 selection	0	12,000	12,000	21,000	21,000
Material Mineral Disposal					
Total closed to material mineral disposal	5,000	53,000	61,000	17,000	4,000
Total open to material mineral disposal	331,000	252,000	276,000	331,000	332,000

Source: BLM GIS 2017
[1]Acres calculated as AWC stream buffered by 0.25 miles.
*Open to metalliferous, closed to other locatables occurs only under Alternative A. It comprises PLO 5180 and PLO 5184 lands and includes the Dalton Utility Corridor, Nulatto Hills, and other large blocks of BLM-managed lands (PLO 5180), as well as checkerboard land around villages (PLO 5184).

Table 3-12
Acres of ARM Watersheds by Alternative for Fluid Mineral Leasing and Development Actions, Locatable Mineral Actions, and Mineral Materials Disposal

	Alternative (Acres)				
Fluid Minerals-Related Management Action	**A**	**B**	**C1**	**C2**	**D**
Total closed to leasing and development	29,000	4,198,000	809,000	238,000	238,000
High value watershed areas closed	9,000	2,122,000	204,000	21,000	21,000
Total open to leasing and development	4,736,000	7,746,000	11,133,000	12,447,000	12,447,000
High value watershed areas open	1,374,000	1,423,000	3,340,000	3,767,000	3,767,000
Total withdrawn from leasing and development	7,920,000	742,000	742,000	0	0
High value watershed withdrawn	2,406,000	244,000	244,000	0	0
Locatable Minerals-Related Management Action					
Total withdrawn from locatable mineral entry	4,450,000	742,000	742,000	0	0
High value watersheds, withdrawn	1,429,000	244,000	244,000	0	0
Total recommended for withdrawal	458,000	1,459,000	155,000	0	0
Total open to locatable mineral entry	6,598,000	10,484,000	11,788,000	12,685,000	12,685,000
Open, State or Native selection, segregated	3,235,000	6,972,000	6,972,000	7,714,000	7,714,000
High value watersheds, open	1,964,000	2,727,000	3,425,000	3,788,000	3,788,000
High value watersheds, open, State or Native selection, segregated	875,000	2,222,000	2,222,000	2,466,000	2,466,000
High potential areas, open	174,000	130,000	132,000	266,000	266,000
High potential areas, open, State or Native selection, segregated	19,000	130,000	130,000	165,000	165,000
High potential area, high value watershed, open, State or Native selection, segregated, Priority 1 selection	10,000	115,000	115,000	150,000	150,000
Material Mineral Disposal					
Total closed to material minerals disposal	246,000	5,018,000	1,436,000	976,000	238,000
High value watershed areas closed	28,000	2,357,000	475,000	292,000	21,000
Total open to material mineral disposal	12,439,000	7,668,000	11,250,000	11,710,000	12,447,000
High value watershed areas open	3,761,000	1,431,000	3,313,000	3,496,000	3,767,000

Source: BLM GIS 2017

Less than 2 percent of total watershed acreage is closed to material mineral disposal under Alternative A across all watersheds. Within the high value portion of these watersheds, all but about 1 percent (28,000 acres) of land is open for material mineral disposal. Alternative A provides few protections for fish and their habitat under these guidelines, potentially reducing water quality through runoff and sedimentation. Similarly, the smallest total watershed acreage of all alternatives is closed to fluid mineral leasing (29,000 acres), one-third of which is in high value watersheds. This means that the bulk of high value watersheds are not protected from fluid mineral leasing and associated activities, thereby providing relatively low protection for fish and fish habitat.

In the 603 river miles designated under Alternative A as eligible for inclusion in the NWSRS (see **Table 2-1** in **Chapter 2**), fish and aquatic species would be afforded additional habitat protections. This would result from agency management of allowable activities in these waters. Specifically, the Hogatza, Jim, and Sulukna Rivers would be managed to preserve their fish ORV (see **Table 2-9** in **Chapter 2** and **Map 2.10**, **Appendix A**). Management of these rivers would likely affect habitat conditions for fish by providing for additional protections from erosion and sedimentation and other potential pollutants.

Under Alternative A, approximately 43 percent (756,000 acres) of areas designated as an ACEC or RNA would be in high value watersheds, according to the ARM model. Management for ACECs would impact fish and aquatic species by potentially preserving high quality habitat conditions. This would be due to management that would limit allowable activities in these areas and require plans of operation for locatable mineral entry to include actions to protect spawning habitat.

Closing 7 RNAs to FLPMA leases and sales and recommending these areas for withdrawal from locatable mineral entry (see **Appendix J**) could impact fish and aquatic species by preserving high-quality habitat conditions. This is because aquatic habitat in these RNAs would be preserved from development and other potential impacts from human activities. Management for these RNAs would also impact fish and aquatic species by providing education and research opportunities and preserving aquatic form and function and genetic diversity. This could result in more informed management and improved habitat conditions.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

All action alternatives would include the Ambler and Umiat utility and transportation corridors. Designating these administrative corridors allows the BLM to collocate ROW, access, and utility infrastructure. This would reduce dispersed impacts from multiple transportation and utility corridors and reduce overall surface disturbance. The potential for hazardous material spills, and associated impacts on fish and aquatic species (potential for habitat degradation, injury, and mortality), would increase, compared with Alternative A. This would come about by opening additional administrative designations of utility and transportation corridors, but the action alternatives would concentrate use and allow for efficient placement of spill cleanup materials.

Likewise, all action alternatives would include the AKLNG pipeline corridor and associated ROWs and other transportation and utility infrastructure. Many of the potential impacts on fish and aquatic species from specific actions associated with these large projects are outlined below.

Increased human activity may affect watersheds under all alternatives. Land uses such as ROW construction and mining typically lead to increased erosion, channel alterations, fuel spills, changes in water quality, and riparian vegetation loss, all of which may affect fish populations. All of the direct and indirect impacts on fish and aquatic species that are described below would occur to some extent under all management alternatives.

For fish and aquatic species, the primary potential direct and indirect impacts of management allocation decisions relate to habitat loss and alteration, disturbance and displacement, and injury and mortality. Direct habitat loss would occur in the footprints of any type of development activity, from ROWs to locatable minerals, mineral materials (gravel), and fluid leasables. Fill and vegetation clearing for project infrastructure could permanently remove aquatic habitat within these footprints.

Culverts may also directly alter aquatic habitats. However, impacts can be mitigated through the adherence to State and federal fish passage guidelines, use of stream simulation-based culvert designs, and routine maintenance.

Gravel mining typically occurs in floodplains, where deposits are located. Gravel excavation removes existing waterbodies and natural vegetation, leading to short-term increases in turbidity and other water quality changes, and often creates artificial waterbodies in excavated pits (Johnson 1987). In some cases, these pits can be deep enough to provide overwintering or deep freshwater fish habitats that were absent before gravel mining (Johnson 1987; Winters 1990; Jorgenson and Joyce 1994).

Runoff from surface disturbances, including ROWs, fill, and vegetation clearing near waterbodies, could alter aquatic habitats indirectly by changing water quality, for example by increasing turbidity and suspended solids. Additionally, indirect impacts on habitats would occur due to dust and gravel spray fallout adjacent to permanent or temporary gravel ROWs. Road dust accumulation is greatest within 35 feet of roads but may occur over a much broader area (Myers-Smith et al. 2006; Walker and Everett 1987). Dust could increase turbidity and sediment and gravel inputs to existing substrates with long-term impacts on aquatic habitats and species (Walker and Everett 1987).

Various development activities can result in alteration of stream flow and increased sedimentation (Wellman et al. 2000). Development activities in streams may affect fish communities and fish movement, including during ice road construction, snow management practices, off-road vehicle traffic, and the placing of culverts, pilings, and bridge abutments (Prowse 1994, Cunjak 1996, Slaughter et al. 1990). Sedimentation may directly impact aquatic habitat for fish and invertebrates and may also reduce spawning gravel permeability, oxygen and nutrient availability, microbial processes and hyporheic flow (Sear 1993, Kondolf 2000, Nogaro et al. 2010). Flow alteration can result from artificial obstructions as well as from compacted ice, which can delay ice melt, temporarily change natural drainage patterns, influence benthic invertebrate community structure, and block fish passage (Arp and Simmons 2012, Bunn and Arthington 2002). Impediments to fish movement are particularly damaging during seasonal migrations between overwintering and open-water season habitats.

Other activities that can affect water quality include withdrawal from waterbodies for ice roads, water supply, dust suppression, and other uses, and discharges, including sewage, produced waters, and industrial effluents (Walker and Everett 1987). Water withdrawal from lakes in winter can affect water chemistry by depleting oxygen and changing pH and conductivity. Reduced lake volume during winter can also result in increased salinity of water beneath ice cover. Water withdrawal can also reduce the availability of overwintering habitat, affect summer habitat accessibility, and alter habitat characteristics for fish (Cott et al. 2008).

Noise and human activity may result in behavioral disturbance or displacement of fish, particularly if blasting or explosive discharges occur, in areas of dredging or pile driving, or during activities such as seismic surveys (BLM 2012e). In extreme cases, underwater shock waves can result in injury or death of fish (McCauley et al. 2003; Popper 2003).

Injury or mortality of fish and aquatic species may also result from entrainment or impingement at water intake sites and exposure to contaminants. Accidental exposure can occur from open storage or transport or from spills, including spills from tanks, trucks and vehicles, and pipelines. Mining activities may also result in contaminated mine site runoff, tailings and settling ponds, and other contaminated sites.

Oil and gas activities that could cause impacts related to contaminants/spills would mainly occur during the transport phase associated with an AKLNG pipeline project. Activities include potential spills from storage, use, and transport of waste and hazardous materials, potential spills from wells, pipelines, or other infrastructure, and mobilization of contaminants into aquatic or terrestrial systems from erosion, fugitive dust, and permafrost degradation. Pipeline spills can affect aquatic habitats and species by exposing them to contaminants. Spills can injure or kill fish, and effects can be long or short lived depending on the type, size, duration, and season of the spill.

Placer mining represents an ongoing impact on fish and aquatic species in the decision area. Placer mining often results in direct loss of habitat because mineral deposits are typically found in alluvial deposits. Placer mining activity results in high turbidity, increased heavy metal concentrations, and other downstream water quality changes (LaPerriere and Reynolds 1997, Brabets and Ourso 2013) and alters physical habitat through removal of vegetation, channelization, and sedimentation (Trammell et al. 2016; Van Nieuwenhuyse and LaPerriere 1986).

No invasive fish species are present in the decision area; however, *Elodea*, an invasive aquatic plant, has become established in the Chena River system, near Fairbanks. It has also dispersed to suitable habitats downstream in the Tanana River and likely will be spread to other waterbodies on boats, trailers, airplane floats, and other vehicles (Carey et al. 2016). *Elodea* can degrade fish habitats by increasing sedimentation in spawning habitats and sheltering northern pike (Trammell et al. 2016). Invasive plants are discussed more fully in **Section 3.2.4**.

Alternative B

Under Alternative B, 16 miles of streams in the AWC are in habitat with a high fluid mineral potential, and 47 miles are in habitat with a high locatable mineral potential (see **Table 3-9** and **Table 3-10**). They are designated as open to fluid mineral or locatable mineral extraction. This represents an increase in high potential AWC miles open to locatable and fluid mineral extraction, relative to Alternative A. This increase in AWC/EFH waters open to locatable and fluid mineral extraction would result in additional management protections for anadromous fish and their habitat, compared with Alternative A; however, there would be additional impacts, as described under *Impacts Common to All Action Alternatives*.

The acres of high value ARM watersheds that would be withdrawn from locatable mineral entry would decrease under Alternative B, relative to Alternative A, to 742,000 acres (see **Table 3-11**). Decreasing areas withdrawn for locatable mineral entry would increase the likelihood of impacts from mining and habitat degradation, compared with Alternative A, by decreasing protections for fish and fish habitat. Under Alternative B, 2,727,000 acres would be open to locatable mineral entry in high value ARM watersheds; 2,222,000 of these acres are segregated and would not be available until conveyed, relinquished, or rejected. This is more than double the area of the high value ARM watershed areas that would be open to locatable mineral development under Alternative A (see **Table 3-11**). While not all areas open to entry would be developed, high value fish and aquatic resources would lose protections from locatable mineral entry (including placer mining) under Alternative B, relative to Alternative A. Of the segregated acres of high value ARM watersheds, 115,000 acres are Priority 1 and would likely be conveyed within 10 years.

The area of buffered AWC stream miles open to locatable mineral entry would increase under Alternative B, relative to A, from 192,000 to 219,000 acres. Of these, 14,000 acres would be in high potential areas. All of these acres are segregated and would not be available until conveyed, relinquished, or rejected. Under Alternative B, 37,000 acres of buffered AWC stream miles would be withdrawn from locatable mineral entry, representing a decrease, relative to Alternative A (see **Table 3-10**). These provisions would also decrease protections for fish and fish habitat, compared with Alternative A, thereby increasing the potential for impacts, such as habitat degradation.

Under Alternative B, 5,018,000 acres would be closed to mineral materials disposal (gravel mining), nearly 20 times the acreage protected under Alternative A. Ultimately this would reduce the likelihood of impacts on fish and fish habitat from these activities in decision area streams.

The types of impacts from WSR designations under Alternative B would be the same as those described under Alternative A (see **Table 2-1** in **Chapter 2** and **Map 2.10**, **Appendix A**), resulting in no additional increases in protections for fish and fish habitat under Alternative B; however, under Alternative B more ACEC/RNAs would be designated. This would provide additional protections for fish and aquatic species and their habitats. This is because ACEC/RNA designations include special management actions, such as a pursuit of FLPMA withdrawal, recommendation for withdrawal from locatable mineral entry, closure to mineral materials disposal, and ROW avoidance or exclusions. All of these would provide protections to fish and their habitats by reducing surface-disturbing activities (see **Table 2-1** in **Chapter 2** and **Appendix J**).

Management for all ACECs would also provide protections for fish and aquatic resources, including recommendation for withdrawal from locatable mineral entry, closure to mineral materials development, and other restrictions on surface activities. This would further increase protections for fish, aquatic species, and their habitat, relative to Alternative A.

Approximately 33 percent (118,000 acres) of lands with wilderness characteristics (LWC) managed to protect those characteristics are in high value watersheds under Alternative B. To the extent that these blocks of land are protected from surface disturbance, they also are protective of fish and aquatic species in streams, rivers, and other waterbodies therein. Another 4,716,000 acres of LWC would be managed to reduce impacts on those wilderness characteristics while allowing for other uses and may also provide some protection to the fish and aquatic species and their habitats in those areas. Alternative A does not provide for these types of management restrictions by comparison (see **Table 2-1** in **Chapter 2**).

Areas open to ROW location under Alternative B comprise 18 percent (937,000 acres) high value watersheds. This would further decrease likely impacts on fish and fish habitat resources in Alternative B, compared with Alternative A. This would come about by providing additional protections for fish and fish habitat from decreased potential for road, culvert/bridge, and transmission line construction. More than 7.5 million acres would be designated as ROW exclusion or ROW avoidance areas under Alternative B compared with fewer than 260,000 acres under Alternative A (see **Table 2-1** in **Chapter 2**).

Alternative C1

Overall, the AWC miles in areas of high fluid or mineral potential that would be open to fluid and mineral extraction under Alternative C1 (93 and 47 miles, respectively) would increase, relative to Alternative A (see **Table 3-9**). This would result in greater potential for impacts on fish and aquatic species and their habitat, as described under *Impacts Common to All Action Alternatives*, compared with Alternative A. Some of these impacts would be mitigated or avoided by management protections from NSO and controlled surface use stipulations.

Under Alternative C1, the acres of high value ARM watersheds that would be withdrawn from locatable mineral entry would be the same as under Alternative B (244,000 acres), representing a decrease, relative to Alternative A (see **Table 3-11**). Impacts from withdrawing fewer acres from locatable mineral entry would be the same as described for Alternative B. Under Alternative C1, 3,425,000 acres would be open to locatable mineral entry in high value ARM watersheds. This is nearly double the area of the high value ARM watershed areas that would be open to locatable mineral development under Alternative A (see **Table 3-11**). This would therefore increase the likelihood of impacts on fish and fish habitat from mining overall, with an increased likelihood of sedimentation from runoff and potential removal of riparian habitat from mining activities. Of the 2,129,000 acres open to locatable mineral entry in high value ARM watersheds under Alternative C1, 2,222,000 acres are segregated and would not be available until conveyed, relinquished, or rejected. Of these segregated acres of high value ARM watersheds, 115,000 are Priority 1 and would likely be conveyed within 10 years.

Under Alternative C1, the acres of buffered AWC stream miles that would be withdrawn from locatable mineral entry would be the same as under Alternative B. This is a decrease in protection for fish and aquatic species and their habitats relative to Alternative A (see **Table 3-10**).

Under Alternative C1, 1,436,000 acres would be closed to mineral materials disposal (gravel mining), nearly five times the amount under Alternative A (see **Table 3-11**). ROW exclusion and avoidance designations would apply to just over 3.5 million acres, providing more fish and fish habitat protections than under Alternative A.

Under Alternative C1, there would be a 25 percent decrease in ROW locations, compared with Alternative A. This would reduce the number of potential impacts on fish and fish habitat from activities associated with roads, bridges/culverts, and transmission lines from dust and sedimentation being introduced to decision area streams.

Under Alternative C1, no rivers would be eligible or suitable for WSR designation, thereby reducing protections to fish and fish habitat from WSR management for protecting free flow, compared with Alternative A (603 miles of habitat on 10 rivers protected; see **Table 2-1** in **Chapter 2**). Still, the extent of LWCs to be managed to emphasize multiple use and various other resource values (11,839,000 acres) would be slightly less (7 percent) than that of Alternative A. Overall, this would likely result in similar protections to fish and fish habitat for Alternative C1 compared with Alternative A.

With Alternative C1, there is a 78 percent decrease in protections for fish and fish habitat from allocation to ACEC/RNAs, compared with Alternative A (**Table 2-1**). As a result, there would be a reduction in acreage designated NSO for fluid leasing and ROW avoidance areas and fewer restrictions on surface disturbance overall (see **Appendix J**). Under Alternative C1, 27 percent (111,000 acres) of areas designated as ACEC/RNAs occur in high value watersheds compared with 43 percent (756,000 acres) in Alternative A. As with Alternative B, under Alternative C1, 7,965,000 acres would remain withdrawn or segregated from locatable mineral entry, which is slightly lower than Alternative A (see **Table 2-1** in **Chapter 2**). An additional 156,000 acres (50 percent fewer acres than Alternative A) would be recommended for withdrawal.

Alternative C2 (Preferred Alternative)

The miles of AWC streams in areas of high fluid or mineral potential that are open to fluid and locatable mineral extraction under Alternative C2 are 0 and 78 miles, respectively; this represents a decrease in miles open to mineral extraction but an increase in miles open to locatable mineral extraction, compared with Alternative A (see **Table 3-9** and **Table 3-10**). Compared with Alternative A, this would result in a lower

potential for impacts from fluid mineral extraction but a greater potential for impacts on fish and aquatic species and their habitat from locatable mineral extraction, as described under *Impacts Common to All Action Alternatives*. Some of these impacts would be mitigated or avoided by management protections from NSO and controlled surface use stipulations.

Under Alternative C2, no lands would be withdrawn from leasing and development or locatable mineral entry; thus, there is a higher chance of development than if they were fully withdrawn from fluid or locatable mineral extraction. Compared with Alternative A, this would result in a potential for impacts on fish and aquatic species and their habitat, as described under *Impacts Common to All Action Alternatives*, Some of these impacts would be mitigated or avoided by management protections from NSO and controlled surface use stipulations. The total acres of buffered AWC streams that are designated as open to fluid mineral and locatable mineral extraction would increase from Alternative A, from 192,000 to 348,000 acres; the number of buffered AWC streams that are found in habitat with a high locatable mineral potential (23,000 acres) would also increase from Alternative A (see **Table 3-10)**.

Under Alternative C2, 3,788,000 acres would be open to locatable mineral entry in high value watersheds, representing an increase relative to Alternative A; 2,466,000 of these acres are segregated and would not be available until conveyed, relinquished, or rejected. Of the segregated acres of high value watersheds, 165,000 acres are Priority 1 and would likely be conveyed within 10 years (see **Table 3-11**). Additionally, compared with Alternative A, nearly three times the acreage of high value watersheds would be open to fluid mineral leasing under Alternative C2. Increasing the area of high value fish habitat open to mineral entry would likely increase the impacts on fish and aquatic species, such as habitat degradation or the potential for injury or mortality, as described in *Impacts Common to All Action Alternatives*.

Overall, 100 percent of total BLM-managed lands in this RMP would be open to locatable mineral entry, and 96 percent would be open to mineral materials disposal (gravel mining); however, there is essentially no difference in high value watersheds impacted by gravel mining, compared with Alternative A (see **Table 2-1** in **Chapter 2** and **Table 3-11**). Particularly for locatable mineral entry, these allowances are substantial increases over Alternative A and provide the fewest potential protections from impacts on aquatic resources of all alternatives.

Nearly three times the acreage of high value watersheds would be open to fluid mineral leasing under Alternative C2.

A total of 11,710,000 acres (92 percent) would be open to mineral materials disposal (gravel mining) across all watersheds, although there would be a slight decrease (7 percent) in acreage open within high value watersheds (see **Table 2-1** in **Chapter 2**). For gravel mining, this represents a slight increase (7 percent) in protections, compared with Alternative A, from sedimentation and other impacts on fish habitat. For locatable mineral entry, this is a 48 percent increase over Alternative A in total watershed acreages potentially impacted. It also represents a 21 percent increase in high value watersheds open to locatable mineral entry. This would likely increase the impacts on fish and aquatic species found in high value watersheds, compared with Alternative A.

All but approximately 7 percent of BLM-managed lands would be open to ROW location (excluding the 259,000-acre CAMA protected for all alternatives). Likewise, this represents a slight increase in potential protections for fish and aquatic habitat, relative to Alternative A, for this category; however, overall, fish and fish habitat could be subject to considerably more impacts from development, compared with Alternative A.

As with Alternative C1, under Alternative C2 no rivers are eligible or suitable for designation as WSRs. As is the case with Alternative A, no lands under Alternative C2 would be managed to protect wilderness characteristics. Instead, 12,721,000 acres (96 percent of total BLM-managed lands in this RMP) would be managed to emphasize other values and uses. Furthermore, one ACEC, comprising 77,000 acres (Toolik Lake), is designated under Alternative C2 (see **Table 2-1** in **Chapter 2** and **Appendix J**). Taken together, this lack of preserved wilderness represents a decrease in habitat protections for fish and aquatic species and their habitat under Alternative C2, compared with Alternative A.

Alternative D

Overall, AWC miles in areas of high fluid or mineral potential that are open to fluid and mineral extraction under Alternative D are 0 and 78 miles, respectively; this represents a decrease in miles open to mineral extraction but an increase in miles open to locatable mineral extraction, compared with Alternative A (see **Table 3-9** and **Table 3-10**). Compared with Alternative A, this would result in a greater potential for impacts on fish and aquatic species and their habitat, as described under *Impacts Common to All Action Alternatives*. Some of these impacts would be mitigated or avoided by management protections from NSO and controlled surface use stipulations.

Under Alternative D, the acres of buffered AWC streams and ARM watersheds that would be designated as withdrawn or open to locatable mineral extraction would be the same as described for Alternative C2 (see **Table 3-9** through **Table 3-12**). The acres segregated and Priority 1 acres would also be the same, and impacts resulting from these actions are the same as described for Alternative C2.

Impacts from managing 100 percent of total BLM-managed lands in this RMP as open to locatable mineral entry and from managing 96 percent as open to mineral materials disposal (gravel mining) would be the same as described for Alternative C2.

As with Alternatives C1 and C2, no rivers are eligible or suitable for designation as WSRs. As is the case with Alternative A, no lands under Alternative D would be managed to protect wilderness characteristics; instead, 96 percent of total BLM-managed lands in this RMP would be managed to emphasize other values and uses. No ACECs are designated under Alternative D (see **Table 2-1** in **Chapter 2** and **Appendix J**). This would increase the likelihood of potential impacts on fish and their habitat under this alternative.

Conclusion

Each alternative has varying number and miles of AWC streams and high value watersheds that would be open to fluid or locatable mineral extraction, resulting in different levels of State and federal regulatory oversight with regard to potential impacts from development activities; however, Alternatives C2 and D could impact the largest overall proportion of fish and fish habitat in the decision area and allow for the largest proportion of locatable and fluid mineral extraction; therefore, Alternatives C2 and D have the greatest potential for impacts from surface disturbance. Alternative D also provides for no acreage designated as ACEC/RNAs, and therefore the fewest fish/habitat protections from these designations, followed by Alternatives C2, C1, A, and B, respectively.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis. The WCM is an indicator of anthropogenic activity in a watershed and is used as an indicator of impacts of past and present projects for cumulative impact analysis.

To date, the direct and indirect impacts on aquatic resources in the planning area stem from placer mining, energy transportation (TAPS), road and culvert development (Dalton Highway), community development, and recreational uses such as OHV use. Future land use activities that will likely impact the planning area include increased placer mining, increased road and other infrastructure development associated with ROWs (e.g., Ambler Road, Dalton Highway, and AKLNG), and increased recreational hunting and fishing activities in or near waterbodies. These activities may lead to increased sedimentation through run-off, degradation of water quality, changes in nutrient and macroinvertebrate abundance, reduced spawning/rearing habitat for fishes, and a shift in fish population dynamics, which could in turn impact subsistence success for local subsistence communities. Specifically, Ambler Road would require many bridges, culverts, and bank modifications to be completed. This would indirectly impact fish populations through habitat loss and lower spawning success to such a degree that subsistence use may be restricted (BLM 2020; also see **Section 3.5.2**).

The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts.

Under the action alternatives, the potential for conveying the Priority 1 top-filed lands that become selections as a result of the revocation of PLO 5150 could result in AWC miles being revoked from their current status as BLM-managed lands. This could result in some changes in adjacent land management along the Dalton Utility Corridor, and these lands may become available for development of fluid minerals or locatable minerals. Where these lands overlap fish habitat, there would be potential impacts on fish and aquatic species. Ultimately, conveyance could increase the potential for resource development near AWC/EFH streams, compared with Alternative A. The effect would be highest under Alternative C1 (112 AWC miles), followed by Alternatives C2 and D (71 AWC miles), and Alternative B (42 AWC miles) (see **Table 3-9**).

3.2.7 Wildlife

Wildlife population management is under the authority of the Alaska Department of Fish and Game, but BLM manages wildlife habitat on federal land to sustain viable wildlife populations. Golden eagle, moose, caribou, Dall sheep, and beaver are designated as priority species for impact assessment in the planning area. Other important wildlife species include brown bear, black bear, gray wolf, muskoxen, migratory birds, pollinators, and various furbearer species. With the exception of the Dalton Highway Corridor Management Area, including the TAPS infrastructure, and numerous small-scale mining activities, habitat within the planning area is relatively undisturbed and the current fluctuations in wildlife populations are likely within normal levels. Adverse effects on wildlife populations are attributed to development activities, potentially including additional habitat fragmentation by ROWs or pipelines. In addition, climate change is likely to increasingly affect wildlife populations. Additional information is available in Section 2.1.8, Wildlife, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

NNIS have not been documented in the planning area but are known to be established in Interior Alaska. Additional information is available in Section 2.1.5, NNIS, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

SSS may include federally listed, state-listed, and BLM sensitive species. Management objectives include conserving habitat and ensuring that BLM-approved activities do not contribute to the need to list any species. The BLM Alaska SSS List (BLM 2019a) was developed from state lists, expert input (BLM, Alaska Department of Fish and Game, or other partners), and the NatureServe global ranking system. Important areas for special status animals include wetlands and riparian habitats that support sensitive waterbirds, and bluffs

that provide important habitat for golden eagles. Species of concern in the decision area include bald and golden eagles, protected by the Bald and Golden Eagle Protection Act.

Three federally listed species—polar bears, spectacled eiders, and wood bison—occur within the planning area but not on BLM-managed lands in the decision area. Wood bison are an Endangered Species Act Section 10(j) species and designated as a nonessential experimental population. Range expansion of wood bison may include BLM-managed lands in the Yukon River drainage within the lifetime of this plan. Additional information is available in Section 2.1.9, SSS, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

Climate change has been affecting regions of Alaska more than any other parts of the U.S., including the most rapid temperature increases and a warming rate twice that of the rest of the U.S. over the past 50 years (Haufler et al. 2010). Longer snow-free periods, changing precipitation patterns, and an increase in rain-on-snow events may impact wildlife in the planning area through changes in vegetation communities, species ranges, and species composition. Various taxonomic groups, including plants, invertebrates, and birds, all have exhibited advancement of plant phenology[3] in seasonal habitats (Lehikoinen et al. 2019; Potter and Alexander 2020).

Invasive plants and invasive and endemic disease-causing animal pest species, such as insects, may increase in abundance and distribution from climate change effects (Volney and Fleming 2000), with potential direct and indirect effects on wildlife. Increases in permafrost melt, shrubification, the northern, western, and elevational extent of treeline, changing species composition, and changes in lake surface area and distribution (Miller et al. 2017; Jepsen et al. 2013; Roach et al. 2013) would alter the range of multiple species of bird, mammals, and invertebrates. Beaver, moose, and snowshoe hare have expanded their ranges north (Tape et al. 2015, 2016, 2018), affecting predator densities and distribution.

Longer growing seasons and warmer winters may increase productivity and survival of Dall sheep, but increases in rain-on-snow events and the elevation of alpine treeline and shrubline (IPCC 2014, Reimer et al. 2016) could reduce access to forage. Dall sheep lamb recruitment increases with early springs (Rattenbury et al. 2018, Van de Kerk et al. 2018). A range of climate change impacts on caribou are expected, making the overall effects difficult to predict. Hotter summers can result in higher insect harassment (Weladji et al. 2003) which can in turn lead to reduced fitness and calf survival. Substantial increases in snow depth in some areas or in the frequency of rain-on-snow events (Bieniek et al. 2018) can limit forage access for caribou in the winter (Hansen et al. 2011, Loe et al. 2016).

Shrub expansion caused by a warming climate may be related to declines in caribou populations across Canada (Fauchald et al. 2017). Increased wildfire can increase browse for moose (MacCracken and Viereck 1990) but decrease lichen availability for caribou (Joly et al. 2007). Continued warming will accelerate related ecosystem alterations in ways that are difficult to predict, making adaptation and impact analysis more challenging (Markon et al. 2018).

Direct and Indirect Impacts

See **Appendix M** for the issues related to wildlife and the analytical methods used in this analysis. The effects of climate change described above could influence the rate or degree of the potential direct and indirect impacts.

[3]The earlier seasonal timing of recurring events in a species' life cycle.

Comparative Summary Tables

Tables of land allocations under different alternatives for Dall sheep habitat, caribou herd ranges, and beaver habitat are included in **Appendix P**. The areas in acres of different vegetation classes and land allocations under different alternatives are included in **Appendix O**. Dall sheep and caribou will be primarily found in the alpine-arctic tussock tundra and alpine dwarf shrub tundra classes, although caribou may use upland mesic spruce forest and other landcover classes, especially during winter. Moose are widespread and use most landcover classes but will be most associated with riparian forest and shrub and areas with numerous wetlands. Beaver are closely associated with riparian areas and lakes and ponds with forest or tall shrubs along the margins.

Alternative A: No Action

For all wildlife resources, the primary direct and indirect impacts of development allowed by management allocation decisions include habitat loss and alteration; behavioral disturbance (including reaction/physiological and habitat avoidance/displacement); attraction of some species (particularly scavengers and predators) to human activity or to structures; and direct mortality and injury (including vehicle and tower strikes, contaminant exposure, and increased hunter access). Under Alternative A, the land management allocations that are most likely to affect wildlife are locatable mineral allocations, ROW allocations, and mineral materials allocations.

Development activities associated with locatable minerals would include ROWs and associated mineral materials disposal, so these activities are linked and impacts on wildlife would be cumulative. Commercial harvest of forest products (i.e., logging) is not included among RFD scenarios considered important in the planning area because of limited occurrence of harvestable timber, but logging is another potential land allocation activity that can impact habitat for some species but, in time, can create additional foraging habitats for some species such as moose.

For locatables, ROWs, and mineral materials, direct impacts on wildlife habitats would occur in the footprint of disturbance, whether excavations, tailings and waste rock storage sites, roads, or fill or surface disturbance. Indirect effects on habitat would occur at varying distances and result from fugitive dust, dust abatement chemicals, gravel spray, thermokarsting, snow drifting, impoundment, and altered drainage or snowmelt patterns. Disturbance and displacement could occur over a larger area, depending on the source of disturbance as well as the different behavioral reactions of wildlife species present (Monda et al. 1994, Livezy et al. 2016).

Activities that result in disturbance or displacement of wildlife may include road and air traffic, noise, light, and human presence/activity. The behavioral reactions of wildlife can vary from temporary alert reactions and concealment behaviors to flush, flight, and escape or long-term abandonment of an area (Reimers and Colman 2006, Uher-Koch et al. 2015, Stien and Ims 2015). Wildlife are attracted to sites of human activity when human presence results in increased availability of food resources or for denning, nesting, or shelter sites (National Research Council 2003). Foxes, wolves, bears, gulls, ravens, raptors, and even songbirds may be attracted to human infrastructure and activity (Follman and Hechtel 1990, Savory et al. 2014). **SOP WILD-4** would help minimize the access of wildlife to anthropogenic food. Increased abundance of predators can result in decreased productivity and increased mortality of nesting birds (Truett et al. 1997, Liebezeit et al. 2009) (see **Map 3.13**, **Appendix A** for breeding bird survey observations).

Changes in hunter and trapper access could have large effects on game species, although these could be partially controlled through adjustments to hunting and trapping regulations through the Alaska Board of Game or the Federal Subsistence Board. Exposure to contaminants from accidental releases could directly

impact wildlife, contaminate habitat, or lead to subsistence concerns. Tall structures, particularly communication towers and powerlines, can result in large numbers of bird strikes and mortality (Manville 2005, Gehring et al. 2011, Longcore et al. 2012). **SOP WILD-2** and **SOP WILD-3** (see **Appendix F**) require industry best practices and limit guy wires to minimize bird collisions.

Under Alternative A, wildlife would potentially be subject to the direct and indirect impacts described above in lands that are open to locatable mineral entry (52 percent of the decision area) and open to metalliferous mineral entry (9 percent of the decision area) (see **Map 2.67**, **Appendix A**). These BLM-managed lands potentially impacted by locatables development under Alternative A are primarily upland low and tall shrub and upland mesic spruce forest (see **Appendix O**); therefore, species using those habitats would be primarily impacted; however, the areas with high potential for locatables that are open to locatable entry contain 19 percent alpine dwarf shrub tundra, suggesting that wildlife species in tundra habitats may also be affected.

Similarly, wildlife would be subject to direct and indirect impacts in 98 percent of the decision area that is open to ROW location and 96 percent of the decision area that are open to mineral materials disposal. Areas withdrawn from and recommended for withdrawal from locatable mineral entry, areas subject to ROW exclusion, and areas closed to mineral materials disposal all include generally similar proportions of habitat types as in the overall planning area (see **Appendix O**).

Alternative A offers little protection from commercial forest harvest impacts on wildlife. Almost all the decision area (98 percent) is open to commercial harvest of forestry products, although about 32 percent of these lands are forested and extensive logging is not anticipated to occur.

Under Alternative A, OHV use is not subject to seasonal limitations and disturbance of wildlife is likely to occur, particularly in the winter ranges of caribou, as discussed below.

Golden Eagle. Alternative A does not provide any other specific protections for golden eagles beyond those provided by the Bald and Golden Eagle Protection Act; however, retention of the PLO 5150 utility corridor lands would prevent locatable mineral entry in important raptor habitat that occurs in the inner corridor, thereby protecting some of the eagle nesting and foraging habitats that probably occur throughout mountainous and open tundra habitats in the planning area. Nesting and foraging habitat in the outer corridor would not be withdrawn from mineral entry under Alternative A.

Dall Sheep. Dall sheep are sensitive to disturbance and move in response to human activity (Frid 2000a, 2000b). Bighorn sheep have shown the ability to habituate to mining activity in desert environments (Jansen et al. 2006), but mountain goats in southeast Alaska were displaced by 1–1.8 kilometers from mining activities (White and Gregovich 2017). All BLM-managed Dall sheep habitat in the area was defined as the area within the Dall sheep range (Reimer et al. 2016) with alpine dwarf shrub tundra or alpine and arctic tussock tundra (622,000 acres). In addition, some specific areas important to Dall sheep within the PLO 5150 utility corridor have been identified by the BLM as Dall Sheep Habitat Areas (DSHA) which contain mineral licks, Dall Sheep Movement Corridors (DSMC), and Dall Sheep Study Areas (DSSA).

Almost all of the sheep habitat areas are open to ROWs and mineral materials but are withdrawn from fluid mineral and nonenergy solids leasing. A total of 40.0 percent, 81.5 percent, 46.1 percent, and 56.8 percent of DSHA, DSMC, DSSA, and all sheep habitat, respectively, are open to locatable mineral entry under Alternative A (see **Table P-3** in **Appendix P**). Five ACECs (West Fork Atigun River, Snowden Mountain, Poss Mountain, Nugget Creek, and Galbraith Lake) provide some additional restrictions on development in Dall sheep habitat. These ACECs cover 40 percent of the DSHA, 20 percent of DSMC, and 8 percent of

DSSA in the decision area. Almost all of the DSHA, DSMC, and DSSA are in Special Recreation Management Areas (SRMAs). Non-subsistence hunting with firearms within the Dalton Highway Corridor Management Area is prohibited by the Alaska Department of Fish and Game.

Development, human activity, and OHV traffic could cause temporary or long-term displacement of sheep. In addition to energetic costs associated with movements and behavioral reactions, displacement from DSHA could limit intake of trace minerals, increasing consequences for sheep (Heimer 1973; Ayotte et al. 2006). Activity that disrupts or blocks access to DSMC could result in reduced use of a larger area, prevent movement between sheep habitats, or isolate populations.

The primary RFD activities (locatable minerals, ROWs, and mineral materials) in Dall sheep habitat in the decision area would result in direct loss and degradation of sheep habitat. Linear ROWs could disrupt sheep movements and result in habitat fragmentation. Aircraft traffic, especially helicopters, could result in disturbance and increased energetic costs to sheep (Frid 2000a, 2000b). Exposure to certain livestock species could infect Dall sheep with foreign pathogens such as *Mycoplasma ovipneumoniae*. The BLM can mitigate permitted helicopter use but cannot mitigate non-permitted use. Most use in this area would require a permit.

Caribou. The decision area is occasionally used by caribou from the Western Arctic Herd, Teshekpuk Caribou Herd, and Porcupine Caribou Herd. Portions of the Central Arctic Herd (CAH) migratory route and winter range are near the Dalton Highway (see **Map 3.12**, **Appendix A**). The ranges of three small nonmigratory herds—the Galena Mountain Herd (GMH), Ray Mountains Herd (RMH), and Hodzana Hills Herd (HHH)—all include BLM-managed lands.

The CAH already interacts with oilfield infrastructure, the Dalton Highway, and TAPS extensively but could be exposed to additional fluid mineral activity as well as additional ROWs and locatable mineral development in the future. Development of locatable minerals and associated development of ROWs and mineral materials for access to locatable minerals has the highest potential to impact the ranges of the small nonmigratory herds. Concerns for caribou would be displacement and disturbance during calving and other sensitive times of the year, impediments to seasonal movements, and increased hunter access. Calving caribou near northern Alaska oilfields occur at lower density within 2–5 kilometers of active roads and pads for 2–3 weeks (Dau and Cameron 1986, Lawhead 1988, Nellemann and Cameron 1998, Johnson et al. 2020). ROWs for linear projects are required to provide for unimpeded movements for caribou and other priority species. If semi-domestic reindeer herding occurred, it could create competition for winter forage; however, there has been limited interest in reindeer herding and it is unlikely to occur during the life of the plan.

Locatable mineral development could result in habitat loss, degradation, and habitat fragmentation of caribou herds, as well as displacement and disturbance (especially during the calving period; Dau and Cameron 1986, Cameron et al. 1992). Although 46.0 percent of the GMH range is open to metalliferous mining under Alternative A, there is low locatable mineral potential and therefore mining impacts are not reasonably foreseeable (see **Table P-2** in **Appendix P**).

The RMH range has high and medium mineral potential with 64.5percent open to locatable entry and 55.6segregated from locatable mineral entry under Alternative A. It is likely to be impacted by mineral development if State selections are conveyed.

Within the HHH range, 41.2 is percent open to locatable entry under Alternative A and small-scale placer mining is ongoing, but it is unlikely that extensive mineral development would occur. All three herd ranges are 100 percent open to ROWs under Alternative A, which could result in impacts associated with roads,

pipelines, and gravel mines, including displacement and increased human access. All of the HHH range is within a SRMA that manages the area as Visual Resource Management (VRM) Class III, providing some limits on development.

Alternative A designates 2 ACECs for caribou, the Galena Mountain and Tozitna Subunits North and South, and 3.4 percent, 16.1 percent, and 54.7 percent of the GMH, HHH, and RMH ranges, respectively, are within these ACECs. The Galena Mountain ACEC would not allow any surface-disturbing activities during calving, only allow temporary facilities, and put limits on aircraft flight altitudes and landings to protect calving caribou. The Tozitna ACEC is established for the RMH.

Moose. Moose are widely distributed but vary in density in different regions and habitats. Under Alternative A, moose would be locally impacted by development projects and changes to hunter access that would occur with the development of ROWs. Impacts on riparian and lacustrine areas would typically have larger effects on moose. Although land clearing activities result in direct habitat loss and/or alteration, long-term impacts could include regrowth of preferred forage species.

Beaver. Because of their close association with waterbodies, beavers would be affected by direct and indirect habitat loss, including degradation of water quality, from surface-disturbing activities in any floodplain. This would be the case in particular from such activities as placer mining, which may occur in waterbodies and wetlands. Changes in distribution of trapping activity would also impact beavers. All of the mapped beaver habitat is open to ROW and mineral material sales, 42.9 percent is open to fluid mineral leasing, and 54.1 percent is open to locatable mineral entry or open to metalliferous mineral entry (see **Table P-1** in **Appendix P**).

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Under all action alternatives, impacts on wildlife would include the direct and indirect impacts described above for Alternative A (i.e., habitat loss, behavioral disturbance and displacement, attraction to human activities and facilities, and mortality and injury from various sources). Under all action alternatives and as described for Alternative A, the land management allocations that are most likely to affect wildlife are locatable mineral allocations, ROW allocations, and mineral materials allocations. Travel and transport management (i.e., open versus seasonal restrictions on OHV travel) would also affect wildlife. These impacts would not always be additive, because some new development projects could be collocated within utility and transportation corridors to minimize impacts.

All action alternatives designate the Ambler and Umiat utility and transportation corridors, which are likely to increase the potential for future road construction in those areas. Although ACECs and RNAs are protective of specifically listed resources, the various restrictions associated with these areas typically are also protective of the various plants and animals found there; however, each ACEC/RNA incorporates specific restrictions, withdrawals, or closures with each alternative.

A full or partial revocation of PLO 5150 enables top-filings to become valid selections. Forty-three percent of lands in PLO 5150 are identified by the State as Priority 1 top-filed lands for conveyance and are likely to be conveyed within 10 years of the PLO revocation. These lands would no longer be under BLM management and would no longer be subject to SOPs.

Golden Eagle. Under all action alternatives, the direct and indirect impacts on golden eagles would be as described under Alternative A. Under all action alternatives, **SOP WILD-7** (see **Appendix F**), specific to golden eagles, requires that permitted activities in the vicinity of eagle nests be conducted in accordance with

the Bald and Golden Eagle Protection Act and U.S. Fish and Wildlife Service Alaska Region recommendations. Unlike Alternative A, all action alternatives also include ongoing monitoring and survey efforts to identify and protect golden eagle nest sites and concentration areas, and to identify and monitor prey populations. Activities would have to minimize impacts on golden eagles from March 15 through August 30.

Dall Sheep. Under all action alternatives, the direct and indirect impacts on Dall sheep would be as described under Alternative A. Dall sheep habitat is primarily in lands covered by PLO 5150 in the decision area. Dall sheep habitat is primarily in PLO 5150, which becomes State land with valid State of Alaska selections following the BLM's revocation of this PLO; therefore, a full or partial revocation of PLO 5150 could indirectly impact Dall sheep, depending on how the State handles selections; it is unknown how the State would manage the lands. The revocation removes the segregations associated with the PLO. The segregative effect of State selections (no new mineral entry) may be none, as the inner corridor is already withdrawn, and the outer corridor is open but would not have new mineral entry. The effect of Priority 1 lands is a change in land status or fragmented land status; therefore, a full or partial revocation of PLO 5150 could impact Dall sheep if other protective mitigation measures are not enacted. SOPs for Dall sheep would reduce or minimize impacts of some activities on Dall sheep. These include recommending low-profile road and facility designs, ROW avoidance and traffic controls, and clustering facilities as closely together as possible.

Caribou. Under all action alternatives, the direct and indirect impacts on caribou would be as described under Alternative A. Portions of the CAH and HHH ranges overlap PLO 5150. Under all action alternatives, the amount of land segregated to locatable mineral entry would decrease, compared with Alternative A, for the GMH and RMH range, but it would increase for the HHH range.

SOP WILD-11 requires all aboveground pipelines to be elevated a minimum of 7 feet above ground, requires ramps or buried pipeline in areas of concentrated animal movements, and separates pipelines and roads by 500 feet. These mitigations have been effective for allowing midsummer movements of caribou through oilfields in the absence of hunting, although delays and deflections in movements still occur (Cronin et al. 1994; Murphy and Lawhead 2000).

Moose. Under all action alternatives, the direct and indirect impacts on moose would be as described under Alternative A.

Beaver. Under all action alternatives, the direct and indirect impacts on beaver would be as described under Alternative A, but they would vary according to the activities allowed. SOPs designed to protect watersheds and fisheries may also contribute to conservation of beavers and their habitats.

Alternative B

Under Alternative B, wildlife could be affected by mining in 83 percent of the decision area that is open to locatable mineral entry. This is an increase of 4,116,000 acres (31 percent of the decision area) over Alternative A. No areas of high potential locatables would be open to locatable mineral entry under Alternative B (see **Appendix O**), but some high potential areas are segregated from locatable entry and could be transferred to State ownership.

Under Alternative B, less area would be open to ROW development and mineral materials disposal compared with Alternative A (see **Table 2-1** in **Chapter 2**). The areas withdrawn from locatable mineral entry, subject to ROW exclusion, and closed to mineral materials disposal under Alternative B include larger proportions of alpine tundra vegetation types than occur in the overall planning area (see **Appendix O**) and, therefore, provide somewhat more protection for wildlife in tundra than in other habitats. Under Alternative B, alpine

vegetation, lichen, and pingos, wherever they occur, would be managed as ROW avoidance areas, providing some protection for these specific wildlife habitats.

Potential impacts on wildlife associated with commercial harvest of forestry products would be lower under Alternative B. Under Alternative B, areas open to commercial harvest of forestry products that contain forest habitat would decrease 20 percent from Alternative A.

In contrast to Alternative A, Alternative B would offer considerable protection to wildlife from disturbance by OHVs by establishing seasonal limitations on OHV use in 24 percent of the decision area, primarily in specific ACECs.

Larger areas designated as ACECs or RNAs under Alternative B (30 percent of the decision area) would limit development by comparison with non-designated areas and would provide more protections for wildlife and their habitats than under Alternative A (13 percent of the decision area), although most ACECs are open to locatable mineral entry. Under Alternative B, new SOPs would be applied to maintain landscape connectivity corridors.

Golden Eagle. Alternative B protects golden eagle nests by excluding many development-related activities within 0.5 miles of nest sites, including NSO stipulations for fluid mineral leasing, withdrawal from locatable mineral entry, and closure to mineral materials. Alternative A includes no such buffers around golden eagle nest sites, but **SOP WILD-7** is common to all alternatives.

Dall Sheep. Alternative B adds the Midnight Dome/Kalhabuk ACEC to the five existing ACECs under Alternative A. Five of the ACECs would include restrictions within 0.5 miles of mineral licks under Alternative B. Compared with Alternative A, the area that is open to locatable mineral entry and mineral materials decreases for all sheep habitat DSHA, DSMC, and DSSA areas. The percent open to mineral ROWs deceases for DSHA, DSMC, and DSSA. The higher level of protection for the important DSHAs would decrease impacts relative to Alternative A.

Caribou. For the GMH, Alternative B would increase the area open to locatable minerals but decrease it for RMH. For GMH and RMH, Alternative B would decrease the area open to mineral materials and ROWs compared with Alternative A. This would reduce impacts related to mineral materials mining (habitat disturbance and displacement) and ROW developments (habitat fragmentation and creating new access for hunting). For the HHH, Alternative B would decrease the area open to locatable minerals, mineral materials, and ROWs compared with Alternative A, which would reduce potential impacts associated with these types of development on the HHH caribou.

Two additional ACECs would be designated for caribou (the Spooky Valley ACEC for the RMH and Upper Kanuti River ACEC for the HHH), and the Galena Mountain and Tozitna Subunits North and South ACECs would be expanded and have additional stipulations and TLs.

OHV and surface-disturbing activities would be prohibited in the Upper Kanuti River ACEC from May 1 to June 30 to avoid disturbance during the HHH caribou calving period. A total of 4,000 acres of PLO 5150 lands are within the calving core area. They are top-filed as Priority 1 by the State of Alaska and are likely to leave BLM management.

Moose. There would a small increase in land available for locatable minerals under Alternative B, but the amount of riparian forest and shrub habitat would decline (see **Appendix O**); therefore, impacts on moose

habitat would be similar or somewhat lower than under Alternative A. Additional limits on OHV use, ROWs, and additional ACECs would lower disturbance of moose compared with Alternative A.

Beaver. The amount of beaver habitat open to mineral material sales and ROWs would decline from 100 percent in Alternative A to 57 percent and 39 percent, respectively, in Alternative B, and the amount of beaver habitat open to locatable mineral entry would increase, from 54.1 percent to 77.0 percent.

Alternative C1

Under Alternative C1, wildlife would be potentially affected by mining activities in 93 percent of the decision area that is open to locatable mineral entry. This is an increase to 41 percent of the decision area, compared with Alternative A.

Similar to Alternative A, wildlife habitats in areas open to locatable mineral entry under Alternative C1 comprise the two dominant vegetation types in rough proportion to their occurrence in the decision area (39 percent upland low and tall shrub and 24 percent upland mesic spruce forest); however, as with Alternative B, very little area with high potential for locatable minerals is open for locatable mineral entry under Alternative C1 (see **Appendix O**); however, other high potential areas are segregated from locatable mineral entry and could change to State ownership.

Under Alternative C1, wildlife would be subject to the effects of ROW development and mineral materials disposal on 74 percent and 87 percent of the decision area, respectively. This is compared with 98 percent open to ROW development and 96 percent open to mineral materials disposal under Alternative A.

As with Alternative A, the areas open to ROWs and mineral materials disposal under Alternative C1 reflect the overall distribution of habitats, 39 percent upland low and tall shrub and 27 percent upland mesic spruce forest (39 percent and 25 percent for open to mineral materials disposal), while areas open to locatable mineral entry, open to ROWs, and open to mineral materials disposal under Alternative C1 all include somewhat smaller proportions of alpine tundra vegetation types than occur in the overall planning area (see **Appendix O**). The closed, withdrawn, and potentially withdrawn areas are, therefore, more protective of wildlife in tundra than in other habitats.

Potential impacts on wildlife associated with commercial harvest of forestry products would be similar under Alternatives A and C1. Under Alternative C1, 36 percent of the acres open to commercial harvest of forestry products are forested, which is similar to the 37 percent under Alternative A.

Alternative C1 would establish seasonal limitations on OHV use in the Toolik Lake ACEC/RNA and TLs for no OHV use from May 1 to June 30 in core caribou ranges of the GMH and RMH. Disturbance of wildlife from OHV activity potentially would be reduced from Alternative A in those areas.

Under Alternative C1, 418,000 acres would be designated ACECs, compared with 1,751,000 acres under Alternative A, and the Alternative C1 designations would offer much less protection to wildlife, being largely open to most types of development activities. Under Alternative C1, ACECs occur primarily in tundra, including upland low and tall shrub, and to the extent that these designations are protective, they would protect wildlife primarily in tundra habitats as opposed to forest.

Under Alternative C1, SOPs would be applied to maintain landscape connectivity corridors, which would likely be important to large carnivores.

Golden Eagle. For golden eagles, Alternative C1 stipulates that disturbance would be avoided or minimized and there would be NSO to fluid minerals within 0.5 miles of nests, compared with Alternative A. This includes no similar actions that would be protective of eagle nests.

Dall Sheep. Alternative C1 has the most protective requirements for Dall sheep. It replaces the five ACECs designated for Dall sheep under Alternative A with specific protections for DSHA, DSMC, and DSSA areas, including seasonal noise and helicopter restrictions, NSOs on fluid mineral leases, closures to new mineral material disposal, restriction or avoidance zones for new ROWs, and removal of infrastructure that is no longer in use (see **Appendix I**). More area would be segregated from locatable mineral entry, compared with Alternative A, but non-segregated land in the DSHA would be withdrawn or recommended for closure to the mining laws. Overall, these targeted restrictions should reduce potential Dall sheep disturbance and displacement and preserve use of DSHA and DSMC compared with Alternative A.

Caribou. Alternative C1 manages the GMH and RMH ranges as core caribou ranges (see **Map 2.1**, **Appendix A**). RMH range would be closed to fluid mineral leasing, withdrawn from locatable mineral entry, mineral material disposal, and nonenergy solid mineral leasing and development, and designated as a ROW avoidance area. Aircraft would be required to maintain an altitude of 2,000 feet above ground level in core caribou ranges from May 1 to June 30. Alternative C1 would designate 100 percent of the GMH and RMH range but just 48 percent of the HHH as ROW avoidance or exclusion areas.

Under Alternative C1, 27.1 percent of the RMH range and 0 percent of the GMH and HHH ranges would be recommended for withdrawal from the mining laws; 72.7 percent of the RMH range, 100 percent of the GMH range, 100 of the HHH range would be open to locatable mineral entry. Of these open areas, all of the RMH range (72.7 of the total), 53.5 percent of the GMH, and 76.1 percent of the HHH range would be withdrawn from the mining laws.

Alternative C1 provides additional limits on development in the decision area for the RMH, compared with Alternative A. Four thousand acres of PLO 5150 lands are in the calving core area. They are top-filed as Priority 1 by the State of Alaska and are likely to leave BLM management.

Moose. Alternative C1 would open more riparian forest and shrub habitat to locatable minerals but would reduce the amount open to ROWs and mineral materials disposal compared with Alternative A. The impacts would largely depend on the location of development and change in distribution of hunting effort.

Beaver. With Alternative C1, a reduction of 603 miles of stream segments for inclusion in WSR System as well as the increase in riparian habitats open to locatable minerals would decrease river habitat protection and potentially impact beaver and other aquatic furbearers, as well as bird species using riparian zones, compared with Alternative A.

Alternative C2 (Preferred Alternative)

Under Alternative C2, wildlife could be affected by mining in all of the decision area that is open to locatable mineral entry. Ninety-eight percent of the decision area would be open to ROW location, and 91 percent would be open to mineral material extraction under Alternative C2. Similar to Alternative A, wildlife habitats in areas open to locatable mineral entry under Alternative C2 comprise the two dominant vegetation types in rough proportion to their occurrence in the decision area (39 percent Upland Low and Tall Shrub and 24 percent Upland Mesic Spruce Forest).

Potential impacts on wildlife and habitat associated with commercial harvest of forestry products would be largely the same under Alternatives C2 and A. Almost all the decision area (98 percent) would be open to forestry under Alternative C2.

Under Alternative C2, no areas would be designated ACECs, compared with 1,751,000 acres under Alternative A. The direct management actions associated with those ACECs that have caribou or Dall sheep as a relevant and important (R&I) value would no longer be in place. Alternative C2 would designate 77,000 acres as RNA (Toolik Lake). This RNA would protect research projects in the area, would prohibit mineral materials disposal, and would limit OHV use (see **Appendix J**). Alternative C2 would also designate TLs for no OHV use from May 1 through June 30 in core caribou ranges of the GMH and RMH. Disturbing wildlife and habitat from OHV activity could be reduced from Alternative A in those areas.

Golden Eagle. For golden eagles, Alternative C2 has the same stipulations as Alternative C1; disturbance would be avoided or minimized and there would be NSO to fluid minerals within 0.5 miles of nests. Otherwise, Alternative C2 is similar to Alternative A, including the basic protections provided by the Bald and Golden Eagle Protection Act; however, because more areas would be open to locatable mineral entry, ROWs, and material mineral extraction, more golden eagle nests could be impacted by development than under Alternative A.

Dall Sheep. Alternative C2 would remove the five ACECs designated with Dall sheep as a key resource under Alternative A. There would be no requisite plan of operations for surface-disturbing activities as are currently required for ACECs designated with Dall sheep as a key resource. Alternative C2 also would not provide the new protections to DSHA, DSMC, or DSSA that are required under Alternative C1. Alternative C2 would allow full revocation of PLO 5150 lands. It would not withdraw DSHA from mineral entry or provide NSO designations for fluid mineral leases. No stipulations on mineral materials extraction, plans of operation for surface-disturbing activities, or aircraft height restrictions would be included.

Loss of important habitat and potential disturbance of Dall sheep from these activities could increase, with the potential for displacement from important mineral licks and movement corridors and potential impacts on productivity or survival; however, the degree of impact would depend on the location and type of activity.

The attachment of State of Alaska selections resulting from the BLM's revocation of PLO 5150 would segregate most of these lands from mineral entry; however, the lands identified as Priority 1 would likely leave BLM management within 10 years of PLO 5150 revocation.

Caribou. Under Alternative C2, the GMH and RMH ranges would be managed as core caribou ranges (see **Map 2.1**, **Appendix A**), as described for Alternative C1. Core caribou ranges would be closed for mineral material disposal. They would be designated as ROW avoidance but open to fluid mineral leasing and nonenergy solids (see **Appendix P**). For the GMH, 100 percent of the range would be open to locatable mineral entry, and 53.5 percent of the open areas would be segregated from locatable mineral entry. For the RMH, 100 percent of the range would be open to locatable mineral entry and of the open areas, 72.7 percent would be segregated from locatable mineral entry. The HHH range would be open to ROW, nonenergy solids, mineral material disposal, and fluid mineral leasing. 100 percent of the HHH range would be open to locatable mineral entry, and 76.1 percent of the open areas would be segregated from locatable mineral entry.

The GMH is small and thought to be declining (see description of affected environment, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf); additional development under Alternative C2 could further lower the probability of maintaining

a viable GMH population. Alternative C2 would also recommend a full revocation of PLO 5150, allowing State top-filed lands within the current area withdrawn by PLO 5150 to become valid selections. Lands within the PLO 5150 corridor that become valid selections are likely to be conveyed and would leave federal management, which may or may not increase development potential. The remaining selected lands would be segregated from new mineral entry.

Twenty-five thousand acres of PLO 5150 lands are in the calving core area, are top-filed as Priority 1 by the State of Alaska and are likely to be transferred to the State under Alternative C2. This would also make additional areas of HHH open to potential surface disturbance and development, compared with Alternative A, and could impact CAH caribou movements during migratory periods. Increased development in the range of the RMH could result in direct and indirect loss of habitat, lower productivity, and increase hunting activity. Overall, Alternative C2 would make more area available for locatable mineral entry, fluid leasing, and nonenergy solids for all herds; however, it would limit ROW and material mineral disposal and would establish OHV TLs for the GMH and RMH, compared with Alternative A.

Moose. Alternative C2 would open more riparian forest and shrub habitat to locatable minerals, but it would reduce the amount open to ROWs and mineral materials disposal, compared with Alternative A. The impacts would largely depend on the location of development and the change in distribution of hunting effort. The 158,000 acres of the Venetie Arm would be managed as ROW avoidance to mitigate impacts on moose habitat in this narrow corridor. This would provide more protection for moose than would Alternative A (open to ROW) but less than would Alternative B (ROW exclusion).

Beaver. With Alternative C2, 0.6 percent of beaver habitat would be in ACECs or RNAs, 100 percent would be open to fluid leasing, 100 percent would be open to locatable mineral entry, and 53 percent of the open areas would be segregated from locatable mineral entry.

Alternative D

Under Alternative D, wildlife could be affected by mining in 100 percent of the decision area that is open to locatable mineral entry. This is an increase of 48 percent of the decision area, compared with Alternative A, although the location and amount of future development is unknown. Ninety-nine percent of the decision area would be open to ROW location and mineral material extraction. Under Alternative D, 259,000 acres would be closed to ROW and mineral material extraction; this consists primarily of tundra in the CAMA WSA (plus small buffers around hot springs).

Golden Eagle. Unlike Alternative A but like the other action alternatives, Alternative D includes monitoring and ongoing surveying for golden eagles. Otherwise, Alternative D is similar to Alternative A, including the basic protections provided by the Bald and Golden Eagle Protection Act; however, because more areas would be open to locatable mineral entry, ROW, and material mineral extraction, more golden eagle nests could be impacted by development, compared with Alternative A.

Dall Sheep. Alternative D would result in similar impacts on Dall sheep as those described for Alternative C2. Loss of important habitat and potential disturbance of Dall sheep from development could increase with the displacement from important mineral licks and movement corridors. This could have impacts on productivity or survival.

Caribou. Impacts on caribou under Alternative D would be similar to those described for Alternative C2; however, the core ranges for the GMH and RMH would no longer have ROW avoidance and would no longer be closed to mineral materials disposal, similar to Alternative A.

Moose. Alternative D would open more riparian forest and shrub habitat to locatable minerals, but would decrease the riparian habitat with high potential for locatable minerals that is open to mineral entry from 3,000 to 0 acres, compared with Alternative A; however, much of this area would be segregated from locatable mineral entry. The amount of riparian habitat open to ROWs and forestry would be unchanged from Alternative A.

Beaver. Effects of changes in WSR designation would be the same as in Alternative C1. A total of 100 percent of the beaver habitat would be open for locatable mineral entry compared with 54.1 percent under Alternative A, with potential impacts as described above.

Conclusion

Much of the planning area is remote, with little development and relatively undisturbed wildlife habitat. This may remain the case for most of the area under all alternatives, but climate change is likely to have impacts on wildlife in the planning area within the life of this plan. Synergistic impacts from climate change and development are difficult to predict and add considerable uncertainty to estimated impacts. Potential ROW projects could have effects on the distribution of human activity, and large- and small-scale mining activity could impact wildlife on a local scale. The distribution of Dall sheep is limited within the planning area. Caribou are sensitive to disturbance, especially during calving (Dau and Cameron 1986; Cameron et al. 1992); therefore, those species may be impacted to a greater degree by the differing management regimes among alternatives.

Dall sheep and the RMH of caribou may be especially impacted under some alternatives. Overall, Alternatives B and C1 would likely provide more protections than Alternative A, and Alternatives C2 and D would provide fewer protections. Alternative D would provide the least protection for wildlife. Alternative B is likely to have the most protections, but because Alternative C1 has specific protections for important Dall sheep habitat, it may provide the most protections for this species.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

Wildlife in the planning area would be impacted by development in the decision area, as well as land development on adjacent land and land outside the planning area that is used by migratory species. Many species of passerines, waterfowl, and raptors would encounter development on their winter range and migratory routes and face potential impacts from climate change in all phases of their annual life cycle.

Caribou of the Teshekpuk Caribou Herd, CAH, and Porcupine Caribou Herd will continue to come into contact with existing and potential future oil development on the Arctic Coastal Plain as well as development on winter range to the south. The CAH interacts heavily with oilfield infrastructure during the summer and the Dalton Highway during migration (Nicholson et al. 2016).

Caribou still avoid active roads and pads by about 4 kilometers during calving (Dau and Cameron 1986; Cameron et al. 1992; Lawhead et al. 2004), but the amount of displacement is lower during other seasons (Smith et al. 1994; Murphy and Lawhead 2000; Haskell et al. 2006), and caribou use gravel roads and pads for oestrid fly relief in midsummer (Noel et al. 1998). Improvements to the Dalton Highway could result in more hunting and recreation in the PLO 5150 utility corridor, although current limits on OHV use and hunting with firearms along the Dalton Highway designated by Alaska statute limit hunting exposure.

Cumulative increases in development and mineral extraction could impact golden eagles and their nests though disturbance and displacement. Eagles would continue to have basic protections provided by the Bald and Golden Eagle Protection Act for all development. The action alternatives provide additional stipulations or direction for surveying for golden eagles that would reduce or avoid cumulative impacts further.

Partial or total revocation of PLO 5150 under some alternatives would transfer ownership of land along the Dalton Highway, which could increase development in this area. Potential development of Ambler Road, potential increased development made economically feasible by the presence of that transportation corridor, and potential pipeline projects could impact Dall sheep and caribou of the Western Arctic Herd and Teshekpuk Caribou Herd. This would come about through direct habitat loss, disturbance or displacement, and through increased hunter access.

Additional mining activity as well as potential ROW projects could impact wildlife through direct habitat loss, displacement, and increased human activity, including hunting and trapping. Direct mortality of caribou from the Western Arctic Herd could occur along the Ambler Road corridor from vehicle-caribou strikes. Caribou may also see these new linear features across the landscape as barriers that could shift their behaviors or migratory patterns. This could affect herd population through a decrease in overwinter survival or lower reproductive success. Road traffic and construction activities could also cause behavioral and migratory changes in caribou. Impacts would be experienced to such a degree that subsistence uses may be restricted (BLM 2020; also see **Section 3.5.2**).

Potential rare earth mining in the Ray Mountains region could impact range use by caribou of the RMH. This could impact caribou survival or productivity and make protection for other adjacent land more important.

Changes to the climate could have additive effects on development impacts through additional loss of waterbodies from landscape drying, increases in human-caused fire, and increased fire potential. Decreased forage quality or forage access, such as changes in species composition or rain-on-snow events, from climate change would add to the potential declines in available caribou herd range from development.

3.2.8 Wildland Fire Ecology and Management

Wildland fire management consists of wildland fire, fuels management, and prevention. Priority fire management goals are protection of human life and property, use of wildland fire to meet resource objectives, reducing risk and cost of uncontrolled fires, and reducing effects of wildland fire management. Fire management options for lands within the planning area are described in the Interagency Wildland Fire Management Plan (Alaska Wildland Fire Coordinating Group 2016) and currently are: critical, full, modified, or limited.

Lands in the limited fire management option would generally tend to trend away from a natural fire regime at a much lower rate than areas with a more aggressive suppression strategy due to the reduced occurrence of fire suppression efforts. Lands in other fire management options would continue trend farther away from the natural regime due to aggressive fire suppression efforts. As the vast majority of the planning area is unpopulated, the natural fire regime in the planning area is more intact than most of the U.S. Additional information is available in Section 2.1.10, Wildland Fire Ecology and Management, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Impacts on resources and resource uses from implementing the wildland fire ecology and management program are discussed in those particular resource sections in this chapter. This analysis of impacts on

wildland fire and fuels management consists of a review of proposed BLM management decisions that could affect wildfire size and/or intensity or potential impacts on identified values at risk.

Climate Change

Changes to wildland fire ecology and management could occur as a result of climate change. The higher temperatures and drier conditions increase the risk of drought, wildland fire, and insect infestation. In recent decades, fire return intervals in the planning area have become much shorter (Trammell et al. 2016). Fire return intervals are expected to continue to shorten, however at a lesser rate than in recent decades because even as temperatures are projected to increase, vegetation is expected to transition to a less flammable deciduous type under the now shorter fire return intervals (Trammell et al. 2016).The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts.

The effects of climate change on fire intensity (the energy released from a fire, as characterized by fire behavior, such as flame length and rate of spread) and severity (effects of a fire on ecosystems) are projected to be variable. This is because they are influenced by site-specific species composition, fuel loads, and precipitation (Flannigan et al. 2009); however, changing climate conditions are anticipated to result in hotter and drier periods that start earlier and last longer, increasing fuel flammability and burned areas (Abatzoglou and Williams 2016; Littell 2016).

The effects of climate change described above could influence the rate or degree of the potential cumulative impacts.

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to wildland fire ecology and management and the analytical methods used in this analysis.

Alternative A

Under Alternative A, management decisions would continue to follow the direction provided by existing BLM (BLM 2005b) policy and Executive Order 13855. Under Alternative A, there would be no acres of the forested wildland urban interface (WUI) where management decisions would prohibit or restrict fuel treatments (see **Map 3.14**, **Appendix A**).

Impacts Common to All Action Alternatives (B, C1, C2, and D)

There are no direct or indirect common impacts under Alternatives B, C1, C2, and D.

Alternative B

Management decisions for forestry, which limit the number of board feet in timber sales, may limit the size (acres) of a timber sale for fuels treatments. Timber would not be able to be sold if the fuel treatment area contains over 250,000 board feet. The average number of board feet per acre ranges from 4,000 to 24,000 board feet per acre (St. Clair 2019). If all acres were to represent commercially viable timber, a 250,000-board foot commercial sale would be limited to a 10- to 63-acre sale. By limiting the number of board feet in a timber sale, materials from fuels treatments larger than approximately 10 to 63 acres would not be salable unless they were combined with a ROW; however, in many areas, fuel treatment projects include acres with noncommercial materials; therefore, the specific acreage restrictions would be determined based on site-specific vegetation conditions. Management decisions restricting the size of a fuels treatment area could reduce the use of timber sales as a fuels treatment tool and increase the cost of fuels treatments within the entire forested WUI.

In areas closed to commercial timber harvest, timber would not be salable for fuels treatment purposes. While demand for commercial timber harvest on BLM-managed land in the planning area has been historically low, there exists the potential for commercial timber harvest to be used as a fire and fuels management tool.

Alternative C1

The nature and type of impacts from management decisions that close areas to commercial timber harvest would be the same as those under Alternative B. Under Alternative C1, management decisions would affect the extent and severity of potential wildland fires on 17 percent (12,000 acres) of forested lands in the WUI. The harvest of special forest products for personal use would be allowed on all lands but would likely have minimal impact on the extent and severity of potential wildland fires. The lack of a cap for timber sales would allow for greater flexibility in fire and fuels management.

Alternative C2 (Preferred Alternative)

The nature and type of impacts from management decisions that close areas to commercial timber harvest would be the same as those under Alternative B. Under Alternative C2, management decisions would affect the extent and severity of potential wildland fires on 17 percent (12,000 acres) of forested lands in the WUI. Restrictions on personal use and harvest of special forest products would be the same as under Alternative C1. As under Alternative C1, there would be no cap for timber sales.

Alternative D

Under Alternative D, resource development is emphasized by minimizing restrictions for surface-disturbing activities. Management decisions with potential to prohibit or restrict fuels treatments are discussed under Alternatives B, C1, and C2.

Conclusion

The BLM assumes all impacts from management decisions would be limited to forested areas in the WUI. Restrictions regarding timber sales that occur in the areas around communities and infrastructure would result in the greatest level of impact on wildland fire management.

All alternatives would have management decisions around forestry that would follow existing BLM directives and would comply with Executive Order 13855. There would be no acres where fuels treatments would be prohibited, and the ability to use commercial timber harvest as a tool for fuels management would be restricted in varying ways by alternative.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

The cumulative analysis area for fire management is the planning area. Cumulative impacts could result from activities changing the level of fuels or the amount and nature of values at risk, which could increase the extent and severity of wildland fires, decrease treatment efficiency, and increase costs. This effect would likely be the pronounced in areas near infrastructure that receive aggressive fire suppression efforts. Active management of vegetation would be implemented to address fuels buildup that could lead to loss of infrastructure and private property from wildfires. Under Executive Order 13855, the emphasis is to share management priorities; coordinate federal, state, tribal, and local assets; and remove hazardous fuels across 2 million acres of Department of the Interior-managed land. The cumulative effects of active management and Executive Order 13855 would reduce the extent and severity of wildland fires while increasing treatment efficiency and reducing costs.

Past and present projects that have increased human activity areas and permanent infrastructure have increased wildland fire suppression treatment priorities. Projects contributing to treatment priorities include those for mining operations, military bases, oil and gas exploration and leasing, pipelines, and highways. Together, these projects have created a network of infrastructure that supports increased human activity and that increases suppression priorities and the potential for human-caused ignitions. Future ROW projects, such as the Ambler Road project, would increase access to remote sections of the planning area and would contribute to the rising trend of an increased potential for human-caused ignitions.

By implementing the fewest restrictions, Alternative A would continue the trend of increasing development. As development increases, the number of suppression priorities also would increase. The areas of human use would continue to increase and consequently increase the potential for human-caused ignitions. The overall level of restrictions under Alternative A would be low compared with the action alternatives.

Due to the restriction of activities proposed under Alternatives B, C, and D, development would potentially be slower than under Alternative A, and the number of suppression priorities would remain the same or would increase much more slowly. Restrictions around various resources also would limit the potential for human-caused ignitions, and the trend would be toward a lower increase in the frequency of human-caused ignitions than under Alternative A.

3.2.9 Cultural Resources

Cultural resources are locations of human activity, occupation, or use. Cultural resources include archaeological, historic, or architecture sites, structures, or places with important public and scientific uses and locations of traditional cultural or religious importance to specified social or cultural groups. The 2016 AMS describes the affected environment for cultural resources. The AMS was supplemented in 2019 with a summary discussion on the potential for cultural resources related to ethnographic land use and the consideration of cultural landscapes and traditional cultural properties (TCPs) that were not covered by the 2016 AMS. Refer to the updated AMS for details regarding the inclusion of other cultural resources types in the affected environment for the planning area.

Data relevant in quantifying and framing the impact analysis are summarized here. Information from the RFD scenario is incorporated into the cumulative impacts discussion. The number of cultural resources in the Alaska Heritage Resources Survey database (AHRS) has also been updated; however, site totals in the 2016 AMS based on the division of the planning area into three subzones have not been updated. Even though additional cultural resources have been added to the AHRS since the AMS was first published (3,473 versus 4,498 AHRS sites identified in 2019 across the entire planning area), it remains unlikely that the distribution and density patterns have changed substantially.

There are 4,498 cultural resources listed in the AHRS within the planning area. This includes 684 AHRS locations have been recorded. The vast majority of the planning area has not been subject to cultural resources surveys. Data on cultural resources are primarily provided by the AHRS. Other sources of information indicate that several hundred additional cultural resource features are located across the planning area (e.g., Allakaket and Alatna Tribal Councils; Yukon River Drainage Fisheries Association 2008; and Jones and Kwaraceius 1997).

Within the planning area, the highest density of known cultural resources occur in areas that have been subject to inventories resulting from compliance with the National Historic Preservation Act (NHPA) Section 106 process, which typically take place in developed areas such as near cities or villages, military bases, mining areas, or transportation corridors. This led to what appears to be colocation of known sites with developed

areas. For example, the highest density of known resources is also located within a 100 mile radius of the most developed area (Fairbanks North Star Borough); however, there are likely other high densities of cultural resources located throughout the planning area that have not been inventoried yet. Additional information, including applicable regulations, is available in Section 2.1.11, Cultural Resources, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

Natural effects caused by climate change are possible in the decision area. Terrestrial processes, such as increased permafrost thaw, coastal and river erosion, and increasing wildfire all pose direct and indirect adverse impacts on cultural resources. Physical degradation of sites due to thawing ground and permafrost results in erosion, loss of artifacts and features, and potentially complete destruction of cultural sites embodied by surface and subsurface features. Climate changes also increase threats to subsistence activities (where and when food sources are available), which are integral in defining cultural practices with tribes and rural communities in the planning area.

Direct and Indirect Impacts

See A**ppendix M** for the analytical issues related to cultural resources and the analytical methods used in this analysis.

Management actions the BLM takes in the planning area have the potential to result in direct and indirect impacts on cultural resources. Both natural and human actions cause direct impacts. Adverse direct effects relate to the destruction, damage, or permanent removal of part or all of a cultural resource, which typically result from management decisions that allow for surface and subsurface ground-disturbing actions (e.g., locatable mineral extraction, ROW location, and development of recreation facilities). Flooding, wildfire, trampling of artifacts by wildlife, and erosion are examples of natural processes that can result in direct impacts on cultural resources. Management actions that restrict or limit ground disturbance conversely reduce the potential for human-caused direct impacts, and they may result in impacts because the cultural resource remains undisturbed.

Cultural resources are a fragile and nonrenewable resource; once damaged or destroyed, direct impacts are typically irreversible. Direct impacts on cultural resources can be site specific, such as the demolition of a prehistoric site during construction, or regional, such as the loss of multiple archaeological sites resulting from a wildland fire. Indirect impacts may be temporary, such as the introduction of noise from heavy equipment near a traditional hunting area during project construction, which occur during active construction and terminate when construction ends. Even when indirect, impacts on cultural resources, such as noise pollution disrupting traditional religious practices at a specific site, can impact use and cultural significance of a site.

Actions that may not lead to direct impacts may still result in indirect impacts on cultural resources. Indirect effects may include the introduction of new visual, atmospheric, or audible elements in the landscape that affect the qualities of cultural resources by diminishing their use, integrity, or cultural significance. These impacts range from short term and temporary to long term and permanent. Indirect effects also may include the removal of existing federal protections for cultural resources through transfer of land out of federal ownership.

The increase of vehicular traffic and number of visitors due to travel management, routing decisions, and recreation improvements also may directly or indirectly affect cultural resources. Cultural resources near

transportation routes may be subject to purposeful or inadvertent looting, vandalism, and site damage. The potential for erosion also increases as trails see increasing use or campsites are developed.

In addition to the information disclosed in the AMS (BLM 2016a), the BLM also considered ethnographic cultural resources, such as ethnographic landscapes, TCPs, indigenous sacred sites, place names, or intangible resources (e.g., oral traditions or indigenous knowledge). One exception to this is a TCP nomination that the Allakaket and Alatna Village Councils have submitted to the BLM for 17 places of cultural significance in the Alatna, Koyukuk, and Kanuti drainages. The BLM has determined that the places meet the criteria for a TCP and would work with the tribes to continue the nomination process. While this is the one TCP within the planning area, the BLM assumes TCPs and other types of cultural resources exist across the planning area, even if limited quantifiable information is available. These site types are also subject to direct and indirect effects described in this section.

Any development in the planning area could adversely affect belief systems and religious practices, traditional use areas, and sacred sites, even if such developments are far removed from specific cultural resource locations. Relatedly, impacts on wildlife that affect access and availability of food resources, such as caribou, fish, moose, or other wildlife resources important to the subsistence way of life, would be considered effects on cultural resources. These impacts would be adverse, regional in scale, and long term.

The main indicator used to assess impacts on cultural resources is the number of acres subject to direct surface or subsurface disturbances. Given that much of the planning area has not been subject to a cultural resource survey or review, the BLM assumes cultural resources locations and features exist across the planning area. This indicator provides a relative comparison of management actions within each alternative and does not attempt to quantify specific numbers of sites affected.

Cultural resources would be impacted under all alternatives through natural processes, such as erosion, wildfires, and melting permafrost, and by long-term cumulative impacts, such as the formation of braided trails through archaeological sites from day hikers. There would also be impacts from permitted activities under all alternatives. This is because there are no cultural resource laws that prevent or restrict permitted activities from happening or prioritize the protection of cultural resources over other uses of public lands.

The most comprehensive law ensuring consideration of the cultural resources is the NHPA, which requires that impacts on historic properties (cultural resources that meet certain criteria to be considered significant) are reduced, minimized, or mitigated, but not avoided; therefore, even though the BLM would ensure compliance with all cultural resource laws, regulations, and policies, there would be impacts from agency permitted actions under all alternatives.

Particular emphasis is given to areas where management decisions would likely occur that would result in impacts on cultural resources. For example, areas that may be subject to particular management decisions, such as opening more acres for locatable minerals, also must assess the likelihood of actual mineral development in those locations. Actions affecting resources analyzed below include ground-disturbing activities resulting from mining, infrastructure, and other resource development; recreation; climate change and fire management; revocation of PLO 5150; and ACEC and other protective designations.

The effects of climate change described above could influence the rate or degree of the potential direct and indirect impacts.

Alternative A

Under Alternative A, present BLM management direction and policies on cultural resources, including compliance with Section 106 of the NHPA and NEPA, would continue. Cultural resources would be managed to balance current and future scientific use, and would allow for consumptive use of archaeological sites for interpretation. Limited action is proposed for the identification of additional cultural resources outside the reactive cultural survey work completed for Section 106 compliance. Impacts on cultural resources based on management decisions from other resources would be assessed through application of BLM policy for cultural resource uses as needed. Proactive identification, evaluation, and mitigation of impacts would be limited as funding and time allow. Direct and indirect impacts would continue to be mitigated through compliance with the NHPA and NEPA.

The examples below demonstrate how select land use restrictions influence the acreage potentially open to ground-disturbing activity. The examples reflect key indicators that result in more or less acreage becoming susceptible to ground-disturbing activity.

Mining- and infrastructure-related development, such as access road construction, blasting, material removal, and vegetation clearing, in the planning area can cause direct and indirect impacts. For example, under Alternative A, there are currently 4,670,000 acres (36 percent of the decision area) withdrawn from locatable mineral entry and 6,763,000 (52 percent of the decision area) open for locatable minerals with an additional 1,182,000 acres (9 percent of the decision area) open to metalliferous mineral development. Much of the withdrawn area follows the Dalton Highway, a high-density area for known cultural resources. The RFD scenario indicates that the potential for locatable minerals on BLM-managed lands is generally low throughout the planning area; however, high and medium potential areas exist within and near the Dalton Highway corridor. Typically, mining occurs in areas known for historic-era cultural resources. While the overall potential for locatable minerals is low, the areas where mining is most likely to occur represent a high potential for cultural resources that may be affected by mining operations.

Recreation planning under Alternative A involves the classification of 3,010,000 acres as SRMAs and an additional 629,000 acres as Extensive Recreation Management Areas (ERMAs) (combined 27 percent of the BLM decision area). The SRMAs include the Dalton Highway SRMA and Dalton Corridor SRMA, which represent high-density areas for identified cultural resources. Recreational development, including trails, parking lots, and buildings, can result in direct or indirect impacts on cultural resources. Direct impacts may occur from construction of trails, and indirect impacts may result from increased visitors to an area that can lead to erosion, trampling, vandalism, or looting of archaeological resources. The designations of SRMAs or ERMAs would result in increased consideration of impacts on cultural resources when planning for recreation areas and compatible uses.

Other protective land designations serve to protect cultural resources, even if coincidentally to the main objective of the designation's purpose. For example, protective designations under Alternative A for WSRs include 603 river miles classified as eligible for WSR designation. Relatedly, 1,747,000 acres (13 percent of the planning area) are designated as ACECs under Alternative A. These include three ACECs with a specific focus on protecting cultural resources (Galbraith Lake, Jim River, and Nigu-Iteriak). Overall, protective designations represent actions with long-term impacts on cultural resources by increasing the acreage of protected areas specifically for or incidentally to the enhancement of their cultural values. These actions reduce or remove the potential for imminent threats, conflict with other resources, and ground-disturbing actions that cause direct and indirect impacts on cultural resources.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Certain management decisions affecting cultural resources apply to all alternatives and would affect such resources equally, regardless of the alternative. Applicable federal and state regulations, BLM policies, and current programmatic agreements would apply to any ground-disturbing actions associated with a proposed development. These processes serve to avoid and minimize direct and indirect impacts on cultural resources regardless of alternative. The prioritization of proactive NHPA Section 110 cultural resources surveys; the stabilization or excavation of significant cultural sites; archaeological monitoring; partnerships and collaboration with agencies, tribes, and landowners; increased public awareness; and impact avoidance stipulations would be applied under all action alternatives, though there are currently no similar actions under Alternative A.

The use allocation for cultural resources per Table C-2 of the BLM Land Use Planning Handbook (H-1601-1) would also be applied across all action alternatives (Alternatives B, C1, C2 and D). All recorded cultural resources would be assessed and categorized. Impacts under the action alternatives would involve advancing archaeological scientific inquiry, enhancing interpretive and educational use of sites, conserving sites, and selecting locations for experimental and traditional uses. While methods used during scientific or experimental studies may be detrimental and involve destructive sampling or site excavation, the knowledge gained about, cultural resources could be useful for the BLM, tribes, research communities, or the public.

Management decisions regarding the Iditarod National Historic Trail (INHT) are the same across all alternatives and generally aim to minimize any effects on intact INHT segments, which includes maintaining the quality of the setting and associated sites. The goal is to preserve and protect historic remains and settings, which purposefully and incidentally preserve and protect all cultural resources within the geographic scope of the trail. These actions have long-term impacts on cultural resources associated with the trail or located in the proposed INHT Management Corridor, as management decisions would occur that enhance and support the nature and purposes for which the trail was designated.

Management decisions for the Alatna and Allakaket TCP areas would be the same across all action alternatives, with the goal of ensuring access to, and use of, the TCP areas by tribal members. Pending formal designation of 52,000 acres of the Allakaket and Alatna TCPs by the State Historic Preservation Officer, the BLM would consult with the Allakaket and Alatna Traditional Councils when considering any permit applications, (including SRPs (special recreation permits) for proposed actions in the TCP areas. In addition, the BLM would send a notification letter and written description of any proposed actions to the tribes and would, at minimum, discuss the proposed action with the tribal councils via telephone. The BLM would allow, at minimum, 30 days for the tribal councils to consider the proposed action and provide proposed mitigation measures. The BLM would equally consider those mitigation measures in any agency decisions and would consider and consult on any future TCP nominations as requested by tribes.

Lands and realty recommendations could cause indirect impacts on cultural resources by either implementing or removing policy protections, or authorizing or closing ROWs, utility corridors, development nodes, or leases. For example, the permitting of a utility corridor may allow for ground-disturbing activities in the planning area that could lead to the removal, relocation, damage, or other permanent adverse impacts on cultural resources from construction work in the corridor. Realty and related decisions that affect federal landownership or management could cause indirect impacts on cultural resources. Federal ownership and management means that federal processes for minimizing impacts on cultural resources must be followed. Once the ownership changes, the regulatory and enforcement setting also changes for those lands. This may result in an increased potential for adverse effects if no process is in place to assess these impacts on cultural

resources, ensure implementation of NHPA and other related cultural resource laws, and ensure policies are applied to these lands.

The conveyance of selected lands and the subsequent removal of federal ownership would also remove provisions within ANILCA, such as the rural subsistence preference that protects the subsistence lifeway of Native villages. The Alaska Historic Preservation Act (AS 41.35) serves to protect cultural resources on lands transferred to the State. This helps reduce the potential for adverse effects on cultural resources because a state-level process is in place that would continue to require the minimization and avoidance of impacts on cultural resources.

Wildland fire and hazardous material decisions concerning cultural resources are the same across all action alternatives. During wildland fire events, the locations of cultural sites that should be protected (such as historic cabins and structures) or avoided (such as surface archaeological sites) are shared with the fire crews so those resources can be appropriately managed, and direct and indirect impacts from the fire are minimized. Selecting hazardous materials cleanup locations includes cultural resource-specific criteria to prioritize cleanup actions at locations where cultural sites may be affected. These actions have impacts that follow the duration of the event (fire or cleanup) that protect cultural resources from direct and indirect adverse effects.

WSA actions are also the same across all alternatives; current BLM policy for the CAMA Study Area serves to protect cultural resources by limiting adverse impacts on cultural resources that result from ground disturbance.

The impacts common to all action alternatives are primarily facilitate the BLM achieving its goals regarding the preservation, treatment, knowledge, and positive use of cultural resources in the planning area; no similar actions are defined under Alternative A.

Alternative B

Generally, Alternative B identifies more proactive cultural resource management actions, such as actively assessing climate change impacts throughout the planning area, and actions that allow for the treatment of cultural resources threatened by climate change. All known sites would be monitored on an established schedule, which results in the preservation and protection of cultural resources.

The administrative designation of utility and transportation corridors (e.g., Ambler and Umiat) would serve to collocate development and infrastructure. Subsequent NEPA processes for projects can analyze and mitigate impacts on cultural resources; however, disturbance could be expected in these corridors. As a result, Alternative B would present a greater potential for impacts on cultural resources related to mining and infrastructure development than Alternative A, particularly when considering the high density of known cultural resources in PLO 5150.

Under Alternative B, SRMA and ERMA acreages are less than under Alternative A (497,000 and 145,000, respectively, or 5 percent of the decision area); however, the entire Dalton Highway corridor is designated as a BCA (1,603,000 acres or 12 percent of the decision area). The BCA designation prioritizes recreational experiences where the goal is to protect, enhance, or restore larger areas of generally intact and undeveloped BLM-managed lands coupled with high-quality, wildlife-dependent recreational experiences. This would, in turn, yield mitigations for any development that may affect this priority focus. This management designation protects the high density of known cultural resources located within PLO 5150. No acres in Alternative A have the BCA designation.

Under Alternative B, lands and realty recommendations regarding PLO 5150 that propose a revocation of the outer corridor would be removed under this alternative. The partial revocation of PLO 5150 would allow top-filed lands to become valid selections; this would have a twofold result: 1) those lands that have a valid selection would now be segregated from further federal mineral entry; and 2) there would be a high likelihood that those valid selections would be conveyed out of federal ownership during the life of the plan and therefore removed from BLM management. Cultural resources would be managed in accordance with the Historic Preservation Act (AS 41.35) for top filings that would transfer to the State of Alaska.

Alternative B would increase the acreage contained in ACECs (3,899,000 acres, 29 percent of the decision area) compared with Alternative A (12 percent of the decision area). Under Alternative B, 603 miles of WSR corridors would be established (the same as under Alternative A); however, additional interim protective measures would be offered under Alternative B that include actions such as closing wild river segments to mineral material disposal and to nonenergy solid mineral leasing. Collectively, when compared with Alternative A, the additional protective measures under Alternative B would reduce the potential for actions that would have detrimental direct or indirect impacts on cultural resources.

Alternative C1

The potential for mining-related direct and indirect effects on cultural resources increases under Alternative C1 with 12,184,000 acres (93 percent of the decision area) open for locatable mineral entry, as compared with 52 percent of the decision area under Alternative A; however, while closed to fluid leasing under Alternative C1, the Dalton Utility Corridor would remain open to other locatable minerals, whereas under Alternative A the Dalton Utility Corridor would be closed. As a result, Alternative C1 would present a greater potential for impacts on cultural resources related to mining and infrastructure development than Alternative A.

When compared with Alternative A, impacts on cultural resources related to recreation resource development would likely increase under Alternative C1 because less acreage would be designated as an SRMA or ERMA (2,437,000 and 145,000, respectively, or a combined 18 percent of the decision area). There would be no BCA designations associated with the Dalton Highway under Alternative C1. This would result in a greater potential for areas with known cultural resources to be managed in ways that do not consider impacts on cultural resources.

The administrative designation of utility and transportation corridors (e.g., Ambler and Umiat) would serve to collocate development and infrastructure off the main access. Subsequent NEPA analyses for projects can analyze and mitigate impacts on cultural resources; however, disturbance could be expected in these corridors. Lands and realty recommendations regarding PLO 5150 would be the same as those described under Alternative B.

Protective designations, such as WSRs and ACECs, would contain less acreage under Alternative C1 when compared with Alternative A. Under Alternative C1, 0 miles of river corridors would be designated as eligible or suitable for inclusion in the WSR system. Alternative C1 would include eight ACEC designations for a total of 312,000 acres (less than 1 percent of the decision area), which is fewer than the 1,747,000 acres designated under Alternative A. All sites eligible for listing on the National Register of Historic Places would be regularly monitored.

Alternative C2 (Preferred Alternative)

Under Alternative C2, there would be 13,083,000 acres (100 percent of the decision area) open to locatable mineral development, more than under Alternative A (52 percent of the decision area). Although areas including the Dalton Utility Corridor would remain open to locatable mineral entry, Alternative C2

recommends that 0 acres be withdrawn from locatable mineral entry, compared with the 458,000 (4 percent of the decision area) recommended under Alternative A. This would result in less land withdrawn from activities that could have direct or indirect impacts on cultural resources under Alternative C2.

When compared with Alternative A, impacts on cultural resources related to recreation resource development would likely increase under Alternative C2. This is because 46 percent less acreage would be designated as an SRMA or ERMA (497,000 and 1,460,000, respectively, or a combined 14 percent of the decision area). There would be no BCA designations under Alternative C2. This would result in a greater potential for areas with known cultural resources to be managed in ways that do not consider impacts on cultural resources.

Land and realty decisions under Alternative C2 would result in the complete revocation of PLO 5150, which could result in the loss of cultural resource protections under federal law. If PLO5 150 is revoked and as lands transfer to the State, such federal laws as the NHPA, Native American Graves Protection and Repatriation Act, Archaeological Resources Protection Act, and other federal laws for cultural and archaeological resources would no longer apply. Cultural resources on lands transferred to the state would be managed under the Alaska Historic Preservation Act (AS 41.35). The administrative designation of utility and transportation corridors, such as the Ambler, Umiat, and the Dalton Utility corridors, would serve to collocate development and infrastructure.

Subsequent NEPA analyses for projects can analyze and mitigate impacts on cultural resources; however, disturbance could be expected in these corridors. Additionally, under Alternative C2, consideration of impacts on cultural resources under the administrative designation of the Dalton utility and transportation corridor to replace PLO 5150 would remain consistent with the current development uses of the corridor. Alternative C2 has one caveat: lands that are not top-filed would be open to mineral entry, which could increase the potential for adverse effects related to that development potential. As noted, lands transferred to the State would still be subject to AS 41.35.

Under Alternative C2 there would be 77,000 acres of ACEC at one location, Toolik Lake, and 0 miles of WSR designations. This could increase the potential for adverse impacts on cultural resources, due to less land being offered protective management that would otherwise limit land use decisions, compared with Alternative A.

Alternative D

Under Alternative D, there would be 13,083,000 acres (100 percent of the decision area) open to locatable mineral development, which would be more than under Alternative A (52 percent of the decision area). The Dalton Utility Corridor would remain open to other locatable mineral entry, as described under Alternatives C1 and C2. Alternative D also would recommend 0 acres for withdrawal from locatable mineral entry, compared with the 458,000 (4 percent of the decision area) recommended under Alternative A, resulting in less land withdrawn from activities that could result in direct or indirect impacts on cultural resources under Alternative D.

There would be no SRMAs or ERMAs designated under Alternative D, as compared with the 27 percent of the planning area with these designations under Alternative A. The lack of these designations would affect cultural resources by removing any opportunity for planners to consider impacts on cultural resource sites in these areas of recreation use.

As under Alternative C2, land and realty decisions under Alternative D would result in the complete revocation of PLO 5150, which could result in the loss of cultural resource protections under federal law for those lands. The administrative designation of utility and transportation corridors (e.g., Ambler, Umiat, and

Dalton) would serve to collocate development and infrastructure. Subsequent NEPA analyses for projects can analyze and mitigate impacts on cultural resources; however, disturbance could be expected in these corridors. Additionally, under Alternative D, consideration of impacts on cultural resources under the administrative designation of the Dalton utility and transportation corridor to replace PLO 5150 would remain consistent with the current development uses of the corridor. One caveat is applied under Alternative D in that lands that are not top-filed would be open to mineral entry, which could increase the potential for adverse effects related to that development potential. As noted, lands transferred to the State would still be subject to AS 41.35.

There generally would be fewer protective land status designations under Alternative D when compared with Alternative A. There would be 0 acres of ACECs under Alternative D and 0 miles of WSR designations. This could result in increasing the potential for adverse impacts on cultural resources due to less land designated under some form of protective status that would otherwise limit land use decisions.

Conclusion

Overall, cultural resource review, compliance, and consultation procedures would continue under all alternatives. Proactive measures to assign use values (e.g., scientific or experimental) to cultural resources would be expanded under Alternatives B, C1, C2, and D when compared with Alternative A. Alternatives C1, C2, and D would include management actions with the potential to expand areas open to ground-disturbing activities, with Alternatives C2 and D posing the greatest potential for direct and indirect adverse effects on cultural resources. Alternative B would offer the most protection and has the least potential for adverse impacts on cultural resources.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

Past actions that have affected cultural resources occurred across the planning area but are primarily located along the Dalton Utility Corridor and related to initial construction and ongoing maintenance of the TAPS and transportation/access developments. Archaeological and historic sites were identified, excavated, and damaged or destroyed by TAPS construction activities, and during the construction and ongoing maintenance of the Dalton Highway (including development of material sites adjacent to the highway). The ongoing maintenance of the Dalton Highway, particularly in the creation and expansion of material sources, has also adversely affected cultural resources by blasting and gravel extraction. Construction materials are often collocated with terraces and benches that serve as prime locations for prehistoric archaeological sites.

Other impacts are associated with the past and present military activities in the planning area, such as training ground improvements, bombing ranges, and new facility construction on military lease lands, which also contain the highest number of known archaeological resources in the planning area. Recreation, particularly ORV trail use and visitors traveling the Dalton Highway, has resulted in the trampling of artifacts and sites by vehicles and pedestrians, erosion by trails and trail braiding, site looting, and vandalism. Past and present mining activities also have also directly affected cultural resources, particularly in the areas of Coldfoot and Wiseman with historic and contemporary mining operations, and in the vicinity of the Usibelli Coal Mine in the southern reach of the planning area.

Outside the Dalton Utility Corridor, past and present human-caused actions are fewer, and actions derive largely from weathering, erosion, permafrost thaw, and natural degradation of artifacts, features, and other physical remains of cultural resource sites. These natural actions also have affected sites within the Dalton Utility Corridor. Impacts resulting from these actions are consistent with the types of direct and indirect impacts discussed above and tend to be irreversible direct impacts on archaeological sites.

Compliance with Section 106 has mitigated impacts on many cultural resources locations, such as the archaeological site data recovery prior to pipeline construction in the mid- to late 1970s; however, impacts on ethnographic cultural resources, place names, and cultural landscapes have not been fully assessed, as systematic documentation of these resource types does not currently exist.

RFD impacts include the continued maintenance and operation of the TAPS system and existing roads and trails by Alaska Department of Transportation & Public Facilities, and continued or expanded mining operations. Those actions directly affect cultural resources within each project area due to ground disturbances. Indirect effects may include the introduction of a new ROW into an undeveloped area that changes the visual setting important to certain cultural resource types. Increased recreation and visitation, including hiking, sport hunting, and wildlife viewing, would continue to affect cultural resources, with the impacts being greatest near access points along the Dalton Highway in areas where increased volumes of people lead to trail and erosional issues, and better access to areas containing cultural resources results in direct and indirect impacts.

When coupled with the impacts discussed for each alternative above, cumulative impacts under Alternative A would continue and could increase with the permitting of various access and development projects within the planning area during the plan duration. Direct and indirect impacts associated with ground-disturbing actions would continue, as would the application of NHPA Section 106 and other policies that aim to minimize or avoid impacts on cultural resources.

Under Alternative B, cumulative impacts would likely decrease when compared with Alternative A because Alternative B would assign more acreage into protective status designations that purposefully or coincidentally provide more protections for cultural resources in those areas. Cumulative impacts would increase under Alternatives C1, C2, and D when compared with Alternative A because more lands would be open to activities that potentially result in ground-disturbing activities. It would be likely that under Alternatives C1, C2, and D adverse impacts, including loss or damage to all or portions of National Register of Historic Places-eligible cultural resources, could occur and result in permanent loss of these resources and the associated contributions these sites make in understanding the nation's prehistory and history.

The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts.

3.2.10 Paleontological Resources

Little work has been done to systematically inventory paleontological materials on BLM-managed lands in the planning area. While geologic mapping can be used to determine areas likely to contain fossils, the known distribution of fossil occurrences in the planning area is primarily a result of a limited amount of scientific inventory and activities that produce the field samples and finds (i.e., placer mining and U.S. Geological Survey sampling); it should not be taken as representative of the entire area.

A Potential Fossil Yield Classification (PFYC) model for Alaska is in development. Preliminary PFYC values have been assigned to the mapped geologic units in the planning area (Breithaupt 2019). The BLM maintains and would update these PFYC assignments as additional data are available. PFYC values range from Class 1, very low, to Class 5, very high. In the BLM planning area, 1,734,000 acres, or 3.1 percent of the land area, are in high and very high potential PFYC 4 and 5 units (see **Map 3.15**, **Appendix A**). In the BLM surface decision area (land where the BLM manages the surface and subsurface resources), 121,000 acres or 0.9 percent of the land area are in high and very high potential PFYC 4 and 5 units. When complete, the PFYC model will provide more information on the overall potential for paleontological resources presented in a

geospatial format. There is currently no comprehensive BLM geodatabase of known fossil localities, although the AHRS cultural resource dataset does include some localities.

The nature of the paleontological resources in the planning area spans the breadth of the Paleozoic (approximately 540 to 250 million years ago), the Mesozoic (approximately 250 to 65 million years ago), and the Cenozoic (approximately 65 million years ago to present). All manner of vertebrate and invertebrate faunal, as well as floral specimens, are reported, with the large mammal vertebrate remains concentrating in the Pleistocene epoch (approximately 1.8 million years ago to 10,000 years ago). Examples include fossil bone beds and dinosaur footprints identified along the Yukon River, and vertebrate deposits along the Dalton Highway in the vicinity of the Brooks Range. Pleistocene fossils are relatively common in the drainages of the planning area that have not been subjected to intensive post-depositional glacial-ice scouring. Pleistocene fossils continue to be excavated from placer deposits near Fairbanks, Livengood, and Wiseman in the planning area. Fossil finds would continue to increase with the interest from the University of Alaska Museum of the North and other research communities, from inventory related to development, and from the increase in placer mining. Additional information is available in Section 2.1.12, Paleontological Resources, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Changing climate conditions would not directly affect paleontological resources but could affect several geologic hazards, including thawing permafrost and coastal erosion. An increase in the active layer expected from a warming climate could result in greater areas of land subsidence and melting, which may expose geologic units with paleontological resources to weathering action. Similarly, erosion would also expose previously protected units to weathering and make them more visible and susceptible to unauthorized collection. For example, there is erosion of river terraces and exposure of fluvial-deposited "bone beds" along the Colville River. Given the surficial context of these deposits, the geologic unit with the greatest risk is the unconsolidated and poorly consolidated surficial Quaternary deposits, which may contain Pleistocene fossils.

Direct and Indirect Impacts

Table 3-13 contains a comparison of acres of potential disturbance associated with management allocations by PFYC 4 and PFYC 5 units**.** These allocations provide an indication of the potential for impact, but they do not imply a known impact or that all acres would be subject to actions that may affect paleontological resources. These data serve as a guide to evaluate the need for further investigation when authorizing future actions and to broadly compare the relative risk of impacts among alternatives. The presence of PFYC 4 or 5 units does not necessarily predict exposures of significant fossil localities, or the likelihood of actions at a depth or intensity that would affect the resource. Fossils may also occur in areas that may have less sensitive or unknown PFYC units, and the classifications may not highlight potential fossil-bearing alluvium or locations where young alluvial deposits or deep soils may cover and obscure sedimentary bedrock. The effects of climate change described above, could influence the rate or degree of the potential direct and indirect impacts.

See **Appendix M** for the analytical issues related to paleontological resources and the analytical methods used in this analysis.

Comparative Summary Tables

Table 3-13 summarizes potential disturbance to PFYC 4 and 5 units by alternative.

Table 3-13
Acres of Potential Disturbance to PFYC 4–5 Units[1]

	Alternative				
	A	**B**	**C1**	**C2**	**D**
Open to locatable mineral entry	6,757,000	10,866,000	12,169,000	13,066,000	13,066,000
Total PFYC 5 acres	14,000	92,000	95,000	95,000	95,000
Total PFYC 4 acres	N/A	16,000	16,000	16,000	16,000
Open to mineral materials sales	12,081,000	8,034,000	11,603,000	12,063,000	12,808,000
Total PFYC 5 acres	95,000	35,000	90,000	95,000	95,000
Total PFYC 4 acres	15,000	14,000	15,000	15,000	15,000
PLO/ANCSA—Revoking	N/A	6,635,000	6,635,000	7,377,000	7,377,000
Total PFYC 5 acres	N/A	88,000	88,000	88,000	88,000
Total PFYC 4 acres	N/A	16,000	16,000	16,000	16,000
ROW—Open	13,027,000	5,591,000	9,777,000	12,123,000	13,027,000
Total PFYC 5 acres	95,000	5,000	77,000	95,000	95,000
Total PFYC 4 acres	26,000	25,000	25,000	26,000	26,000
Recreation—SRMAs and ERMAs	3,639,000	642,000	2,581,000	1,956,977	0
Total PFYC 5 acres	N/A	N/A	N/A	N/A	N/A
Total PFYC 4 acres	16,000 (ERMA)	N/A	N/A	N/A	N/A
ACEC/RNA—Incidental protection	1,747,000	4,033,000	417,000	77,000	0
Total PFYC 5 acres	N/A	60,000	5,000	N/A	N/A
Total PFYC 4 acres	N/A	N/A	N/A	N/A	N/A

Sources: BLM GIS 2017; Breithaupt 2019
[1]Alternative acres are the totals for the planning area not the sum of total PFYC acres.

Alternative A

BLM management actions and authorizations under Alternative A related to mining, infrastructure, and ROW development could cause direct adverse impacts on paleontological resources through the damage or destruction of fossils or the disturbance of the stratigraphic context in which they are located. Indirect adverse impacts could be created from increased accessibility to fossils leading to looting or vandalism activities. Erosion caused by development could result in new discoveries of paleontological resources due to requirements for review, surveys, or monitoring. While there would be a risk for direct damage to scientifically important resources caused by development, there also would be an opportunity for new discoveries and public interpretation.

Under Alternative A, there are currently 6,757,000 acres open to locatable mineral entry, with 14,000 acres in PFYC 5 (see **Table 3-13**). All forms of locatable mineral mining could affect the physical integrity of paleontological resources through surface and subsurface disturbance, erosion, unauthorized collection, or vandalism related to extraction, infrastructure, and access roads. Much of the activity in locatable minerals involves smaller-scale placer mining where the removal of vegetation and sediment layers could directly affect substantially both aboveground and buried paleontological resources. Placer mining deposits have been associated with late Pleistocene or Ice Age vertebrate fossils; there has been a large number of samples collected and removed from BLM-managed land, often without authorization and scientific documentation (see Section 2.2.12 of the AMS). The potential for unauthorized collection or damage of fossils associated with placer mining and locatable mineral entry would continue.

Under Alternative A, 14,000 acres of PFYC 5 are available for locatable mineral entry. Of these, 11,000 acres are segregated and would not be available until conveyed, relinquished, or rejected.

For mineral materials sales, 12,801,000 acres would be open for development, with 95,000 acres in the PFYC 5 unit and 15,000 acres in the PFYC 4 unit (see **Table 3-13**); however, according to the RFD scenario (see **Appendix N**), over 50 new material sites are anticipated on BLM-managed land in addition to current sites to provide construction and maintenance material support for the Dalton Utility Corridor and other corridors. BLM-managed lands along the Dalton Utility Corridor are rich in vertebrate sites (see Section 2.2.12 of the AMS). Mineral materials site development may lead to new fossil discoveries; but it could also increase the potential for damage or loss of paleontological resources and for unauthorized collection.

Under Alternative A, 13,027,000 acres would remain open to ROW development, with all 121,000 acres of the PFYC 5 and PFYC 4 units in the BLM decision area remaining open (see **Table 3-13**). ROW developments that disturb large linear areas (such as pipelines and power lines) are more difficult to reroute or adjust to avoid resources. ROW exclusion areas would reduce potential damage to the physical integrity of paleontological resources from development.

Two SRMAs totaling 3,010,000 acres and 3 ERMAs totaling 629,000 acres would continue to be managed to promote recreation opportunities (see **Table 3-13**). PFYC classification data are very limited for these areas, but the SRMAs include the Dalton Highway SRMA and Dalton Corridor SRMA, which have known fossil localities (see Section 2.2.12 of the AMS). Recreation can affect paleontological resources through direct disturbance and access that leads to unauthorized collection or vandalism. The potential for impacts on paleontological resources would increase as recreational use increases or becomes concentrated. The effect of repeated uses or visits over time could also increase the intensity of impacts due to natural processes. Repeated visits to localities also can create social trails, directing more people to increased access, which could damage paleontological resources through vandalism and unauthorized collection. Areas designated as ERMAs and SRMAs would increase the intensity of permitted recreational use of these areas and the risk for direct, indirect, and inadvertent damage to paleontological resources.

Land exchange or conveyance to nonfederal entities can permanently remove federal protections of any scientifically important paleontological resources, making them susceptible to loss or degradation. Retaining important fossil localities in federal ownership can provide federal protections for the scientifically important resources. In this case, revocation of the PLO does not necessarily mean that all lands associated with the PLO would be conveyed, nor does retention of the PLO necessarily imply protection of resources. PLO 5150 withdrew lands for the purposes of a utility and transportation corridor.

The outer corridor of PLO 5150 is withdrawn from all forms of appropriation under the public land laws, except for location of metalliferous minerals under the mining laws. It is also withdrawn from leasing under the mineral leasing laws and withdrawn from selection by the State of Alaska and Native corporations. While the segregation from mineral entry could protect paleontological resources, the purpose for the PLO would imply that development would and should occur in the future. Current PLO lands totaling 7,377,000 acres would continue to be retained, including 104,000 acres in PFYC 5 and PFYC 4 units, or about 91 percent of the PFYC 5 and PFYC 4 units in the BLM surface decision area (see **Table 3-13**). Under Alternative A, PLO 5150 lands would be retained.

ACECs and other designations that restrict surface uses could incidentally protect any paleontological resources within their boundaries. Under Alternative A, 1,747,000 acres would continue to be managed as ACECs/RNAs; however, there would be no PFYC 4 or 5 units designated, and locality information is not

compiled for these areas (see **Table 3-13**). Likewise, paleontological resources are listed among the ORVs that are relevant to WSRs eligibility for segments of the Colville River. Current management of this corridor and other river corridors could provide incidental protections for paleontological resources that may be present.

Ongoing effects of climate change and natural processes such as subsidence, melting, and erosion would continue to expose previously protected units to weathering and make them more visible and susceptible to unauthorized collection.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Under all action alternatives, the types of impacts would be similar to those described under Alternative A. In addition to the identification, inventory, protection, education, and use of mapping tools, the BLM would prioritize survey for all PFYC 4 and 5 areas, prioritize fuels vegetation management to avoid damage from fire and fire suppression in sensitive areas, promote research collaborations and promote stewardship and conservation through education and outreach. Each of these actions would provide more proactive and focused management, and in the long term, help reduce the potential for direct and indirect impacts on paleontological resources.

Alternative B

The nature and types of impacts caused by mining, infrastructure, and ROW development would be as described for Alternative A. Alternative B would increase lands open to locatable mineral entry to 10,866,000 acres, with 92,000 acres in PFYC 5 and 16,000 acres in PFYC 4. Alternative B would open the Dalton Utility Corridor to locatable mineral development and represent a greater risk of disturbing paleontological resources. The administrative designation of utility and transportation corridors (Amber and Umiat) serve to collocate development and infrastructure off the main access. Subsequent NEPA review for projects can analyze and mitigate impacts on paleontological resources; however, disturbance could be expected in these corridors.

Areas open to mineral materials sales would be reduced to 8,034,000 acres, with 35,000 acres in PFYC 5 and 14,000 acres in PFYC 4, thus reducing the potential risk for impacts from anticipated increases in mineral materials sites for PFYC 5 units, compared with Alternative A.

Under Alternative B, 92,000 acres of PFYC 5 and 16,000 acres in PFYC 4 are available for locatable mineral entry, but 100 percent of these are segregated and would not be available until conveyed, relinquished, or rejected.

Areas open to ROW development would be reduced to 5,591,000 acres with 30,000 acres in PFYC 5 and PFYC 4 units. This is a reduction of 75 percent from Alternative A in the acres of PFYC 5 and PFYC 4 units (see **Table 3-13**).

Recreation can affect paleontological resources through direct disturbance and access that leads to unauthorized collection or vandalism. Areas designated as SRMAs and ERMAs would be reduced from Alternative A, potentially decreasing any impacts from recreational use or unauthorized collection in those areas. PFYC classification data are very limited for these areas. The BLM would designate 1,603,000 acres as the Dalton Highway Corridor BCA. This would prioritize recreational uses for a semiprimitive recreational experience that focuses on recreational hunting; it could serve to mitigate future development and ground disturbance in an area where paleontological resources are present.

Under Alternative B, a partial revocation of the PLO 5150 withdrawal and full revocations of all ANCSA 17(d)(1) withdrawals would be proposed. This would allow top-filed lands to become valid State selections. There are 104,000 acres in PFYC 5 and PFYC 4 units in these areas (see **Table 3-13**). There is no timeline for the potential conveyance of valid selections, but it is assumed that the priority top-filed lands within PLO 5150 could be conveyed and leave federal ownership within the life of the plan. Scientifically important fossil locations may lose federal protections with this conveyance. Under Alternative B and the other action alternatives, the BLM would prioritize evaluating whether significant fossils would be removed from federal ownership, the impacts of removal, and any applicable mitigation strategies to reduce potential impacts.

ACECs/RNAs and other designations that restrict surface uses could incidentally protect any paleontological resources within their boundaries. Land managed as ACECs and RNAs under Alternative B would increase to 4,037,000 acres and restrict certain surface uses. About 1.5 percent (60,000 acres) of these ACECs/RNAs include PFYC 5 units, and no PFYC 4 units were identified in ACECs under this Alternative (see **Table 3-13**). Under Alternative B, segments of 11 rivers and associated buffers, totaling 603 acres, would be determined suitable for designation under the WSRs Act. Management of these river corridors could provide incidental protections for paleontological resources that may be present, including paleontological ORVs present in segments of the Colville River.

Alternative C1

Alternative C1 would increase lands open to locatable mineral entry to 12,169,000 acres, with 95,000 acres in PFYC 5 and 16,000 acres in PFYC 4. Alternative C1 would also open the Dalton Utility Corridor to locatable mineral development, increasing the potential for impacts on paleontological resources in a sensitive area.

Under Alternative C1, 95,000 acres of PFYC 5 and 16,000 acres in PFYC 4 are available for locatable mineral entry. Of these, 92,000 acres are segregated and would not be available until conveyed, relinquished, or rejected.

Areas open to mineral materials sales would include up to 11,603,000 acres, with 90,000 acres in the PFYC 5 unit and 15,000 acres in the PFYC 4 unit. Areas open to ROW development would be reduced, when compared with Alternative A, to 9,777,000 acres, with a total 102,000 acres in both the PFYC 5 and PFYC 4 units. This would be a reduction of 15 percent from Alternative A (see **Table 3-13**). There is an anticipated need for more mineral materials development in this area, which has known paleontological resources that may be at risk for impacts.

Acres designated as SRMAs and ERMAs would be reduced by 29 percent from Alternative A. PFYC classification data are very limited for these areas, but the BLM anticipates that the potential impacts on paleontological resources through direct disturbance and access that leads to unauthorized collection or vandalism would be reduced. Potential impacts of a partial revocation of PLO 5150 and full revocation of all ANCSA 17(d)(1) withdrawals would be the same as Alternative B and include the sensitive Dalton Utility Corridor.

Land that would be managed as ACECs and RNAs under Alternative C1 would decrease from 1,747,000 acres under Alternative A to 417,000 acres. The remaining of these ACECs includes 5,000 acres in PFYC 5 unit (see **Table 3-13**). ACEC designations that restrict surface uses could incidentally protect any paleontological resources within their boundaries. No segments of the 11 rivers and associated buffers, totaling 603 acres, would be determined suitable for designation under the WSRs Act. Incidental protections for paleontological resources under this management would not occur.

Alternative C2 (Preferred Alternative)

Alternative C2 would increase lands open to locatable mineral entry to 13,066,000 acres, with 95,000 acres in PFYC 5 and 16,000 acres in PFYC 4. Areas open to mineral materials sales would be up to 12,063,000 acres, with 95,000 acres in the PFYC 5 unit and 15,000 acres in the PFYC 4 unit. Areas open to ROW development would be slightly reduced, when compared with Alternative A, to 12,123,000 acres with 95,000 acres in PFYC 5 units and 26,000 acres in PFYC 4 units. There remains the likely need for more mineral materials development in this area, which has known paleontological resources. These resources may be at increased risk for impacts, with additional mineral materials development.

Under Alternative C2, 95,000 acres of PFYC 5 are available for locatable mineral entry. Of this, 92,000 acres are segregated and would not be available until conveyed, relinquished, or rejected. Similarly, 16,000 acres in PFYC 4 are available for locatable mineral entry, but 100 percent of these are segregated and would not be available until conveyed, relinquished, or rejected.

Acres designated as SRMAs and ERMAs would be reduced by 46 percent from Alternative A (see **Table 3-13**). PFYC classification data are very limited for these areas, but the BLM anticipates that the potential impacts on paleontological resources through direct disturbance and access that leads to unauthorized collection or vandalism would be reduced.

Under Alternative C2, a full revocation of PLO 5150 would be proposed. The assumption is that the selected lands would be conveyed to the State of Alaska during the life of the plan; however, there is no clear indication of how many acres of valid selections may be conveyed. This analysis assumes that Priority 1 selections would be conveyed over the first 10 years of the life of this plan. As under Alternatives B and C, 104,000 acres of these lands would be in PFYC 5 and PFYC 4 units. The BLM would prioritize evaluating whether significant fossils would be removed from federal ownership, the impacts of removal, and any applicable mitigation strategies to reduce potential impacts.

Land that would be managed as ACECs and RNAs under Alternative C2 would total 77,000 acres (see **Table 3-13**). ACEC designations that restrict surface uses could incidentally protect any paleontological resources within their boundaries. No segments of the 11 rivers and associated buffers, totaling 603 acres, would be determined suitable for designation under the WSRs Act. There would be no incidental protections for paleontological resources under this management.

Alternative D

Alternative D would increase lands open to locatable mineral entry to 13,066,000 acres under Alternative D, with 95,000 acres in PFYC 5 and 16,000 acres in PFYC 4. This would be the same as under Alternative C2 (see **Table 3-13**). Alternative D would also open the Dalton Utility Corridor to locatable mineral development where there are known paleontological resources that could be affected.

Under Alternative D, 95,000 acres of PFYC 5 are available for locatable mineral entry. Of this, 92,000 acres are segregated and would not be available until conveyed, relinquished, or rejected. Similarly, 16,000 acres in PFYC 4 are available for locatable mineral entry, but 100 percent of these are segregated and would not be available until conveyed, relinquished, or rejected.

Areas open to mineral materials sales would be up to 12,808,000 acres, with 95,000 acres in the PFYC 5 unit and 15,000 acres in the PFYC 4 unit. Areas open to ROW development and the number of acres (121,000 acres) in PFYC 5 and PFYC 4 units would be the same as under Alternative A (see **Table 3-13**).

No acres would be designated as SRMAs and ERMAs under Alternative D; the potential for impacts on paleontological resources would remain the same as it is for any undesignated lands.

Under Alternative D, a full revocation of PLO 5150 would be proposed. It is assumed that the selected lands would be conveyed to the State of Alaska during the life of the plan; however, there is no clear indication how many acres of valid selections may be conveyed. Like Alternatives B and C, 104,000 acres of these lands would be in PFYC 5 and PFYC 4 units. The BLM would prioritize evaluating whether significant fossils would be removed from federal ownership, the impacts of removal, and any applicable mitigation strategies to reduce potential impacts.

Under Alternative D, no land would be managed as ACECs or RNAs, with no information available on paleontological resource sensitivity. No segments of the 11 rivers and associated buffers, totaling 603 acres, would be determined suitable for designation under the WSRs Act. Incidental protections for paleontological resources under this management would not occur.

Conclusion

Because of limited information regarding paleontological resources at the planning-level scale for the analysis area, the presence of PFYC 4 or 5 geological units in the BLM decision area is used to discuss the presence of paleontological resources and the potential for impacts. The presence of PFYC 4 or 5 units does not necessarily predict exposures of significant fossil localities, or the likelihood of actions at a depth or intensity that would affect the resource. For all alternatives, there would be the potential for surface-disturbing impacts on paleontological resources resulting from BLM management actions and allocations. All the alternatives include objectives to develop baseline inventory information on a broad scale through updated PFYC mapping and to survey where ground-disturbing activities or conveyance are anticipated. More comprehensive information and detailed mapping of known localities and sampled areas would need to be developed for review of authorized activities. Review and surveys may lead to discovery, preservation, research, and interpretive opportunities.

Alternatives B, C1, C2, and D provide additional, specific, proactive protection, research, and interpretive measures when compared with Alternative A. Alternatives C2 and D would be associated with the greatest potential for direct and indirect impacts on paleontological resources because of the acres open to ground-disturbing activities. To a lesser degree, Alternative C1, and to a greater extent, Alternative C2, would expand the potential for additional ground disturbance and conveyance that could affect paleontological resources. Of the action alternatives, Alternative B would have the least potential for ground-disturbing impacts. Alternative A would continue to retain all lands selected by PLO 5150 and ANCSA 17(d)(1) and maintain the segregations from selection and varied by each withdrawal. It would continue forms of appropriation and have the least amount of land open to locatable mineral entry. In all cases, there would be further consideration of the impacts on paleontological resources for future site-specific actions.

Cumulative Impacts

Past, present, and future projects and actions relevant to the cumulative impact analysis and analytical methods used in this analysis are in **Appendix M**.

Much of the planning area has not been subject to activities at the depths or intensity that may affect paleontological resources. Impacts are associated with past, present, and future activities from locatable mineral mining, mineral materials sales, road development and maintenance, pipelines, utilities, recreational use, erosion, weathering, and unauthorized collection. Within the planning area, these activities have occurred, and would continue to primarily occur, in the Dalton Utility Corridor.

Several mines have operated, are operating, and may be expanding in the Dalton Utility Corridor and other areas. In addition to larger mining operations, there is smaller-scale placer mining activity that occurs and would likely increase. Locatable mineral mining and supporting facilities disturb the ground in areas where fossils may be collocated. Fossils may be lost, damaged, or collected without authorization or documentation. All the action alternatives anticipate conveyance of valid selected lands upon the partial or full revocation of PLO 5150 lands to the State. There would be further review and possible mitigation prior to removing these lands from federal management, but the potential for additional cumulative impacts on paleontological resources from mining actions would continue.

Past and ongoing construction and maintenance of roads, pipelines, fiber optic lines, and other utilities have likely impacted paleontological resources through direct ground disturbance and access. In particular, the construction and ongoing maintenance of the TAPS and the Dalton Highway may have affected paleontological resources. Mineral materials sites would continue to be developed to support existing road and pipeline facilities, the Ambler and Umiat utility and transportation corridors, and two potential natural gas pipelines: the Alaska Stand Alone Pipeline and AKLNG Pipeline. The potential for cumulative impacts on paleontological resources from these actions would continue.

Better access, recreational use, and more human activity in areas where paleontological resources may be present may lead to cumulative effects resulting from concentrated use, OHV disturbance, and unauthorized collection or vandalism. The potential for impacts on paleontological resources would increase as access and recreational use increases or becomes concentrated.

The ongoing and future effects of climate change would expose previously protected units to weathering, damage, and possible unauthorized collection, especially in unconsolidated and poorly consolidated surficial Quaternary deposits, which may contain Pleistocene fossils. The potential effects of erosion and subsidence would be cumulatively greater when combined with anticipated ground disturbance.

All the alternatives would contribute to cumulative effects on paleontological resources. Alternative A would continue to have the least land open to locatable mineral development. The BLM would expect potential contributions to cumulative impacts to be the greatest under Alternative D, and to a lesser extent under Alternative C2, and followed by Alternative C1 because the most land would be open to ground-disturbing activity under these alternatives. Alternative B would have similar but less potential for contributing to cumulative impacts because of reduced acres of PFYC 5 units in lands open to mineral materials sales and ROWs, and incidentally protected PFYC 5 unit acres in ACECs. In all cases, there would be further consideration of the impacts on paleontological resources for future site-specific actions.

3.2.11 Visual Resources

VRM addresses the visual quality of landscapes for views of natural landscapes and unique areas with high visual quality. Implementing VRM involves conducting an inventory, establishing management classes, and providing an impact assessment. During the inventory stage, data are collected to identify the visual resources of an area in order to designate visual resource inventory (VRI) classes. The VRM classes are established through the RMP, and adjustments are made to reflect resource allocation decisions made in the RMP.

Due to the large size of the planning area and the lack of roads, the BLM modified the established visual resources inventory to reflect constraints on access, time, and budget. As such, a visual resources inventory was conducted by fixed wing aircraft for most of the planning area with the exception of the Dalton and Elliot highway accessible lands. Two RMPs, the Utility Corridor RMP and the CYRMP, identified visual resources and assigned scenic quality values. Impacts on visual resources are forecasted to increase on the North Slope

due to increased development. Impacts on visual resources along the Dalton Highway are also forecasted to increase with increased North Slope development and in response to tourism.

Multiple areas with outstanding scenic quality were identified in the Utility Corridor RMP and North Slope RMP. The VRI reviewed the 56 million-acre planning area. The report was signed and published in 2018. In the decision area, no acreage was identified to meet VRI Class I while 44 percent of the area was identified to meet VRI Class II; 15 percent met a VRI Class III and 41 percent met a VRI Class IV (see **Table 3-14**). Additional information is available in Section 2.1.13, Visual Resources, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Table 3-14
VRI Components

VRI Component	Acres of BLM-Managed Lands	Percent of BLM-Managed Lands
Scenic Quality		
A	5,753,866	43
B	6,211,935	47
C	1,328,200	10
Total	**13,294,000**	**100**
Sensitivity		
High	4,466,664	34
Medium	4,712,646	35
Low	4,114,690	31
Total	**13,294,000**	**100**
Distance Zone*		
Foreground-middleground	5,379,000	40
Background	3,871,000	30
Seldom seen	4,044,000	30
Total	**13,294,000**	**100**
VRI Class*		
I	0	0
II	5,879,000	44
III	1,950,000	15
IV	5,465,000	41
Total	**13,294,000**	**100**
VRM Class*		
I	259,000	2
II	0	0
III	2,584,000	19
IV	800,000	6
Unclassified	9,651,000	73
Total	**13,294,000**	**100**

Source: BLM GIS 2017
*Data have been rounded to the nearest 1,000 acres. Acreages are approximate.
See **Maps 3.16** through **3.19**, **Appendix A.**

Climate Change

Changes in the visual character of the project area could occur as a result of climate warming. Climate projection data indicate a warming trend in northern Alaska exhibited by longer growing seasons with ice-free conditions. Similarly, simulated future projections for the boreal region indicate land cover changes (SNAP 2019). In boreal forest, this increase in growing season length, combined with an associated increase

in seasonal fire events, would continue to change the appearance of the forest. Fires are a normal part of the visual setting in the decision area, and fire scars are typical in boreal forest, which is considered a fire-dependent landscape; however, increased fire frequency would result in nuanced changes in the visual character of the landscape.

Similarly, as increased soil moisture can cause warming of permafrost soils, increases in rain events caused by the general warming trend will result in an increase in thermal warming of permafrost (Subin et al. 2013). Over time, these increasing rain events will result in changes to landscape features, such as pingos, and possibly result in increases in localized erosion. The resulting effects on the landscape's visual character are increasing visual contrasts in coastal areas affected by these processes. The rate of change in flora and other landscape features will continue to be dependent on associated changes in climatic conditions. As a result, the hue, tone, and visual line of some features in the landscape could be expected to change over time. Overall, however, the general visual continuity of the natural landscape is expected to remain the same.

Direct and Indirect Impacts

The analysis area for analyzing impacts on visual resources is the planning area. See **Appendix M** for the analytical issues related to visual resources and the analytical methods used in this analysis.

The effects of climate change described above, could influence the rate or degree of the potential direct and indirect impacts.

Comparative Summary Tables

The VRI classes form the basis for analysis in this section. The BLM uses VRI classes to identify the relative importance of different landscapes in the area. Potential impacts on visual resources are assessed by comparing the VRI class to the VRM class assigned for an area. **Table 3-15** lists how visual resources would be managed for each VRI class for the alternatives.

Table 3-15
VRM for Visual Resources by Alternative

Alternative A Acres					
VRM Class	**VRI Class I**	**VRI Class II**	**VRI Class III**	**VRI Class IV**	**Total**
I	0	259,000	0	0	259,000
II	0	0	0	0	0
III	0	2,506,000	21,000	57,000	2,584,000
IV	0	792,000	8,000	0	800,000
Unclassified		2,322,000	1,921,000	5,408,000	9,651,000
Total	**0**	**5,879,000**	**1,950,000**	**5,465,000**	**13,294,000**

Alternative B Acres					
VRM Class	**VRI Class I**	**VRI Class II**	**VRI Class III**	**VRI Class IV**	**Total**
I	0	614,000	78,000	70,000	762,000
II	0	3,711,000	545,000	2,398,000	6,654,000
III	0	262,000	0	1,000	263,000
IV	0	1,292,000	1,327,000	2,996,000	5,615,000
Total	**0**	**5,879,000**	**1,950,000**	**5,465,000**	**13,294,000**

Alternative C1 Acres					
VRM Class	**VRI Class I**	**VRI Class II**	**VRI Class III**	**VRI Class IV**	**Total**
I	0	268,000	0	0	268,000
II	0	2,730,000	62,000	143,000	2,935,000
III	0	117,000	0	0	117,000
IV	0	2,765,000	1,887,000	5,322,000	9,974,000
Total	**0**	**5,880,000**	**1,949,000**	**5,465,000**	**13,294,000**

Alternative C2 Acres					
VRM Class	**VRI Class I**	**VRI Class II**	**VRI Class III**	**VRI Class IV**	**Total**
I	0	258,000	0	0	258,000
II	0	144,000	0	0	144,000
III	0	1,788,000	9,000	3,000	1,800,000
IV	0	3,689,000	1,941,000	5,462,000	11,092,000
Total	**0**	**5,879,000**	**1,950,000**	**5,465,000**	**13,294,000**

Alternative D Acres					
VRM Class	**VRI Class I**	**VRI Class II**	**VRI Class III**	**VRI Class IV**	**Total**
I	0	258,000	0	0	258,000
II	0	0	0	0	0
III	0	2,016,000	8,000	3,000	2,027,000
IV	0	3,606,000	1,941,000	5,462,000	11,009,000
Total	**0**	**5,880,000**	**1,949,000**	**5,465,000**	**13,294,000**

Source: BLM GIS 2017
Note: Data have been rounded to the nearest 1,000 acres. Acreages are approximate.

Lands classified as VRI Class IV are landscapes with low visual value. This is generally due to their low scenic quality, public sensitivity, and visibility, or because they are seldom seen from platforms considered in the inventory.

Managing these landscapes as VRM Class III or Class IV would allow for modifications that result in slight changes to the scenic quality, if any. By managing these landscapes as VRM Class I or Class II, the scenic quality of the landscape would likely remain the same. In other words, scenic quality would be maintained when an area with a high VRI class number is assigned a lower VRM class number (e.g., VRI Class III managed as VRM Class II).

Conversely, lands classified as VRI Class I or Class II represent landscapes with high visual value. This is the result of a landscape having higher visual variety leading to a higher scenic quality rating. These landscapes commonly have a higher public sensitivity rating. As such, lands classified as VRI Class I or Class II have the potential to experience a greater magnitude of impact from VRM Class III or Class IV management than lands classified as VRI Class III or Class IV. In other words, scenic quality may not be maintained when an area with a low VRI class number is assigned a higher VRM class number (e.g., VRI Class II managed as VRM Class III).

Alternative A

Under Alternative A, lands under VRM Class I would constitute approximately 259,000 acres, while approximately 9,651,000 acres would remain unclassified. VRM Class I designation would continue to retain the visual character of the existing landscape near the Nigu-Iteriak ACEC. Unclassified areas include the Dulbi River WSR, the Tozitna River ACEC, and several other smaller ACECs. Under Alternative A, visual

resources in these areas would not be subject to appropriate management that is informed by VRM class objectives and designed to fulfill those objectives.

Approximately 2,584,000 acres of VRM Class III lands would be retained, which would provide for partial retention of the visual character in areas east of Kanuti National Wildlife Refuge and along the Dalton Highway. For the ACECs existing close to the highway corridor, the visual character would remain subject to VRM Class III designations, which would provide for partial retention of the existing character of the landscape and allow for potential activities that may cause major modification of the landscape.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

There are no common direct or indirect impacts under Alternatives B, C1, C2, and D.

Alternative B

Under Alternative B, an additional 731,000 acres would be managed as VRM Class I areas compared with Alternative A. This would be the greatest increase in VRM Class I designation under any alternative. New VRM Class I areas would be designated near the Hogatza River and Dulbi River WSRs and near the South Fork Koyukuk River ACEC. Additionally, the designation of 6,867,000 acres of VRM Class II would allow for enhanced preservation and would retain the character of the landscape near several ACECs existing along the Dalton Highway. VRM Class III would also partially retain the existing character of the landscape in areas along the Dalton Highway. On other lands in the planning area, previously unclassified lands would also be designated as VRM Class IV or VRM Class II.

Alternative C1

Under Alternative C1, no additional VRM Class I areas would be designated, with the exception of 9,000 acres for the Spooky Valley LWCs unit. In this area, the BLM would manage lands in a manner that would preserve and retain the character of the landscape. VRM Class II would retain the character of the landscape areas east of Kanuti National Wildlife Refuge near the Dalton Highway; VRM Class III would partially retain the existing character of the landscape along the Dalton Highway. On other lands in the planning area, previously unclassified lands would be largely designated as VRM Class IV, with a smaller amount of previously unclassified lands designated VRM Class II.

Alternative C2 (Preferred Alternative)

Under Alternative C2, no additional VRM Class I areas would be designated. VRM Class II would retain the character of the Dalton SRMA, Sukakpak Region RMZ; VRM Class III would partially retain the existing character of the landscape along the Dalton ERMA, Dalton SRMA, and Dalton Uplands RMZ. On other lands in the planning area, previously unclassified lands would be largely designated as VRM Class IV, including the Yukon Crossing and Coldfoot RMZs in the Dalton SRMA, as well as the Ambler and Umiat utility and transportation corridors. Overall, an increase of approximately 10.2 million acres of VRM Class IV designations, compared with Alternative A, would allow for changes to the character of the landscape in other parts of the decision area.

Alternative D

Under Alternative D, there would be a slight reduction in VRM Class 3 designations throughout the planning area compared with Alternative A. VRM Class I designations would remain intact in approximately 258,000 acres. Similar to Alternative C2, a large increase in VRM Class IV designations, compared with Alternative A, would allow for changes to the character of the landscape, although to a slightly lesser degree than under Alternative C2.

Conclusion

Compared with Alternative A, all action alternatives would increase the acreage under VRM Class IV classification, which would allow for potential reductions in the scenic quality through major landscape modifications. Alternative D represents the largest increase in acreage under VRM Class IV classification. By contrast, Alternative B would allow for the largest increase in acreage under VRM Class I and VRM Class II classification, reflecting a greater sensitivity toward preserving the visual character of the landscape in specific portions of the decision area.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

The analysis area for visual resources is the planning area. Past, present, and RFFAs which affect visual resources in the decision area include roadway and other infrastructure projects, such as cell towers; mining activities, including small-scale placer mining activities and gravel extraction; and new construction related to planning oil and gas development. Naturally occurring events, such as wildfire and flooding, can also alter the landscape with effects on visual resources in the planning area. Many of these actions and events have altered vegetation and landforms and have introduced artificial elements into the natural landscape. Some past developments are being reclaimed, and visual impacts are lessening.

Any RFFAs or projects that would disturb the surface can affect the scenic quality. Proposed surface-disturbing projects can change landform, vegetation, color, and adjacent scenery. Depending on the location and scale of the activities and modifications, the scenic quality of an area can be degraded.

Under Alternative A, the BLM would continue to manage visual resources on all BLM-managed lands in the planning area under current VRM classifications. When combined with past, present, and RFFAs or projects, Alternative A would have no cumulative impacts on visual resources. Under Alternative C2, 11,092,000 acres would be managed in a manner that could allow activities that have an increased potential to change the scenic quality in areas with high value. This represents the largest amount under any alternative. Alternative B would allow these activities on 5,615,000 acres. Alternative C1 would allow these activities on 9,974,000 acres, and Alternative D would allow them on 11,009,000 acres. When combined with past, present, and RFFAs or projects, Alternative C2 would have the greatest influence on cumulative impacts on visual resources.

The effects of climate change described above could influence the rate or degree of the potential cumulative impacts.

3.2.12 Wilderness Characteristics

The planning area does not contain any congressionally designated wilderness. Before 2011, no inventories had been conducted in the planning area, and management is not addressed in any existing land use plans. A non-wilderness assessment conducted in 1980 in a utility corridor on BLM-managed lands identified 1,347,300 acres not meeting wilderness criteria.

Most of the decision area meets the criteria for LWCs, as defined in BLM Manual 6310 (BLM 2012b). A wilderness characteristics inventory identified 23 units containing 12,721,000 acres (96 percent of the decision area) that meet the criteria for lands containing wilderness character (BLM 2018a) (see **Table 3-16**). LWCs in the planning area are primarily roadless units of adequate size (5,000 acres) that are untrammeled by humans and contain outstanding opportunities for solitude or a primitive and unconfined type of recreation.

Additional guidance specifically for BLM-managed lands in Alaska has been established by Alaska Instruction Memorandum 2016-005 (BLM 2016b). Pursuant to this instruction memorandum, the following ANILCA-specific uses are compatible with LWC designations: public use cabins and shelters; snowmachine travel with adequate snow cover; airplane use, including primitive landing areas; motorboat use; and temporary structures and equipment for hunting, fishing, and trapping.

Additional information is available in Section 2.1.14, Wilderness Characteristics, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

Climate change may affect wilderness characteristics, such as naturalness, through landscape-scale changes to water availability and hydrology, as well as by disrupting vegetation communities and wildlife. Changes to the overall topography, hydrology, and ecology in the planning area could occur as a result of a warming climate.

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to wilderness characteristics and the analytical methods used in this analysis.

The effects of climate change described above, could influence the rate or degree of the potential direct and indirect impacts.

Comparative Summary Tables

Table 3-16 summarizes impacts on LWCs by alternative.

Table 3-16
Acreage of Potential Impacts on LWCs

Management Action	Alternative (Acres)				
	A	B	C1	C2	D
Timber					
Closed	0	2,580,000	325,000	0	0
Open	12,721,000	10,141,000	12,395,000	12,721,000	12,721,000
ROW					
Avoidance	0	5,258,000	3,184,000	906,000	0
Exclusion	0	2,048,200	6,000	0	0
Open	12,721,000	5,415,000	9,530,000	11,815,000	12,721,000
Utility corridor	0	324,000	324,000	876,000	0
OHV					
Closed in summer	2,006,000	2,005,000	745,000	745,000	63,000
Closed May 1–June 30	1,163,000	1,163,000	87,000	63,000	0
Route restrictions	9,552,000	9,551,000	11,888,000	11,913,000	12,658,000
VRM					
Class I	1,000	707,000	10,000	0	0
Class II	0	6,727,000	2,774,000	102,000	0
Class III	2,559,000	199,000	76,000	1,645,000	1,810,000
Class IV	602,000	5,089,000	9,862,000	10,112,000	10,911,000
No VRM	9,558,000	0	0	0	0
ACECs					
Designated	1,683,358	3,959,000	373,000	63,000	0
Undesignated	2,454,986	175,000	3,765,000	4,075,000	4,138,000

Management Action	Alternative (Acres)				
	A	B	C1	C2	D
Recreation Management Areas (RMAs)					
ERMA	370,000	10,000	10,000	1,397,000	0
SRMA (RMA only for Alt A)	2,792,000	359,000	2,218,000	359,000	0
BCA	0	1,527,000	0	0	0
WSRs					
Wild	126,000	125,000	126,000	126,000	126,000
Recreation	8,000	8,000	8,000	8,000	8,000

Source: BLM GIS 2017

Table 3-17
Mineral Acreage of Potential Impacts on LWCs

Management Action	Alternative (Acres)				
	A	B	C1	C2	D
Withdrawn from fluid minerals	7,615,000	558,000	558,000	0	0
Closed to fluid minerals	29,000	3,936,000	572,000	0	0
Open to fluid minerals	4,858,000	8,007,000	11,371,00	12,502,000	12,502,000
Open to fluid minerals, subject to controlled surface use[1]	0	0	1,136,000	0	0
Open to fluid minerals, subject to NSO[2]	0	2,254,000	1,495,000	0	0
Open to locatable mineral entry	6,696,000	10,350,000	11,788,000	12,502,000	12,502,000
Open, State or Native-selection	3,283,000	7,020,000	7,020,000	7,579,000	7,579,000
Recommended for withdrawal from locatable mineral entry[3]	0	1,460,000	156,000	0	0
Withdrawn from locatable mineral entry	4,318,000	558,000	558,000	0	0
Closed to mineral material disposal	7,000	8,805,000	7,431,000	745,000	0
Open to mineral material disposal	12,495,000	7,831,000	11,344,000	11,756,000	12,502,000

Source: BLM GIS 2017
[1]Controlled surface use areas do not overlap closed or withdrawn. Note that NSO and controlled surface use data may overlap, as there may be exceptions or modifications of the stronger stipulation.
[2]NSOs do not overlap closed or withdrawn.
[3]Recommended for withdrawal are a subset of open.
[4]Minerals calculations are less than the total LWCs because some of the LWCs are on native patent subsurface, which is not managed by the BLM.

Alternative A

Under Alternative A, all LWCs would continue to be managed to emphasize other resource values and multiple uses as a priority over maintaining wilderness characteristics. Most LWCs receive limited visitation and resource use and so would be likely to retain their wilderness characteristics due to remoteness, lack of access, and limited demand for ground-disturbing activities.

Outstanding opportunities for solitude could be affected on LWCs by recreation, timber removal, and energy, infrastructure, ROW, utility corridor, and road development. Some LWCs could receive indirect complementary protections offered to VRM Class I and designated ACECs (1,000 acres and 1,683,358 acres, respectively). The designation of LWCs as VRM and ACECs would contribute to the protection of the naturalness of these areas. In addition, restrictions on OHV use could limit impacts seasonally and outside of existing trails. Seasonal closures, TLs, and route restrictions are discussed in **Section 3.3.5**.

Under Alternative A, 370,000 acres (0.03 percent of decision area) and 2,792,000 acres (21 percent of decision area) of LWCs would be managed as ERMA and SRMA, respectively. This could affect opportunities for solitude and primitive and unconfined recreation due to higher concentrations of recreationists in those areas. These impacts are more likely to occur in SRMAs because they would attract more concentrated and targeted

recreation. Current management in the SMRAs includes semi primitive types of recreation and concentrated development nodes to concentrate use so risks to impacts for solitude and primitive and unconfined recreation are reduced in the current alternative.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

The development of ROWs and utility and transportation corridors could lead to a diminished appearance of naturalness and could bisect units with inventoried wilderness. In such cases, they would no longer be roadless areas[4] of adequate size, eliminating the wilderness characteristics for that unit. Timber production and vegetation management could decrease the availability of opportunities for solitude through increased human presence and machinery. It could also introduce localized ground disturbance and vegetation removal, resulting in a trammeled landscape and a diminished appearance of naturalness. The scale of areas inventoried in the decision area for wilderness character has very few locations that such activities would bisect or create disturbance that would penetrate the entirety of the unit.

Increased human presence from energy production and mineral development could also affect LWCs by reducing opportunities for solitude and primitive recreation. Fluid minerals production could lead to a loss of naturalness from infrastructure development and landscape alterations. Oil and gas production may create linear infrastructure, such as roads, pipelines, and utility corridors, which may bisect units so that they are no longer adequate and eliminating that unit's wilderness characteristics;[5] however, while some roads may detract from naturalness and reduce opportunities for solitude, they may directly or indirectly increase opportunities for primitive recreation.

Aside from the utility corridor, which is accessed via the Dalton Highway, most of the LWCs in the decision area receive little concentrated recreation. Such use off the Dalton Highway is for hunting, backpacking, and float boating. These tend to involve small groups that disperse across the landscape. The terrain and dispersion limit the impact on a primitive recreation experience. The potential for guided recreational groups could affect the primitive recreation experience; however, most of the guided recreation is confined to the developed recreation areas or winter dog-sled excursions.

Outside of the Dalton Highway, most human presence is village residents, in places where they are usually participating in subsistence activities, such as hunting, fishing, trapping, foraging, and harvesting timber for firewood or house building. Residents may access the surrounding areas by motorboat, OHVs (including snowmachines), and, less commonly, by dog team. While opportunities for solitude and primitive recreation could be affected by noise and human presence associated with subsistence activities, it is likely those impacts would be highly temporal and localized. In addition, the BLM considers several subsistence activities specified in ANILCA to be compatible with LWCs in Alaska, including use of public cabins and shelters,[6] snowmachine use with adequate snow cover,[7] airplane use and primitive landing areas,[8] motorboat use,[9] and building temporary structures for hunting, fishing, or trapping[10] (BLM 2016b).

[4]Roadless refers to the absence of roads that have been improved and maintained by mechanical means to ensure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road.
[5]Travel on ice roads, however, would not substantially modify the non-snow landscape and they are not considered roads for wilderness characteristics inventory (BLM Manual 6310 [BLM 2012b]).
[6]ANILCA 1315(c) and (d)
[7]ANILCA 811(b) and 1110(a)
[8]ANILCA 1110(a)
[9]ANILCA 811(b) and 1110(a)
[10]ANILCA 811(b) and 1110(a)

Vegetation management treatments, such as prescribed fire or herbicide treatments of invasive species, could affect LWCs over the short term. This could come about through a reduction in naturalness from vegetation removal, but it could maintain or improve naturalness over the long term. This could lead to an overall improvement of the landscape and long-term enhancement of naturalness.

Alternative B

Under Alternative B, LWCs would receive the most protections, as this is the one alternative with management to maintain wilderness characteristics as a priority over other uses. LWCs would be managed under three different tiers: 1) 7,642,000 acres of LWCs (57 percent of the decision area) would be managed to emphasize other resource values and multiple uses as a priority over maintaining those characteristics;[11] 2) 4,716,000 acres (35 percent of the decision area) would be managed to emphasize other multiple uses, while applying management restrictions to reduce impacts on wilderness characteristics;[12] and 3) 363,000 acres (2.7 percent of the decision area) would be managed to protect wilderness characteristics as a priority over other multiple uses (see **Table 3-17**).[13]

Where wilderness characteristics are not managed as a priority over other uses (57 percent of the decision area; 7,642,000 acres), naturalness and opportunities for solitude and primitive recreation could be lost as a result of resource management and land use allocations. Wilderness characteristics are likely to be diminished where they occur on or near sites for the following:

- Timber production, which can diminish the appearance of naturalness
- Recreation (front country and rural RMZs can affect opportunities for solitude or primitive and unconfined recreation)
- Mineral or energy development, which can diminish the appearance of naturalness
- ROWs and utility and transportation corridors, which can diminish the appearance of naturalness or, if access roads are authorized, could bisect units so that they are no longer considered to be in a roadless area of adequate size and would eliminate wilderness characteristics of the entire unit

However, some land use allocations could offer complementary protection of wilderness characteristics. Examples are ROW avoidance and exclusion areas, primitive, semi primitive and backcountry RMZs, closures to timber removal, withdrawals, eligible or suitable WSR segments, VRM Classes I and II, ACECs, and WSAs (see **Table 3-16**). Specifically, protection of ORVs along eligible or suitable river segments would indirectly protect the naturalness of LWCs where they overlap the WSR study corridor. VRM Classes I and II and ACECs would protect wilderness characteristics, as described under Alternative A.

Under Alternative B, outside of lands managed to emphasize the protection of LWCs as a priority, 2,048,000 acres (16 percent of the decision area) would be managed as ROW exclusion, thus prohibiting development and helping preserve wilderness characteristics in those areas; 1,097,000 acres would be on lands with management restrictions. Additionally, 5,258,000 acres (40 percent of the decision area) of lands not managed to protect wilderness characteristics as a priority would be managed as ROW avoidance. Access roads could

[11]This includes all LWCs, including the PLO 5150 corridor.
[12]This includes Galena Mountain, Hogatza River Tributaries, Huslia; Klikhtentotza Creek, Sethkokna River, Sulukna River, Tozitna, Toolik Lake, and Wheeler Creek Units; lands in the areas of PLO 5173; and lands in the area of PLO 5179 (CAMA lands outside of the WSA).
[13]This includes McQuesten Creek, Spooky Valley, Arms Lake, Redlands Lake, Ishtalinta Creek Hot Springs, Accomplishment Creek, Alatna River, and Upper Teedriinjik (Chandalar) River Units.

still be authorized in ROW avoidance areas. This could affect LWCs by potentially bisecting inventoried units, eliminating the wilderness characteristics for the entire unit.

Additional management restrictions outside of lands managed to protect wilderness characteristics as a priority, such as NSO for fluid mineral leasing, would limit the surface impacts on LWCs from fluid minerals development. On lands where wilderness characteristics are not managed as a priority, mining for mineral materials would be allowed on 3,697,000 acres 28 percent of the decision area). This would affect naturalness and opportunities for solitude on LWCs via increased human presence, noise, and odors associated with mineral materials mining; however, on 1,819,000 acres (14 percent of the decision area), management restrictions dictate that mineral materials pits be fewer than 5 acres of disturbance and require VRM mitigation and concurrent reclamation. This would limit the long-term impacts on naturalness from mining.

Locatable mineral entry that prioritizes protecting and maintaining LWCs would be managed on approximately 3,721,000 acres (29 percent of the decision area). Areas would be closed to development of mineral materials and fluid minerals. Additionally, these areas would be closed to commercial timber production and would prohibit non-subsistence collecting of live vegetation, except in existing ROWs. These acres are also recommended to be withdrawn from locatable mineral entry. This would emphasize the protection of wilderness characteristics by limiting impacts from mineral development on naturalness and opportunities for solitude and primitive recreation.

Under Alternative B, 10,000 acres (0.08 percent of the decision area) and 359,000 acres (2.8 percent of the decision area) of LWCs would be managed as ERMA and SRMA, respectively.[14] This management may affect opportunities for solitude and primitive and unconfined recreation, due to higher concentrations of recreationists in those areas, compared with the sparse recreation that happens in the balance of the planning area. Comparatively, RMA management under Alternative B would result in fewer impacts on LWCs than under Alternative A.

WSR suitability under this alternative would offer complementary interim protective management on LWCs along 125,000 acres next to river segments identified as wild. Specific protections and development limitations are described in **Section 3.4.2**; however, where WSRs are identified as recreational, opportunities for solitude and primitive recreation could be affected on 8,000 acres, due to increased presence and concentration of recreationists and increased development, which may parallel or cross the river.

Overall, compared with Alternative A, “Alternative B could maximize protection of LWCs through priority management and management restrictions. It could maximize protection of LWCs indirectly through VRM designation and WSR eligibility, ROW exclusion and avoidance, and minerals development prohibition.”

Alternative C1

Under Alternative C1, the BLM would identify specific LWCs and would apply management restrictions to maintain their natural qualities, while allowing other uses. LWCs would be prioritized in areas that are next to controlled surface uses or watersheds that drain into them. Management restrictions would be applied to the Alatna River and the CAMA WSA.

A total of 882,000 acres with wilderness characteristics (7 percent of decision area) would be protected through overlapping management restrictions for other resources. The remaining 11,839,000 acres with wilderness characteristics (89 percent of the decision area) would be managed to emphasize other multiple

[14]This includes 1,000 acres of ERMA with management restrictions and 9,000 acres of ERMA on lands managed to protect wilderness characteristics

uses. Emphasis of other multiple uses has the potential to diminish wilderness characteristics through loss of naturalness and reductions in solitude and opportunities for primitive recreation.

LWCs overlap various protective land use allocations and management decisions, including ROW avoidance areas (3,1984,000 acres [24 percent of the decision area]), ROW exclusion areas (6,000 acres [0.04 percent of the decision area]), VRM Classes I and II (a total of 2,784,000 acres [22 percent of the decision area]), and various OHV restrictions, as described in **Section 3.3.5**. These allocations could indirectly offer additional complementary protections, as described in *Impacts Common to All Action Alternatives.*

Overall, Alternative C1 would be relatively protective of LWCs, when compared with Alternative A. Protection would be offered through management restrictions and land use allocations, as described above.

Alternative C2 (Preferred Alternative)

Under Alternative C2, the BLM would not apply management restrictions to maintain the natural qualities of LWCs. LWCs would be managed similarly to how they would be managed under Alternative C1 but with an added emphasis on resource development. A total of 12,721,000 acres (96 percent of decision area) would be managed to emphasize other multiple uses. If these areas are developed, it could gradually diminish wilderness characteristics through loss of naturalness and reductions in solitude and opportunities for primitive recreation. Mineral development would be open on 12,502,000 acres (94 percent of the decision area).

A total of 63,000 acres (less than 1 percent of the decision area) with wilderness characteristics would be protected through overlapping management restrictions in the Toolik Lake ACEC. ROW avoidance areas (906,000 acres [7 percent of the decision area]), VRM Class II (102,000 acres [less than 1 percent of the decision area]), and various OHV restrictions could indirectly offer additional complementary protections, as described in *Impacts Common to All Action Alternatives.*

Overall, Alternative C2 would be slightly more protective of LWCs than Alternative A.

Alternative D

Under Alternative D, the BLM would identify LWCs, but would not manage the maintenance or improvement of those characteristics as a priority over other multiple uses. Similar to Alternative A, all 12,721,000 acres of inventoried LWCs (96 percent of the decision area) could experience impacts from management actions for other resources. For example, no VRM Classes I or II would be designated (VRM Classes III and IV would be designated on 1,810,000 acres and 10,911,000 acres, respectively [14 percent and 82 percent of the decision area, respectively]). Additionally, all PLO withdrawals (6,956,000 acres) would be revoked. Lands that would otherwise be protected by PLOs under Alternative A would be open to development under Alternative D, which could increase the likelihood of development impacts on LWCs, compared with Alternative A.

Alternative D would apply fewer seasonal OHV restrictions than Alternative A (3,106,000 fewer acres [98 percent decrease]), potentially decreasing opportunities for solitude during the summer in areas where OHV concentrations are high.

Similar to Alternative A, minerals development would be open on 12,721,000 acres (96 percent of decision area) under Alternative D.

Compared with Alternative A, Alternative D would be less protective of LWCs.

Conclusion

Opportunities for solitude and primitive recreation, as well as naturalness, could be affected in various ways through the management actions and land allocations analyzed above. The total acres of LWCs with the potential to be affected include all inventoried LWCs in the decision area (12,721,000 acres [96 percent of decision area]); however, a vast amount of these lands is highly remote and receives limited visitation or widespread development and, thus, the lands are not likely to be affected on a large scale.

Where development does take place, some LWCs could be affected, but it is unlikely that the development or associated access would bisect inventoried lands to fewer than 5,000 acres; therefore, it is likely that there would be some limited net loss of wilderness characteristics under all alternatives. The largest losses of wilderness characteristics would occur under Alternatives A and D, while Alternatives B, C1 and C2 would likely retain the most, with Alternative C1 being the most protective.

In general, LWCs are not likely to be affected under any alternative, regardless of how the lands are managed (e.g., to emphasize protection, with management restrictions, or to emphasize other multiple uses). Because nearly the entirety of the decision area contains wilderness characteristics and the demand for surface-disturbing opportunities is likely to remain low, impacts on LWCs would remain negligible for the foreseeable future.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

The area of analysis for cumulative impacts on LWCs is all lands in the planning area. Lands with wilderness character, though not designated, exist throughout most of the planning area, and those lands have the potential to be affected cumulatively by actions outlined in this document as well as others. The time frame for the cumulative effects analysis is the life of the RMP, which is likely several decades. LWCs could be cumulatively affected by past, present, and reasonably foreseeable projects, plans, and actions, including land use plans, RMPs, transportation and infrastructure, ROW and utility corridor development, mining, oil and gas development, tourism and recreation, research activities, and natural events. Cumulatively, impacts on wilderness characteristics are likely to be very low, and wilderness characteristics would persist on most lands in the decision area.

The effects of climate change described above could influence the rate or degree of the potential cumulative impacts.

3.3 RESOURCE USES

3.3.1 Forest and Woodland Products

Forest and woodland products are described within eight ecoregions. Forest and woodland products are limited by small-diameter logs, high defects in hardwoods, access limitations, infrastructure deficiencies, and long distances to significant markets. There has been essentially no demand for commercial timber harvest on BLM-managed lands in the planning area. Wildland fire has been identified as a major change agent in the planning area. Where wildland fire overlaps with populated areas and infrastructure, it has potential to be catastrophic. In other areas, it is generally viewed as necessary to maintain forest health. Overall, the forests in the planning area are in relatively good health with generally endemic levels of forest pests affecting the forest health. Additional information is available in Section 2.2.2, Forest and Woodland Products, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

Changes to the extent and availability of forest resources could occur as a result of climate change. The higher temperatures and drier conditions increase the risk of drought, wildland fire, and insect infestation. In recent decades, fire return intervals in the planning area have becoming shorter (Trammell et al. 2016). Fire return intervals are expected to continue to get shorter, however, at a lesser rate than recent decades because, even as temperatures are expected to increase, vegetation is expected to transition to a less flammable deciduous type under the now-shorter fire return intervals (Trammell et al. 2016). Warmer temperatures also are expected to increase the risk of insect damage to forests. This would lead to increased fuel loads near population and infrastructure areas where fire is suppressed. These factors combine to produce an increased risk of wildland fire that would reduce acres of forested areas available for timber harvest.

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to forest and woodland products and the analytical methods used in this analysis.

Impacts on forestry resources include those that would directly or indirectly limit the acres available to harvest. Limitations would occur from management decisions specifically imposing restrictions on timber removal or vegetation collection, as well as those imposing restrictions on surface-disturbing activities, which includes vegetation removal. Because of limited access to most forested areas in the planning area, current forestry product use is focused on areas near communities and associated infrastructure. Impacts on availability of forest resources would therefore be greatest when restrictions affecting harvest occur in these areas.

Areas where the BLM would expect the highest potential for impacts on forest resources to occur were determined by creating a 0.25-mile radius around Native allotments and 1 mile around populated places where harvest would be most likely to occur. A buffer was also applied around existing infrastructure where there is a forested resource, including 2.5 miles around Richardson Highway. This area is referred to as the forested WUI (see **Map 3.14**, **Appendix A**). In total, the BLM mapped 10,997 acres of forested vegetation within the forested WUI (see **Section 3.2.8** for additional information on the Forested WUI). Acres of resource restrictions that overlap that radius were calculated.

Comparative Summary Tables

Table 3-18 provides the acres of restrictions on forestry harvest in the forested WUI.

Table 3-18
Summary of Potential Impacts on Forest Harvest in the Forested WUI*

Resource	Action	A	B	C1	C2	D
Water	Prohibit timber harvest near waterbody	No similar action	100-foot buffer	66-foot buffer	50-foot buffer	Same as Alternative C2
	Prohibit surface-disturbing activities around lentic areas	No similar action	635 acres	Same as Alternative B	Same as Alternative B	No similar action
	Minimize surface-disturbing activities around lentic areas	No similar action	0 acres	635 acres	0 acres	No similar action
	Mitigation required for surface disturbing activities	No similar action	0 acres	0 acres	635 acres	No similar action
	Prohibit surface-disturbing activities around hot springs	No similar action	59 acres	No similar action	No similar action	No similar action
Soils	Prohibit surface disturbance on sensitive soils	No similar action	1,477 acres	No similar action	No similar action	No similar action
	Soil surveys required for surface disturbance greater than 5 acres	No similar action	Reduced forested acres available for timber harvest and vegetation removal		No similar action	No similar action
Wildlife	Restrictions in Dall sheep ACECs	9 acres	732 acres	No similar action	No similar action	No similar action
	Restrictions in DSHA	No similar action	No similar action	11 acres	No similar action	No similar action
	Restrictions around golden eagle nests	No similar action	Reduced forested acres available for timber harvest and vegetation removal			
LWCs	Designate LWCs	No similar action	8,069 acres	No similar action	No similar action	No similar action
WSRs	Wild segments closed to commercial timber harvest	No similar action	2,328 acres	No similar action	No similar action	No similar action
Vegetation	NNIS best management practices must be followed for all BLM-permitted activities	No similar action	Management requirements put in place to limit the introduction and spread of NNIS could increase the time and costs for forest project development but limit impacts on forest health from development in the long term.			

Resource	Action	A	B	C1	C2	D
Forestry	Prohibit tree cutting along roads	Reduced forested acres available for timber harvest and vegetation removal				
	Areas closed to commercial timber harvest	0 acres	2,747 acres	1,882 acres	0 acres	0 acres
	Prohibit timber harvest in ACECs	No similar action	6 acres	6 acres	0 acres	No similar action
Lands and Realty	Timber removal from ROW corridors**	Potential reduction in timber resources with timber removal for authorized ROWs; greatest potential in areas open to ROWs (13,043,000 aces)	Potential reduction in timber resources with timber removal for authorized ROWs; greatest potential in areas open to ROWs (5,593,000 aces)		Potential reduction in timber resources with timber removal for authorized ROWs; greatest potential in areas open to ROWs (9,874,000 aces)	Potential reduction in timber resources with timber removal for authorized ROWs; greatest potential in areas open to ROWs (12,137,000 aces)
	Designate additional utility corridors*	No similar action	Increased access to forestry resources from designation of Ambler transportation corridor		Increased access to forestry resources from designating Ambler and Dalton utility and transportation corridors	
Travel Management	Closed to OHV use in the summer	Use of vehicles greater than 1,500 pounds gross vehicle weight restricted to winter season	Reduced access on 10,997 acres (9,935 acres limited [summer OHV use limited to 1,500 pounds curb weight] and 1,043 acres closed to OHV use in summer)	Similar to Alternative A; summer OHV use is limited to 1,500 pounds curb weight.	Similar to Alternative A; summer OHV use is limited to those that are 1,500 pounds curb weight	Same as Alternative C1

Source: BLM GIS 2017
*Acres calculated are the acres with restrictions in forested WUI and not total acres of restrictions in the planning area.
**Acres for ROW corridors represent the portion of the planning area that does not contain ROW exclusion or avoidance restrictions. Actual acres impacted by ROW development would be determined by specific ROW approvals.

Alternative A

Under Alternative A, potential impacts on forestry would occur from management decisions that prohibit or restrict forestry. Timber harvest would not be restricted around any waterbody. Restrictions in the Nugget Creek ACEC would reduce areas available for timber harvest in less than 1 percent (9 acres) of the forested WUI. Restrictions in DSHA that prohibit vegetation removal would reduce areas available for timber harvest in less than 1 percent (11 acres) of the forested WUI.

Management decisions that prohibit tree cutting along roads would result in a reduction in areas available for timber harvest and removal; however, commercial harvest of timber resources in the utility corridor for salvage purposes would still be allowed. This would include clearing operations along ROWs or clearing fire-killed timber. Alternative A would have the largest number of acres open to ROW development in the planning area, without ROW exclusion or avoidance restrictions: 13,043,040. Timber harvest is permitted in authorized ROWs. As a result, ROW development could result in one-time availability of timber product but would remove the area from timber production in the long term.

Management decisions that restrict the vehicle weight would also restrict the ability to harvest forestry products.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Impacts from vegetation management decisions would be common across all action alternatives. Other land uses with the potential to impact forested vegetation, including mineral development and transportation corridor development, would occur under all alternatives. All action alternatives would include goals, objectives, and actions to limit the introduction and spread of NNIS to reduce their impacts on vegetation communities and SSS plants, compared with current management. This management could increase the time or costs for commercial timber operations to comply with this guidance. In the long term, these requirements would limit the impacts of development on forest health.

Alternative B

Management decisions that limit or prohibit timber harvest for the protection of other resources would be increased under Alternative B.

Under this alternative, restrictions would include limitations on surface-disturbing activities around waterbodies within the 100-year floodplain, which would decrease the forested acres available for timber harvest and vegetation removal. Restrictions that prohibit timber harvest around waterbodies (including lentic areas) within 100 feet of the 100-year floodplain would reduce areas available for timber harvest.

Restrictions that prohibit timber around lentic areas would also reduce areas available for timber harvest within the forested WUI. Additionally, any commercial harvest within the 100-year floodplain must demonstrated that it meets aquatic, riparian, and floodplain objectives. Notable exceptions, subject to the AO's discretion, are subsistence harvest, harvest within designated transportation and utility corridors, research harvest, fire and fuels management, and development and maintenance of federal administrative sites.

Management decisions that require soil surveys for surface-disturbing activities, or that restrict timber harvest on sensitive soils or in high value watersheds, would result in site-specific limits on the areas in which harvest could occur. Restrictions around sensitive soils would affect 31 percent (3,454 acres) of the forested WUI. Restrictions that would require soil surveys prior to surface-disturbing activities greater than 5 acres would reduce forested areas available for timber harvest.

Management decisions that establish Dall sheep ACECs could potentially restrict timber harvest. Restrictions around Dall sheep ACECs would reduce areas available for timber harvest over 7 percent (732 acres) of the forested WUI.

Designation of LWCs that prioritize those characteristics over other multiple uses could result in site-specific limits on timber harvest and vegetation collection. Restrictions within LWCs would decrease the area available for timber harvest and vegetation collection over 73 percent (8,069 acres) of the forested WUI. Similarly, designation of WSRs that prohibit commercial timber harvest would reduce the forested acres available for harvest. Restrictions within WSRs would decrease the area available for timber harvest over 21 percent (2,328 acres) of the forested WUI.

As under Alternative A, management decisions that prohibit tree cutting along roads would reduce the forested acres available for harvest. Compared with Alternative A, more acres would be unavailable for timber harvest along roads due to the 300-foot restriction. Unless specifically authorized, no green timber may be cut within 300 feet of a highway or public road. Areas closed to commercial harvest of forest products would decrease the area available for timber harvest over 25 percent (2,747 acres) of the forested WUI. Restrictions in the Sukakpak/Snowden Mountain ACECs would decrease the area available for timber harvest over less than 1 percent (6 acres) of the forested WUI.

Management decisions that designate additional utility corridors would increase access for forestry resources; they could increase the use of forest products as timber is removed to clear the ROW, and more forested areas become accessible. In particular, lands around the Ambler utility and transportation corridor are expected to experience increased use of forest products as public access increases. Alternative B would have 5,593,000 acres open to ROW development in the planning area, a 57 percent reduction from Alternative A. This would reduce the potential for one-time timber harvest in authorized ROWs, compared with Alternative A. but would decrease the impact on the long-term availability of timber resources.

Management decisions that restrict OHV use would occur over 100 percent of the forested WUI. By restricting the means by which users can access or remove forest products, the use of forest resources would decrease.

Alternative C1

Under this alternative, management decisions that limit or prohibit timber harvest for the protection of other resources would be increased compared with Alternative A.

The nature and type of impacts from management decisions around waterbodies, lentic areas, hot springs, or areas within the 100-year floodplain would be the same as those under Alternative B. The area of impact, however, would be limited to a 66-foot buffer around the waterbody. Notable exceptions, subject to the AO's discretion, are the same as those discussed under Alternative B. Around hot springs, minimizing surface-disturbing activities within the 160-acre area centered around hot springs would limit the availability of forest resources.

The nature of impacts on forestry resources around sensitive soils would be the same as discussed under Alternative A.

Under Alternative C1, management decisions for DSHA would reduce areas available for timber harvest by less than 1 percent (11 acres). While restrictions around golden eagle nests would be expected to reduce areas available for timber harvest, the location of golden eagle nests within the forested WUI was not available to quantify those impacts. Impacts on forestry from WSA designations would be the same as those under Alternative A.

Restrictions that would close areas to commercial timber harvest would reduce areas available for timber harvest. Under Alternative C1, approximately 17 percent (1,882 acres) of the forested WUI would be closed to commercial timber harvest. The harvest of special forest products for personal use would be allowed on all lands.

Lands and realty management decisions for land use authorizations under Alternative C1 would increase access to forestry resources along the Ambler utility and transportation corridor. Alternative C1 would have 9,784,000 acres open to ROW development in the planning area, a 25 percent reduction from Alternative A. This would reduce the potential for one-time timber harvest in authorized ROWs, compared with Alternative A, but would decrease the impact on the long-term availability of timber resources.

Management decisions that limit OHV use to existing routes would restrict the use of forest products over 100 percent of the forested WUI.

Alternative C2 (Preferred Alternative)

Under this alternative, management decisions that limit or prohibit timber harvest to protect other resources would be increased, compared with Alternative A.

Management decisions that prohibit timber harvest near waterbodies would be the same as under Alternative B but with a buffer of 50 feet. Restrictions around hot springs would be the same as under Alternative C1. Authorization for any surface-disturbing activity within 0.25 miles of lentic areas would not be minimized but would include mitigation actions.

The nature of impacts on forestry resources around sensitive soils would be the same as discussed under Alternative A. Under Alternative C2, management decisions for DSHA would be the same as discussed under Alternative A. Restrictions that would close areas to commercial timber harvest would reduce areas available for timber harvest. Under Alternative C2, there would be no acres of the forested WUI closed to commercial timber harvest. Lands and realty management decisions for land use authorizations under Alternative C2 would increase access to forestry resources along the Ambler utility and transportation corridor and the Dalton Utility Corridor. Similar to Alternative A, Alternative C2 would have 12,137,000 acres open to ROW development in the planning area (a 7 percent reduction from Alternative A). Impacts would be similar to Alternative A.

Management decisions that limit OHV use to existing routes would restrict the use of forest products over 100 percent of the forested WUI.

Alternative D

Under Alternative D, resources would be managed to facilitate resource development and as such, Alternative D presents the fewest restrictions to forestry.

Management decisions that prohibit timber harvest near waterbodies would be the same as under Alternative B but with a buffer of 50 feet. Under Alternative D, restrictions on timber harvest near waterbodies would be minimal and would support the greatest use of forest resources.

Lands and realty management decisions for land use authorizations may increase the amount of forest products created or temporarily available, as discussed under Alternative B. In particular, the designation of the Ambler utility and transportation corridor and the Dalton Utility Corridor would increase access to and use of forest products. Impacts of timber removal from ROW development would be as described under Alternative A.

Impacts from management decisions that limit OHV travel would be the same as those under Alternative C1.

Conclusion

Under all alternatives, impacts on forestry would be concentrated in the forested WUI, which comprises less than 1 percent (10,997 acres) of the total forested areas in the planning area (13,302,000 acres). As such, forest resources under all alternatives would remain relatively intact and undisturbed. Alternatives A and D would have the least impacts on forestry because management decisions would limit or prohibit forestry in the fewest areas. Impacts on forestry would be greatest under Alternative B where management decisions prioritize other resources over forestry. Under Alternatives C1 and C2, management decisions would balance resource development with resource protection; management decisions would limit or prohibit more forest uses than Alternative D but in fewer areas than Alternative B. Timber removal in authorized ROWs could reduce timber resources in the long term. The highest potential for timber resources from ROW development would occur under Alternatives A, C2, and D, and the lowest would occur under Alternative B.

Vegetation management would influence the health and availability of forest products. As management decisions for vegetation would be the same across all action alternatives, all impacts would be the same; however, without specific directions and actions for BLM-permitted activities, such as wildland fire, use of weed-free material, and casual use, Alternative A would be less effective at accomplishing the vegetation management goals and objectives. The largest disturbance factor for forestry is wildland fire. As management decisions for wildland fire would be the same across all alternatives, all impacts would also be the same.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

Demand for forest resources in the planning area has been relatively low due to factors including accessibility and the type of forest products available; it has been centered primarily around existing communities. Growth of communities and the application of biomass heating technology has led to a slightly increasing trend in the use of forest resources. Under Alternative A, the demand for forest resources would remain low but would continue to increase at a similar rate. Under Alternative B, prioritizing other resources over forest resources would reduce the use of forest resources. Proposed actions that would increase access to forestry resources would occur from the Ambler and Umiat utility and transportation corridor projects. Under Alternatives C1 and C2, the increase of restrictions relative to current conditions would decrease the demand for forest resources. Under Alternative D, restrictions on use of forest resources would be similar to current conditions, and the trends in use of forest resources would increase at a similar or slightly higher rate as that under Alternative A.

The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts.

3.3.2 Lands and Realty and Utility Corridor

Most BLM-managed lands in the planning area are in rural and remote areas away from developed communities and settlements, without road access. Most of the BLM-managed lands in the planning area are withdrawn, pursuant to ANCSA 17(d)(1), the Trans-Alaska Pipeline Authorization Act, or other federal law.

The ANCSA 17(d)(1) withdrawals provided for Native corporation selections. While these entitlements have been filled, the conveyance of the selections is ongoing and is not complete at this time. The John D. Dingell Act of 2019 establishes additional lands to be made available for selection as land allotments by Alaska Native Vietnam-era veterans. Additionally, the State of Alaska has lands selected under its entitlement act.

Approximately 5,856,000 acres of BLM-managed land in the planning area is currently selected by either the State of Alaska (5,219,000 acres) or Native corporations (638,000 acres).

Land status changes and demand for the use of public lands is likely to increase as the population in and adjacent to the planning area increases. In particular, it is expected that lands around the Dalton Highway will experience the largest increase in public use. Additional information is available in Section 2.2.3, Lands and Realty, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

In 1971, PLO 5150 withdrew lands for a utility and transportation corridor in aid of programs for the US Government and the State of Alaska. PLO 5150, which covers approximately 2.1 million acres, is withdrawn from all forms of appropriation under the public land laws except for location for metalliferous minerals under the mining laws; withdrawn from leasing under the mineral leasing laws; and withdrawn from selection by the State of Alaska and Native corporations. See **Section 3.1.1** for a full description of the lands reserved under PLO 5150.

As explained in **Section 3.1.1**, ANILCA Section 906(e) allows the State of Alaska to top-file BLM-managed lands that are withdrawn or otherwise not currently available for selection. In the decision area, the State has top-filed a total of 2,717,000 acres of BLM-managed lands under multiple PLOs. Approximately 2,066,000 acres in PLO 5150 are top-filed. Of these, 1,326,000 acres are in the outer corridor and 740,000 acres are in the inner corridor.

Including PLO 5150, 43 percent of the top-filed lands in the planning area are identified by the State of Alaska as Priority 1 for conveyance to the State of Alaska, meaning they would likely be conveyed within 10 years. These parcels would become selections only if the Secretary of the Interior approves the revocation of the pertinent PLOs, including PLO 5150. (For a more detailed description of lands without ANCSA or State of Alaska selections, see **Section 3.1.1**.)

The Dalton Highway, managed by the State of Alaska, bisects PLO 5150. Uses within the corridor include the TAPS, communication utility lines, placer mining, recreation and tourism, transportation, and subsistence uses. These activities occur primarily within the 743,000 acres of the inner corridor of PLO 5150. Additional information is available in Section 2.2.8, Utility Corridor, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

Changes to the landscape as a result of climate change would not affect the landownership or designations of utility corridors in the decision area.

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to lands and realty and the utility corridor, and the analytical methods used in this analysis. The effects of climate change described above, would not influence the management actions described in the section below.

Comparative Summary Tables

Table 3-19 provides the lands and realty actions by alternative.

Table 3-19
Lands and Realty Actions by Alternative

Management Action	Alternative (acres)				
	A	B	C1	C2	D
ROW exclusion areas	259,000	2,349,000	265,000	259,000	259,000
ROW avoidance areas	0	5,360,000	3,253,000	906,000	0
Open to ROW location	13,043,000	5,593,000	9,784,000	12,137,000	13,043,000
Lands that meet the criteria available for disposal	0	193,600	193,600	0	0
Dalton Utility Corridor	0	0	0	743,300	743,300
Ambler Road utility and transportation corridor	0	65,000	65,000	65,000	65,000
Umiat utility and transportation corridor	0	268,000	268,000	268,000	268,000
ANCSA 17 (d)1 PLO withdrawal	5,253,000	0	0	0	0
PLO 5150 revoke	0	1,395,000	1,395,000	2,138,000	2,138,000
PLO 5150 retain	2,138,000	743,000	743,000	0	0

Source: BLM GIS 2017

Alternative A

Under Alternative A, current lands and realty and the utility corridor management designations would persist. There would be no lands that meet the criteria identified for disposal, and the BLM would maintain all seven ANCSA 17(d)(I) withdrawals covering 5,253,000 acres (BLM GIS 2017) (see **Table 3-19**). PLO 5150 would maintain its status as a utility and transportation corridor withdrawal.

Access corridors would be open to facilitate the Ambler Mining District Transportation Corridor. No lands would be designated as ROW avoidance areas. There would be 259,000 acres (1.9 percent of the decision area) at the CAMA WSA designated as ROW exclusion areas. The remaining 13,043,000 acres (98.1 percent of the decision area) would be open to ROW location. Acreage open to ROW location would face limited conflicts with other resources uses. ROWs on sensitive soils would not require any special considerations.

Development node designations would encourage industrial and economic development in the region. They would provide greater certainty on collocated infrastructure and industrial development, while also identifying areas with a higher potential for land transfers. ROW grants could increase near identified development nodes. While development nodes encourage collocation of development, the BLM could still authorize activities outside these zones.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Under all action alternatives, BLM land tenure actions would be carried out to further the programs of the Secretary of the Interior. Lands transferred out of federal ownership would no longer be available for public uses as identified in the FLPMA. Prioritizing acquisition and retention of public lands in the remaining acres would preserve and enhance opportunities for the use of public lands. The BLM would consider land tenure actions on a case-by-case basis to determine whether they would be in the public interest consistent with the FLPMA. These actions would improve public access and the BLM's ability to manage public lands.

Maintaining Department of Defense withdrawn lands (1,307,000 acres) would continue to allow the Department of Defense to carry out defined actions on those lands. Withdrawn lands would continue to be unavailable for other public uses.

The recommendation to revoke all seven ANCSA 17(d)(1) withdrawals would allow for the opening of lands to mineral leasing, location, entry, and other forms of appropriation under public laws, as applicable. These withdrawals have been modified many times and many are already open to location or entry and selection. Effects relative to lands open for mineral entry can be found in the discussion of energy and minerals (see **Section 3.3.3**). Of the 605,000 acres of land top-filed by the State of Alaska would become valid State selections upon the revocation of the withdrawals, 203,000 acres are labeled as Priority 1 and would be Priority 1 selections if the corresponding withdrawal were revoked.

The action alternatives recommend a partial or full revocation of PLO 5150, detailed in each alternative. The lands in the area commonly referred to as the outer corridor have not been used for and are not projected to contain utility or transportation infrastructure. The portion known as the inner corridor does contain utility and transportation infrastructure and is anticipated to continue be managed for these uses. The alternatives explore the difference between retaining the withdrawal for this purpose or removing the withdrawal and replacing with an administrative designation for the same type of management.

The revocation would allow for State of Alaska top-filed lands to become selections once the Secretary of the Interior revokes the PLO per ANILCA 906(e), contributing to the fulfillment of the State of Alaska's conveyance allotment of public lands under the Alaska Statehood Act. This increases the acres of encumbered lands under all action alternatives. Because these lands would become valid State selections under all action alternatives, they would be segregated from new federal mineral entry and become unavailable for federal priority subsistence activities under Title VIII of ANILCA. There is no established timeline for conveying or relinquishing selections; however, the BLM believes it is likely that the State of Alaska would pursue the Priority 1 selections in the planning area for conveyance within 10 years of the ROD being signed.

New fluid and locatable mineral development under the action alternatives would result in the potential for new ROWs in the decision area to support that development. The demand would be associated with any new mineral activity in the acres managed as open to fluid mineral leasing and locatable mineral development; however, the potential demand for new ROWs would be reduced in acres closed to fluid mineral leasing, as well as those acres segregated from locatable mineral development or withdrawn from locatable mineral development.

Alternative B

The nature and types of impacts associated with land tenure adjustments under Alternative B would be the same as those described under *Impacts Common to All Action Alternatives*.

The recommendation to partially revoke PLO 5150 also would allow for 1,326,000 acres of lands in the outer corridor top-filed by the State of Alaska to attach as valid selections, 34 percent of which are identified as Priority 1 for conveyance by the State. The remaining 880,000 acres of Priority 2 or lower lands are expected to remain selected through the life of the plan or until the selections are relinquished or rejected.

Selected lands are unavailable for federal priority subsistence activities conducted under Title VIII of ANILCA. Priority 1 selections are expected to be conveyed within 10 years of the ROD being signed. The conveyance of such lands could also fragment federal landownership.

Land status changes may affect snowmachine access for federally qualified subsistence users in lands encumbered by selections or conveyed where access is impacted by AS 19.40.210 within 5 miles of the Dalton Highway or cross the area affected by AS 19.40.210. The BLM would maintain 743,000 acres of lands in the inner corridor of PLO 5150 for management as a utility and transportation corridor. Revocation of outer corridor of PLO 5150 would also contribute to the fulfillment of the State of Alaska's conveyance allotment of public lands under the Alaska Statehood Act.

The portion of PLO 5150 that is proposed to be revoked under Alternative B is open to mineral entry. The effect of the attachment of State of Alaska selection encumbers these lands and segregates them from new mineral entry. This segregation would continue until conveyance to the State of Alaska or until the State relinquishes its claims.

Management of the 5-mile Ambler utility and transportation corridor (65,000 acres) and Umiat utility and transportation corridor (268,000 acres) would encourage, but not require, the collocation of future infrastructure. Compared with Alternative A, this would increase the potential for future infrastructure to be located in the corridors.

Compared with Alternative A, development node designations would improve the alignment of development node locations with observed patterns of demand.

Alternative B would result in 2,090,000 more acres of ROW exclusion areas than Alternative A, which would reduce the amount of land in the decision area that would be available for new ROW development. Designating an additional 5,360,000 acres as ROW avoidance, which is 5,360,000 more acres than under Alternative A, would discourage widespread ROW development for new ROWs. It would allow the BLM to review ROW applications in these areas to encourage collocation or avoidance mitigation for specific resources and may impact ROW locations. The potential for additional limitations on ROW siting and design in areas with sensitive soils would further limit opportunities for new ROW development compared with Alternative A. Overall, Alternative B would reduce the portion of the decision area that would be open to ROW entry with standard mitigations from 98.1 percent to 42.0 percent.

The potential for new ROWs associated with new fluid mineral leasing would be greater than it would be under Alternative A because there would be 3,232,000 more acres managed as open to fluid mineral leasing. Managing 4,116,000 more acres as open to locatable mineral development would also increase the potential demand for new ROWs compared with Alternative A.

Alternative C1

The nature and types of impacts associated with land tenure under Alternative C1 would be the same as those described under *Impacts Common to All Action Alternatives*.

Impacts on lands and realty from the partial revocation of PLO 5150 and designation of utility corridors would be the same as those under Alternative B.

Compared with Alternative A, development node designations would improve the alignment of development node locations with observed patterns of demand. Alternative C1 would encourage economic and infrastructure development at Yukon Crossing, Kanuti/Old Man, Chapman, Prospect, Dietrich, and Chandalar Shelf. Industrial development may increase the potential for ROWs near these development nodes.

Alternative C1 would result in 6,000 more acres of ROW exclusion areas than Alternative A, which would reduce the amount of land in the decision area that would be available for new ROW development.

Designating 3,253,000 more acres as ROW avoidance than Alternative A would discourage widespread ROW development for new ROWs. It would allow the BLM to review ROW applications in these areas. This would encourage collocation or avoidance mitigation for specific resources and may impact ROW locations. The potential for additional limitations on ROW siting and design in areas with sensitive soils would have the same impacts as those under Alternative B.

The potential for new ROWs associated with new fluid mineral leasing would be greater than it would be under Alternative A because there would be 6,622,000 more acres managed as open to fluid mineral leasing. Managing 5,421,000 more acres as open to locatable mineral development would also increase the potential demand for new ROWs compared with Alternative A.

Alternative C2 (Preferred Alternative)

The nature and types of impacts associated with land tenure under Alternative C2 would be the same as those described under *Impacts Common to All Action Alternatives*.

Alternative C2 proposes a full revocation of PLO 5150 (2,138,000 acres) and an administrative designation of 743,000 acres as the Dalton Utility and Transportation Corridor for management as a utility and transportation corridor. This area contains the Trans-Alaska Pipeline and multiple gas, utility, and fiber-optic line ROWs. Similar to Alternatives B and C1, revoking the PLO would also revoke the withdrawal, and the State of Alaska top-filings would attach as selections. Under Alternative C2 this action would result in additional 2,066,000 acres of selected lands.

The revocation of the PLO would open 743,000 acres commonly known as the inner corridor to mineral entry. The 2,066,000 acres of selected lands would be segregated from new mineral entry, per 43 CFR 2627.4(b), until the land is conveyed or the selection is relinquished or rejected.

Under Alternative C2, 1,180,000 acres of the top-filed lands are Priority 1 selections and would likely be conveyed within 10 years of the revocation of the PLOs. Of these Priority 1 lands, 503,000 acres would be in the area proposed as the Dalton Utility and Transportation Corridor. Lands not selected would be open to mineral entry, as would any lands in which the selected status is relinquished or rejected.

Management for utility and transportation uses in the Dalton Utility and Transportation Corridor would continue; however, the effects from the full revocation of PLO 5150 would include fragmentation of federal landownership, particularly along the Trans-Alaska Pipeline and existing infrastructure.

ROWs could still be granted in the remaining selected lands; however, they would require concurrence from the State of Alaska, per ANILCA 906 (k), on State-selected lands. The indirect effects of segregations to priority federal subsistence and the current State of Alaska restrictions on the use of OHVs, including snowmachines, per AS 19.40.20, would restrict access for residents for federal subsistence harvest.

Revocation of PLO 5150 under this alternative would make lands currently withdrawn under this PLO available for State selection, contributing to the fulfillment of the State of Alaska's conveyance allotment of public lands under the Alaska Statehood Act.

Alternative C2 would not designate any development nodes. There would be no administrative framework in place to encourage economic development toward predetermined centers. Compared with Alternative A, new development would be more likely to be dispersed across the landscape rather than concentrated at nodes.

The potential for new ROWs associated with new fluid mineral leasing would be greater than it would be under Alternative A. This is because there would be 7,936,000 more acres managed as open to fluid mineral leasing. Managing 6,320,000 more acres as open to locatable mineral development would also increase the potential demand for new ROWs, compared with Alternative A.

Alternative D

The nature and types of impacts associated with land tenure under Alternative D would be the same as those described under *Impacts Common to All Action Alternatives*.

Impacts from the designation of ROW avoidance and exclusion areas would be the same as those under Alternative A.

The recommendation to fully revoke PLO 5150 and the designation of the Ambler and Umiat utility and transportation corridors would result in the same impacts as those under Alternative C2.

Alternative D would not designate any development nodes. There would be no administrative framework in place to encourage economic development toward predetermined centers. Compared with Alternative D, new development would be more likely to be dispersed across the landscape rather than concentrated at nodes.

The potential for new ROWs associated with new fluid mineral leasing would be greater than it would be under Alternative A because there would be 7,936,000 more acres managed as open to fluid mineral leasing. Managing 6,320,000 more acres as open to locatable mineral development and 458,000 fewer acres as recommended for withdrawal from locatable mineral development would also increase the potential demand for new ROWs compared with Alternative A.

Conclusion

All action alternatives designate the Ambler and Umiat utility and transportation corridors, with Alternatives C2 and D also designating the Dalton Utility Corridor. Utility corridor designations range from 2.5 percent to 8.1 percent of the decision area across the action alternatives. Land status would change across all action alternatives with the revocation of the ANCSA 17(d) withdrawals, partial and full revocations of PLO 5150, and the attachment of State of Alaska selection for top-filed lands. Additionally, up to 1,180,000 acres of Priority 1 lands are anticipated to be conveyed to the State as a result of the revocation of PLO 5150. This would result in further land management changes within the Dalton Utility Corridor, which accounts for approximately 16 percent of the planning area and is the primary area for land use activity.

Compared with Alternative A, the demand for new ROWs from mineral activity would be the least under Alternative B. This is because there would be the fewest acres managed as open to fluid mineral leasing and open to locatable mineral development. Alternative B also would result in the most acres of ROW avoidance and exclusion areas. With the least demand and greatest number of restrictions on ROWs, the likelihood of new ROWs would be the least under Alternative B. Conversely, Alternatives C2 and D would manage the most areas as open to fluid mineral leasing and open to locatable mineral development, which would result in the most demand for new ROWs. Under Alternatives A and D, designating approximately 98 percent of the decision area as ROW open areas would enable the BLM to accommodate the potential demand for new ROWs.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis. Past, present, and RFFAs that would cumulatively affect lands and realty would be the result of activities both within and outside the planning area

that would increase or decrease the demand for land use authorizations or the BLM's ability to accommodate new land use authorizations. Cumulative impacts also would be the result of past, present, and reasonably foreseeable actions that would prompt the BLM to consider a land tenure action or modification to a land withdrawal. The transition from federal to State regulatory regimes for locatable, salable, and leasable minerals could have impacts on access to mineral resources as well as other resources on the lands that could be impacted by development of such minerals.

The BLM is aware of and has authorized new ROWs and communication site leases in the decision area, including those associated with the Ambler Road ROW, AKLNG pipeline, Bettles Road, ASTAR, Alaska Intertie Project, and Terra Nova projects. These projects would likely require additional ROWs. While none of the alternatives would restrict or remove valid existing rights, ROW avoidance and exclusion area designations could modify the locations where new ROWs associated with these and other projects could occur. The potential for these impacts would be greatest under Alternative B because it would have the largest number of ROW avoidance and exclusion areas.

The recommendation to partially revoke PLO 5150 under Alternatives B and C1, the recommendation to fully revoke PLO 5150 under Alternatives C2 and D, and the indirect effects of the attachment of State of Alaska selections to 2,066,000 acres, would cumulatively affect land status and federal landownership, lands available for mineral entry and access to existing claims, ROW permitting, and casual and subsistence access in the only road-accessible area of the planning area.

Revocation of the ANCSA 17(d)(1) withdrawals would open lands to mineral leasing and entry where not already available through amendments the PLOs. Revocation may also result in an increase access to high priority mineral lands adding to the lands available within the State of Alaska for resource development within the life of the plan. Existing and proposed locatable and fluid mineral activities identified in **Table M-1** in **Appendix M** would cumulatively affect lands and realty by creating a demand for land use authorizations, such as roads, communication sites, power lines, and pipelines that are ancillary to the mineral activity. Alternatives A, C1, C2, and D would provide more opportunities for expanded mineral development than Alternative B, with associated cumulative impacts on lands and realty.

Past, present, and reasonably foreseeable infrastructure improvements and community development activities could lead to new ROW applications or land tenure considerations. Development node designations under Alternatives B, C1, and C2 would improve the alignment of development node locations with observed patterns of current and anticipated demand. These nodes would provide greater certainty as to the likely locations of future lands and realty actions.

3.3.3 Energy and Minerals

The solid leasable minerals in the planning area are coal, oil shale, and native asphalt; the fluid leasable minerals are oil, gas, coalbed natural gas, and geothermal resources, and mineral materials are sand and gravel. A leasable mineral occurrence and development potential report and a locatable and mineral materials occurrence and development potential report have been developed for the Central Yukon Planning Area and are available on the project planning website.

There are oil reserves accessible in the northern portions of the planning area, next to the National Petroleum Reserve Alaska. Coalbed gas, natural gas, and coal have a low development potential, largely due to difficulty of access and small deposit sizes; coal resources are sub-bituminous or lignite rank and have generated little interest (see **Appendix N** for more information on coal reserves). The only area of coalbed gas exploration in

the planning area is on private mineral estate in the southern portion. Coal deposits on BLM-managed land are not near the current development.

Locatable minerals, such as gold, silver, and lead, are also widely distributed in the planning area. Gold prices plateau, copper and rare earth elements are becoming more important economically. The forecasted demand for locatable minerals is expected to remain largely the same as current levels. Additional information is available in Section 2.2.4, Energy and Minerals, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Direct and Indirect Impacts

The BLM considered a quantitative impact assessment of fluid leasable minerals nonessential and eliminated it from detailed analysis. Fluid mineral potential in most of the planning area is very low to low. As detailed in the RFD scenario (see **Appendix N**), areas of fluid mineral potential are limited to a few locations in the planning area, and no development is expected on BLM-managed surface or mineral estate during the life of the RMP. There is production in the northern part of the planning area near Prudhoe Bay on State lands and exploratory drilling in one location near the town of Nenana on Native corporation lands. Fluid leasable minerals were not raised during the public scoping process.

Also, the BLM considered a quantitative impact assessment of nonenergy solid leasables not essential and eliminated it from detailed analysis. No development of nonenergy solid leasables is anticipated in the planning area. As discussed in the RFD scenario (see **Appendix N**), no significant deposits of nonenergy solid leasables have been identified within a reasonable distance of roads or other transportation corridors. Global demand for nonenergy solid leasables is well supplied by sources outside the planning area, and local market demand is very low to nonexistent. Nonenergy solid leasables were not raised during the public scoping process.

See **Appendix M** for the analytical issues related to energy and minerals (excluding fluid leasable minerals and nonenergy solid leasables) and the analytical methods used in this analysis.

Comparative Summary Tables

Table 3-20 and **Table 3-21** summarize the locatable minerals and mineral materials acres by alternative.

Alternative A

Under Alternative A current management would continue, and 4,670,000 acres would remain withdrawn from locatable mineral entry, per ANCSA 17(d)(1) withdrawals and PLO 5150 (Dalton Utility Corridor), and 458,000 acres would remain recommended for withdrawal from mineral entry (see **Table 3-20** and **Table 3-21**). There would be 6,763,000 acres open for locatable mineral entry, 174,000 acres of which are classified as high potential. There would be 1,182,000 acres that would remain open to location of metalliferous minerals and closed to location of nonmetalliferous metals (PLO 5180, PLO 5186). There would be 3,305,000 acres of land open to locatable minerals that would be segregated under this alternative (see **Table 3-20**).

Locatable mineral development is expected to continue at approximately the same rate, unless there are drastic changes in metals prices.

Mineral material development is expected to continue as needed to supply road maintenance and construction needs. Major projects that may occur in the future, such as the AKLNG pipeline, the Alaska Stand Alone Pipeline Project, and the Ambler Road project, would require additional mineral materials and the opening of new mineral material pits.

Table 3-20
Summary of Locatable Minerals Acreages

Locatable Minerals	Alternative A	Alternative B	Alternative C1	Alternative C2	Alternative D
Withdrawn from locatable mineral entry	4,670,000	743,000	743,000	0	0
Withdrawn but open to metalliferous*	1,182,000	0	0	0	0
Recommended for withdrawal from locatable mineral entry	458,000	1,461,000	156,000	0	0
Open to locatable mineral entry	6,763,000	10,879,000	12,184,000	13,083,000	13,083,000
Open, State, or Native-selection, segregated**	3,305,000	7,222,000	7,222,000	7,965,000	7,965,000
Priority 1 selections	193,000	1,403,000	1,403,000	1,910,000	1,910,000
Priority 2–4 selections	3,061,000	6,336,000	6,336,000	6,571,000	6,571,000

Source: BLM GIS 2017
*Acreage open to metalliferous mining only was considered open because most or all mining in the planning area is expected to be metalliferous mining.
**Some areas are both State- and Native selected. The calculations used in the alternatives and the open, State, or Native-selection, would not count the overlap. The totals of Priority 1 and Priority 2–4 selections do include the overlap; therefore, the totals of Priority 1 and Priority 2–4 selections above are greater than the totals.

Table 3-21
Summary of Mineral Materials Acreages

Mineral Material Disposal	Alternative A	Alternative B	Alternative C1	Alternative C2	Alternative D
Closed to mineral material disposal	266,000	5,041,000	1,465,000	1,004,000	259,000
Open to mineral material disposal	12,817,000	8,042,000	11,618,000	12,079,000	12,824,000

Source: BLM GIS 2017

Under this alternative, the BLM would continue to manage 266,000 acres out of a total of 13,083,000 acres as closed to mineral material disposal. 12,817,000 acres in the planning area would remain open to mineral material disposal.

While fluid mineral potential in most of the planning area is very low to low, under Alternative A, 4,888,000 acres, out of 13,083,000 total acres, would be open to fluid mineral leasing.

Under Alternative A, 4,901,000 acres would be open to nonenergy solid mineral leasing.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Selected lands are segregated from locatable mineral entry and location, per 43 CFR 2627.4(b). Selection would increase the amount of lands immediately unavailable for mineral entry and location until the time of conveyance or until the selections are relinquished or rejected. Priority 1 selections are anticipated to be conveyed to the State of Alaska within 10 years, and those lands would be administered under State of Alaska statutes and regulations for mineral entry if the State choses to keep those lands open. For selected lands with a Priority 2 or lower, the BLM's actions to open lands currently selected would apply when the selection is relinquished or rejected.

PLOs 5180 and 5186 would be recommended for revocation under all action alternatives, these PLOs stipulate areas where the location of metalliferous minerals is permitted but location on nonmetalliferous metals is no

longer permitted. This would remove the ban of nonmetalliferous locatable mineral entry on approximately 1,182,000 acres and would allow the BLM to make decisions to allow development on these lands.

Under all action alternatives, new requirements would be introduced to reduce the impacts of locatable mineral exploration and development on the environment. Operators would be required to submit and follow mining and reclamation plans that comply with laws, regulations, and BLM policy. These requirements could add complexity and discourage small operators attempting to open new locations, but they could also provide regularity certainty. See **Section 2.7** for more details on exact requirements and stipulations.

Under all action alternatives, mineral material development is expected to continue as needed to supply road maintenance needs. Potential major future projects, such as the AKLNG pipeline, the Alaska Stand Alone Pipeline Project, and the Ambler Road project, would require additional mineral materials and the opening of new mineral material pits. Due to the low value of mineral materials, they can only be economically transported about 10 miles before it becomes less expensive to create a new pit. Mineral material development in the decision area is restricted by local needs and transportation costs, not occurrence, so levels and locations of development are not expected to vary by alternative.

Operators would be required to justify why a new site is needed and to use existing sites if possible. Operators would be required to comply with published reclamation standards (see **Section 2.7** for more detail) to maintain functionality of nearby soils, vegetation, wetlands, riparian areas, and fisheries. These steps could increase the costs of mineral material mining but are unlikely to affect development of mineral material resources.

Alternative B

Under Alternative B, the area withdrawn from locatable mineral entry would be reduced from 4,670,000 acres under Alternative A to 743,000 acres of the inner PLO 5150; 1,461,000 acres would be recommended for withdrawal. The revocation of PLOs that apply under Alternative B would allow for top-filed lands to become valid selections, per ANILCA 906(e), which would increase selections by 3,917,000 acres in the planning area. The area of increase is open to locatable mineral entry under Alternative A but now segregated from new claims until the selections are conveyed, rejected, or relinquished.

Lands recommended for withdrawal under Alternative B are valid only on lands that are not selected by the State. Of the total 10,879,000 acres open for locatable mineral entry, 224,000 acres are classified as high mineral potential under this alternative. Of these, 223,000 acres would be segregated from new mineral entry due to their selected land status, per 43 CFR 2627.4(b). This would leave 1,000 acres of high mineral potential that would not be selected. Of the selected lands, 1,403,000 acres are identified as Priority 1 and are likely to be conveyed to the State of Alaska. they would leave federal management within 10 years and would be managed under the State of Alaska's laws and regulations. Priority 2 through 4 selections could remain over the life of the plan or until the selections are relinquished or rejected, at which point the lands would be available to mineral entry.

Under this alternative, the BLM would manage 5,041,000 acres out of a total of 13,083,000 acres as closed to mineral material disposal; 8,042,000 acres would be open to mineral material disposal. This alternative would result in an increase in areas closed to mineral material development, compared with Alternative A. Mineral material pit locations are expected to shift off BLM-managed lands in some areas, due to these closures; however, overall demand would not change.

While fluid mineral potential in most of the planning area is very low to low, under Alternative B 8,120,000 acres, out of 13,083,000 total acres, would be open to fluid mineral leasing.

Under Alternative B, 7,249,000 acres would be open to nonenergy solid mineral leasing.

Alternative C1

Under Alternative C1, the area withdrawn from locatable mineral entry would be reduced from 4,670,000 acres under Alternative A to 743,000 acres; 156,000 acres would be recommended for withdrawal. Such recommendations are valid only on lands that are not selected by the State and on the remaining BLM-managed lands following conveyance. Of the total 12,184,000 acres open for locatable mineral entry, 227,000 acres are classified as high potential under this alternative; 7,222,000 acres of land open to locatable minerals would be segregated from new mineral entry due to their selected land status, per 43 CFR 2627.4(b).

Under this alternative, the BLM would manage 1,465,000 acres out of a total of 13,083,000 acres as closed to mineral material disposal. This alternative would increase the area closed to mineral material development, compared with Alternative A. mineral material pit locations are expected to change in some areas, due to these closures; however, overall demand would not change.

Alternative C2 (Preferred Alternative)

Under Alternative C2, there would be 0 acres recommended for locatable mineral withdrawal, and 268,000 acres classified as high potential. Of the 13,083,000 acres open to locatable mineral entry, 7,965,000 are selected lands and are segregated from new mineral entry, per 43 CFR 2627.4(b), until the selected lands are conveyed or the selection is relinquished or rejected. Under Alternative C2, the selected lands would increase by 4,660,000 acres over Alternative A.

Of the total 13,083,000 acres open for locatable mineral entry under Alternative C2, 268,000 are classified as high mineral potential. Of these acres, 264,000 would be segregated from new mineral entry due to their selected land status, per 43 CFR 2627.4(b). This would leave 4,000 acres of high mineral potential that would not be selected. Of the selected lands, 1,910,000 acres are identified as Priority 1 and are likely to be conveyed to the State of Alaska. They would leave federal management within 10 years and would be managed under the State of Alaska's laws and regulations. Priority 2 through 4 selections could remain over the life of the plan or until the selections are relinquished or rejected, at which point the lands would be available to mineral entry.

The inner corridor has not been open for the location of new mining claims since PLO 5150 was established in 1971. Since this time, the price of gold has increased significantly. Given the proximity of these lands to the Dalton Highway and the relative high value of gold since these lands were last open to mineral development, the revocation of PLO 5150 would provide an economic development opportunity that has yet to be explored in the current market context. Because the lands in the inner corridor are top-filed by the State of Alaska, upon revocation of PLO 5150, these lands would automatically become State selected. In this status they would remain segregated from federal mineral entry until they are conveyed or the selection is relinquished or rejected.

In order for these lands to become available for federal mineral entry, the State of Alaska would have to relinquish, or the BLM would have to reject, their selections. This would remove the encumbrance, resulting in unencumbered lands managed by the BLM and now open to locatable mineral entry. If PLO 5150 is revoked, it is expected to take at least 10 years for resolution on State Priority 1 selections and is expected to be handled in multiple conveyance actions. The potential economic impacts associated with filing new federal

claims and accessing locatable minerals on these lands would occur gradually over a number of years or possibly decades after the revocation of PLO 5150.

There are 80 active mining claims in the inner corridor that encompass 1,772 acres. Revoking PLO 5150 would eliminate the need for a mineral validity examination before the existing claims may be developed, pursuant to 43 CFR 3809.100. Validity examinations, where claim owners had to prove their claim contains enough quantity and grade of material to be profitable, both at the time of the claim and in 1971 when PLO 5150 was established. In 1971, the land lacked both the benefit of the access provided by the Dalton Highway and the benefit of a free market gold price. The difficulty of proving profitability in 1971 is a major factor in preventing the development of claims in the inner corridor. And though these lands have been accessible for over 40 years since construction of the Dalton Highway, the BLM has experienced little interest in mine development on these lands during that time.

While Alternative C2 would provide for more potential economic development opportunities in the inner corridor related to mining than would Alternatives A, B, or C1, these development opportunities would be constrained to exploration and operations in existing claims until State selections are relinquished or rejected on other lands.

Under Alternative C2, the BLM would manage 1,004,000 acres, out of a total of 13,083,000 acres, as closed to mineral material disposal; 12,079,000 acres would be open to mineral material disposal. This alternative would increase the area closed to mineral material development, compared with Alternative A. Mineral material pit locations might have to shift in some areas, due to these closures, but overall demand would not change.

While fluid mineral potential in most of the planning area is very low to low, under Alternative C2 12,824,000 acres, out of 13,083,000 total acres, would be open to fluid mineral leasing.

Under this Alternative, 12,824,000 acres would be open to nonenergy solid mineral leasing.

Alternative D

Under Alternative D, 0 acres would be recommended for withdrawal; 7,965,000 would remain segregated. Because all PLOs would be revoked, no acres would remain withdrawn.

Under Alternative D, BLM would manage 259,000 acres out of a total of 13,083,000 acres as closed to mineral material disposal; 12,824,000 acres would be open to mineral material disposal. This alternative would decrease the area closed to mineral material development, compared with Alternative A. Mineral material pit locations might have to shift in some areas due to these closures, but overall demand would not change.

While fluid mineral potential in most of the planning area is very low to low, under Alternative D 12,824,000, out of 13,083,000 total acres, acres would be open to fluid mineral leasing.

Under this Alternative, 12,824,000 acres would be open to nonenergy solid mineral leasing.

Conclusion

Extracting locatable minerals would reduce the available future reserves of locatable minerals. The magnitude and intensity of impacts are not predictable, due to the strong correlation between precious metals prices and new exploration and development. As such prices are prone to changes over time, it is not possible to predict how much development would occur. Development is generally expected in high and moderate potential areas near roads or other infrastructure that can provide easy access for locatable mineral exploration and

development. Alternatives that reduce the acreages of high and moderate potential areas available for locatable mineral entry would affect the ultimate production of these minerals. Closing acreage in the Dalton Utility Corridor would have a greater impact, due to the loss of acreage near easy access to a transportation corridor.

Mineral material development is expected to continue under all alternatives in existing mines to supply road maintenance needs. Proponents of new projects requiring mineral materials would seek to use existing locations before opening new material pits. Alternatives that close large parts of the planning area to mineral material disposal may shift mining to nearby State or private lands or increase the costs of future projects. Road, pipeline, and other infrastructure projects would be the primary drivers of mineral material demand during the RMP timeline. Without knowledge of the exact material demands and locations of proposed projects, exact impacts and magnitude of impacts from withdrawing areas to mineral material disposal are impossible to predict.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

Locatable mineral mining is anticipated to continue in the decision area and across the rest of Alaska. The closure of BLM-managed lands in in the planning area to locatable mineral entry could displace locatable mineral exploration and development to non-BLM-managed lands in the decision area and to BLM-managed and non-BLM-managed lands outside the decision area.

Mineral materials are mined on a small scale across the planning area and surrounding areas. Closing lands to mineral material disposal could displace mining to non-BLM-managed lands in the vicinity for up to 10 miles. If alternate sites are not available in the area, projects may be rerouted or canceled, reducing mineral material demand.

3.3.4 Recreation and Visitor Services

Recreation in the planning area is enjoyed by resident and nonresident users representing varied recreational interests. Activities of the user groups include, but are not limited to, sightseeing tours, living and natural history tours, backcountry travel, day trips from Fairbanks, camping, berry picking, photography, fishing, big game hunting, motorcycle tours, river trips, and day hikes.

Summer recreation on BLM-managed lands occurs primarily over a 100-day period between Memorial Day weekend and Labor Day weekend. Visitation to the Arctic Interagency Visitor Center, located at Coldfoot, recorded 8,549 visitors for the 2018 summer season (BLM 2018b). The primary activities visitors participate in include driving and sightseeing, photography, wildlife viewing, and bird-watching (BLM 2016a). Organized groups and commercial tours use the Dalton Highway in the summer to visit the Arctic Circle and experience the midnight sun.

Other activities include dispersed big game hunting throughout the planning area and camping along the Dalton Highway (BLM 2016a). Winter recreation on BLM-managed lands primarily occurs from December through March. During the 2017–18 season, the Yukon River Camp recorded 10,951 winter visitors primarily engaging in aurora viewing and visiting the Arctic Circle through companies providing day trips from Fairbanks (BLM 2018b). A portion of the INHT, used for the Iditarod Trail Race in early March, runs through the Central Yukon planning area on even years when race organizers use the Northern Route (Iditarod 2019).

As of 2019, the Central Yukon Field Office manages 30 SRPs, with three additional pending permits for dog mushing proposals along the Dalton Highway. Twenty-one of those permits focus on tour and adventure activities and nine permits focus on commercial hunting guides. Recreational demand is expected to increase

along the Dalton Highway for its ease of access to popular recreational activities such as aurora viewing and Arctic Circle visitation.

An increase in independent, non-guided domestic and international visitors has been observed through recent trends in visitation use and is expected to increase. Exposure to reality television shows and expanded marketing from local tourism groups to view the aurora lights have contributed to national and international tourism growth. The number of hunters is expected to remain steady or increase. Day trips to the Arctic Circle are also increasing. Environmental education and interpretation also are expected to increase. Additional information is available in Section 2.2.6, Recreation and Visitor Services, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Climate Change

Natural events have the potential to disrupt the recreational setting, particularly winter-based recreation. The planning area is one of the fastest-warming regions in the U.S., with temperatures having increased roughly 3°F over the past 60 years (Markon et al. 2018). Climate extremes may affect recreational quality through an increased potential of prolonged drought and high-intensity precipitation events. In the long run, climate change may affect the usable snow-cover in the planning area. Decreased longevity of snow-cover and prolonged summers would increase the length of summer OHV closures, and reduce OHV-based recreation and use of OHVs for subsistence or recreational access purposes.

Direct and Indirect Impacts

The effects of climate change described above, may influence the proposed recreation management designations and may influence the rate or degree of the potential direct and indirect impacts.

Comparative Summary Tables

Table 3-22 summarizes recreation management areas by alternative.

Alternative A

Continuing to designate two SRMAs, accounting for 3,014,000 acres and 22.7 percent of the decision area, per the 1998 Utility Corridor RMP would provide visitors with targeted recreation opportunities and settings (BLM 1989). Current management for the SRMAs identifies desired recreational setting characteristics as semiprimitive motorized, roaded natural, roaded modified, and rural; while this has worked through the current plan, use levels and increased pressure may require the BLM to modify these to identify specific RMZs and desired characteristics to avoid user conflicts. VRM Class III management for both SRMAs would reduce the potential for changes to the visual landscape with development but would not preclude it. SRPs would be considered on a case-by-case basis; the nature and type of impacts associated with the SRPs would be based on the type and location of the permitted activity.

Three ERMAs, accounting for 630,000 acres and 4.7 percent of the decision area, would be managed to provide targeted developed and dispersed recreation opportunities in a predominantly primitive setting (BLM 1989). VRM at Oolamnagavik-Colville River ERMA would limit the potential for changes to the visual landscape but may allow for moderate changes. Moderate changes allowed under the VRM Class III would influence opportunities for a primitive experience. Conversely, VRM would allow for recreation facilities and other improvements, which would enhance developed recreation opportunities.

Table 3-22
RMAs by Alternative

Management Action	Alternative (Acres)				
	A	B	C1	C2	D
Dalton Highway SRMA	801,000	0	0	0	0
Dalton Corridor SRMA	2,213,000	0	0	0	0
Sukakpak Region SRMA	0	353,000	0	0	0
Central Dalton SRMA	0	144,000	0	0	0
Dalton Highway Corridor SRMA	0	0	2,437,000	0	0
Dalton SRMA	0	0	0	497,000	0
SRMA Total	**3,014,000**	**497,000**	**2,437,000**	**497,000**	**0**
CAMA ERMA	405,000	0	0	0	0
Dalton ERMA	0	0	0	1,460,000	0
Nigu-Iteriak ACEC/RMA ERMA	152,000	0	0	0	0
Nigu-Iteriak River CAMA ERMA	0	136,000	136,000	0	0
Oolamnagavik-Colville ERMA	73,000	0	0	0	0
Spooky Valley ERMA	0	9,000	9,000	0	0
ERMA Total	**630,000**	**145,000**	**145,000**	**1,460,000**	**0**
Total ERMAs and SRMAs	**3,644,000**	**642,000**	**2,582,000**	**1,957,000**	**0**
Dalton Corridor BCA	0	1,605,000	0	0	0

Source: BLM GIS 2017

There would continue to be dispersed recreation opportunities in a primitive setting outside the SRMAs and ERMAs, including traditional activities with the primary users being local villagers, community members, and recreationists engaged in backcountry trips. There also would be permitted recreation activities, such as commercial guided tours along rivers in the Nulato Hills and with commercial hunting along the Hogatza, Pah, Koyukuk, Melozitna, and Tozitna Rivers (BLM 2016a).

The Dalton Highway SRMA and Dalton Corridor SRMA under Alternative A would maintain the targeted recreation objectives of sightseeing and wildlife viewing. There would be no lands managed as a BCA.

Managing the entire 13,302,000 acres of the decision area as limited for OHV use would allow for OHV travel on existing routes. Managing for a weight limitation of 1,500 pounds gross vehicle weight for summer OHV travel would exclude travel opportunities for those whose vehicles exceed the weight threshold.

Requiring a permit for use of OHVs on the Dalton Highway Travel Management Area (TMA) would preclude travel for non-permitted users. Management for the Nigu-Iteriak (CAMA) lands would allow OHV use for subsistence purposes only, which would preclude OHV use for non-subsistence users. While limitations would exist in these areas, the remainder of the decision area would have no seasonal closures under Alternative A, and OHV recreationists would have the opportunity to engage in OHV recreation year-round.

There would be no motorboat restrictions in Alternative A, which would allow recreational users motorized and nonmotorized access to water-based recreation opportunities. There would continue to be the potential for conflicts between motorized and nonmotorized water-based recreation users.

The 259,000 acres designated as ROW exclusion areas would also be within the CAMA lands that prohibit non-subsistence-related OHV travel; therefore, recreational uses there would be largely nonmotorized and primitive and would not be impacted from any permitted ROW access improvements, even if they were allowed.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Under all action alternatives, limiting recreational firewood collecting to dead or down trees, restricting overnight camping to 14 days, and encouraging "leave no trace" principles would increase the quality of most recreational experiences and reduce the potential for recreational conflict, compared with Alternative A.

Limitations on domestic sheep and pack goats in Dall sheep habitats would enable an effective separation to avoid disease risk. The use of camelids as pack animals would still be considered in these areas on a case-by-case basis. Under all action alternatives, SRPs also would be considered on a case-by-case basis; the nature and type of impacts associated with the SRPs would be based on the type and location of the permitted activity. Tribal consultation would be required for the Allakaket/Alatna TCPs locations, which would result in recreation activities being compatible with cultural and tribal resources.

Under all action alternatives, the road to Ambler and Umiat utility and transportation corridors would be designated. An administrative utility and transportation corridor designation may not directly create public recreational access opportunities; however, the rugged terrain of the planning area is difficult to navigate. Recreationists may use the pathways created by developers for construction to access dispersed opportunities in the decision area, such as camping, hunting, sightseeing, or float boating; however, Ambler Road is not a public, and such uses would be consequential to the associated access route clearing. New utility and transportation corridors could also increase the potential for summer OHV access to dispersed recreation sites in the Central Yukon planning area.

Under all action alternatives, AS sec. 19.40.210 would prohibit the use of OHVs on lands within 5 miles of the Dalton Highway ROW north of the Yukon River, except for persons who hold a mining claim near the highway, persons who must use land within 5 miles of the ROW to gain access to the mining claim, or persons who use a snowmachine to travel across the highway corridor from land outside the corridor to access land outside the other side of the corridor. These restrictions would preclude access for some users.

Authorized OHV use could diminish the quality of the recreational experience for those seeking dispersed recreation opportunities in a primitive setting. For areas near the Dalton Highway, the anticipated increase in recreational travelers on the corridor through the life of the plan is expected to increase all types of recreation, including nonmotorized day hikers; some user-created trail proliferation can be expected. Noise from vehicles on the Dalton Highway could also affect the recreation setting and experiences for those seeking a more backcountry experience.

OHV use within the CAMA TMA would continue the limitation for subsistence-related travel to existing ways and would reduce the potential for casual user OHV recreational experiences in the CAMA WSA. Across previously unplanned areas along the Middle Yukon and Fairbanks/Military Lands, the change to curb weight restrictions would reduce confusion for users and would be similar to the State of Alaska regulatory language for OHV use. This would increase compliance for all users, and long-term trail degradation may be reduced.

Alternative B

Compared with Alternative A, there would be 3,002,000 fewer acres of recreation management areas (see **Table 3-22**); however, under Alternative B the BLM would manage the 1,605,000-acre Dalton Corridor BCA.

Compared with Alternative A, protective measures intended to maintain the semiprimitive experience of the Dalton Corridor BCA would improve opportunities for backcountry experiences. Visual quality would contribute to the physical setting and directly influence recreational value, while undisturbed landscapes would contribute to the semiprimitive quality of the BCA. Enforcing the stay limitation would reduce the potential for user conflict in the Dalton Corridor BCA.

Designating RMZs within the Central Dalton SRMA would provide more specific management for targeted recreation opportunities. This would improve recreation experiences for managed activities, compared with Alternative A.

Mineral materials management decisions would reduce the potential for surface disturbance, while ROW avoidance management would reduce the potential for mineral and ROW conflicts by concentrating those uses after additional NEPA review. These actions would avoid the displacement of visitors and minimize changes to the recreation setting.

There would be 485,000 fewer acres managed as ERMAs, compared with Alternative A. Areas managed as the CAMA and Oolamnagavik-Colville ERMAs would be managed for dispersed recreation. Managing the Nigu-Iteriak and Spooky Valley ERMAs as VRM Class II would limit development in the area and help maintain opportunities for primitive recreation experiences; however, access could be limited, given the rugged terrain.

Within the Central Dalton SRMA, VRM on the Dalton Uplands RMZ (339,000 acres) would allow for development to support managed recreation opportunities in the RMZ. Changes to the visual landscape would be consistent with the front-country setting of the RMZ and would allow for ease of access to recreation opportunities via proximity to established roadways. VRM along Coldfoot and Yukon River Crossing RMZs would allow for development, which could conflict with wildlife viewing and hiking activities; however, visitors to these RMZs generally expect a relatively developed recreational experience. Any development along the Yukon River Crossing RMZ could be visible from and would conflict with recreationists' desired experiences in the nearby Dalton Uplands RMZ.

Compared with Alternative A, VRM of the Sukakpak Region SRMA would require more mitigation measures to minimize the visual impacts of development near the inner corridor of PLO 5150. These measures would be more likely to maintain the primitive recreation setting and associated backcountry opportunities, compared with Alternative A.

Roadways and infrastructure in the Ambler and Umiat utility and transportation corridors would provide pathways for individuals to access previously unattainable dispersed recreation opportunities. Corridor designations could support motorized and nonmotorized access but could also increase crowding and the potential for user conflicts, which could reduce the quality of the recreation experience.

The road to the Umiat utility and transportation corridor could increase access to regional recreation destinations, such as the Nigu-Iteriak River ERMA and Gates of the Arctic National Park and Preserve lands to the west of the decision area; Ambler Road could increase access opportunities to the Kanuti National Wildlife Refuge and Gates of the Arctic National Park and Preserve. Transportation and utility corridor development could interfere with hunting and wildlife viewing opportunities by decreasing game availability

and disrupting migration routes and established habitats. Transportation and utility corridor development would also improve access conditions for other recreationists and increase use of dispersed BLM-managed lands.

Under Alternative B, 4,035,000 acres of ACECs, 2,284,000 more acres than under Alternative A, would reduce the potential for surface-disturbing activities and associated visual and noise disruptions and enhance the quality of recreational experiences, especially for visitors interested in wildlife and nature viewing. Compared with Alternative A, designating the Midnight Dome/Kalhabuk ACEC to protect Dall sheep habitats would support healthy Dall sheep populations, which would enhance the recreational experiences associated with wildlife viewing, wildlife photography, and big game hunting.

There would be fewer opportunities for mineral exploration and development in ACECs, which would reduce the potential for those activities to displace visitors, to modify the recreation setting, or to conflict with recreation. Airspace restrictions over ACECs would reduce recreation opportunities that depend on access via aircraft.

The partial revocation of PLO 5150 in the area commonly known as the outer corridor would remove the management purpose in this area for utility and transportation purposes. While these lands have not been used for this purpose, the revocation of the PLO removes the withdrawal for this purpose. Under Alternative B, these lands are designated as a BCA for the purpose of hunting-related recreation. The State of Alaska has top-filed lands selected by PLO 5150, per ANILCA 906 (e). These top-filed lands will become selections upon the revocation of the PLO.

A total of 24,000 acres of Priority 1 top-filed lands are within the Central Dalton SRMA and Sukakpak Region SRMA, 9,000 acres of Priority 1 top-filed lands are within the Nigu-Iteriak ACEC/RMA ERMA or Spooky Valley ERMA, and 439,000 acres of Priority 1 top-filed lands are within the Dalton Corridor BCA. The BLM anticipates that Priority 1 selected lands would be conveyed to the State of Alaska within 10 years of the revocation of the PLO. This may impact the remaining lands within the SRMA and the connectivity of federal lands for recreation.

Alternative B would preclude summer OHV use on 2,072,000 acres within the planning area. This would reduce OHV-related recreation opportunities and access to other activities, such as big game hunting. Impacts from OHV use limitations in TMAs are discussed in *Impacts Common to All Action Alternatives*.

Under Alternative B, managing 10,879,000 acres (83 percent) of the decision area as open for locatable mineral entry, 8,120,000 acres (62 percent) of the decision area as open to fluid mineral leasing, and 8,402,000 acres (61 percent) of the decision area as open for mineral material disposal would create the potential for mineral development and activity to displace visitors. It also would create noise and visible infrastructure or surface disturbance that would diminish the quality of the recreation setting. As compared with Alternative A, the acres in the decision area managed as open to locatable mineral entry and fluid mineral leasing under Alternative B would increase by 4,116,000 acres and 3,232,000 acres, respectively; the area open for mineral material disposal would decrease by 4,775,000 acres. More areas managed as open for locatable and fluid mineral activity could increase the potential for conflicts with recreation; however, despite the different areas managed as open or closed, impacts would be largely similar to those described under Alternative A. This is because most activity would be concentrated in high development potential areas.

Alternative C1

Designating 2,437,000 acres as the Dalton Highway Corridor SRMA under Alternative C1, including nine independent RMZs, would provide focused management for the recreation opportunities available in the SRMA. Managing the Chapman Lake, Brooks Range South, Brooks Range North/Galbraith Lake, and outer corridor RMZs as VRM Class II would maintain the semiprimitive setting and associated recreational experiences in the RMZs. Managing the Brooks Range South, Brooks Range North/Galbraith Lake, and Chapman Lake RMZs for sightseeing, wildlife photography, angling, camping, and hiking would maintain opportunities for those activities. Limitations on the number of consecutive overnight stays would reduce the potential for user conflicts. Compared with Alternative A, in the Brooks Range South, Brooks Range North/Galbraith Lake, and Chapman Lake RMZs management could reduce opportunities for large groups desiring front-country or developed opportunities. This would particularly affect recreationists desiring a more isolated experience.

Management intended to maintain the front-country recreation setting of the Finger Mountain, Arctic Circle, and Grayling Lake RMZs would enhance the recreation opportunities for those desiring developed uses. Managing each RMZ as VRM Class III would result in the potential for new development that could change the recreation setting.

In the Finger Mountain RMZ, management would expand and enhance opportunities for sightseeing, photography, and hiking. Not establishing use limitations would result in opportunities for visitors to participate in group sightseeing activities and have other similar experiences in larger group settings. Compared with Alternative A, there would be fewer opportunities for solitude.

Opportunities at the Arctic Circle RMZ would be similar to those described for the Finger Mountain RMZ, with the exception that the Arctic Circle RMZ would provide focused management for camping. This would improve camping opportunities, compared with Alternative A. Visitors could expect to interact with small camping groups; 14-day stay limitations would reduce extended camping opportunities. Experiences at Grayling Lake RMZ would be similar to those described for the Arctic Circle RMZ, with the exception that management for float planes would enhance big game hunting in the summer, compared with Alternative A.

Management actions intended to maintain the rural recreational setting of the Yukon River and Coldfoot RMZs would increase opportunities for bicycling, motorcycling, day hiking, camping, and other developed or trail-based recreation opportunities in those areas, compared with Alternative A. Managing these RMZs as VRM Class IV would allow for facilities and other improvements to support developed recreation opportunities; it would also allow ROWs and other non-recreation development, which would change the area's recreation setting over time. While camping stay limitations would exist in the RMZs, there would be the potential for conflicts due to the developed infrastructure and ease of accessibility in the RMZs.

Impacts associated with ERMAs would be the same as those described under Alternative B. Impacts from not designating BCAs would be the same as those under Alternative A.

The partial revocation of PLO 5150 in the area commonly known as the outer corridor would remove the management purpose in this area for utility and transportation. The State of Alaska has top-filed lands selected by PLO 5150, per ANILCA 906 (e). These top-filed lands would become selections upon the revocation of the PLO. Of the Priority 1 top-filed lands, 491,000 acres are within the Dalton Highway Corridor SRMA, and no acres of Priority 1 top-filed lands are within the Nigu-Iteriak River CAMA ERMA or Spooky Valley ERMA. The BLM anticipates that Priority 1 selected lands would be conveyed to the State of Alaska within

10 years of the revocation of the PLO. This may have an impact on the remaining lands within the SRMA and the connectivity of federal lands for recreation.

Impacts from management decisions regarding utility and transportation corridors would be the same as those described under Alternative B.

Compared with Alternative A, designating 1,333,000 fewer acres of ACECs under Alternative C1 would increase the potential for visual and noise-related impacts on recreation. Managing 538,900 acres of DSHA, DSMC, and DSSA with human, noise, and travel disturbance caps would improve opportunities for wildlife viewing, compared with Alternative A. Establishing 746,000 acres of core caribou calving ranges would encourage healthy caribou populations, which would enhance recreational experiences associated with wildlife viewing and hunting. TLs for OHV travel during caribou calving would seasonally limit recreational access in those areas.

Restricting summer OHV travel on 106,000 acres of the Toolik RNA would preclude access; however, the RNA's purpose and use and associated activity relative to scientific research and authorized activities would be a natural impediment to recreation in the RNA.

Under Alternative C1, managing 12,184,000 acres (93 percent) of the decision area as open for locatable mineral entry, 11,510,000 acres (88 percent) of the decision area as open to fluid mineral leasing, and 11,618,000 (89 percent) of the decision area as open for mineral material disposal would create the potential for mineral development and activity to displace visitors. It also would create noise and visible infrastructure or surface disturbance, which would diminish the quality of the recreation setting. As compared with Alternative A, the acres in the decision area managed as open to locatable mineral entry and fluid mineral leasing under Alternative C1 would increase by 5,421,000 acres and 6,622,000 acres, respectively; the area open for mineral material disposal would decrease by 1,199,000 acres.

Compared with Alternative A, more areas managed as open for locatable and fluid mineral activity could increase the potential for conflicts with recreation; however, despite the different areas managed as open or closed, impacts would be largely similar to those described under Alternative A. This is because mineral activity would be concentrated in high development potential areas.

Alternative C2 (Preferred Alternative)

Designating the 497,000-acre Dalton SRMA and associated RMZs would provide focused management for targeted recreation opportunities.

Managing the Dalton Uplands RMZ (339,000 acres) to maintain the front-country recreation setting would enhance developed recreation opportunities, compared with Alternative A. There would be opportunities for access via established roadways. This RMZ would be managed as a VRM Class III, which would allow for moderate changes on the landscape, and impacts would be the same as described under Alternative A. Impacts from managing the RMZ as VRM Class III and not managing for use limitations would be the same as described for the Finger Mountain RMZ under Alternative C1.

Management actions intended to maintain the rural recreation setting of the Coldfoot RMZ (7,000 acres) and Yukon River RMZ (7,000 acres) would increase developed recreational opportunities, as described in Alternative C1, compared with Alternative A. Both the Coldfoot RMZ and Yukon River RMZ would be managed as VRM Class IV, which could result in activities that would change the area's recreation setting over time. The Yukon River RMZ and Coldfoot River RMZ would be a developed recreational area, within which the BLM would manage for such activities as sightseeing, day hiking, camping, bicycling, fishing, and

river floating. While stay limitations of 14 days in one location exist for overnight camping, there could be conflicts among the same types of users and between user groups. This would be due to the developed infrastructure and ease of accessibility in the RMZs.

Management intended to maintain the backcountry recreation setting of the Sukukpak Region SRMA (353,000 acres) would enhance the recreation experience for those desiring a less developed experience. Recreation activity in the SRMA increases throughout the summer, with the primary activities being driving for pleasure, sightseeing, photography, and wildlife viewing. Recreation users can expect encounters with groups of up to 15 when stopping at points along the way. In most waysides, group size typically ranges from 2 to 10 individuals, with a small number of commercial tour companies accessing the area. Despite protective measures, noise from the nearby heavily used Dalton Highway could disrupt desired experiences and impact the quality of the recreation setting.

Alternative C2 would designate 1,460,000 acres as the Dalton ERMA. Protective measures intended to maintain the semiprimitive setting of the Dalton ERMA would enhance recreation opportunities for those desiring an undeveloped recreation experience. The Dalton ERMA would be managed as a VRM Class III, which would reduce the potential for visual disruptions, leaving the landscape undisturbed and with little evidence of previous human use. The combination of protective management activities would enhance opportunities for those desiring a semiprimitive experience but would preclude the availability for developed camping and travel via motorized use.

Under Alternative C2, the proposal for a full revocation of PLO 5150 includes the area commonly known as the inner corridor, the proposed Dalton SRMA, and a portion of the Dalton ERMA. The State of Alaska has top-filed lands selected by PLO 5150, per ANILCA 906 (e). These top-filed lands would become selections upon the revocation of the PLO. A total of 896,000 acres of Priority 1 top-filed lands are within the Dalton SRMA and the Dalton ERMA. A total of 385,000 acres of the SRMA contain the Priority 1 lands, and 511,000 acres of the ERMA contain the Priority 1 lands. The BLM anticipates that Priority 1 selected lands would be conveyed to the State of Alaska within 10 years of the revocation of the PLO. Most of these lands are within the SRMA, and this would directly impact the remaining lands within the SRMA and the connectivity of federal lands for recreation. The change in land status would also likely affect existing infrastructure, such as campgrounds and visitor contact stations; however, it is unknown if the State of Alaska would seek to take title to these lands or the BLM would retain a ROW for these facilities. Designating the 77,000-acre Toolik Lake RNA/ACEC would decrease the potential for surface-disturbing activities and associated visual and noise disruptions, compared with Alternative A. Establishing 746,000 acres of core caribou calving ranges would increase the potential for healthy caribou populations and associated impacts, the same as under Alternative C1.

Impacts from OHV restrictions and TLs are the same as those under Alternative C1.

Under Alternative C2, managing 13,083,000 acres (100 percent) of the decision area as open for locatable mineral entry, 12,824,000 acres (98 percent) of the decision area as open to fluid mineral leasing, and 12,079,000 (92 percent) of the decision area as open for mineral material disposal would create the potential for mineral development and activity to displace visitors. It also would create noise and visible infrastructure or surface disturbance, which would diminish the quality of the recreation setting.

As compared with Alternative A, the acres in the decision area managed as open to locatable mineral entry and fluid mineral leasing under Alternative C2 would increase by 6,320,000 acres and 7,936,000 acres, respectively; the area open for mineral material disposal would decrease by 738,000 acres. Compared with

Alternative A, more areas managed as open for locatable and fluid mineral activity could increase the potential for conflicts with recreation; however, despite the different areas managed as open or closed, impacts would be largely similar to the ones described under Alternative A. This is because mineral activity would be concentrated in high development potential areas.

Alternative D

There would be no designated BCAs, ERMAs, or SRMAs under Alternative D. Compared with Alternative A, there would be 3,644,000 fewer acres managed to achieve desired recreation outcomes and setting characteristics. VRM classifications would not be assigned to specific recreation areas under this alternative. In VRM Class III and IV areas, there would be the potential for surface-disturbing activities that may alter the recreation setting.

There would be established recreational sites, such as the Five Mile, Arctic Circle, Marion Creek, and Galbraith Lake campgrounds, waysides, the Arctic Interagency Visitor Center, and one visitor contact state at the Yukon River Crossing; however, there would not be any focused planning-level management for those areas. Their use could be adjusted as needed for other land use purposes.

Recreational use in the Central Yukon planning area is expected to continue to increase. By not designating RMAs under Alternative D, there would be no specific direction for managing toward desired recreation setting or outcomes. There would be no targeted recreation improvements and no limits on other uses specifically to reduce the potential for conflict with recreation.

Compared with Alternative A, mineral and infrastructure development may conflict with dispersed recreationists, and conflicts could arise between different recreational user groups. All of these factors could reduce the quality of the recreational experience over time, as compared with the other alternatives.

Impacts from not designating BCAs would be the same as those under Alternatives A, C1, and C2.

Impacts from management decisions regarding utility and transportation corridors would be similar to those described under Alternative C2. Under Alternative D, there would be a total of 1,076,300 acres designated as utility and transportation corridors. The effects would be similar to those under Alternative B for the Ambler and Umiat utility and transportation corridor.

Impacts from locatable mineral entry, fluid mineral leasing, and mineral material disposal would be the same as under Alternative C2.

Conclusion

Dispersed recreation occurs over the 13,302,000 BLM-managed acres, but access to dispersed recreation is limited by the geology and conditions of the Central Yukon area. Across all alternatives and given the rugged terrain of the planning area, linear ROWs, utility and transportation corridors, and collocated infrastructure would have the potential to increase recreational access from development activities.

The total acreage of designated recreation management areas would range from 0 percent (0 acres) of the decision area under Alternative D to 27.4 percent (3,644,000 acres) of the decision area under Alternative A. Alternative B would manage for targeted recreation settings and desired outcomes in RMZs within designated SRMAs; it would also designate two ERMAs on 145,000 acres and would designate a BCA.

Alternative A would manage the most RMAs, but Alternatives C1 and C2 would establish RMZs to provide more specific management for achieving desired recreational settings and user outcomes, which contributes

to reduced user conflicts. Recreation management under these alternatives would provide for desired recreation settings and experiences. There would be no BCAs, SRMAs or ERMAs under Alternative D.

Without focused recreation management for desired settings and outcomes, other uses could displace visitors and diminish the quality of the recreation setting and experiences, compared with the other alternatives.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

Potential cumulative impacts on recreation would be the result of actions—both in and outside the BLM's ability to manage—that would change the quality of the recreation setting or opportunities, change the level of access to recreation opportunities, change the level or location of user conflicts, or change the level of subsistence opportunities.

Under all alternatives, growth in recreational demand in the planning area would result, in part, from a growing Asian market driven by efforts from the State of Alaska, tourist interest in the Interior, and private entities. The growing popularity of the planning area for outdoor recreation, combined with advancements in recreation equipment, would increase demand for winter recreation opportunities, including SRPs, in the decision area. Growing visitor use would increase the potential for conflicts among user groups. Most of these impacts would occur in areas near developed communities and areas with established road access, including the Dalton Highway and other utility and transportation corridors. This is because they provide easier access.

Recreational access is anticipated to have a moderate increase, with new recreational pursuits such as packrafting, fat-tire biking, and other innovations that make backcountry travel more accessible.

Under all action alternatives, the potential development of the proposed 211-mile Ambler Road and collocated infrastructure would increase access opportunities for recreationists. While ROWs may not be open to the public, development activities may create access routes that recreationists may potentially use for dispersed activity.

Oil and gas development and mining activities described in detail in **Table M-1** in **Appendix M** would increase the presence of collocated infrastructure to support those actions to a varying degree under all alternatives. Under Alternative A fluid mineral leasing would be open to 37 percent (4,888,000 acres) of the decision area, whereas more than twice as many acres (12,824,000 acres, or 98 percent) would be open to fluid mineral leasing under Alternatives C2 and D. Additionally, Alternative D would have the most area (12,824,000 acres, or 98 percent) open to mineral material disposal, compared with Alternative B, which would have the least area (8,402,000 acres, or 61 percent). Across all alternatives, areas open to locatable mineral entry would range from 52 percent (6,763,000 acres) to 100 percent (13,803,000). These activities may displace recreation in the decision area or diminish the quality of the area's unique recreational experience. The potential impacts would last until the activities and associated infrastructure are removed; however, development of infrastructure also could increase the potential for recreationists to use routes established by developers to access previously unattainable recreation opportunities.

Improving existing transportation infrastructure may expand access opportunities in the region, especially along the Dalton Highway. This could enhance driving-based recreation, aurora viewing, and visitation to the Arctic Circle; however, new infrastructure development would diminish the quality of the recreation setting near the Dalton Highway and may conflict with RMZ management directions.

The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts.

3.3.5 Travel Management

OHV use in the planning area is low because of the area's remoteness. Most travel occurs near and between remote village communities, including for the purposes of sustaining a subsistence-based lifestyle and inter-village travel. Advances in OHV technology and the potential for highways to be extended into previously roadless areas are expected to increase motorized vehicle use in the planning area. While inter-village travel routes and transportation corridors exist between developed communities in the region, key areas for travel management are minimal due to the remote and rugged nature of the planning area. The Parks, Richardson, Elliot, and Dalton Highways provide some road access points, but most of the planning area is inaccessible by road, and travel is primarily done by OHV, snowmobile, motorboat, or foot.

Access to BLM-managed lands for non-subsistence or non-inter-village travel in the planning area is primarily done via the State-managed Dalton Highway that bisects the BLM-managed PLO 5150 utility corridor. Travel along the Dalton Highway can be divided into personal and commercial use categories. Personal use is done primarily for the purposes of recreation—to enjoy the scenery or access the Arctic Circle, Brooks Range, or North Slope regions. Commercial use is divided between recreational tour companies and activities associated with supporting the oil and drilling operations of the TAPS.

Waterways are used for motorized and nonmotorized travel across the planning area. During the winter months, cross country travel is permissible using snowmobiles throughout the planning area except where prohibited in the Dalton Utility Corridor by State of Alaska Statue AS 19.41.210. Additional information is available in Section 2.2.7, Travel Management, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf, while ANILCA access requirements are described in further detail in Chapter 2 .

Climate Change

Prolonged summer conditions and reduced snow coverage as a result of climate change may affect the travel conditions in the planning area. Longer TLs on summer OHV travel increase the period in which summer OHV travel would be precluded to OHV recreationists. In the long run, reduced snow coverage when OHV travel is allowed may lead to increased trail degradation. These factors combine to produce reduced access opportunities and a decreased quality of travel conditions in the planning area.

Direct and Indirect Impacts

See A**ppendix M** for the analytical issues related to travel management and the analytical methods used in this analysis.

The effects of climate change described above, could influence the rate or degree of the potential direct and indirect impacts.

Comparative Summary Tables

Table 3-23 summarizes seasonal OHV limitations by alternative.

Alternative A

Under Alternative A, 100 percent of the decision area would be managed as limited. Travel would continue to be associated with infrastructure development and maintenance, subsistence use, recreation, and inter-village travel.

Table 3-23
Seasonal OHV Limitation by Alternative

Management Action	Alternative (Acres)				
	A*	B	C1	C2	D
Closed to summer OHV use	0	2,072,000	106,000	77,000	0
Closed May 1 through June 30	0	1,163,000	745,000	745,000	0
Total seasonal limitations	**0**	**3,235,000**	**851,000**	**822,000**	**0**

Source: BLM GIS 2017
*While Alternative A does not designate OHV limitations, it does contain TMAs. These TMAs are described in detail in Chapter 2.

TMAs along the Dalton Highway, Nigu-Iteriak ACEC, CAMA, and dispersed regions of the Central Yukon planning area would support specific resource management decisions and public needs and would address use conflicts. Specific actions are described in detail below. Weight limitations enforced by a gross vehicle weight of 1,500 pounds for summer OHV use would limit the ability for OHVs to tow or carry heavy equipment across the decision area; however, it would help prevent long-term degradation on existing trail ways, which that would diminish future access (BLM 1989).

At the Dalton Highway TMA, requiring permits for casual and commercial use during the summer season and restricting TAPS crossings at designated points would reduce travel use conflicts with commercial vehicles using the Dalton Utility Corridor for drill-related activities.

Limiting OHV travel within the CAMA WSA would maintain existing access opportunities on existing routes. Development nodes at Yukon Crossing, Coldfoot, and Chandalar could generate economic activity, which could result in roadway improvements, thereby increasing access opportunities and travel routes for residents, subsistence communities, private entities, recreationists, and visitors. Infrastructure near these development nodes would create pathways in the terrain that may be used by OHVs or foot travel to access recreation or subsistence opportunities.

By placing seasonal permitted aircraft restrictions across 51,000 acres (less than 1 percent) of the decision area, localized noise disturbance and aircraft pollution may be reduced; however, travel and access to certain parts of the decision area via various forms of aircraft would be seasonally precluded.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Under all action alternatives, new or expanded ROWs would provide opportunities for improved access and reduced potential for impacts from cross-country travel. Under all action alternatives, curb weight restrictions would limit travel opportunities for those using heavier vehicles. Limiting cross-country travel along the Dalton Highway TMA to subsistence use only would preclude other forms of travel.

Alternative B

Under Alternative B, there would be 3,235,000 more acres subject to OHV seasonal limitations, as compared with Alternative A. Seasonal closures would preclude OHV travel on 15.6 percent of the decision area during the summer. TLs proposed for caribou calving would close another 8.7 percent of the decision area from May 1 through June 30 (see **Table 3-23** and **Appendix J**). This would preclude access to existing inter-village travel routes and summer season subsistence harvest areas.

The partial revocation of PLO 5150 in the area commonly known as the outer corridor would affect federally qualified subsistence users' OHV access. The revocation of the PLO would allow the State of Alaska top-

filed lands to become selections, per ANILCA 906 (e). Selected lands are not considered public lands for the purposes of federally qualified subsistence. While subsistence use can continue, the provisions that allow for OHV and snowmachine use in the area promulgated under the Office of Subsistence Management for the residents of Coldfoot and Wiseman would no longer be in place on those selected lands. Casual use would remain the same and subject to AS 19.40.210[15] within the 5-mile corridor of the Dalton Highway and limited to existing trails and weight limits in the Dalton Corridor TMA. Casual use is anticipated to be minimal to nonexistent, as primary access is off the Dalton Highway as long as AS 19.40.210 is in place. Establishing the Ambler and Umiat utility and transportation corridors would identify areas where development opportunities in the planning area may occur. Construction activities would develop trail or roadways along the rugged terrain of the Central Yukon that may be used by OHVs or foot travel to access dispersed regions of the planning area. Compared with Alternative A, designating utility corridors would increase the potential for improved access farther away from the currently developed areas along the established highways.

Under Alternative B, on 600,000 acres (4.5 percent) of the decision area and across Dall sheep habitat, operators of aircraft associated with all BLM-authorized land use activities would be required to fly a minimum of 2,000 feet above ground level from May 1 through August 31, unless doing so would endanger human health and safety or be deemed an unsafe flying practice. Aircraft restrictions for the Galena and Ray Mountains caribou calving areas are from May 1 through June 30. Normal landings would be prohibited from May 1 through June 30 on 1,856,000 acres or 14 percent of the decision area, except during an emergency or for scientific purposes. By placing seasonal aircraft flying restrictions on a larger portion of the decision area, aircraft access would be reduced, compared with Alternative A.

Alternative C1

Under Alternative C1, OHV travel on 851,000 acres, or 6.4 percent of the decision area, would be subject to summer seasonal limitations compared with no summer restrictions under Alternative A. Of those acres removed, approximately 106,000 acres of the Toolik Lake RNA would be closed to summer OHV usage, while an additional 745,000 acres would be proposed for closure from May 1 through June 30 for caribou calving in the Galena and Ray Mountains core caribou ranges. These restrictions would preclude OHV travel in those regions and restrict access during that time period, but they would not prevent access during other times. On the remaining 94 percent (12,451,000 acres) of the decision area, OHV travel would be limited to existing routes; there would be no change to travel or access in those areas, compared with Alternative A.

Under Alternative C1, ROW exclusions in DSHAs on 4,600 acres would preclude any form of permitted ROW development access on less than 1 percent of the decision area. Compared with Alternative A, ROW avoidance areas on DSMCs (163,000 acres) would reduce the potential for permitted ROW-associated transportation development on approximately 1.2 percent of the decision area. There would be opportunities to expand the travel system in the remaining 98 percent of the decision area.

Impacts from the partial revocation of PLO 5150 and from the Ambler and Umiat utility and transportation corridors would be the same as those described under Alternative B.

[15]Alaska Statute Section 19.40.210 prohibits OHV and snowmachine travel within 5 miles of the Dalton Highway, with exceptions for travel to mining operations and homesteads. While the BLM designation would be limited in this area, this statute prevents casual use of OHVs in the 5-mile corridor. Subsistence use of OHVs is allowed for residents of Wiseman and Coldfoot and for federally qualified subsistence users accessing the corridor from lands outside the 5-mile restriction area and traveling to other BLM-managed public lands.

Designating development nodes would encourage the collocation of infrastructure to support development activities. New infrastructure could enhance access and transportation opportunities at those development nodes; however, these areas would be in the Dalton Utility Corridor, which would limit travel to existing ways and would be intended to isolate development potential to a singular area. The result would be that impacts on travel management from development nodes would be largely the same as under Alternative A.

Impacts from placing seasonal restrictions on aircraft use are the same as those under Alternative B.

Alternative C2 (Preferred Alternative)

Under Alternative C2, OHV travel on 822,000 acres, or 6.2 percent of the decision area, would be subject to seasonal limitations, compared with no restrictions under Alternative A. Of those acres, approximately 77,000 in the Toolik Lake RNA/ACEC would be closed to summer use; an additional 745,000 acres would be proposed for closure from May 1 through June 30 for caribou calving in the Galena Mountain and Ray Mountains core caribou ranges (see **Table 3-23**). The Toolik Lake RNA acreage would remain the same as under Alternative A but would no longer be available for OHV summer use under this alternative. These management actions would preclude OHV travel in those regions and would seasonally preclude access; however, year-round OHV travel on existing routes would be allowed on the remaining 94 percent of the decision area, where impacts would be the same as under Alternative A.

Impacts from not designating any protective areas for Dall sheep across the decision area would be the same as under Alternative A.

Alternative C2 proposes a full revocation of PLO 5150. The effects would be similar to Alternatives B and C1: Where the indirect effect of the revocation of the PLO lead to State of Alaska selections on top-filed lands, those selected lands would not be available for OHV subsistence travel allocated under the Office of Subsistence Management for the residents of Coldfoot and Wiseman. The potential for conveyance of Priority 1 top-filed lands (950,000 acres) within 10 years of the revocation of the PLO would change the landownership pattern in the Dalton Utility Corridor. It is unknown if OHV access would change once these lands are not under federal management; however, AS 19.40.210 would preclude casual access regardless of state or federal ownership outside of the 5-mile highway corridor. Establishing the Ambler, Umiat, and Dalton utility and transportation corridors would result in areas where there could be development opportunities in the decision area. New infrastructure development could include trails or roadways being constructed along the rugged terrain of the Central Yukon that may be used by OHV users or foot travelers to access dispersed regions of the planning area. Compared with Alternative A, designating utility corridors would increase the potential for improved access farther from the currently developed areas along the established highways.

The impacts of not establishing any development nodes under Alternative C2 would be the same as under Alternative A.

Not restricting aircraft operators to minimum flying levels or to seasonal TLs would result in the decision area being fully accessible via aircraft during all times of the year.

Alternative D

Impacts from OHV area designations and not applying seasonal limitations for OHV use would be the same as under Alternative A, which would maintain more opportunities for travel.

Impacts from the full revocation of PLO 5150 and establishing the Ambler, Umiat, and Dalton utility and transportation corridors would be the same as under Alternative C2. Impacts from not applying stipulations

regarding aircraft use and not establishing development nodes within the decision area would be the same as under Alternative C2.

Conclusion

Alternatives B, C1, and C2 are subject to summer closures on 0.58 percent to 15.6 percent of the decision area and to TLs, from May 1 through June 30, on 5.6 percent to 8.7 percent of the decision area. Under these alternatives, in areas where no seasonal TLs occur, cross-country travel would be allowed for vehicles with a curb weight of 1,500 pounds or less.

New infrastructure development could include trails or roadways along the rugged terrain of the Central Yukon that may be used by OHV users and foot travelers to access dispersed regions of the decision area.

Compared with Alternative A, which would not designate any utility corridors, all other alternatives would increase the potential for improved access farther from the currently developed areas along established highways.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

Cumulative impacts on transportation would be the result of past, present, and reasonably foreseeable actions that would change the amount of opportunities for new transportation infrastructure, access opportunities for specific travel modes, and the extent of subsistence use in the planning area. Specific actions are described in **Table M-1** in **Appendix M**.

The action alternatives designate the 5-mile Ambler utility and transportation corridor for the purposes of collocating industrial development and infrastructure for an east-west route toward Ambler; the proposed ROW associated with the Ambler Roadway would be closed to the public. Collocated infrastructure associated with the corridor may create opportunities for individuals to access previously inaccessible dispersed recreation opportunities when infrastructure is put in place. Other projects that would facilitate travel in the planning area include the ASTAR Transportation network and Bettles Road. These travel routes would allow for new access points for visitors, residents, recreationists, and subsistence users.

Past, present, or reasonably foreseeable improvements on the Dalton, Elliot, and Parks Highways would cumulatively affect transportation in the decision area by enhancing access via these existing roadways. Cumulative impacts would be greatest along the Dalton Highway, as it facilitates the most travel in the planning area for commercial and public uses and provides the most commonly used road access for out-of-state road travelers visiting the planning area.

Commercial demand would increase travel along the Dalton Highway by tour guide groups and oil, gas, and mining operations. Retaining the inner corridor of PLO 5150 or applying the administrative utility and transportation corridor designation would ensure that the corridor would remain a national oil and gas transportation system. The potential change in landownership associated with the conveyance of lands, identified as Priority 1, to the State as a result of the revocation of PLO 5150 could impact the intactness of management of a national oil and gas transportation system. Coordination between the State of Alaska and the BLM would be necessary to ensure security for the Trans-Alaska Pipeline. Access to federal subsistence areas is likely to be reduced upon changes in land status, particularly within the Dalton Utility Corridor once top-filed lands become valid State selections. This may increase subsistence access pressures on other BLM-managed lands.

The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts. For example, thawing of permafrost soils over the planning area may alter the travel patterns or routes for inter-village travel or to subsistence harvest areas; however, it is hard to determine what these routes or areas would be at this time. The BLM can determine only that access to higher or drier surface is likely.

Access to remote areas of the planning area could be increased with improved technology with OHVs that can meet the weight limitations.

3.4 SPECIAL DESIGNATIONS

3.4.1 Areas of Critical Environmental Concern

See **Appendix M** for the analytical issues related to ACECs and the analytical methods used in this analysis.

In general, under all alternatives, management actions that protect resources would help maintain or improve the R&I values within undesignated ACECs, while management actions that create the potential for resource degradation may diminish R&I values within undesignated ACECs. Designating ACECs would protect the R&I values in those areas; however, not designating ACECs may degrade R&I values, unless management prescriptions are sufficient to protect the R&I values from degradation. Any potential projects would include mitigation measures to protect R&I values.

Protection of R&I values across all ACECs would be greatest under Alternative B, given that each of the 31 potential ACECs would be designated and would receive direct protection via ACEC-specific management actions. The potential for degradation of R&I values would be greatest under Alternative D, followed by Alternative C2, given that no potential ACECs would be designated under Alternative D and one ACEC/RNA would be designated under Alternative C2. Alternative A would provide greater protection of R&I values than Alternatives C1 and C2, given that more potential ACECs would be designated and would thus receive more direct protection via ACEC-specific management actions.

See **Table 3-24** and **Appendix T** for a full analysis of impacts on undesignated ACECs.

Table 3-24
Total Acreage of Potential Impacts on Undesignated Potential ACECs

Management Action	Alternative				
	A	B	C1	C2	D
SRMA	0	0	0	0	0
ERMA	0	0	9,000	0	0
LWCs—Maintained	0	41,000	513,000	41,000	0
LWCs—Other	0	79,000	3,197,000	0	0
VRM Class I	0	0	9,000	0	0
VRM Class II	0	42,000	916,000	51,000	0
VRM Class III	897,000	0	24,000	566,000	711,949
VRM Class IV	176,000	79,000	2,792,000	3,465,000	3,447,000
VRM Unclassified	1,429,000	0	0	0	0
WSAs	0	0	0	0	0
WSRs	75,000	0	0	92,000	0
Closed to commercial timber development	0	0	154,000	0	0
Open to commercial timber development	0	119,000	3,589,000	4,082,000	4,158,000
ROW exclusion	0	3,000	2,000	0	0
ROW avoidance	0	62,000	1,497,000	648,000	0
Limited to winter OHV travel	0	0	492,000	492,000	0
Limited OHV travel (limited to existing routes)	2,502,000	121,000	3,249,000	3,590,000	4,158,000
DSHA	1,000	0	1,000	0	2,000
DSMC	67,000	0	29,000	100,000	100,000
DSSA	253,000	18,000	629,000	73,000	671,000
Closed to fluid minerals development	0	3,000	430,000	0	0
Open to fluid minerals development	714,000	135,000	3,238,000	4,085,000	4,161,000
Withdrawn from locatable mineral entry	1,098,000	0	72,000	0	0
Withdrawn from locatable mineral entry, but open to metalliferous	207,000	0	0	0	0
Recommended for withdrawal from locatable mineral entry	0	0	116,000	0	0
Open to locatable mineral entry	1,199,000	107,000	3,483,000	3,944,000	3,944,000
Open to locatable mineral entry, State- or Native-selection, segregated from locatable mineral entry	520,000	86,000	2,209,000	2,672,000	2,672,000
Closed to mineral material sales	0	3,000	521,000	492,000	0
Open to mineral material sales	2,503,000	117,000	3,219,000	3,591,000	4,161,000

Source: BLM GIS 2017
0 = No acres overlap

3.4.2 Wild and Scenic Rivers

There are no designated WSRs in the planning area. An initial inventory of planning area rivers was completed to determine eligibility for inclusion in the NWSRS as part of the ANILCA. In the Report to the Secretary of the Interior for Potential Components of the NWSRS (BLM 2019b), Alaska was divided into six drainage subregions, with 69 rivers selected for preliminary consideration for having the greatest potential for inclusion.

Most of the planning area is in the Yukon subregion (with the western portion located in the Northwest subregion) with 31 rivers identified for study. Of these 31 rivers, 11 are within the planning area.

The BLM conducts a WSRs inventory as part of the planning process for RMP revisions. The BLM completed an inventory of rivers in the planning area to determine eligibility and suitability for inclusion in the NWSRS. **Table 3-25** shows the 11 eligible rivers in the planning area being studied for suitability analysis, the identified ORVs associated with each river, and the preliminary classification assigned to each river. Additional information is available in Section 2.3.3, WSRs, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Table 3-25
Eligible Rivers

River	Miles on BLM-Managed Land	Acres on BLM-Managed Land (0.25-mile buffer)	Tentative Classification	ORVs
Colville River	29	6,000	Wild	scenic, recreational, and paleontological
Dietrich River	38	12,000	Wild	scenic and recreational
Dulbi River	61	15,000	Wild	recreational
Hogatza River	157	42,000	Wild	recreational and fish
Jim River	67	20,000	Wild	scenic, recreational, and fish
Kanuti-Kilolitna River	70	19,000	Wild	scenic
Kanuti River	54	15,000	Wild	scenic, hydrologic, and recreational
Mathews River	15	4,000	Wild	scenic and wildlife
Sulukna River	62	11,000	Wild	fish
Atigun River	31	10,000	Recreational	scenic, recreational, and cultural
Sagavanirktok River-Lower (Sag)	19	5,000	Recreational	scenic, recreational, and cultural

Source: BLM GIS 2017

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to WSRs and the analytical methods used in this analysis.

Changes to ORVs for eligible or suitable river segments could occur as a result of climate change. Specifically, climate change could affect various ORVs, including recreational, cultural, paleontological, fish and wildlife, and hydrologic ORVs. For example, general warming of the Arctic region could result in increased erosion rates and thawing of permafrost, affecting all the ORVs listed above. Additionally, the retreat of Arctic Sea ice, melting of glaciers, and decrease in snowpack caused by climate change could result in depleted water resources, which could degrade fish and hydrologic values. These impacts from climate change also could degrade or alter wildlife habitat, affecting wildlife ORVs. Lastly, a warming climate is also likely to change the fire regime, potentially changing the type and extent of wildlife habitat throughout the Arctic region, which could affect wildlife ORVs (Markon et al. 2018).

Comparative Summary Tables

Table 3-26 summarizes potential impacts on WSR segments by alternative.

Table 3-26
Potential Impacts on Non-Eligible or Non-Suitable WSR Segments by Alternative

Management Action	Alternative (miles)				
	A	B	C1	C2	D
SRMA					
Stream segments classified as recreational	49	0	49	0	0
Stream segments classified as wild	165	67	147	67	0
ERMA					
Stream segments classified as recreational	0	0	0	32	0
Stream segments classified as wild	26	0	0	63	0
BCA					
Stream segments classified as recreational	0	48	0	0	0
Stream segments classified as wild	0	63	0	0	0
LWCs —Maintained					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	0	331	51	51	0
LWCs —Other					
Stream segments classified as recreational	0	26	26	26	0
Stream segments classified as wild	0	144	424	424	0
VRM Class I					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	26	548	26	26	26
VRM Class II					
Stream segments classified as recreational	0	49	49	0	0
Stream segments classified as wild	0	0	168	33	0
VRM Class III					
Stream segments classified as recreational	0	0	0	32	49
Stream segments classified as wild	92	0	13	96	129
VRM Class IV					
Stream segments classified as recreational	49	0	0	17	0
Stream segments classified as wild	73	0	342	392	392
VRM unclassified					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	357	0	0	0	0
ACECs					
Stream segments classified as recreational	9	9	9	0	0
Stream segments classified as wild	84	60	140	0	0
WSAs					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	26	26	26	26	26
Closed to commercial timber development					
Stream segments classified as recreational	0	17	17	0	0
Stream segments classified as wild	26	548	298	26	26
Open to commercial timber development					
Stream segments classified as recreational	49	32	32	49	49
Stream segments classified as wild	522	0	249	522	522
ROW exclusion					
Stream segments classified as recreational	0	17	17	0	17
Stream segments classified as wild	26	321	321	26	321

Management Action	Alternative (miles)				
	A	B	C1	C2	D
ROW avoidance					
Stream segments classified as recreational	0	32	32	0	32
Stream segments classified as wild	0	226	226	50	226
Open to ROW					
Stream segments classified as recreational	49	0	0	49	0
Stream segments classified as wild	522	0	0	471	0
Limited OHV travel (closed in summer)					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	0	78	0	0	0
Limited to winter OHV travel					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	0	46	50	50	0
Limited OHV travel (limited to existing routes)					
Stream segments classified as recreational	49	49	49	49	49
Stream segments classified as wild	548	424	497	497	548
Closed to fluid mineral development					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	0	335	76	26	26
Open to fluid mineral development					
Stream segments classified as recreational	0	0	0	49	49
Stream segments classified as wild	187	123	401	522	522
Withdrawn from locatable mineral entry					
Stream segments classified as recreational	49	49	49	49	0
Stream segments classified as wild	231	70	70	70	0
Withdrawn from locatable mineral entry, but open to metalliferous					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	37	0	0	0	0
Recommended for withdrawal from locatable mineral entry					
Stream segments classified as recreational	0	0	0	0	0
Stream segments classified as wild	4	217	0	0	0
Open to locatable mineral entry					
Stream segments classified as recreational	0	0	0	49	49
Stream segments classified as wild	276	260	477	547	547
Open to locatable minerals, State- or Native-selection, segregated from locatable mineral entry					
Stream segments classified as recreational	0	0	0	49	49
Stream segments classified as wild	92	260	260	330	330
Closed to mineral materials sales					
Stream segments classified as recreational	0	32	0	0	0
Stream segments classified as wild	0	548	219	76	26
Open to mineral materials sales					
Stream segments classified as recreational	49	17	49	49	49
Stream segments classified as wild	522	0	328	471	522

Source: BLM GIS 2017
0 = not applicable

Alternative A

Under Alternative A, the BLM would manage the 11 rivers as eligible for inclusion in the NWSRS (603 miles; see **Table 3-26** and **Map 2.10, Appendix A**). The river segments were found eligible based on current management and existing conditions. The BLM must continue to manage all eligible segments to protect the tentative classification, free-flowing condition, ORVs, and adequate water quality to support those ORVs.

Because of this, continuing current management would not diminish the aforementioned qualities. ORVs could be indirectly enhanced by management for other resources.

The BLM would not permit any actions that would affect the free-flowing condition, ORVs, and adequate water quality of the eligible segments to support ORVs; the tentative classification of any of the segments; or that would result in the reduction of water quality to the extent that it would no longer support the ORVs. As such, implementing management actions pursuant to this RMP would not affect eligible segments. As a result, there would not be impacts from other resource management under Alternative A.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

There are no direct or indirect impacts common under Alternatives B, C1, C2, and D.

Alternative B

The BLM would manage the 11 rivers as suitable for inclusion in the NWSRS (603 miles; see **Map 2.10, Appendix A**). The river segments were found suitable based on current management and existing conditions. The BLM must continue to manage all suitable segments to protect the tentative classification, free-flowing condition, ORVs, and adequate water quality to support those ORVs. Because of this, continuing current management would not diminish the aforementioned qualities. ORVs could be indirectly enhanced by management for other resources.

The BLM would not permit any actions that would affect the free-flowing condition, ORVs, and adequate water quality of the suitable segments to support ORVs; the tentative classification of any of the segments; or that would result in the reduction of water quality to the extent that it would no longer support the ORVs. As such, implementing management actions pursuant to this RMP would not affect suitable segments. As a result, there would not be impacts from other resource management under Alternative B.

Alternative C1

The BLM would determine all 11 stream segments not suitable for inclusion in the NWSRS and would release them from interim management protections afforded eligible or suitable segments. Consequently, without any interim management protections, management actions under this RMP could affect the ORVs for these stream segments.

Under Alternative C1, 49 miles (98 percent) of the 2 recreational segments and 147 miles (27 percent) of the 9 wild segments would overlap SRMAs. The amount of overlap for the recreational segments would be the same as under Alternative A, while the overlap for the wild segments would be 18 fewer miles than under Alternative A, resulting in fewer impacts on ORVs. SRMAs could attract concentrated recreation to these stream segments, which could affect ORVs; however, SRMAs would also allow the BLM to restrict land uses to enhance recreation opportunities and protect the resources supporting these opportunities. Impacts would be reduced where recreation is restricted to meet cultural and biological resource objectives or where educational facilities are constructed in a way that minimizes resource impacts. Additionally, concentrating recreation in SRMAs could reduce recreation levels outside the SRMAs and diminish related recreation impacts on ORVs.

Additionally, 51 miles (9 percent) of the 9 wild segments would overlap LWCs that would be managed to maintain wilderness characteristics (no miles of overlap under Alternative A). Managing these areas to maintain wilderness characteristics would restrict development that could degrade these characteristics, thus helping to indirectly protect ORVs. Further, 424 miles (77 percent) of the 9 wild segments and 26 miles (52 percent) of the 2 recreational segments would overlap LWCs that would be managed to emphasize other

resource values and multiple uses while applying management restrictions to reduce impacts on wilderness characteristics. These areas would provide strict protections, such as management according to VRM Class II objectives, ROW avoidance, and NSO stipulations for fluid mineral leasing.

Additionally, the BLM would retain BLM-managed lands unencumbered by State or Native selections and those not conveyed under the Alaska Statehood Act and ANCSA in federal ownership in these areas. As a result, these restrictions and closures would indirectly protect ORVs; however, allowing for some mineral materials disposal, vegetation treatment, and prescribed fire could potentially degrade ORVs in this area.

Managing segments according to VRM class objectives could provide some protection for ORVs. Under Alternative C1, 26 miles (5 percent) of the 9 wild segments would be managed according to VRM Class I objectives (same as under Alternative A); 168 miles (30 percent) would be managed according to VRM Class II objectives (no miles would be managed as VRM Class II under Alternative A); 13 miles (2 percent) would be managed according to VRM Class III objectives (79 miles fewer than under Alternative A); and 342 miles (62 percent) would be managed according to VRM Class IV objectives (4.7 times more than under Alternative A). Additionally, 49 miles (98 percent) of the 2 recreational segments would be managed according to VRM Class II objectives (no miles under Alternative A).

Managing segments according to VRM Class I or II objectives would provide direct protection of segments with a scenic ORV by requiring that landscape alterations be done so they do not dominate the viewshed. Managing as VRM Class I or II also would provide incidental protection to other ORVs; however, managing segments as VRM Class III would allow modifications to the landscape that could diminish scenic ORVs by allowing for landscape modifications that attract the attention of the casual observer. Further, managing segments as VRM Class IV could diminish scenic ORVs by allowing for landscape modifications that have noticeable or dominant visual contrasts, allowing the greatest level of potential impacts of the four VRM classes.

Under Alternative C1, 9 miles (18 percent) of the 2 recreational segments would overlap the Galbraith Lake ACEC (same as under Alternative A). Additionally, 67 miles (12 percent) of the 9 wild segments would overlap the Jim River ACEC (2.2 times more than under Alternative A); 11 miles (2 percent) would overlap the Sukakpak/Snowden Mountain ACEC (no miles overlap under Alternative A); and 62 miles (11 percent) would overlap the Sulukna River ACEC (6.2 times more than under Alternative A). Compared with Alternative A, Alternative C1 would result in more miles of overlap with ACECs. Management of designated ACECs includes various protective management measures that focus on protecting R&I values. Consequently, these management measures would provide some incidental protection to ORVs in these areas.

Under Alternative C1, 26 miles (5 percent) of the 9 wild segments overlap WSAs (same as under Alternative A). Management of WSAs includes management as VRM Class I, minimal allowances for surface-disturbing activities, a closure to fluid mineral leasing, a ROW exclusion, and a closure to commercial timber development. Because the BLM would manage the WSAs to maintain their eligibility for consideration for wilderness by requiring that new activities within WSAs meet the non-impairment criteria, ORVs would be provided some indirect protection in these areas.

Under Alternative C1, 17 miles (34 percent) of the 2 recreational segments would be closed to commercial timber development (no miles would be closed under Alternative A), while 32 miles (64 percent) would be open to commercial timber development (17 miles fewer than under Alternative A). Additionally, 298 miles (54 percent) of the 9 wild segments would be closed to commercial timber development (11.5 times more

than under Alternative A), while 249 miles (45 percent) would be open to commercial timber development (273 miles fewer than under Alternative A).

Opening areas to commercial timber development could affect ORVs by flattening, destroying, or removing vegetation; degrading and fragmenting habitat; causing erosion and runoff; making changes to the visual landscape; causing erosion that could degrade aquatic habitats; and damaging cultural and paleontological resources during timber harvest or road construction. Additionally, allowing commercial harvest in areas where it was not allowed previously and allowing access to timber resulting from trails and roads built for other activities could result in impacts on ORVs. Closing areas to commercial timber development would eliminate these impacts, consequently providing some protection to ORVs, including fish, wildlife, and other values that could be affected by timber harvest. Scenic values also would be protected by prohibiting this type of landscape modification; however, commercial timber development can also be used as a tool to improve vegetation conditions, which could impact ORVs in some instances.

Under Alternative C1, 32 miles (64 percent) of the 2 stream segments classified as recreational would overlap ROW avoidance areas (no miles overlap under Alternative A), and 17 miles would overlap ROW exclusion areas (no miles of overlap under Alternative A). Of the 9 wild segments, 226 miles (41 percent) would overlap ROW avoidance areas (no miles overlap under Alternative A), and 321 miles (58 percent) would overlap ROW exclusion areas (12.3 times more miles than under Alternative A).

Managing as ROW exclusion would protect ORVs by precluding activities associated with utility and access road development, which could cause habitat degradation, erosion, runoff, and landscape modifications affecting the scenic quality and settings for cultural ORVs. Managing areas as ROW avoidance would provide the same protections as ROW exclusion if the areas were avoided. If the areas could not be avoided, activities would minimize impacts through design features or mitigation measures, thereby protecting ORVs; however, 0 miles of the two recreational segments and nine wild segments would overlap areas open to ROWs (49 miles fewer than under Alternative A for recreational and 522 miles fewer for wild).

Additionally, 50 miles (9 percent) of the 9 wild segments would overlap areas with limited OHV travel during the winter season (no miles of overlap under Alternative A). In these areas, OHVs would be prohibited from May 1 through June 30, which could protect ORVs by reducing the impacts associated with OHV use described above. Further, 49 miles (98 percent) of the 2 recreational segments (same as under Alternative A) and 497 miles (90 percent) of the 9 wild segments (51 miles fewer than under Alternative A) would overlap areas with limited OHV travel. In these areas, OHV travel would be limited to existing routes, which could protect ORVs by reducing impacts from motorized and mechanized travel and limiting surface disturbance associated with route development.

Furthermore, 477 miles (86 percent) of the nine wild segments would overlap areas open to locatable mineral entry (1.72 times more than under Alternative A). Additionally, 401 miles (73 percent) would overlap areas open to fluid mineral development for oil and gas (2.14 times more than under Alternative A).

Energy and minerals development could affect ORVs by flattening, destroying, or removing vegetation; changing the visual landscape; degrading and fragmenting habitat; damaging cultural and paleontological resources during road and facility construction; and contaminating surface water from wastewater spills, fuel, chemicals, and runoff containing drilling fluids. The degree of impacts on these stream segments would depend on the proximity of development to the stream segment. NSO stipulations within stream segments could eliminate these impacts by prohibiting surface occupancy or surface-disturbing activities associated with fluid mineral development. NSO stipulations would generally provide the same level of protection as

closing the area to leasing because, while the mineral would still be available for extraction beneath the surface, facilities would be located outside the classified stream segment areas. If NSO stipulations are excepted or waived, ORVs could be protected by a controlled surface use stipulation. While surface occupancy could still occur, mitigation measures would be implemented to minimize impacts on the resource for which the stipulation was designed to protect.

Under this alternative, 70 miles (13 percent) of the nine wild segments would overlap areas withdrawn from locatable mineral entry (161 miles fewer than under Alternative A). Further, 49 miles (98 percent) of the two recreational segments would overlap with areas withdrawn from locatable mineral entry (same as under Alternative A). Additionally, 76 miles (14 percent) of the nine wild segments would overlap areas closed to fluid mineral for oil and gas (no miles closed under Alternative A). Closure to fluid mineral leasing would protect all ORVs by precluding activities associated with mineral development that might cause surface disturbance, habitat degradation, erosion, runoff, and modifications to the landscape that affect scenic quality and settings for cultural ORVs.

Under Alternative C1, 49 miles of the two recreational segments (98 percent) would overlap areas open to mineral material sales (same as under Alternative A). Additionally, 219miles (40 percent) of the nine wild segments would overlap areas closed to mineral materials sales (no miles closed under Alternative A), while 328 miles (59 percent) would overlap areas open to mineral materials sales (122 miles fewer than under Alternative A). Opening areas to mineral materials sales could degrade ORVs by allowing for mineral development, while closing areas could protect ORVs by limiting or restricting the level of mineral materials development that could occur.

Alternative C2 (Preferred Alternative)

Similar to Alternative C1, the BLM would determine all 11 stream segments to be not suitable for inclusion in the NWSRS and would release them from interim management protections afforded eligible or suitable segments; consequently, without any interim management protections, management actions under this RMP could affect the ORVs for these stream segments.

Under Alternative C2, 26 miles (5 percent) of the nine wild segments would be managed according to VRM Class I objectives (same as under Alternative A), 96 miles (18 percent) would be managed according to VRM Class III objectives (1.04 times more than under Alternative A), and 392 miles (71 percent) would be managed according to VRM Class IV objectives (5.4 times more than under Alternative A). Of the two recreational segments, 32 miles (65 percent) would be managed according to VRM Class III objectives (no overlap under Alternative A) and 17 miles (35 percent) would be managed according to VRM Class IV objectives (32 miles fewer than Alternative A). The types of impacts would be the same as those described under Alternative C1.

Under Alternative C2, 26 miles (5 percent) of the nine wild segments overlap WSAs (same as under Alternative A). Impacts would be the same type as those described under Alternative C1. There would be no overlap with any designated ACECs; consequently, ORVs would not receive any indirect protection from ACEC management under Alternative C2.

Additionally, 49 miles (98 percent) of the two recreational segments would be open to commercial timber development (same as under Alternative A). No acres would be closed to commercial timber development, resulting in fewer protections for ORVs; however, 26 miles (5 percent) of the nine wild segments would be closed to commercial timber development (same as under Alternative A), while 522 miles (94 percent) would be open to commercial timber development (same as under Alternative A). These actions would result in the same types of impacts as those described under Alternative C1.

Under Alternative C2, 26 miles (5 percent) of the nine wild segments would overlap ROW exclusion areas (same as under Alternative A), which would result in the same type of impacts as those described under Alternative C1. Additionally, 49 miles (98 percent) of the two recreational segments (same as under Alternative A) and 471 miles (86 percent) of the nine wild segments would overlap areas open to ROWs. Managing these areas as open to ROWs could affect ORVs by allowing activities associated with utility and access road development (51 miles fewer than Alternative A).

Additionally, 49 miles (98 percent) of the two recreational segments (same as under Alternative A) and 497 miles (91 percent, 51 miles fewer than Alternative A) of the nine wild segments would overlap areas with OHV travel limited to existing routes. The types of impacts would be the same as those described under Alternative C1; however, there would be no miles that overlap areas that prohibit OHV travel, resulting in fewer protections of ORVs.

Of the nine wild segments, 547 miles (99 percent) would overlap areas open to locatable mineral entry (2.0 times more than under Alternative A). The number of miles of segments withdrawn from locatable mineral entry would be the same as under Alternative C1. Under this alternative, 26 miles (5 percent) of the nine wild segments would overlap with areas closed to fluid mineral development (no miles under Alternative A), while 522 miles (94 percent) of the nine wild segments would overlap with areas open to fluid mineral development (2.8 times more than under Alternative A). Energy and minerals development would result in the same types of impacts on ORVs as those described under Alternative C1.

Lastly, 471 miles (85 percent) of the nine wild segments (129 miles fewer than under Alternative A) would overlap areas open to mineral materials sales; however, 76 miles (14 percent) of the nine wild segments (no miles under Alternative A) would overlap areas closed to mineral materials sales. The types of impacts would be the same as those described under Alternative C1.

Alternative D

Similar to Alternative C1, the BLM would determine all 11 stream segments not suitable for inclusion in the NWSRS and would release them from interim management protections afforded eligible or suitable segments. Consequently, without any interim management protections, management actions under this RMP could affect the ORVs for these stream segments.

Under Alternative D, 26 miles (5 percent) of the nine wild segments would be managed according to VRM Class I objectives (same as under Alternative A), 129 miles (23 percent) would be managed according to VRM Class III objectives (1.4 times more than under Alternative A), and 392 miles (71 percent) would be managed according to VRM Class IV objectives (5.4 miles more than under Alternative A). Of the two recreational segments, 49 miles (98 percent) would be managed according to VRM Class III objectives (no overlap under Alternative A). The types of impacts would be the same as those described under Alternative C1.

Under Alternative D, 26 miles (5 percent) of the nine wild segments overlap WSAs (same as under Alternative A). Impacts would be the same type as those described under Alternative C1. There would be no overlap with any designated ACECs; consequently, ORVs would not receive any indirect protection from ACEC management under Alternative D.

Additionally, 49 miles (98 percent) of the two recreational segments would be open to commercial timber development (same as under Alternative A). No miles would be closed to commercial timber development, resulting in fewer protections for ORVs; however, 26 miles (5 percent) of the nine wild segments would be

closed to commercial timber development (same as under Alternative A), while 522 miles (94 percent) would be open to commercial timber development (same as under Alternative A). These actions would result in the same types of impacts as those described under Alternative C1.

Under Alternative D, 321 miles (59 percent) of the nine wild segments would overlap ROW exclusion areas (12.3 times more than under Alternative A), which would result in the same type of impacts as those described under Alternative C1.

Additionally, 49 miles (98 percent) of the two recreational segments (same as under Alternative A) and 548 miles (99 percent) of the nine wild segments would overlap areas with OHV travel limited to existing routes (same as under Alternative A). The types of impacts would be the same as those described under Alternative C1; however, there would be no miles that overlap areas that prohibit OHV travel, resulting in fewer protections of ORVs.

Of the nine wild segments, 547 miles (99 percent) would overlap areas open to locatable mineral entry development for oil and gas (2.0 times more than under Alternative A), while 522 miles would overlap areas open to fluid mineral development (2.8 times more than under Alternative A). No miles would be withdrawn from locatable mineral entry. Under this alternative, 26 miles (5 percent) of the nine wild segments would overlap with areas closed to fluid mineral development (no miles under Alternative A), while no miles of the two recreational segments would be closed (same as under Alternative A). Energy and minerals development would result in the same types of impacts on ORVs as those described under Alternative C1.

Lastly, 522 miles (94 percent) of the nine wild segments (same as under Alternative A) and 49 miles of the two recreational segments (98 percent) would overlap areas open to mineral materials sales (same as under Alternative A); however, 26 miles (5 percent) of the nine wild segments (no miles under Alternative A) would overlap areas closed to mineral materials sales. The types of impacts would be the same as those described under Alternative C1.

Conclusion

Under Alternatives A and B, all 11 stream segments would either be found eligible or suitable for inclusion in the NWSRS, and interim protective management measures would protect the tentative classification, free-flowing condition, ORVs, and adequate water quality to support those ORVs for these segments. Consequently, ORVS would be the most protected under these two alternatives.

Alternatively, under Alternatives C1, C2, and D, the 11 stream segments would be found not suitable for inclusion in the NWSRS, and these stream segments would not be directly protected under interim protective management. As a result, the ORVs and free-flowing condition of these segments could either be affected by management actions and allocations under either alternative, or indirectly protected by other management actions and allocations. Between Alternatives C1, C2, and D, the potential degree of alteration would be greatest under Alternative D, given that this alternative allows for fewer land use restrictions, resulting in greater impacts on ORVs and less indirect protection for ORVs. Conversely, under Alternative C1, and to a lesser degree Alternative C2, the implementation of increased restrictions to protect sensitive resources, such as visual resources and LWCs, and the implementation of ROW avoidance and exclusion areas, would result in fewer potential impacts on ORVs between these two alternatives overall.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

Past, present, and RFFAs and conditions within the cumulative impact analysis area in the planning area that have affected and would likely continue to affect ORVs for eligible or suitable segments are mining, oil and gas development, transportation and infrastructure construction and development, utility corridor and ROW development, increased tourism and recreation, increased access to remote areas, wildland fires and fire suppression, flooding, and soil and permafrost changes. The direct and indirect impacts of the alternatives described above, would cumulatively contribute to the impacts of these RFFAs. The BLM, however, would adaptively manage to protect ORVs and minimize impacts on ORVs where applicable and feasible.

Cumulative impacts on ORVs also could result from non-BLM actions and decisions on lands next to the 11 stream segments. Development and growth throughout the planning area could, over time, encroach on these areas. Activities such as unauthorized off-route travel and increased noise, air, and light pollution could degrade ORVs. Visual disturbances, including any structures or resource developments noticeable in the viewshed of stream segments with cultural ORVs, can affect the cultural setting of these segments.

As noted above, the degree of potential alteration resulting from actions and activities considered in this RMP would be greatest under Alternative D because of fewer land use restrictions that could help indirectly protect ORVs. Under Alternative C1, and to a lesser degree Alternative C2, the implementation of increased restrictions, such as visual resources and LWCs, and the implementation of ROW avoidance and exclusion areas, would result in fewer impacts on ORVs. This is because these actions would indirectly protect ORVs. Implementing SOPs, required design features, and mitigation measures would reduce the potential for impacts on ORVs.

Additionally, the effects of climate change, described above, could influence the rate or degree of the potential cumulative impacts.

3.4.3 Iditarod National Historic Trail

Over 400 miles of the INHT segments are in the planning area, approximately 2.7 miles of which are on BLM-managed land; approximately 1.8 miles of the Ruby-Kaltag Connecting Trail (NUL-00066) cross a small block of State-selected land approximately 6 miles northeast of the village of Koyukuk. Approximately 0.9 miles of the INHT cross two small blocks of BLM-managed land south of Kaltag. The INHT is currently absent a National Trail Management Corridor within the planning area. The terrain, scenery, and resources associated with the INHT are mostly unchanged since the Gold Rush period of the 1900s. Current uses of the trail include snowmachine travel between villages, trapping, firewood gathering, subsistence activities, and race events. Very little summer overland use of the INHT occurs. Additional information is available in Section 2.3.5, INHT, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf.

Direct and Indirect Impacts

See **Appendix M** for the analytical issues related to the INHT and the analytical methods used in this analysis.

Implementing management for the following resources would have negligible to no impact on the INHT and are therefore not discussed in detail: air quality, recreation, WSAs, and ACECs.

Comparative Summary Table

Table 3-27 summarizes potential impacts on the INHT by alternative.

Table 3-27
Summary of Potential Impacts on National Trails

Resource Indicator	Alternative (miles of trail)				
	A	B	C1	C2	D
Open to forestry	2.7	2.6	2.7	2.7	2.7
Open to ROWs	2.7	1.4	2.6	2.7	2.7
LWCs					
Maintain	0	0.9	0	0	0
Other	2.7	1.8	2.7	2.7	0
Open to fluid minerals development	1.8	2.6	2.7	2.7	2.7
Open to mineral materials development	2.7	2.7	2.7	2.7	2.7
Open to nonenergy solid minerals development	1.8	2.3	2.7	2.7	2.7

Source: BLM GIS 2017

Alternative A

Of the approximately 400 miles of INHT within the Central Yukon planning area, approximately 2.7 miles are found on BLM-managed lands in the planning area. Management direction is determined on a case-by-case basis. The only current planning document for the INHT is the INHT, Seward to Nome Route: A Comprehensive Management Plan (BLM 1986b). The portion of the INHT on BLM-managed lands would be managed accordingly to minimize impacts on the trail; however, impacts on the surrounding environment's characteristics that contribute to trail significance and introduce visual elements out of character within the national trail corridor, or that alter its setting, could occur. Under all action alternatives, there would be minimal impacts on the INHT from BLM-authorized actions because there are only 2.7 miles of INHT on BLM-managed surface lands, which is less than 1 percent of the total approximate 400 miles of INHT found within the Central Yukon planning area (see **Table 3-27**).

Direct impacts on national trails typically result from surface-disturbing activities, including OHV travel, activities in ROWs, and project development, that disturb soil or alter the surrounding environment's characteristics that contribute to trail significance and introduce visual elements out of character with the property, or that alter its setting or result in neglect of the resource to the extent that it is impaired or destroyed. For example, surface-disturbing activities that destroy or alter trail ruts or create trail braiding for historic trails are considered a direct impact.

Damage from wildland fire, erosion, downed trees, or changes in the vegetation community from nonnative plant species could affect the surrounding environment's setting by altering the visual character or vegetation composition on lands adjacent to and surrounding the national trail. Audible and visual impacts could diminish the integrity of the national trail's historic character by changing its setting and feeling.

Indirect impacts on national trails result from project-induced increases or decreases in activity in the decision area. For example, construction of a recreation facility could increase visitor use, which could result in indirect impacts on previously undisturbed trail segments, particularly along national historic trails. Construction in an area some distance from a trail also can result in erosion or deposition at a trail location.

Stipulations on surface-disturbing activities (e.g., NSO, controlled surface use, and TL for fluid minerals development) could locally indirectly affect the national trail by restricting or minimizing surface disturbance, thus preserving the area scenic, natural, and cultural resource values. Management for other resources (e.g., vegetation, wildlife, cultural, and paleontological) along lands next to the INHT could affect the cultural

landscape and visitor experience associated with the national trail. Wildlife habitat-improvement projects could indirectly enhance or preserve national trail qualities. Protection of cultural and paleontological resources could indirectly affect national trails by preserving the trail's cultural landscape and integrity.

There would be little to no direct impact on the INHT under all alternatives. For projects on BLM-managed lands, the BLM would consider mitigation on a case-by-case basis to reduce direct and indirect impacts on the INHT, consistent with current management and designating legislation. Projects that would conflict with the goals of the national trail's designating legislation may not be approved. Possible mitigation measures could include project mitigation, off-site mitigation, data collection (e.g., historic accounts of the trail's use), or restrictions on resource uses along, across, or next to the trail. Implementing mitigation measures would minimize direct and indirect impacts on the visual and historic characteristics of the INHT.

Under Alternative A, 2.7 miles of the INHT (100 percent of the INHT in the decision area; less than 1 percent of the total length of the INHT in the Central Yukon planning area) would be open to commercial timber harvest and non-subsistence collection of live vegetation. There would be no management actions in place to prevent woodland harvest activities near the trail, which could lead to impacts on its viewshed, physical characteristics, and integrity.

No lands would meet the criteria identified for disposal, and the BLM would maintain all seven ANCSA 17(d)(1) withdrawals. As a result, 1.8 miles of INHT would not experience direct impacts from surface development, or indirect impacts on scenic values and trail experience, over the long term. The remaining 0.9 miles of the INHT would remain closed to fluid mineral leasing, withdrawn from locatable mineral entry, and closed to nonenergy solid mineral leasing per ANCSA 17(d)(1) withdrawals.

The 2.7 miles of INHT in the decision area would not be managed as ROW exclusion or avoidance areas and would be open to ROW development. This could result in ROW-related surface disturbance and development that could indirectly alter the scenic, natural, and cultural values associated with the trail during construction and in the long-term during facility operations.

All LWCs under Alternative A would be managed to emphasize other resource values and multiple uses. No LWC determination has been made for this alternative. As a result, potential management actions in these areas could alter the scenic, natural, and cultural values associated with the INHT.

Under Alternative A, 1.8 miles of the INHT would be in areas open to fluid mineral leasing and open to nonenergy solid mineral leasing; the entire portion of the INHT in the decision area (2.7 miles) would be open to mineral materials disposal. As a result, this portion of the national trail could experience direct impacts from development, or indirect impacts on scenic values and trail experience, over the long term. 0.9 miles of the INHT (33 percent of the INHT in the decision area) would be closed to fluid mineral leasing, withdrawn from locatable mineral entry, and closed to nonenergy solid mineral leasing per ANCSA 17(d)(1) withdrawals.

The planning area would remain open to cross-country OHV travel. Use of vehicles of less than 1,500 pounds gross vehicle weight would be allowed without a permit. Subsistence use of snowmachines also would be allowed throughout the decision area. INHT segments could be used as winter overland routes between communities; very little summer overland use would occur. Vehicle weight restrictions in place under Alternative A would continue to minimize the potential for vehicles to create deeper and wider trail ruts, which, in turn, increase erosion.

The INHT within the decision area is in an undesignated VRM area. Indirect impacts could include changes to scenic quality from major modifications to the landscape, which would compromise the trail's existing landscape character and isolated and primitive nature.

The INHT within the decision area also would likely be in lands designated as limited for fire management actions, which means that management would trend away from a natural fire regime at a slower rate than areas with more aggressive fire suppression. Wildland fire could remove vegetation surrounding the trail and potentially create trail blockages from downed trees. The scenic quality of the landscape of the INHT could be indirectly affected through the drastic alteration associated with wildfire.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

The BLM recognizes a 0.5-mile corridor around the centerline of national historic trails as a National Trail Management Corridor within which resources, qualities, values, and associated settings and the primary use or uses are preserved.

Alternatives B, C1, C2, and D would provide some additional protection of the INHT in the decision area, beyond those under Alternative A, by applying SOPs. Specifically, NAT-1 requires the BLM to authorize feed and mulch that are certified weed-free (when available, as approved by the BLM AO). This SOP would minimize the changes to the INHT's setting and feeling through maintaining its cultural landscape and integrity.

ANCSA 17(d)(1) withdrawals would be revoked; 2.7 miles of the INHT would be open to locatable mineral leasing, location, and entry, which could impact the overall integrity of the INHT in these areas.

Impacts on the INHT from travel and transportation management actions, and from wildland fire would be the same as those described under Alternative A.

Alternative B

Compared with Alternative A, management decisions for high value watersheds under Alternative B would minimally reduce (by 0.1 mile, or 4 percent less than Alternative A) the INHT area open to commercial timber development and non-subsistence collection of live vegetation. Closing the 0.1 mile to commercial timber development and casual use would preserve the trail's viewshed, physical characteristics, and integrity in this portion of the INHT. On the remaining 2.6 miles of the INHT (97 percent of the INHT in the decision area), impacts from commercial timber harvest and non-subsistence collection of live vegetation would be the same as those described under Alternative A.

There would be 1.4 miles of the INHT (52 percent of the INHT in the decision area) that overlap ROW exclusion and avoidance areas as a result of management decisions for high value watersheds, as compared with 0 miles under Alternative A. This would eliminate or limit, respectively, impacts from new development related to ROW activities, including transmission development, in the short and long term. The remaining 1.3 miles of the INHT (48 percent of the INHT in the decision area; 52 percent less than Alternative A) would be in areas open to ROW entry; impacts on these portions of the national trail would be the same as those described under Alternative A, but potentially experienced over a smaller area.

The BLM would manage areas covering 1.8 miles (67 percent of the INHT in the decision area; 33 percent less than Alternative A) of the INHT to emphasize other resource values and multiple uses as a priority over protecting wilderness characteristics. As a result, potential management actions in these areas could alter the scenic, natural, and cultural values associated with the trail; impacts would be experienced over a smaller area than under Alternative A. Across 0.9 miles (33 percent of the INHT in the decision area) of the national trail,

the BLM would manage lands to emphasize other multiple uses, while applying restrictions to reduce impacts on LWCs. Surface disturbances and impacts on the trail's integrity would be minimized in these areas.

There would be 2.6 miles of the INHT in areas open to fluid mineral leasing; 0.1 mile of the INHT in the decision area would be closed to fluid mineral leasing. The type of effects would be the same as those described under Alternative A, but they would affect a greater portion of the total length of the INHT in the decision area.

Under Alternative B, 2.7 miles of the INHT would be open for mineral materials disposal, same as under Alternative A. There would be 0 miles of the INHT closed to mineral materials disposal, which would not protect the trail's scenic quality in the decision area. Further, 2.3 miles of the INHT (85 percent of the INHT in the decision area) would be open to nonenergy solid mineral leasing. The remaining 0.4 miles of the INHT (15 percent of the INHT in the decision area) would be closed to nonenergy solid mineral leasing, providing protection of the trail's scenic quality; however, due to the low potential for nonenergy solid mineral leasing in the decision area, the likelihood of impacts on national trails would be low.

The INHT would be managed as VRM Class I, which would provide more opportunities to protect scenic resources than under Alternative A. This VRM class would retain the existing landscape character and maintain the trail's isolated and primitive nature.

Alternative C1

Impacts on the INHT from forestry, LWCs, and mineral materials disposal would be the same as those described under Alternative A.

Under Alternative C1, 2.6 miles of the INHT (96 percent of the INHT in the decision area) would be available to ROWs, 4 percent less than under Alternative A. 0.1 mile of the INHT (4 percent of the INHT in the decision area) would be managed as ROW avoidance. Types of impacts would be the same as those discussed under Alternative A, but Alternative C1 would limit impacts from new development related to ROW activities over a much smaller area than Alternative A.

Impacts associated with lands open to fluid mineral leasing, mineral materials disposal, and nonenergy solid mineral leasing would affect 2.7 miles of the INHT in the decision area. The type of effects would be the same as those described under Alternative A but would affect a greater portion of the total length of the INHT in the decision area.

The entire INHT in the decision area (2.7 miles) would be managed as VRM Class IV. This VRM class allows the landscape character to be changed dramatically by development. Impacts would vary based on the restrictions and type of development and would be similar to those under Alternative A.

Alternative C2 (Preferred Alternative)

Under Alternative C2, impacts on the INHT in the decision area from forestry, ROWs, LWCs, and mineral materials disposal would be the same as those described under Alternative A. Impacts from visual resources would be the same as those described under Alternative C1.

Impacts on the INHT from fluid mineral leasing and nonenergy solid mineral leasing would be the same as those described under Alternative C1. The type of effects would be the same as those described under Alternative A but would affect a greater portion of the total length of the INHT in the decision area.

Alternative D

Impacts from forestry, ROWs, and mineral materials disposal would be the same as those described under Alternative A. Impacts from fluid mineral leasing, nonenergy solid mineral leasing, and visual resources would be the same as those described under Alternative C1.

No lands would be managed for wilderness characteristics; all lands would be managed to emphasize other multiple uses as a priority. As a result, potential management actions in these areas could alter the scenic, natural, and cultural values associated with the trail, and there would be greater opportunities for direct and indirect impacts related to surface disturbance from development in the short and long term. Impacts on the INHT would be similar to those described under Alternative A, where no LWCs determination has been made.

Conclusion

2.7 miles of INHT cross BLM-managed surface lands in the Central Yukon planning area, which is less than 1 percent of the approximate 400 total miles of INHT in the planning area; however, management actions and activities have the potential to alter the INHT's scenic, natural, and cultural features and integrity. The potential degree of alteration would be greatest under Alternative D because of fewer land use restrictions for the protection of sensitive resources associated with the national trail. Conversely, under Alternative B, the implementation of increased restrictions to protect sensitive resources, such as visual resources and LWCs, and the implementation of ROW avoidance and exclusion areas, would result in the fewest potential impacts on the INHT. Alternatives A, C1, and C2 would have slightly fewer restrictions and, therefore, slightly more potential impacts than Alternative B.

Cumulative Impacts

See **Appendix M** for analytical methods used in this analysis.

The INHT is the one congressionally designated national trail in Alaska and the one National Historic Trail established to commemorate winter trail use. The BLM (Anchorage Field Office) is the Trail Administrator; the State of Alaska manages the INHT on state lands. The BLM works collaboratively with the State of Alaska to operate, develop, and maintain portions of the INHT located outside the boundaries of federally administered areas in accordance with the INHT Comprehensive Management Plan (BLM 1986b) and as agreed to in the 1987 Memorandum of Agreement Between the State of Alaska and BLM, U.S. Department of the Interior Concerning the INHT, and pursuant to the requirements of Public Law 90-543 (as amended). The cumulative impact analysis area used to analyze cumulative impacts on national trails for this RMP includes the INHT within the planning area (approximately 400 miles of the 2,400-mile INHT system). The time frame for the cumulative impact analysis is the life of the RMP (approximately 20 years).

Past and present actions have had minimal influence on the existing condition of the INHT throughout most of the planning area, which remains largely dominated by natural features. Population densities are generally low across the planning area. Past and present actions are expected to continue, including community infrastructure development, localized transportation improvements, energy consumption, subsistence activities, and recreation uses, including the reestablishment and designation of the INHT in 1978 and its growing use for organized race events, including the Iditarod Trail Sled Dog Race and the Iron Dog snowmobile race. The primary natural phenomena that have historically affected trail resources are erosion, wildland fire, and changes to the length and intensity of winter weather. Historic trail landforms have been vulnerable to, or eroded by, shifting river and creek beds. RFFAs would likely induce minimal changes to the nature and purpose of the INHT, as lands with high mineral potential, utility corridors, and major ROWs within the planning area occur away from the trail corridor.

As noted above, the degree of potential alteration resulting from actions and activities considered in this RMP would be greatest under Alternative D because of fewer land use restrictions for the protection of sensitive resources associated with the INHT. Conversely, under Alternative B, the implementation of increased restrictions to protect sensitive resources, such as visual resources and LWCs, and the implementation of ROW avoidance and exclusion areas, would result in the fewest potential impacts on the INHT. Implementing SOPs, required design features, and mitigation measures would reduce the potential for impacts on the INHT's historic integrity, nature, and purpose from BLM-authorized activities on decision area lands. Overall, the contribution of impacts on the INHT resulting from actions and activities in this RMP would not be measurable or apparent.

3.5 Social and Economic

3.5.1 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, requires that federal agencies identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

Guidance for evaluating environmental justice issues in land use planning is included in the BLM planning handbook, Appendix D (BLM 2005c). Environmental justice involves the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

In addition to determining if its proposed actions would adversely and disproportionally impact minority populations, low-income communities, and tribes, the BLM has established environmental justice principles that include promoting and providing opportunities for the full involvement of minority populations, low-income communities, and tribes in BLM decisions that affect their lives, livelihoods, and health. Where disproportionately high adverse impacts are anticipated, the BLM would work with local community groups/associations, governments, and tribal leaders to determine if land disposition or acquisition policies affect real estate values and real income of minority and low-income communities and tribes.

The BLM provided many opportunities for engagement of low-income and minority communities during the planning process, in addition to the government-to-government consultation process described in **Chapter 1**. During project scoping, the BLM solicited public comments and held 16 public meetings in 15 different communities (two in Fairbanks and one each in Anchorage, Wiseman, Nenana, Nulato, Venetie, Lake Minchumina, Ruby, Anaktuvak Pass, Koyukuk, Tanana, Bettles/Evansville, Galena, Hughes, and Allakaket. Another opportunity was when the Central Yukon Field Office solicited nominations for ACECs, sending a letter inviting ACEC nominations to those on the project mailing list and a reminder email 30 days before the end of the nomination period.

When preliminary alternatives were available, a 60-day public comment period included 10 meetings in communities across interior Alaska (Koyukuk, Galena, Tanana, Allakaket, Ruby, Lake Minchumina, Venetie, Coldfoot, Anaktuvuk Pass, and Nenana) and in the cities of Fairbanks and Anchorage. To publicize the meetings and the comment period, the BLM sent emails tailored to each community/meeting location to 250 mailing list contacts. The BLM also sent postcards to an additional 480 mailing list contacts and to each

general box holder in each village where a meeting was to be held. Tribal governments, village corporations, and tribal corporations were also notified.

Federally Recognized Tribes

Tribal populations are also considered to be environmental justice populations. In accordance with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, and the President's memorandum of April 29, 1994, Government-to-Government Relations with Native American Tribal Governments, the Central Yukon Field Office conducted government-to-government consultation with federally recognized tribes in the planning area. Such consultation complies with the Department of the Interior's Alaska Policy on Government-to-Government Relations with Alaska Native Tribes, dated January 18, 2001, and is consistent with BLM Manual 1780, Tribal Relations. In Alaska, the minority population is frequently dominated by Alaska Natives, so tribal consultation overlaps substantially with environmental justice analyses, although neither is a substitute for the other.

The following list includes federally recognized tribes in or near the planning area:

- Alatna Village
- Evansville Village (aka Bettles Field)
- Galena Village (aka Louden Village)
- Allakaket Village
- Hughes Village
- Huslia Village
- Koyukuk Native Village
- Manley Hot Springs Village
- Nenana Native Association
- Nulato Village
- Rampart Village
- Native Village of Minto
- Native Village of Nuiqsuk
- Native Village of Ruby
- Native Village of Stevens Village
- Native Village of Tanana
- Native Village of Unalakleet
- Village of Anaktuvuk Pass
- Village of Kaltag
- Village of Venetie

Low-Income Populations

Low-income populations in an affected area are identified using the statistical poverty thresholds from the Bureau of the Census data, per U.S. Council on Environmental Quality guidelines. In the U.S., 13.1 percent of the population lives below the poverty level; the comparable estimate for Alaska is lower, at 11.1 percent (U.S. Census Bureau 2019).

For the CYRMP, any community having a poverty rate greater than 11.1 percent in terms of the number of individuals below the poverty rate will be considered low income. As a result, 17 of the 30 communities in the planning area or that could be affected by the plan are considered low income; the community name and percent poverty are identified with an asterisk in **Table 3-28**.

Minority Populations

U.S. Council on Environmental Quality guidelines for evaluating the potential environmental effects of projects require specific identification of minority populations, when either a minority population exceeds 50 percent of the population of the affected area or a minority population represents a meaningfully greater increment of the affected population than of the population of some other appropriate geographic unit as a whole. Black/African American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleut, and other non-white persons are defined as minority populations. The meaningfully greater analysis is generally

Table 3-28
Environmental Justice Populations in the Central Yukon Planning Area

City/Village	Total Population 2010[a]	Percent Alaska Native Persons[b]	Percent Persons in Poverty[a]
Wiseman	14	0[c]	0
Coldfoot	10	10	0
Bettles	14	14	0
**Evansville*	14	*53*	0
**Rampart*	24	*96*	0
**Alatna*	37	*97*	0
**Allakaket*	105	*95*	*46*
**Stevens Village*	78	*85*	*51*
**Hughes*	77	*96*	*16*
**Huslia*	275	*92*	*38*
**Ruby*	166	*89*	*29*
**Galena*	470	*64*	11
**Tanana*	246	*87*	*13*
**Koyukuk*	96	*97*	*54*
**Nulato*	264	*94*	*25*
**Kaltag*	190	*92*	*25*
**Manley Hot Springs*	79	13	*40*
**Minto*	210	*90*	*20*
**Nenana*	378	38	*20*
**Venetie*	166	*92*	*32*
**Lake Minchumina*	13	15	*13*
Anderson	246	3	2
**McKinley Park*	185	0	*22*
Healy	1,021	2	8
**Ester*	2,422	7	*18*
**Fairbanks*	31,535	10	*12*
North Pole	2,117	3	6
Big Delta	591	2	7
Delta Junction	958	3	7
**Anaktuvuk Pass*	324	*83*	7

[a]Community and Regional Affairs, Alaska Department of Commerce, Community and Economic Development at http://www.commerce.state.ak.us/cra/DCRAExternal/Community
[b]Economic Profile System data from 2010 U.S. Census available at http://headwaterseconomics.org/tools/eps-hdt
[c]Seven percent part Alaska Native

used to make sure that no areas of minority populations are omitted if the 50 percent threshold does not identify any environmental justice populations.

As shown in **Table 3-28**, 17 of the communities in or associated with the planning area are more than 50 percent Alaska Native, for the people who, in the 2010 Census, reported that they were one race. The only other community approaching the 50 percent level was Nenana, which was 38 percent Alaska Native. Because this is close to the 50 percent threshold, the BLM took a closer look to see if the proportion would increase when considering people who reported being more than one race; however, the proportion increased to 40 percent, so Nenana was not added as an environmental justice community due to minority status.

In summary, when considering both of the criteria (minority and poverty status), 8 of the 30 communities are not considered to be environmental justice communities: Wiseman, Coldfoot, Bettles, Anderson, North Pole, Big Delta, Delta Junction, and Healy. All of the other communities are subject to environmental justice considerations because of their minority status or their poverty status or both.

Direct and Indirect Impacts

As described in **Appendix M**, the goal of the environmental justice analysis is to determine whether impacts on low-income and minority populations are disproportionately negative. The primary impacts of concern are already identified in the *Subsistence* and *Social and Economic Conditions* sections; therefore, the goal of the environmental justice analysis in this EIS is not to generate new impacts but to assess whether the ones already identified are disproportionately negative.

Alternative A

Alternative A fully retains PLO 5150 segregated lands from selection, so subsistence access would be maintained, and motorized access would be allowed for the communities of Coldfoot and Wiseman on 1,376,834 acres. The use of firearms by residents of Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, Stevens Village within the Dalton Utility Corridor only for the taking of wildlife would continue to be allowed, so there would be no associated change in expenses. Under Alternative A, subsistence access is greatest, compared with all other alternatives, and it has the second highest acreage of ACECs among all the alternatives.

Alternative A does not propose travel restrictions or limitations, so it would have no direct effect on household transportation costs, existing customary trade patterns, and subsistence harvest distribution to low-income households among communities. There would be no new restrictions on recreational use or minerals development. Authorization for new mineral material sites and expansion of existing sites would continue to be processed to meet demand. This would provide support for jobs and labor income in the mining industry and would contribute indirectly to other industries affected by the mineral material production; therefore, Alternative A would not have a disproportionate, negative effect on environmental justice communities.

Alternative B

Alternative B emphasizes protection of resource values. It is the most restrictive to ROW entry, reducing the amount of acreage that is open from 98 percent under Alternative A to 42 percent. It would include 2.1 million acres of exclusion areas and 5.3 million acres avoidance areas. With the revocation of PLO 5150 in the outer corridor, federal subsistence priority would no longer apply on 1.4 million acres of top-filed lands that would become valid state selections. Residents of Wiseman and Coldfoot would be most affected, but residents of Alatna, Allakaket, Anaktuvuk Pass, Evansville, and Stevens Village (defined as environmental justice communities) would lose the ability to subsistence hunt using firearms within 5 miles of the Dalton Highway. This could increase the time and effort spent hunting and the costs for fuel in order to participate in subsistence practices.

Alternative B would greatly reduce the amount of land available to support mineral material production, compared with Alternative A; however, lands where mineral material development is restricted are not in any transportation corridors where demand is anticipated. In cases where demand cannot be satisfied from BLM-managed lands, the BLM anticipates that production would be available on other lands. Ninety-two percent of permits currently authorized for salable mineral production are in the inner corridor, where mineral material production would continue to be allowed and permit applications would continue to be processed. Alternative B would meet existing demand for mineral material production for the life of the plan, as described under

Alternative A in **Section 3.3.3** and in **Appendix N**. Alternative B may therefore be the least conducive to economic development opportunities related to locatable minerals.

Protective measures in the Dalton Highway Corridor Management Area would conserve Dall sheep and caribou habitat in the region. This could create more favorable conditions for recreational hunters, increasing competition with subsistence hunters in the inner corridor at a time when the outer corridor would have additional restrictions for subsistence hunters. Seasonal travel restriction may impede overland travel to Tanana, and Allakaket or Alatna, Wiseman, Coldfoot, Bettles, Evansville, and Hughes. Thirty-one ACECs and RNAs (approximately 4 million acres), the most of any alternative, would be designated, with proposed management to address a wide range of R&I values and research opportunities. Alternative B may reduce risks to subsistence abundance, and it has a lower likelihood than Alternative A of contributing to increased cost of living and a higher likelihood of reducing food insecurity in rural subsistence communities in the planning area.

In summary, Alternative B has some effects on access to resources and communities and would restrict some subsistence uses in portion of the Dalton Highway Corridor, but it also would reduce risks to subsistence species and habitat. Economic development activities would be more costly than under other alternatives but they would not be foreclosed; therefore, although some types of activities would be affected in some communities, there is no overall pattern of impacts to suggest that any communities would be disproportionately negatively affected.

Alternative C1

Alternative C1 emphasizes a blend of resource protection and resource development. While it designates more acres of land ranked as high and moderate locatable mineral potential as open to locatable metalliferous mineral development than Alternative A, 147,707 acres would be unencumbered due by State or Native selection and available for new federal mineral claims. This acreage and the associated economic activity due to federal mineral development that may result is less than that under Alternative A but slightly more than Alternative B. Under Alternative C1, there are 81,193 acres of high and moderate ranked locatable mineral potential lands selected by Native corporations. This is roughly a ten-fold increase for Native corporations, representing a large increase in economic development potential related to locatable mineral development.

Like Alternative A, Alternative C1 does not have summer travel restrictions (May through October); however, unlike Alternative A, it does have 125,186 acres of land in subsistence use areas or within 20 miles of communities subject to travel restrictions from May through June. The communities that may be directly affected by the travel restrictions are Rampart, Tanana, Allakaket, and Alatna. The protective measures offered by the travel restrictions in core caribou habitat may reduce impacts on subsistence resources and thereby reduce the amount of effort expended for subsistence hunting. Alternative C1 may result in increased subsistence abundance, which may reduce household fuel costs for travel, compared with Alternative A.

The effects of Alternative C1 on the cost of living in Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, and Stevens Village would be the same as those described UNDER Alternative B. This would be due to the revocation of PLO 5150 in the outer Dalton Highway Corridor. Eight ACECs and RNAs (approximately 418,000 acres) would be designated. Management to protect R&I values would be less restrictive for resource uses than under Alternative B. There would be far fewer acres of ROW exclusion areas, about 10 percent of Alternative B’s acreage in ACECs, and less-restrictive management of resource values, such as LWCs and visual resources.

In summary, Alternative C1 is similar to Alternative B, but with less protection of subsistence resources and fewer restrictions on other economic development activities. In spite of these differences, the alternative's attempt to strike a balance makes it difficult to identify a pattern of impacts that would suggest that environmental justice communities are being disproportionately negatively affected.

Alternative C2 (Preferred Alternative)

Alternative C2 emphasizes a blend of resource protection and resource development by reducing the acres set aside as ACECs or closed to mineral entry and appropriation. Like Alternative A, Alternative C2 has one ROW exclusion area, the CAMA WSA, which totals 1.9 percent of the planning area. Unlike Alternative A though, Alternative C2 proposes ROW avoidance areas, similar to Alternatives B and C1; however, Alternative C2 would provide a more favorable economic development environment to impact the growth of jobs and labor income than Alternatives B and C1. With the exception of the Toolik Lake RNA, there are no ACEC designations that require a plan of operation to be completed before developing locatable mineral interests.

Alternative C2 proposes a full revocation of PLO 5150, including the area commonly known as the inner corridor. If the Secretary of the Interior accepts the proposed revocation, most lands in the inner corridor that are top-filed by the State of Alaska, per ANILCA 906(e), would become selections and considered encumbered lands. These lands would not allow for new federal mineral claims but would allow for mineral exploration and operation within existing claims.

With the full revocation of PLO 5150, the communities of Wiseman and Coldfoot would lose motorized access to top-filed or State-selected lands in both the inner and outer corridor and within 5 miles of the Dalton Highway. Fragmentation of ownership patterns, along with federal subsistence regulations, would disrupt travel patterns and prohibit motorized access to federal lands beyond State-selected lands.

For those lands no longer subject to the federal subsistence regulations, the residents of Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, Stevens Village, Wiseman and Coldfoot would no longer be allowed the use of firearms for subsistence hunting within 5 miles of the Dalton Highway. The loss of federal subsistence access to these lands would likely increase the cost of living to residents in these communities by increasing the time or amount of effort spent hunting. This would be due to the restrictions on the use of firearms in this area, as compared with Alternative A and the other action alternatives. Because of these effects, the communities of Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, and Stevens Village in the planning area may experience an increased cost of living and a heightened risk of food insecurity due to impacts on subsistence resources, constituting a disproportionate and negative impact.

Alternative D

Alternative D emphasizes management to facilitate resource development more than the other alternatives. It has some commonalities with Alternative C2, such as fully revoking PLO 5150 in the Dalton Highway Corridor; however, there would be with fewer acres closed to mineral sales and disposal and no restrictions on OHV travel near communities and subsistence zones, no ROW avoidance areas, no recreation designations, no Class II areas of VRM, and no additional protection of Dall sheep or core caribou habitat.

As is the case with the other action alternatives, the Road to Umiat and Ambler Road Utility and Transportation Corridors would be designated, increasing demand for mineral materials in this region and potentially providing income for community residents along the corridors. This alternative is the most likely to facilitate resource development and any associated jobs and labor income. Any additional labor income would also support subsistence lifestyles in a mixed-subsistence economy; however, Alternative D also poses

the greatest risk to subsistence resources and access; therefore, the 22 environmental justice communities in the planning area would be at risk of disproportionate, negative impacts due to effects on subsistence access and abundance.

3.5.2 Subsistence

The planning area contains rural communities with mixed subsistence-cash economies, whose residents live a subsistence-based lifestyle. This includes sharing, bartering, and cash exchanges associated with the customary, traditional harvest of natural resources, combined with a wage labor economic system (Wolfe and Walker 1987). Within the borders of the planning area, the Fairbanks North Star Borough was determined to be a predominantly nonrural area, and residents do not qualify as subsistence users. Residents of all other areas and communities in the planning area are designated as federally qualified subsistence users.

Twenty-four recognized villages in or next to the planning area qualify as rural and are included in the impact analysis. These communities have subsistence use areas that overlap the planning area or rely on resources that pass through or depend on habitat in the planning area.

The 24 communities are grouped into three regions, as follows:

- **North Slope**—Anaktuvuk Pass and Nuiqsut
- **Yukon River**—Alatna, Allakaket, Bettles, Coldfoot, Evansville, Stevens Village, Rampart, and Wiseman
- **Upper Interior**—Arctic Village, Galena, Hughes, Huslia, Kaltag, Koyukuk, Lake Minchumina, Manley Hot Springs, Minto, Nenana, Nuiqsut, Nulato, Ruby, Tanana, and Venetie

These communities use large portions of the planning area and beyond to harvest resources for subsistence uses, often with overlapping use areas between communities. **Map Q-1** in **Appendix Q** shows the subsistence use areas.

Hunting and gathering of subsistence resources, including fish, terrestrial wildlife, marine mammals, birds, and vegetation, follow a seasonal round. It varies from year to year by community, based on traditional knowledge, river and weather conditions, and migratory patterns. Searching for and harvesting subsistence resources typically follows a general pattern during specific seasons. State and federal hunting regulations have contributed to changes in seasonal rounds by creating open and closed seasons for harvesting resources.

Several important subsistence resources are found in the planning area. Most notable are caribou, moose, Dall sheep, and Chinook and chum salmon. Many other resources, such as wood, berries, bears, and furbearers, are also important. The 24 communities and their subsistence practices are described in more detail in **Appendix Q**.

Harvest pressure by subsistence users in the planning area has remained consistent, with some fluctuations since ANILCA was passed. Future changes in availability of subsistence resources depend on changes in the human population, the climate and environment that shift species distribution and complicate access, competition from sport hunters outside the region, and surface-disturbing activities, including that for new roads and mining. Additional information is available in the AMS Section 2.4.2, Subsistence, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf,

Climate Change

Climate change could result in impacts on the health, density, distribution, and availability of subsistence resources throughout the state. Climate change is altering the physical setting in which subsistence activities are conducted. A recent University of Alaska Fairbanks study (Brinkman et al. 2016) interviewed 71 subsistence harvesters (including 20 harvesters in Venetie) to identify climate-driven changes in the access, distribution, and abundance of subsistence resources. The results showed that harvesters perceived that climate change-driven factors related to access are affecting subsistence harvest more than changes in the distribution or abundance of resources (Brinkman et al. 2016).

Climate change could also result in natural occurrences, such as changes in precipitation and flooding, that could pose barriers to accessing subsistence use areas. Access may be affected by permafrost thaw, which creates unpredictable ice conditions that causes safety hazards for winter travel on frozen rivers (Wolken et al. 2011), stronger and more erratic winds across open water (Hansen et al. 2013), and unusual and unpredictable ice conditions on rivers and lakes (Jones 2014, Moerlein and Carothers 2012). Subsistence harvesters have expressed concern that less precipitation is resulting in rivers becoming shallower and lakes drying (Brinkman 2016). Thawing permafrost in the boreal forest has accelerated land and riverbank erosion, and the increasingly dynamic nature of interior river characteristics has contributed to more challenging boat navigability and less dependable locations for placement of fish wheels and net sets (Markon 2018).

Direct and Indirect Impacts

The discussion below is a summary of the larger analysis contained in **Appendix Q**. The effects of climate change described above, could influence the rate or degree of the potential direct and indirect impacts.

Comparative Summary Table

Table 3-29 displays the acreages in community subsistence use areas that would be potentially impacted by the various management actions under each alternative. **Table 3-30** displays acreages in community subsistence use areas that would be potentially impacted by minerals management actions. Community subsistence use areas are shown in **Map Q-1** in **Appendix Q**.

Table 3-29
Acreage Analyzed for Potential Impacts on Community Subsistence Use Areas

Management Action	Alternative (Acres)				
	A	B	C1	C2	D
Timber					
Closed	0	952,000	157,000	0	0
Open	4,406,000	3,454,000	4,249,000	4,406,000	4,406,000
ROWs					
Avoidance	0	1,991,000	1,243,000	399,000	0
Exclusion	0	692,000	5,000	0	0
Open	4,406,000	1,723,000	3,158,000	4,007,000	4,406,000
Utility corridor	0	43,000	43,000	221,000	221,000
OHVs					
Seasonal limitations (closed in summer)	0	615,000	0	0	0
TL (closed May 1 through June 30)	0	655,000	399,000	399,000	0
Route restrictions	4,406,000	3,136,000	4,007,000	4,007,000	4,406,000

Management Action	Alternative (Acres)				
	A	B	C1	C2	D
LWCs					
Manage LWCs to emphasize other resource values and multiple uses	0	2,416,000	4,193,000	0	0
Manage LWCs to protect wilderness characteristics as a priority over other multiple uses	0	14, 000	104,000	0	0
Manage LWCs to emphases other multiple uses, while applying management restrictions to reduce impacts on wilderness characteristics	4,401,000	1,867,000	0	4,401,000	4,401,000
ACECs and RNAs					
Designated	777,000	1,502,000	141,000	0	0
RMAs					
ERMA	0	5,000	5,000	463,000	0
SRMA	671,000	189,000	688,000	189,000	0
BCA	0	463,000	0	0	0
WSRs					
Manage as eligible or suitable	83,000	83,000	0	0	0
Withdrawals					
Retain PLO 5150	651,000	189,000	189,000	0	0
Revoke PLO 5150	0	463,000	463,000	651,000	651,000

Source: BLM GIS 2017

Table 3-30
Mineral Acreage Analyzed for Potential Impacts on Community Subsistence Use Areas

Management Action	Alternative (Acres)				
	A	B	C1	C2	D
Closed to fluid minerals	17,000	1,505,000	319,000	0	0
Open to fluid minerals	1,861,000	2,713,000	3,899,000	4,406,000	4,406,000
Withdrawn from fluid minerals	2,527,000	189,000	189,000	0	0
Open to fluid minerals, subject to NSO[1]	0	868,000	262,000	0	0
Open to fluid minerals, subject to controlled surface use[1]	0	0	551,000	0	0
Open to locatable mineral entry[2]	2,547,000	3,686,000	4,200,000	4,406,000	4,406,000
Recommended for withdrawal from locatable mineral entry	117,000	532,000	18,000	0	0
Withdrawn from locatable mineral entry	1,280,000	189,000	189,000	0	0
Closed to mineral material disposal	7,000	1,709,000	629,000	399,000	0
Open to mineral material disposal	4,399,000	2,697,000	3,778,000	4,007,000	4,406,000

Source: BLM GIS 2017
[1]NSOs and controlled surface use do not overlap closed or withdrawn areas.
[2]Recommended for closure is a subset of open.

Alternative A

Under Alternative A, the present management direction and practices would continue, including the acres of land available for development and protected from development, which are shown in **Table 3-29**. Access to subsistence resources and management of habitat for subsistence resources would remain as it currently is under this alternative. Although current subsistence harvest levels of wildlife, fish, and other resources in the

planning area are sustainable, there is concern that the subsistence needs of rural residents in the planning area are not being met, particularly for salmon, moose, and Dall sheep (BLM 2016a).

Under Alternative A, 777,000 acres (18 percent) of community subsistence use areas in the decision area would be managed as ACECs or RNAs, which would provide protection of subsistence resources and resource availability in those areas (see **Table 3-29**).

Alternative A designates the Tozitna Subunits North and South ACEC\ to protect caribou habitat for the RMH (211,000 acres; 0.4 percent of the planning area). All Dall sheep habitat in the planning area is open to locatable mineral entry under Alternative A. The West Fork Atigun River, Snowden Mountain, Poss Mountain, Nugget Creek, and Galbraith Lake ACECs, totaling 104,000 acres (0.2 percent of the planning area), provide some additional restrictions on development in Dall sheep habitat.

Alternative A would include the highest number of acres in community subsistence use areas within the decision area out of all other alternatives that would be either withdrawn from locatable mineral entry or recommended for withdrawal. Locatable mineral development could result in habitat loss, degradation, and habitat fragmentation of caribou herds and Dall sheep that use alpine dwarf shrub tundra habitat, as well as displacement and disturbance. Most of the areas with medium to high locatable mineral potential are found in the vicinity of Wiseman and Coldfoot. Over 99 percent of the community subsistence use areas in the decision area would be open to mineral material sites (i.e., salable minerals), and 42 percent of those in the decision area would be open to fluid mineral leasing. Several areas of high fluid leasable potential north of Anaktuvuk Pass would continue to be withdrawn from fluid leasable entry and development under this alternative, which would protect subsistence resources in this area from impacts associated with fluid leasable development (see **Table 3-30**).

There are 120,000 acres of community subsistence use areas in the decision area that correspond to high mineral development potential and that would be open to locatable mineral entry under Alternative A. Of these, 19,000 acres are selected lands that fall under Priority 1 classification. These lands would be segregated from mineral potential until they are conveyed, relinquished, or rejected, and they are expected to be conveyed within 10 years of a ROD being signed. Of the 4,406,000 acres of community subsistence use areas within the decision area, 651,000 acres (15 percent) fall within PLO 5150. Under Alternative A, the PLO 5150 withdrawal that designates the inner and outer utility corridors and the segregation from State of Alaska or ANCSA corporation selection would remain in place. In addition, the inner corridor would remain segregated from all forms of mineral entry. There would be no change in the management of wildlife or anadromous waters within the Dalton Utility Corridor in terms of their availability for mineral development under Alternative A. As a result, there would be no changes to subsistence uses or access for the 24 analysis communities under Alternative A.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

Under each of the action alternatives, subsistence users would be impacted from efforts to protect water resources and fisheries and wildlife habitats, including management actions to preserve stream flows necessary to protect fish and wildlife habitat, fish migration, and propagation and maintain and improve recreational and subsistence fisheries. Continued maintenance of healthy watersheds, riparian areas, and associated fish and wildlife habitats would support harvests of subsistence resources including fish, vegetation and woodland products, land mammals, and waterfowl.

Under all the action alternatives, the BLM would cooperate with the State of Alaska on NNIS prevention related to use of navigable waterways by motorboats and floatplanes for casual and subsistence use. Under all

the action alternatives, subsistence resources would be managed to sustain wild resource population levels to provide for continued rural economic opportunity and support subsistence lifestyles. The BLM would consolidate land management that sustains natural resources necessary for meeting subsistence needs.

Under all action alternatives, the full or partial revocation of PLO 5150 (for the outer corridor under Alternatives B and C1; full revocation under Alternatives C2 and D) triggers conversion of top-filings to valid selections. This would impact federal priority subsistence access and harvest provisions provided under Federal Subsistence Management regulations for the communities of Allakaket, Anaktuvuk Pass, Bettles, Coldfoot, Evansville, Rampart, Stevens Village, and Wiseman.

Forty-three percent of lands within PLO 5150 that would become valid selections upon the revocation of the PLO are identified by the State as Priority 1. The BLM assumes that these lands will be conveyed to the State of Alaska within 10 years after the PLO is revoked, at which time these lands would no longer be under BLM management or subject to SOPs.

The full or partial revocation of PLO 5150 would have the practical effect of removing the federal subsistence priority for residents of Coldfoot and Wiseman Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville and Stevens Village. This is because any selected lands would no longer be considered public (as defined by ANILCA Section 102). Residents of Coldfoot and Wiseman would not retain legal federal motorized access for subsistence purposes. This would increase competition from hunters hunting under state regulation for moose, caribou, and Dall sheep in the area and would impact subsistence resource abundance and availability. Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville and Stevens Village would be impacted by a change in federal priority for use of firearms for these residents within the corridor.

The State of Alaska does manage for subsistence for all users, and conveyance of these lands would allow for broader subsistence use under State of Alaska subsistence management, including these communities; however, the provisions for federal priority subsistence promulgated under 50 CFR 100.26 for access and harvest would not be in effect where these lands are selected or conveyed

It also would remove federal subsistence management regulations that provide for a method of harvest (firearms), which was determined to be needed for residents of Coldfoot and Wiseman. Residents would not be able to use firearms within 5 miles of the Dalton Highway in the outer corridor, which substantially inhibits their ability to harvest moose, Dall sheep, and other large land mammals. Dall sheep habitat is primarily on lands within the Dalton Corridor covered by PLO 5150; therefore, a partial or full revocation of the PLO could impact this important subsistence species through loss of habitat, if other protective mitigation measures are not enacted.

All action alternatives designate the Ambler and Umiat utility and transportation corridors, which is likely to increase the potential for increased mineral exploration, road construction, and recreation in these areas. The communities of Anaktuvuk Pass, Allakaket, Alatna, Bettles, Evansville, Wiseman, and Coldfoot would have the highest potential to experience impacts associated with the designation of these corridors.

An administrative utility and transportation corridor designation may not directly create public access opportunities; however, the rugged terrain of the planning area is often difficult to navigate. Federally qualified subsistence users may experience impacts from using pathways created by developers for easier access to subsistence use areas. The new corridors could also directly affect resource abundance through increased subsistence hunting access. Potential development associated with the utility and transportation corridors could directly affect subsistence resource abundance and availability of wildlife species, including

caribou and Dall sheep. This would come about through habitat fragmentation and disturbance and displacement of subsistence species from their typical migration patterns or habits.

Alternative B

Alternative B emphasizes protection of resource values and designates substantially less area as available for surface-disturbing activities associated with locatable, salable, and leasable activities, commercial timber harvest, and ROWs than Alternative A. It also would protect more area with resource values through ACECs, RNAs, OHV seasonal and timing use restrictions and recreational designations (see **Table 3-29**).

There are OHV use restrictions under Alternative B that may aid in protecting vulnerable resources. The OHV seasonal restrictions could also limit access to subsistence harvest areas. Summer travel restrictions may reduce direct access to communities or areas where subsistence is practiced: Tanana, Allakaket, Alatna, Bettles, Evansville, Ruby, and Rampart. Travel restrictions from May through June may disrupt travel patterns between Allakaket, Alatna, and Tanana.

The seasonal travel restriction may impede overland travel on an unimproved historical travel route between Tanana and Allakaket or Alatna. This would increase summer travel costs and would limit summer travel between Allakaket and Tanana to air and river travel. Other communities that may be directly affected by travel restrictions are Wiseman, Coldfoot, Bettles, Evansville, and Hughes. Additionally, the designation of the Dalton Corridor BCA, which emphasizes recreational hunting, may pose increased competition for subsistence resources in that area under this alternative.

Under Alternative B, 1,502,000 acres (34 percent) of community subsistence use areas in the decision area would be managed as ACECs or RNAs. This would provide the most impact on subsistence by protecting subsistence resources on the largest geographic area. Alternative B provides protections through ACEC or RNA designations on 725,000 more acres (15 percent increase) of community subsistence use areas than Alternative A (see **Table 3-29**). This reduces the potential for surface-disturbing activities and associated visual and noise disruptions that could impact subsistence species.

Two additional ACECs would be designated for caribou: the Spooky Valley ACEC for the RMH and Upper Kanuti River ACEC for the HHH. These would provide additional subsistence resource protection for the communities whose residents search for and harvest caribou around these locations. The Midnight Dome/Kalhabuk ACEC would be expanded by 10,000 acres under Alternative B to provide additional protections for Dall sheep habitat, an important subsistence species for the nearby communities of Wiseman and Coldfoot.

The protections for subsistence access and resources resulting from acres closed to fluid mineral leasing, mineral material development, and nonenergy mineral leasing is greater under Alternative B than under Alternative A (see **Table 3-29**). In the high potential fluid leasable area north of Anaktuvuk Pass, several river corridors would be closed to fluid mineral leasing and development. This would protect subsistence resources from potential impacts associated with these activities; however, the current demand for fluid leasable minerals is low in these areas. Under Alternative B, 3,686,000 acres (84 percent) of community subsistence use areas in the decision area would be open to location of metalliferous minerals and closed to location of nonmetalliferous minerals.

There would be 138,000 acres (3 percent) of high potential locatable minerals open to locatable mineral entry under Alternative B, all of which are selected lands that would become available for locatable mineral entry when those lands are conveyed, relinquished, or rejected. Of these, 130,000 acres are State of Alaska Priority

1 lands that are likely to be conveyed and would leave federal management within 10 years of a ROD being signed.

There are some areas of medium locatable mineral potential north of Tanana that would not be withdrawn from mineral entry under this alternative. Subsistence resources could be affected by mineral activities in these areas. Alternative B would also reduce the potential for habitat fragmentation, disturbance, and displacement of Dall sheep and caribou, as compared with Alternative A. It would do this by reducing areas open to leasable, locatable, mineral material development, and ROW development. Alternative B recommends a partial revocation of PLO 5150 withdrawal outer corridor lands (463,000 acres of community subsistence use areas), citing that the outer corridor is not currently used for or foreseeably used for utility and transportation purposes. As a result of the partial revocation, the lands become encumbered and no longer available for federal priority subsistence. This includes the current motorized use (including snowmachines) for subsistence users crossing the Dalton Highway Corridor or starting from within 5 miles of the Dalton Highway Corridor for the subsistence harvest. This would have the most effect in a relatively narrow strip of land near the communities of Coldfoot and Wiseman.

At its widest point, which is east of Bettles, the outer corridor is approximately 14 miles wide. Loss of priority subsistence access to these lands would eliminate legal motorized access for subsistence for the communities of Coldfoot and Wiseman (see **Section 3.3.5** and **Map Q-2** in **Appendix Q**). Subsistence users in Wiseman and Coldfoot use the Dalton Highway Corridor Management Area for accessing other subsistence use areas to gather firewood, to fish, and to trap (Holen et al. 2012).[16] As a result, residents of Wiseman would not be able to use snowmachines to cross BLM-managed lands within the Dalton Highway Corridor Management Area to access Gates of the Arctic National Park and Preserve to the west of Wiseman, where residents do much of their Dall sheep hunting. Subsistence users would not be able to use the Nolan Road and the Dalton Highway Corridor Management Area for subsistence access, and this would eliminate their ability to harvest resources in traditional locations.[17]

Areas where residents of Wiseman have customary and traditional use determinations in Game Management Units 24A, 26B, and 25A would also become inaccessible. Residents of Coldfoot do not have a customary and traditional use determination for Gates of the Arctic National Park and Preserve lands; they are not allowed to hunt on National Park Service lands under federal subsistence management regulations. As a result, Coldfoot residents primarily hunt within the Dalton Highway Corridor Management Area. Alternative B would limit access to subsistence resources for these residents.

Overall, Alternative B provides a greater level of protection for subsistence species by designating substantially less area as available for surface-disturbing activities associated with locatable, salable, and leasable activities, commercial timber harvest, and ROWs than Alternative A. It would designate more area with resource values protected through ACECs, RNAs, OHV seasonal and timing use restrictions, and recreational designations; however, the partial revocation of PLO 5150 under Alternative B would create more restrictions to subsistence use and access for specific communities than under Alternative A. See **Appendix Q** for further discussion.

[16]Information also supported through personal communication with Jack Reakoff and BLM Subsistence Team. July 31, 2019; Personal communication with Ute Hicker and Michelle Ethun (BLM Project Manager). July 25, 2019.
[17]Personal communication with Jack Reakoff and BLM Subsistence Team. July 31, 2019.

Alternative C1

Alternative C1 provides protections through ACEC or RNA designations on 636,000 fewer acres (16 percent fewer) of community subsistence use areas in the decision area than Alternative A, which increases the potential for impacts on subsistence resources through surface-disturbing activities.

Under Alternative C1, 4,200,000 acres (95 percent) of the community subsistence use areas in the decision area would be open to location of metalliferous minerals and closed to location of nonmetalliferous minerals, which is more acreage than under Alternative A. No areas of high potential locatable minerals would be open to locatable mineral entry under Alternative C1; however, some high potential areas are segregated from locatable mineral entry and could be transferred to State ownership under this alternative.

There would be 138,000 acres (3 percent) of high potential locatable minerals open to locatable mineral entry in community subsistence use areas under Alternative C1. All these acres are selected lands that would become available for locatable mineral entry when those lands are conveyed, relinquished, or rejected. Of these, 130,000 acres are State of Alaska Priority 1 lands that are likely to be conveyed and would leave federal management within 10 years of a ROD being signed.

The acreage within community subsistence use areas in the decision area open to fluid leasable minerals (3,899,000 acres, or 88 percent) would be larger than under Alternative A. Alternative C1 would close a larger geographic area to mineral material sales (629,000 acres,14 percent) than Alternative A, providing additional impacts on subsistence resources and users through limiting surface-disturbing activities (see **Table 3-30**). While more area would be segregated from locatable mineral entry, compared with Alternative A, non-segregated land in DSHAs would be withdrawn or recommended for closure to the mining laws, thereby reducing potential disturbance and displacement of Dall sheep and protection of habitat. The RMH and GMH would be managed as core caribou ranges. The RMH range would be closed to fluid mineral leasing, and it would be withdrawn from locatable mineral entry, mineral material disposal, nonenergy solid mineral leasing, and development under Alternative C1.

There would be 1,243,000 acres (28 percent) under Alternative C1 designated as ROW avoidance, and 5,000 acres (less than 1 percent) would be designated as ROW exclusion. This is more restrictive on development than under Alternative A, so it would be more protective of subsistence uses and resources. Potential impacts associated with the partial revocation of PLO 5150 outer corridor lands would be the same as those under Alternative B.

Overall, there would be less land open under Alternative C1 to mineral material development, ROWs, and commercial timber harvest than Alternative A. Like Alternative A, Alternative C1 does not have summer travel restrictions (May through October); however, unlike Alternative A, it does have 125,186 acres of land in subsistence use areas or within 20 miles of communities subject to travel restrictions from May through June. The communities that may be directly affected by the travel restrictions are Rampart, Tanana, Allakaket, and Alatna.

The protective measures offered by the travel restrictions in core caribou habitat and additional protections to reduce potential Dall sheep disturbance and displacement and preserve important habitat areas may reduce impacts on subsistence resources. In turn, this would reduce the amount of effort expended for subsistence hunting. Potential direct effects may increase travel distances and related fuel costs for subsistence purposes, but they may be countered by the indirect effects related to increased abundance of subsistence resources.

Additionally, there would be more land open to locatable and leasable mineral development and less land protected by ACECs, RNAs, and recreational designations under Alternative C1, as compared with Alternative A. The partial revocation of PLO 5150 under Alternative C1 would create more restrictions to subsistence abundance, availability, and access for specific communities than under Alternative A. See **Appendix Q** for further discussion.

Alternative C2 (Preferred Alternative)

Except for Toolik Lake RNA, there would be no additional ACEC or RNA designations under Alternative C2. Protections provided from these designations for subsistence species under Alternative A, particularly for Dall sheep and caribou, would be removed.

Alternative C2 would make more area available for locatable mineral entry than Alternative A. Under Alternative C2, 4,406,000 acres (100 percent) of the community subsistence use areas in the decision area would be open to location of metalliferous minerals and closed to location of nonmetalliferous minerals. There would be 0 acres recommended for locatable mineral withdrawal. Because all PLOs would be revoked under Alternative C2, no acreage would remain withdrawn under this alternative.

The BLM-managed lands around Coldfoot and Wiseman contain the greatest concentrations of areas with medium to high locatable mineral potential; the abundance, availability, and access to subsistence users and resources could be affected by mineral development through disturbance, displacement, changes to subsistence access, and competition for resources.

There would be 167,000 acres (4 percent) of high potential locatable minerals open to locatable mineral entry in community subsistence use areas under Alternative C2, all of which are selected lands that would become available for locatable mineral entry when those lands are conveyed, relinquished, or rejected. Of these, 159,000 acres are State of Alaska Priority 1 lands that are likely to be conveyed and would leave federal management within 10 years of a ROD being signed.

Alternative C2 would also make more area available for fluid mineral leasing, mineral material development, and nonenergy solid mineral leasing as compared with Alternative A. Alternative C2 would not provide the protections from mineral entry to Dall sheep habitat that are required under Alternative C1 (see **Table 3-30**).

There would be 399,000 acres of community subsistence use areas in the decision area (9 percent) under Alternative C2 designated as ROW avoidance, and 0 acres of community subsistence use areas in the decision area designated as ROW exclusion. Under Alternative C2, 4,007,000 acres (91 percent) of community subsistence use areas in the decision area would be open to ROWs with standard restrictions. This alternative would be more protective of subsistence resources and uses than Alternative A through the designation of the ROW avoidance areas (see **Table 3-29**).

Alternative C2 recommends a full revocation of the PLO 5150 withdrawal and a replacement with an administrative designation of the Dalton utility and transportation corridor in place of the inner corridor, which overlaps with 221,000 acres (5 percent) of community subsistence use areas in the decision area (see **Map Q-2** in **Appendix Q**). The full revocation would entail 651,000 acres (15 percent) of community subsistence use areas in the decision area automatically becoming valid selections for the State of Alaska. This change in management within PLO 5150 may result in increased competition for access to resources from non-subsistence users.

Increased competition could also cause adverse impacts on subsistence resource abundance, as more competition means fewer resources overall available for harvest. Similarly, increased competition may impact

resource availability as subsistence resources may become sparser within the planning area. Alternatively, subsistence users may choose to expend a greater effort to harvest in a different location to avoid sport hunters.

Lands transferred to the State of Alaska would be unavailable for subsistence activities conducted under Title VIII of ANILCA. Though the State manages for subsistence on any lands that may be conveyed, it does not have a rural preference and those federally qualified subsistence hunters that have a federal preference for access and harvest type would no longer have that preference. The nature and types of impacts associated with PLO 5150 revocation would be the same as described under *Impacts Common to All Action Alternatives*.

The residents of Coldfoot and Wiseman would likely be most affected by the full revocation of the PLO 5150 withdrawal due to the proximity and their current use of the area for subsistence practices. Other communities, such as Alatna, Allakaket, Bettles, and Evansville, that use the Dalton Highway Corridor Management Area for subsistence hunting would also be impacted; shifting management of the corridor to the State of Alaska would eliminate the rural preference and would likely encourage more outside hunters into the area.

Overall, there would be less of the community subsistence use areas open under Alternative C2 to mineral material development and ROWs than under Alternative A. The same OHV timing restrictions discussed under Alternative C1 would be in place in core caribou habitat areas; however; the additional protections from mineral entry designed to reduce potential Dall sheep disturbance and displacement and preserve important habitat areas would not be included under Alternative C2. Under that alternative, there would be more community subsistence use areas open to locatable and leasable mineral development activities and less land protected by ACECs, RNAs, and recreational designations, as compared with Alternative A; however, Alternative C2 management actions for these resources would be less protective of subsistence uses and resources than Alternative B and C1. Additionally, the full revocation of PLO 5150 under Alternative C2 would create more restrictions to subsistence use and access for specific communities than under Alternative A. See **Appendix Q** for further discussion.

Alternative D

Alternative D emphasizes management to facilitate resource development more than the other alternatives. There would be no ACEC or RNA designations included under Alternative D. Protections provided from these designations for subsistence species under Alternative A, particularly for Dall sheep and caribou, would be removed. Alternative D would not include OHV seasonal or timing restrictions or additional recreational designations (see **Table 3-29**).

Under Alternative D, the entire 4,406,000 acres (100 percent) of the community subsistence use areas in the decision area would be open to locatable minerals, fluid leasable minerals, mineral material sales, and nonenergy leasable mineral development. No areas would be withdrawn from the mining laws or recommended for withdrawal from locatable mineral entry.

There would be 167,000 acres (4 percent) of high potential locatable minerals open to locatable mineral entry in community subsistence use areas under Alternative D, all of which are selected lands that would become available for locatable mineral entry when those lands are conveyed, relinquished, or rejected. Of these, 159,000 acres are State of Alaska Priority 1 lands that are likely to be conveyed and would leave federal management within 10 years of a ROD being signed.

Alternative D would result in impacts on Dall sheep similar to those described for Alternative C2. The BLM-managed lands around Coldfoot and Wiseman contain the greatest concentrations of areas with medium to high locatable mineral potential; the abundance, availability, and access to subsistence users and resources

could be impacted by mineral development activities through disturbance, displacement, changes to subsistence access, and competition for resources (see **Table 3-30**).

Impacts on subsistence resources under Alternative D from the designation of ROW avoidance and exclusion areas would be the same as those under Alternative A. The recommendation to fully revoke PLO 5150 would result in the same impacts on subsistence uses and resources as discussed under Alternative C2.

Overall, Alternative D would open more acres of community subsistence use areas in the decision area to locatable, leasable, and mineral material development than under any other alternative. This would make the potential for impacts on subsistence uses and resources highest under this alternative. There would be less land protected by ACECs, RNAs, and recreational designations, as compared with Alternative A and all other action alternatives. Additionally, the full revocation of PLO 5150 under Alternative C2 would create more restrictions to subsistence use and access for specific communities than under Alternative A. See **Appendix Q** for further discussion.

Conclusion

Overall, Alternatives B and C1 would likely provide more protections to subsistence uses and resources than Alternative A, and Alternatives C2 and D would provide fewer protections. Alternative D would provide the fewest protections for fish and wildlife species and subsistence use and access. Alternative B would provide most protections for subsistence resources and uses, but because Alternative C1 has specific protections for important Dall sheep habitat, it may provide a greater level of protection for this species. Alternative D would also designate no acreage as ACECs or RNAs or with recreational designations, so it would provide the lowest level of protection for subsistence fish and wildlife species and their habitat.

Alternatives B and C1 recommend a partial revocation of PLO 5150, which would impact motorized access for subsistence purposes for the communities of Coldfoot and Wiseman. Under Alternatives C2 and D, the full revocation of PLO 5150 would trigger State of Alaska top-filed lands to automatically become valid selections. Priority 1 selections are likely to be conveyed during the life of the plan, which would provide the greatest potential for impacts on subsistence access and practices for Coldfoot and Wiseman under these two alternatives.

Cumulative Impacts

Past and present land uses in the planning area, such as resource exploration and extraction, community infrastructure, military activities, research and monitoring, recreation (including non-subsistence hunting and fishing) have all affected subsistence resources and uses in the planning area. As discussed in Magdanz et al. (2016, herein incorporated by reference), the development of new roads near or through communities that have previously been remote have historically created impacts on subsistence resource abundance and availability. These effects are expected to continue along current trends; however, future development of transportation corridors and mineral exploration and development could increase these effects.

The communities of Nuiqsut and Anaktuvuk Pass may experience compounded restrictions of subsistence use due to a potential decrease in caribou availability associated with the development of the Alaska Liquified Natural Gas Project (FERC 2020). Continued expansion of industrial activity on the North Slope could displace caribou from the Western Arctic Herd from their normal migratory routes, could increase the area considered to be undesirable by subsistence users, and could cause subsistence users to travel farther to harvest subsistence foods.

The communities of Alatna, Alakaket, Anaktuvuk Pass, Bettles, Coldfoot, and Wiseman may experience compounded restrictions of subsistence use. This would be due to a potential abundance and availability of caribou, fish, and vegetation associated with the development of Ambler Road (BLM 2020). Caribou may also encounter new linear features across the landscape that could be barriers. This could shift their behaviors or migratory patterns, potentially affecting herd population and resource availability.

Road traffic and construction could also cause behavioral and migratory changes in caribou, which, in turn, could impact subsistence hunting success. Impacts on subsistence access would occur in the vicinity of the road corridor, particularly when usable hunting areas have been removed. As subsistence activities occur year-round and local subsistence users would be prohibited from using the road, it is possible that subsistence users could experience access-related impacts.

Construction of Ambler Road would require multiple bridges, culverts, and bank modifications that could indirectly impact fish species through loss of habitat and could lower spawning success. Lower abundance may lead to lower availability of both salmon and non-salmon fish in subsistence use areas. The Ambler Road corridor would also remove suitable vegetation harvest areas and hinder access to historical use areas; vegetation harvesting is a high value resource to most communities in the planning area, which would increase the intensity of this reduction in availability of resources.

Resource abundance and availability of game populations that subsistence users rely on, particularly moose, caribou, and Dall sheep, could be affected by increased levels of hunting. Cumulative impacts would be experienced with the greatest level of intensity along the Dalton Highway, as it facilitates the most travel in and around the planning area for commercial, public, and subsistence uses. Once established as qualified rural residents, new residents would be eligible to hunt and fish under Federal Subsistence Regulations and would likely increase the pressure on the area's subsistence resources.

Residents are concerned that state management would result in an influx of urban hunters if the rural preference under ANILCA is ever lost through a change to the State Constitution. Additionally, the State of Alaska, in accordance with the State Constitution, cannot give preference to rural residents. Only the Federal Subsistence Board, which includes Native representatives, can give rural preference for subsistence, and it defers to Subsistence Regional Advisory Council findings under ANILCA Sec. 805(c).

Future changes in demand and unpredictable fluctuations in populations or distribution of subsistence resources make it difficult to predict the sustainability of subsistence opportunities in many areas. Subsistence resource distribution and availability can be affected by random events, such as severe winters and climate shifts, and changes in demand for allowable land uses, such as increased oil and gas or mineral development activities spurred by favorable market prices. The effects of climate change described above, could influence the rate or degree of the potential cumulative impacts through additional loss of waterbodies from landscape drying or increases in human-caused fire and increased fire potential. Decreased forage quality or forage access from climate change, such as changes in species composition or rain-on-snow events, would add to the potential declines in available Dall sheep habitat or caribou herd range from development.

In comparison of the contribution of the other alternatives to cumulative impacts, the contribution of Alternative B would provide the greatest measure of protection for subsistence resources and uses indirectly affected by present and future activities in the planning area, and Alternative D would provide the least protection.

3.5.3 Social and Economic Conditions

The planning area overlaps portions of the Northwest Arctic Borough, the North Slope Borough, the Denali Borough, the Fairbanks North Star Borough, and the Southeast Fairbanks Census Area. Social and economic conditions are described by the 30 communities that are in the planning area. Fourteen of these communities are unincorporated, 11 are second class cities, 2 are first class cities (Galena and Tanana), and 3 are home rule cities (Fairbanks, Nenana, and North Pole).[18] Seven are non-subsistence use communities: Fairbanks, Ester, Healy, Big Delta, Delta Junction, McKinley Park, and North Pole. Approximately 42,000 people live in the planning area, with 36,000 in the Fairbanks area. Except for the greater Fairbanks area, the communities are predominantly Alaska Native.

The economy in much of rural Alaska is a mixed subsistence-cash economy; subsistence fishing and hunting provides a reliable economic base throughout rural Alaska (Wolfe and Walker 1987), and this is true of many planning area communities. The cost of living in much of the planning area is higher than average for other places in Alaska and much higher than for the U.S. as a whole. As is common in rural Alaska, communities rely on local government as a major source of jobs, and more than 40 percent of workers were employed by government in the 14 communities.

As described in **Section 3.5.1**, 17 of the 30 communities in the planning area or that could be affected by the plan are considered low income due to their poverty rates; however, the average costs of living in rural Alaska are much higher than the nation's due to high transportation costs; for this reason, poverty rates may not be a fair reflection of economic well-being. In addition, the market economy is highly limited in its size and diversity in rural communities in the planning area.

While jobs and labor income provide an important role, it is limited in respect to the role that subsistence provisioning plays in supporting rural Alaskan livelihoods. Because jobs and labor income in private sectors are very limited in rural villages, potential economic development opportunities are valued, such as mining and tourism and the supporting construction, infrastructure, and transportation industries; however, there is typically conflict associated with these opportunities because of their potential to affect subsistence resources and access.

The diverse viewpoints of community residents are reflected in comments received on the preliminary alternatives and during project scoping, such as in the following examples:

> *Our kids/grandkids need jobs. If resources can be properly developed and still protect resources, then we are all for it. Creating jobs and making sure there is a way to keep people employed. Most of our interior villages are a dying commodity. We need to be aware of that and make decisions now not to close up those potential opportunities.* (CYRMP/EIS Preliminary Alternatives Concepts Public Comment Summary Report, 2017, p. B-99.)

> *The area under consideration in this RMP surrounds many rural communities. Resource development in the area could provide economic impacts on the region where well-paying jobs are scarce, as well as improved or added infrastructure and access to areas for multiple use.* (CYRMP Scoping Report, March 2015, Appendix A Public Comments, p. 66)

[18]There are three different classifications of city governments in Alaska: home-rule, first-class, and second-class cities. A community must have at least 400 permanent residents to form a home-rule or first-class city.
First- and second-class cities are general law cities; State law defines their powers, duties, and functions. General law is distinct from home-rule. Home-rule cities have all legislative powers not prohibited by law or charter.

> *Both Alaska Natives and surrounding communities depend upon the bounty of the lands and waters for their livelihoods as commercial fisherman, and for subsistence, cultural and traditional practices. Development projects including mines, roads and associated infrastructure could pose impacts on surrounding communities, including water degradation and reduced access to subsistence resources.* (CYRMP Scoping Report, March 2015, Appendix A Public Comments, p. 95)

> *Changes in the availability of subsistence resources has a profound impact on the sharing of resources from village to village. Throughout history, tribes in the Central Yukon have established a complex social network of sharing resources. Further impacts on the availability of resources will undoubtedly change the character for these networks and relationship between tribes throughout the region.* (CYRMP Scoping Report, March 2015, Appendix A Public Comments, p. 96)

> One of the questions describing the subsistence issue in pre-planning documents is "How can the BLM protect resources that are important to maintaining a subsistence lifestyle?" This implies that resources are currently not protected or are being damaged. The more appropriate question for the RMP is: "Are subsistence resources being damaged and is additional protection needed?" This is a resource management concern, not solely a subsistence concern. (CYRMP Scoping Report, March 2015, Appendix A Public Comments, p. 97)

> *The subsistence way of life in many Alaska Native villages is augmented with activities supporting cash economy transactions. Alaska Native villages, in partnership with Alaska Native corporations and other business interests, are considering a variety of economic development opportunities. Most Alaska Native villages have decided for themselves that large-scale hard rock mining is not the direction they would like to go and are, primarily, concerned with the long-term sustainability of their communities.* (CYRMP Scoping Report, March 2015, Appendix A Public Comments, p. 66)

The remote rural nature of most of the planning area substantially influences the size and structure of the communities' economies. Rural Alaska communities rely on a mixed economy of a hunting, fishing, and gathering component and a cash component. Sharing, bartering, and exchanging is a key component of the subsistence livelihoods in the planning area, which help guard against risks of food insecurity within communities (Brown et al. 2015). Cash is used not only to complement subsistence incomes through the purchase of food, clothing, shelter, but it also is used to support participation in the subsistence practices. Purchases of fuel and equipment and tools, such as snow machines, all-terrain vehicles, fishing nets, guns, and rain gear, are used to support subsistence activities (ADFG, Division of Subsistence 2019).

Fuel costs are a pivotal influence on well-being in mixed economies. Fuel costs affect the cost of participating in both the subsistence and cash components of the economy. The high cost of fuel in rural communities also contributes to high costs for food and heat purchased in markets. High fuel prices also influence subsistence harvest patterns by encouraging subsistence harvests to occur closer to communities. Another factor affecting subsistence is roads; one analysis found that ". . . being road-connected had substantial negative effects on communities' mean subsistence harvests . . . . This suggests that building new roads risks tipping newly accessible rural communities into a new regime of lower subsistence harvests without commensurate increases in personal incomes" (Magdanz et al. 2016, p. 1).

Additional information is available in **Appendix S** and in Section 2.4.3, Social and Economic Conditions, at https://eplanning.blm.gov/epl-front-office/projects/lup/35315/72940/80089/CYRMP_AMS_all_April_2016_Final.pdf. Community specific information considered in this analysis is presented in **Appendix Q**,

Climate Change

Climate change may affect the rural economy by increasing uncertainty and risk related to participation in subsistence practices and economic development. As described in **Section 3.5.2**, climate change has created unpredictable ice conditions on rivers and lakes, and across the tundra, increasing the risk to subsistence practitioners related to travel on land and water. As noted in **Section 3.2.7**, climate change may result in changes to vegetation communities, species ranges, and species composition, many of which are important to subsistence livelihoods. The increased uncertainty and risk in procuring subsistence resources may result in increased costs related to time, effort, and fuel needed to procure household needs. Climate change could also affect any industrial development, increasing costs associated with engineering, transport, and adaptation of infrastructure to changing conditions.

Direct and Indirect Impacts

See **Appendix M** and **Appendix S** for the issues identified during scoping related to social and economic conditions; the analytical methods used in this analysis, including the social and economic indicators; and additional data specific to the RMP. The effects of climate change described above could influence the rate or degree of the potential direct and indirect impacts.

Alternative A

Alternative A is the no-action alternative and would continue present management direction and practices, based on existing plans and rules. Because it has one ROW exclusion area and no avoidance areas, it would continue to provide a favorable environment to accommodate access and development on State and private lands as needed. Lands within 5 miles of the Dalton Highway would continue to be managed per federal subsistence regulations. These supersede State law, which restricts motorized access to these lands, so they would maintain motorized access and associated income-producing activity for residents of Wiseman and Coldfoot.

Approximately 5.2 million cubic yards of mineral materials deposits, currently authorized and permitted under contract, would continue to support mineral material production. Mineral materials authorized through existing free use mineral material permits to the Alaska Department of Transportation and the Alyeska Pipeline Service Company would be sufficient to maintain infrastructure in the Dalton Utility Corridor over the life of the plan. Authorization for new mineral material sites and expansion of existing sites would continue to be processed to meet demand, providing support for jobs and labor income in the mining industry. This would contribute indirectly to other industries affected by the mineral material production.

Approximately 652,710 acres of high and moderate potential lands are open for metalliferous mineral entry,; however, lands that are not selected by the State or Native corporations would support the development of new federal mineral claims and development, 507,690 acres of which are under Alternative A.

Trends related to locatable minerals production are driven by highly variable market prices and would persist under Alternative A. An average of 20 applications for permits to mine in Alaska are filed annually with the Central Yukon Field Office: 2 new permits and 18 applications for existing mineral exploration and operations. Jobs and labor income generated from placer and lode mining would directly affect mining industries.

The Galbraith ACEC and the Dalton Recreation Corridor Management Area offers one of the few opportunities for developed camping and supports other recreation activities, such as dog mushing or skiing. Recognition of the value of the recreation opportunities and the conservation of infrastructure and recreation opportunities in this area would continue to support the recreation and tourism industry. Most of the economic

contributions, jobs, and labor income would primarily impact Fairbanks and Healy, but visitor expenditures on lodging, guiding, and food services may also impact residents of Coldfoot and Wiseman.

Maintaining PLO 5150 in the inner corridor would limit mineral development opportunities, would allow for cohesive recreation management, and would maintain federal subsistence regulations that provide for subsistence access and hunting regulations. Competition between recreational and subsistence hunters may increase with the predicted increase in recreation visitation.

Potential impacts from mineral, linear infrastructure, and ROW developments may impact habitat for caribou and especially Dall Sheep near the Dalton Utility Corridor. If increased competition for big game species and potential impacts on Dall Sheep populations leads sport hunters to more remote locations, then communities with flight service, such as Bettles, Ambler, Anaktuvuk Pass, and Galena, may receive indirect economic impacts.

Alternative A does not propose travel restrictions or limitations and therefore would have no direct effect on household transportation costs, existing customary trade patterns, and subsistence harvest distribution to low-income households among communities. The indirect effects of no travel restrictions in core caribou calving habitat may increase risks to the RMH from human disturbance, affecting Rampart, Tanana, Allakaket, Alatna, Bettles, and Evansville. If travel increases due to mineral exploration or increased recreational hunting during breeding season in core caribou habitat and results in a lower abundance of subsistence resources, then residents could incur increased household fuel costs for subsistence hunts.

Alternative A fully retains PLO 5150, so subsistence access would be maintained and motorized access would be allowed for the communities of Coldfoot and Wiseman on 1,376,834 acres. The use of firearms by residents of Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, and Stevens Village within the Dalton Utility Corridor only for the taking of wildlife would continue to be allowed, so there would be no associated change in expenses.

Given the importance of subsistence in supporting rural livelihoods, from food, shelter, heating, and cultural systems, any decrease in the ability to procure subsistence resources would have consequential impacts on communities in the planning area in affecting cost of living and risks to food security. Under Alternative A, subsistence access is greatest, compared with all other alternatives, and it has the second highest acreage of ACECs among all the alternatives (see *Subsistence* for communities that are impacted by nearby ACECs). While Alternative A does not provide a high level of protection to subsistence resources through ROW exclusions or NSO stipulations, it does present a lower risk of habitat disturbance to subsistence species in the Dalton Utility Corridor.

Land in the inner corridor that is ranked high and moderate for locatable mineral potential has the greatest likelihood for development; however, PLO 5150 maintains the locatable mineral withdrawal in the inner corridor, mitigating risks to subsistence habitat that would be present should these lands be open to locatable mineral development; however, lands in the outer corridor are open to locatable mineral development.

Given the lack of protective measures, Alternative A does present some risk to communities that rely on subsistence resources in the Dalton Utility Corridor, should locatable mineral development occur. This may increase cost of living and the risk to food security for households in Coldfoot, Wiseman, Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, and Stevens Village.

Impacts Common to All Action Alternatives (B, C1, C2, and D)

As described in **Section 3.5.2**, subsistence resources would be managed to sustain wild resource population levels to provide for continued rural economic opportunity and support subsistence lifestyles. The BLM would consolidate land management that sustains natural resources necessary for meeting subsistence needs. Subsistence users would realize impacts from efforts to protect water resources and fisheries and wildlife habitats, including management actions to preserve stream flows necessary to protect fish and wildlife habitat, fish migration, and propagation and to maintain and improve recreational and subsistence fisheries. Continued maintenance of healthy watersheds, riparian areas, and associated fish and wildlife habitats would support harvests of subsistence resources, including fish, vegetation and woodland products, land mammals, and waterfowl.

Wood and biomass provide fuel for households, public facilities, and businesses in the communities of Tanana and Galena, create opportunities for wood vendors, and reduce household heating costs and municipal fuel costs (Schmidt et al 2019). The total amount of BLM-managed lands available for biomass collection within 20 miles of villages may be reduced, but biomass collection on conveyed lands would continue to be allowed by the State and Native corporations. Most villages in the planning area are primarily surrounded by Native corporation patented lands, from which the vast majority of biomass by villages is likely harvested; therefore, all action alternatives would continue to supply biomass, supporting economic development opportunities and reducing heating and energy costs for rural municipalities and households.

Under all action alternatives, the Road to Umiat and Ambler Road utility and transportation corridors would be designated, increasing demand for mineral materials in this region and potentially providing labor income for community residents along the corridors. While an administrative utility and transportation corridor designation may not directly create public recreational access opportunities, the rugged terrain of the planning area is difficult to navigate, and routes created by developers for construction may eventually be used by recreationists to access dispersed opportunities.

The designation of utility and transportation corridors influences where infrastructure development would occur. It has the potential to improve access for recreation, such as camping, hunting, sightseeing, or float boating in the planning area. As was identified in the AMS Section 2.2.6 (BLM 2016a), recreational visitation is expected to increase.

Improved access for hunting and fishing for recreational and non-subsistence users would increase competition for subsistence resources by sport hunters. Harvests for communities whose subsistence use areas overlap with utility and transportation corridors may be affected by the redistribution of recreationists; this may indirectly affect how far hunters and harvesters travel or how much time is required to access subsistence resources.

There are some accessible mineral interests on BLM-managed lands in the planning area that are likely to be developed over the life of the plan. Most of the planning area would not be affected by direct economic impacts related to mineral development, due in part to lack of accessibility. Mineral exploration in the planning area has not identified economically recoverable deposits of fluid leasables from the federal mineral estate; hence, fluid leasables are anticipated to have a low likelihood of development over the 20-year planning period; however, for mineral material sales and disposal there is current production and identified potential new demand for increased production on BLM-managed lands in the planning area. In particular, gravel, riprap, and common fill used for construction and maintenance of roads and pipelines are produced under mineral materials authorizations on BLM-managed lands.

Locatable minerals in the planning area are gold, silver, copper, nickel, and chromite. The planning area contains approximately 268,000 acres ranked as high potential for locatable development, and roughly 950,000 acres are ranked as medium potential. The number of annual new permit applications is closely tied to the price of gold and has fluctuated greatly over the past 50 years.

The BLM anticipates that recreation opportunities related to scenic viewing and unique geographic or celestial features associated with the Arctic Circle would attract visitors and continue to sustain visitation near the Dalton Highway, regardless of decisions in the RMP. Economic development opportunities for the communities of Wiseman and Coldfoot for lodging, food services, and guiding would persist, regardless of the recreation management emphasis selected. Designation of the Ambler and Umiat utility and transportation corridors may affect recreation and tourism patterns by increasing overland access, although if constructed, Ambler Road would be unavailable for public use. Under all action alternatives, communities near these corridors, including Bettles, Evansville, and Anaktuvuk Pass, are likely to see an increase in economic activity in the tourism sector.

Alternative B

Alternative B emphasizes protection of resource values. Planning for connectivity corridors, adaptability to climate change, and priority species would be considered to a greater degree under this alternative, with less emphasis on resource uses. Alternative B would maintain 5.6 million acres of land open for ROW entry and within the planning area. It is the most restrictive to ROW entry, reducing the amount of acreage that is open from 98 percent under Alternative A to 42 percent under Alternative B, including 2.1 million acres of exclusion areas and 5.3 million acres of avoidance areas.

Alternative B further restricts development of ancillary facilities to two development nodes at Yukon Crossing and Chandalar and requires that linear infrastructure be in designated utility and transportation corridors. This could inhibit economic development by increasing risks to economic viability of projects by increasing planning and construction costs.

With the revocation of PLO 5150 in the outer corridor, federal subsistence access would no longer apply on 1.4 million acres of top-filed lands that would automatically become valid state selections. State restrictions that prohibit the use of snowmachines within 5 miles of the Dalton Highway would fragment ownership patterns and eliminate motorized access to lands in the outer corridor for the communities of Wiseman and Coldfoot, whose residents would have reduced opportunities for generating household income by trapping, among other activities.

Residents of Wiseman, Coldfoot, Alatna, Allakaket, Anaktuvuk Pass, Evansville, and Stevens Village would lose the ability to subsistence hunt using firearms within 5 miles of the Dalton Highway. Loss of motorized access and loss of the use of firearms on these lands would increase the cost of living in these communities by increasing the time and effort spent hunting, increasing the distances travelled to access lands available for subsistence activities, increasing the household costs for fuel in order to participate in subsistence practices, or increasing the need to secure household food and goods through markets rather than through subsistence practices.

Alternative B would greatly reduce the amount of land available to support mineral material production, compared with Alternative A; however, lands where mineral material development is restricted is not in any transportation corridors where demand is anticipated. In cases where demand cannot be satisfied from BLM-managed lands, is the BLM anticipates that production would be available on other lands.

Ninety-two percent of permits currently authorized for salable mineral production are in the inner corridor, where mineral material production would continue to be allowed and permit applications would continue to be processed. Alternative B would meet existing demand for mineral material production for the life of the plan, as described under Alternative A. In addition, given that lands within utility and transportation corridors would be open to mineral material development, is the BLM anticipates that Alternative B would meet future demand and support the development of jobs and labor income in mining, construction, and supporting industries in the planning area.

Alternative B may result in a lower level of locatable mineral production than under Alternative A. Under Alternative B, 602,000 acres are of high and moderate locatable mineral potential and are designated as open; however, 107,240 acres would allow for new federal mineral claims. This is because most of these lands would be encumbered by State and Native selections.

Mineral exploration and operations would continue to be allowed on lands with active mineral claims in the outer corridor. While the amount of land ranked as high and moderate locatable mineral potential that is open is similar to Alternative A, the effects of revoking PLO 5150 in the outer corridor would increase the acres of selected lands in the planning area.

Lands in the outer corridor that are top-filed by the State would become valid State selections and therefore would no longer be open to new federal mineral claims; however, existing claimants, at the time State selection attaches, would be allowed to conduct exploration and mining. As such, 435,080 acres of high or moderate mineral potential lands would be closed to new federal mineral claims due the State selection status.

Of these State-selected lands, 267,880 acres are identified as a number one priority by the State and are expected to be conveyed to the State within 10 years of the RMP decision. Approximately, 170,915 acres of State- selected lands are identified as priority level two through four; the timeline for conveying these lands is unknown but is anticipated to be beyond the life of the plan.

Under Alternative B, 59,679 acres of land ranked as high or moderate locatable mineral potential are selected by Native corporations, so economic development opportunities for them would exceed that of Alternative A.

In addition, federal lands open to mineral entry and located outside of the Dalton Utility Corridor would be available for locatable mineral production. Compared with the other alternatives, Alternative B would provide for the least flexibility in accessing and developing these mineral interests. While the BLM is required to allow reasonable access to federal mineral claims, federal law does not require that claimants are afforded their preferred access. Additionally, Alternative B has the most ACEC designations. ACEC designations require a plan of operation to be developed, which increases planning and development costs associated with locatable minerals. Alternative B may therefore be the least conducive to facilitate economic development opportunities related to locatable minerals.

Recreation visitation and tourism is expected to be similar to Alternative A; however, actions under Alternative B may create more favorable conditions for recreational hunters in and near the Dalton Utility Corridor, given the protective measures that would conserve Dall sheep and caribou habitat in the region. Recreation and visitor services would be maintained and managed as front country and rural recreation settings, but this is not expected to drive a change in recreation visitation or recreation opportunities offered near the Dalton Highway.

Restrictions and seasonal limitations on OHV use during sensitive breeding times in ACECs and rights-of-exclusion may impact caribou and Dall sheep populations, which would indirectly impact recreational hunting

opportunities. Restrictions and seasonal limitation on OHV use may also reduce recreational access to the more remote areas of the planning area. Protective measures, such as visual quality management, ROW avoidance, and stay limitations, would help maintain semiprimitive experiences of the Dalton Corridor BCA and improve desired primitive and semiprimitive recreation opportunities in the Dalton Corridor BCA.

Alternative B includes 810,535 acres of lands that are restricted for summer (May through October) OHV use in subsistence use areas and within 20 miles of communities. Alternative B also includes 788,501 acres of travel restrictions from May through June in subsistence use areas and within 20 miles of planning area communities. Summer travel restrictions may reduce direct access to other communities or areas where subsistence is practiced. The communities potentially affected by the summer travel restrictions are Tanana, Allakaket, Alatna, Bettles, Evansville, Ruby and Rampart.

Travel restrictions from May through June may disrupt travel patterns for residents of Allakaket, Alatna, Tanana, Wiseman, Coldfoot, Bettles, Evansville, and Hughes. The summer travel restriction may increase summer travel costs; however, summer travel restrictions protect wildlife habitat conditions for important subsistence resources, such as caribou.

While the travel restrictions under Alternative B are the most extensive and may have the greatest direct effects on travel patterns, these impacts are expected to be limited. This is because access to subsistence use areas is predominantly by river during the summer or via snowmachine in the winter (Brown et al. 2015; Holen et al. 2012). Conservation measures for wildlife provided under Alternative B may improve subsistence hunter success in subsistence use areas or close to communities; therefore, the impacts associated with seasonal travel restrictions may outweigh the risks, such as increased fuel costs, associated with season travel restrictions.

Planning for connectivity corridors, adaptability to climate change, and priority species would be considered to a greater degree under this alternative, with less emphasis on resource uses. Thirty-one ACECs and RNAs (approximately 4 million acres), the most of any alternative, would be designated. Management is proposed to address a wide range of R&I values and research opportunities. Given the importance of subsistence in supporting rural livelihoods, from food, shelter, heating, and cultural systems, the ability to procure subsistence resources would have consequential impacts on communities in the planning area in affecting cost of living and risks to food security.

Alternative B may reduce risks to subsistence abundance and has a lower likelihood than Alternative A of contributing to increased cost of living and a higher likelihood of reducing food insecurity in rural subsistence communities in the planning area. In addition, establishing ACECs, including those nominated by local communities and tribes, demonstrates support for community values and traditional knowledge. Nevertheless, there are residents and entities who also question the need for ACECs and are concerned about effects on subsistence travel and economic development.

Alternative C1

Alternative C1 emphasizes a blend of resource protection and resource development. Connectivity corridors, adaptability to climate change, and priority species would be considered in the context of allowing for more minerals development and other resource uses than under Alternative B. This would provide a more favorable economic development environment to impact the growth of jobs and labor income.

Alternative C1 proposes very few ROW exclusion areas, encouraging infrastructure development within utility and transportation corridors and development nodes but not requiring that infrastructure and industrial

development be collocated in these areas. Compared with Alternative A or D, Alternative C1 may increase development costs associated with evaluating the feasibility and cost effectiveness of alternative routes or increase costs for routing infrastructure to avoid these areas.

Alternative C1 may result in less economic activity from federal mineral development than under Alternative A, despite designating more acres of land ranked as high and moderate locatable mineral potential as open to locatable mineral development. Due to State or Native selection, 147,707 acres would be unencumbered. This is similar to Alternative B in respect to the amount of economic activity that may result from new and existing federal mineral claims. Under Alternative C1, 677,518 acres would be State selected, 407,276 acres of which are identified as Priority 1 expected to be conveyed to the State within 10 years of the RMP decision

Under Alternative C1, there are 81,193 acres of high and moderate locatable mineral potential lands selected by Native corporations. This is roughly a ten-fold increase in ownership of high and moderate mineral potential lands for Native corporations, compared with Alternative A. This would represent a large increase in economic development potential related to locatable mineral development. In addition, given that the Native selection lands are outside the Dalton Utility Corridor, Alternative C1 is slightly more conducive than Alternative B to promoting economic development. This is because it is less restrictive than Alternative B; that is, there are fewer management actions that may drive costs for mineral development up, such as ROW exclusions and ACEC designations.

Recreational patterns and tourism are expected to be similar to conditions under Alternative B. Given the conservation measures afforded to caribou and Dall sheep habitat, along with the decreased competition from subsistence hunters in the Dalton Utility Corridor, is the BLM anticipates that wildlife viewing and recreational hunting opportunities under Alternative C1 would improve, compared with Alternative A; however, Alternative C1 is not as protective of primitive recreation opportunities in the Dalton Utility Corridor. Hence, jobs and labor income opportunities in Wiseman and Coldfoot, as well as businesses directly or indirectly supported by recreation and tourism in non-subsistence communities, such as Fairbanks and Healy, would continue to be impacted from recreation and tourism facilitated by the Dalton Highway. Remote communities with air service would continue to receive the economic impacts related to shifting recreation hunting patterns but not to the extent as under Alternative A.

Like Alternative A, Alternative C1 does not have summer travel restrictions (May through October); however, unlike Alternative A, Alternative C1 does have 125,186 acres of land in subsistence use areas or within 20 miles of communities subject to travel restrictions from May through June. The communities that may be directly affected by the seasonal travel restrictions are Rampart, Tanana, Allakaket, and Alatna; however, this impact is expected to be minimal, given that river travel, an important transportation method of rural Alaskan communities, would not be affected, and because Alternative C1 would continue to provide for overland travel in the fall, winter and spring.

As described in **Section 3.2.7**, the protective measures offered by seasonal the travel restrictions in core caribou habitat may reduce impacts on subsistence resources, compared with Alternative A. The potential direct effects may increase travel distances and related fuel costs for subsistence purposes but may be countered by the indirect effects related to subsistence resources.

Overall, Alternative C1 has more potential to increase household fuel costs than Alternative A but less than Alternative B. When the direct effects and indirect effects are considered in tandem, then Alternative C1 may result in increased subsistence abundance, which may reduce household fuel costs for travel, compared with Alternative A. The effects of Alternative C1 on the costs-of-living in Alatna, Allakaket, Anaktuvuk Pass,

Bettles, Evansville, and Stevens Village would be the same as those described in Alternative B. This would be due to the revocation of PLO 5150 in the outer corridor.

Connectivity corridors, adaptability to climate change, and priority species would be considered in the context of allowing for more minerals development and other resource uses. Eight ACECs and RNAs (approximately 418,000 acres) would be designated. Management to protect R&I values would be less restrictive for resource uses than under Alternative B, with far fewer acres of ROW exclusion areas, about 10 percent of Alternative B's acreage in ACECs, and less-restrictive management of resource values, such as LWCs and visual resources.

Alternative C2 (Preferred Alternative)

Alternative C2 emphasizes a blend of resource protection and resource development but focuses on reducing the acres set aside as ACECs or closed to mineral entry and appropriation. Like Alternative A, Alternative C2 has one ROW exclusion area, the CAMA WSA, which totals 1.9 percent of the planning area. Unlike Alternative A though, Alternative C2 proposes ROW avoidance areas, similar to Alternatives B and C1; however, Alternative C2 would provide a more favorable economic development environment to affect the growth of jobs and labor income than Alternatives B and C1. This is because Alternative C2 proposes 750,000 acres of ROW avoidance areas near Venetie.

Alternative C2 encourages infrastructure development within utility and transportation corridors and development nodes but does not require that infrastructure and industrial development be collocated in these areas. Compared with Alternative A, Alternative C2 may increase development costs associated with evaluating the feasibility and cost effectiveness of alternative routes or routing infrastructure to accommodate the avoidance area.

Alternative C2 is generally less restrictive to economic development interests, compared with Alternative A, given that there are no ACEC designations, which require that a plan of operation be completed before mineral interests are developed. Alternative A has more lands open to mineral material development than Alternative C2, but Alternative C2 has a number of plan elements that could support industrial development: limited ROW avoidance and exclusion zones, the full revocation of PLO 5150, one existing RNA and no ACECs, and no limit on utility and transportation development, compared with Alternative A. Jobs and labor income in businesses directly and indirectly affected by mineral material development would be supported under Alternative C2.

While Alternative C2 has limited economic development opportunities related to locatable mineral development, revoking PLO 5150 in the inner corridor may lead to greater economic impacts in the short term, defined as within 10 years of the RMP decision. Alternative A has more lands ranked as high and moderate potential open to metalliferous mining without the encumbrance of State and Native selections. Alternative C2 has 1.2 million acres of high and moderate ranked locatable mineral lands open to metalliferous mining, almost twice that of Alternative A; however, over 1 million of these acres would be State or Native selected, constraining federal mineral development and related economic contributions. Nevertheless, Alternative C2 would lift PLO 5150 not only in the outer corridor but in the inner corridor. Most lands in the inner corridor would be automatically selected by the State. This would not allow for new federal mineral claims but would allow for mineral exploration and operation in existing claims.

There are currently 80 active mineral claims in the inner corridor, which encompass 1,772 acres. Locatable mineral claims in the inner corridor have not been open for development since PLO 5150 was established in 1971. Since this time, the price of gold has increased significantly. Given, the proximity of these lands to the

Dalton Highway and the relative high value of gold since these lands were last open to mineral development, revoking PLO 5150 signifies an economic development opportunity that has yet to be explored in this market context.

Revoking PLO 5150, which would allow for federal mineral development in existing claims, would continue to provide for development of these mineral resources and related economic activity in mining and supporting industries in the short term. While Alternatives C2 and D would provide for more economic development opportunities in the inner corridor than Alternatives A, B, and C1, these development opportunities would be constrained to exploration and operations in existing claims until conveyed.

There are 645,331 acres of State-selected land that are identified by the State as a number one priority for conveyance, which is anticipated to occur within 10 years on the RMP decision. In addition, there are 313,478 acres of State-selected lands that are priority 2 through 4, whose timeline for conveyance to the State is unknown.

Alternative C2 may result in a greater distribution of recreational hunting and associated economic impacts in remote communities with air service within the planning area in the long-term. This is because big game populations popular for sport-hunting may not be as robust as under Alternative A. This is due to the potential impacts on important habitat for Dall sheep and caribou in the Dalton Utility Corridor from locatable mineral development. These are important sport-hunting species that attract recreational hunters and contribute to recreation and tourism expenditures. Should recreational hunting opportunities near the Dalton Highway degrade, or visual quality decline due to mineral development, the BLM anticipates that Alternative C2 may result in a redistribution of recreational hunters to more-remote areas of the planning area. Here sport-hunting game species are more abundant, and primitive and semiprimitive recreation opportunities persist; therefore, Alternative C2 may result in a more diffuse distribution of economic impacts, meaning fewer economic contributions to the communities of Wiseman and Coldfoot and more economic contributions, jobs, and labor income to rural communities with air service, which currently are Bettles, Ambler, Anaktuvuk Pass and Galena.

Alternative C2 has effects similar to Alternative C1related to travel management and seasonal travel restrictions. The protective measures offered by the travel restrictions in core caribou habitat may reduce impacts on subsistence resources and thereby reduce the amount of effort expended for subsistence hunting. Potential direct effects may increase travel distances and related fuel costs for subsistence purposes but may be countered by the increased abundance of subsistence resources. Overall, Alternative C2 has greater potential to increase household fuel costs than does Alternative A but less than Alternative B.

Alternative C2 revokes PLO 5150 in the Dalton Utility Corridor, where 956,919 acres of land would continue to be managed for federal subsistence priority access, and 419,915 acres of top-filed lands would no longer be managed according to the federal subsistence regulations. For those lands no longer subject to the federal subsistence regulations, the communities of Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, Stevens Village, Wiseman, and Coldfoot would no longer be allowed the use of firearms for subsistence hunting purposes within 5 miles of the Dalton Highway. The loss of federal subsistence access to these lands would likely increase the cost of living to residents in these communities. This would come about by increasing the time or amount of effort spent hunting due to the restrictions on the use of firearms in this area, as compared with Alternative A and the other action alternatives.

With the full revocation of PLO 5150, the communities of Wiseman and Coldfoot would lose motorized access to top-filed or State-selected lands in both the inner and outer corridors within 5 miles of the Dalton

Highway. Fragmentation of ownership patterns, along with federal subsistence regulation authorities, would disrupt travel patterns and prohibit motorized access to federal lands that occur beyond State-selected lands.

Alternative C2 would inhibit cross-country motorized access to the Gates of the Arctic National Park, which would be accessible to residents of Coldfoot and Wiseman via the Dalton Highway. Residents of Wiseman would not be able to use snowmachines to cross BLM-managed lands in the Dalton Highway Corridor Management Area to access Gates of the Arctic National Park and Preserve managed lands. The community of Wiseman would be most acutely affected by this change. This is because, as described in the subsistence section, Coldfoot is not recognized as a resident zone community; as a result, its residents are not allowed to hunt on National Park Service lands under federal subsistence management regulations.

The potential effects of revoking PLO 5150 are the loss of snowmachine access in the Dalton Utility Corridor, the restriction on firearms use for subsistence, the increased risk to subsistence resources due to mineral development of existing claims, and the potential increased competition between recreational and subsistence hunters. This may result in the greatest increase in the cost of living for residents of Coldfoot and Wiseman than any other alternative. Alternative C2 may result in the need to spend more time and effort engaged in subsistence practices for the same unit of output. It would increase the distance travelled to access subsistence lands and, with it, would increase household fuel costs.

Alternative C2 may also result in residents of Wiseman and Coldfoot needing to secure a greater portion of household food and goods from markets, thereby increasing household costs for securing resources once procured through subsistence practices. This may translate into indirect impacts on low-income households in the planning area, who may would receive a reduce share of subsistence goods facilitated through inter-regional community distribution and trade.

Residents have voiced concern that revoking PLO 5150 would not just restrict but eliminate subsistence on the lands afforded by current federal subsistence uses. The Primary communities using the utility corridor lands are Wiseman and Coldfoot, but the residents of Stevens Village, Evansville, Bettles, Allakaket, Alatna, Hughes, Anaktuvuk Pass, and Nuiqsut use or historically used these lands; they are highly reliant on fish, wildlife, and other wild renewable resources.

As described in **Section 3.5.2**, Alternative C2 may affect subsistence access and abundance for communities in the planning area. Given the importance of subsistence in supporting rural livelihoods, from food, shelter, heating, and cultural systems, decreased access and abundance of subsistence would result in an increased reliance on markets to secure these resources, where there may be no suitable substitute; however, given the limited number of jobs and labor income and the high cost of goods in rural communities, substituting market goods for the loss of subsistence resources may not be feasible for many households. Many households report going without household necessities when they are unable to acquire subsistence resources. (Brinkman et al. 2014); hence, rural subsistence communities, including Coldfoot, Wiseman, Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, and Stevens Village in the planning area, may experience an increased cost of living and a heightened risk of food insecurity due to impacts on subsistence resources, compared with Alternative A.

The lack of designation of any ACECs will be seen by some as a rejection of local concerns about protection of important subsistence species and habitat, as well as a failure to be responsive to local values and knowledge; however, as reflected in comments in the ACEC report, others have commented that ACECs are unnecessary, are larger than needed to protect key resources, pose unwarranted restrictions on mineral and other development, or restrict travel.

Alternative D

Alternative D emphasizes management to facilitate resource development more than the other alternatives. This alternative focuses on maximizing the BLM-managed lands for development potential. It uses current federal management guidelines, without the use of specific area management actions, such as habitat-specific management or ACEC-specific management.

Similar to Alternatives A and C2, Alternative D maintains 98 percent of BLM-managed lands in the planning area as open to ROW and maintains the CAMA WSA ROW exclusion area; however, Alternative D, differs from Alternative C2 in that it does not propose any new ROW avoidance areas.

Economic activity generated from mineral material development under Alternative D may be greater than under Alternative A. This is because, with 259,000 acres closed to mineral material development, there are more lands open under Alternative D than Alternative A. In addition, Alternative D has a number of plan elements that support industrial development, such as no ROW avoidance or exclusion zones, the full revocation of PLO 5150, no designations of ACECs, no limit on utility and transportation development. Demand for mineral materials may exceed that under Alternative A, so jobs and labor income in businesses directly and indirectly affected by mineral material development could increase under Alternative D.

The economic effects associated with locatable mineral entry would be similar to that of Alternative C2. Alternative D would provide the most flexibility for locatable mineral development of all the alternatives. Alternative D does not include any withdrawals from locatable mineral entry and no ROW avoidance zones, nor does it have ACECs, which would require a plan of operation. Alternative D is the least restrictive alternative for locatable mineral development, and the costs for accessing and developing locatable minerals production may be less than all other alternatives.

Economic development impacts related to recreation and tourism under Alternative D would be similar to that of Alternative C2. Alternative D does not have travel restrictions. The effects of Alternative D are similar to Alternative A in respect to travel restrictions.

Like Alternative C2, Alternative D recommends revoking PLO 5150 in the Dalton Utility Corridor. The effects of this action are described under Alternative C2. The effects of Alternative D on subsistence are also similar to the effects of Alternative C2.

Conclusions

In summary, there are unlikely to be direct economic effects that would result in measurable changes to the economic structure or model in most planning area communities. None of the alternatives in themselves are guaranteed to produce jobs and income in the recreational, mining, or other sectors; however, decisions in the RMP that may affect the rate or scale of development of mineral resources over the life of the plan could change the economic composition or the ways people in rural subsistence communities secure their livelihoods and economic well-being.

Revoking PLO 5150 would affect residents of Coldfoot and Wiseman and other subsistence users of the Dalton Utility Corridor. This likely would result in cost of living increases through loss of snowmachine access in the Dalton Utility Corridor, restriction on firearms use for subsistence purposes, the increased risk to subsistence resources due to mineral development of existing claims, and the potential increased competition between recreational and subsistence hunters.

Communities in the planning area that are most likely to experience indirect economic impacts are the rural subsistence communities of Coldfoot, Wiseman, Alatna, Allakaket, Anaktuvuk Pass, Bettles, Evansville, and

Stevens Village. The non-subsistence communities of Fairbanks, Healy, and North Pole would also likely experience indirect economic impacts.

Social conflict and support for a given alternative is grounded in the tension between impacts on subsistence uses and lifestyles and the desire to create desperately needed jobs and income in recreation, mining, and other sectors. Some believe that subsistence and economic development can be compatible, while others believe the risks to subsistence access and abundance are simply too great.

In general, Alternative A is likely to sustain existing economic contributions to the mixed economy and market contributions from tourism, mining, and construction industries.

Alternative B, outside of limitations for subsistence access for Coldfoot and Wiseman, would decrease economic risks for rural subsistence communities due to positive effects on subsistence species abundance; however, it would constrain potential economic development opportunities, leading to jobs and income in both rural subsistence and non-subsistence communities. This would be the result of ROW exclusions, mineral withdrawals, ACEC designations, and NSO stipulations.

Alternative C1 is similar to Alternative B, except it would be more favorable to development and hence support a greater degree of economic activity.

Alternatives C2 and D would increase economic risk for rural subsistence communities due to effects on subsistence access—especially for subsistence uses in the Dalton Utility Corridor—and abundance; however, it is more likely to support economic development in the planning area in the mining and construction industries. This may contribute to limited economic development in rural subsistence communities, shifting recreation and tourism pattern to more remote communities and increasing market contributions to remote rural subsistence communities.

Cumulative Impacts

Economic activity in the planning area is expected to increase due to increased demand for mineral materials needed for developing roads and pipelines over the life of the plan, as described in the RFD scenario (**Appendix N**). Projects in the planning stage that may require sand, gravel, riprap, and common fill from BLM-managed lands in the planning area are the Alaska Stand Alone Pipeline Project, the AKLNG pipeline, Ambler Road, and the ASTAR transportation network. The estimated materials needed for these projects is 59.9 million cubic yards. This does not include the ASTAR transportation network, because the estimated gravel need is unknown at this time.

There are 5.2 million cubic yards of gravel authorized for salable mineral material production on BLM-managed lands in the planning area that currently accommodate maintenance needs for the Dalton Highway and the TAPS. All alternatives would allow for new mineral material permits to be authorized in response to demand created by these projects.

Alternative A would allow the BLM to accommodate an increase in demand for salable minerals. This would support the development of jobs and labor income in mining, construction, transportation, and utilities in response to increased demand that would result from large utility and transportation construction projects in the planning area.

All alternatives would continue to provide opportunities to develop locatable federal mineral claims. The lands with the greatest potential locatable mineral production and related economic impacts are those ranked high and medium potential in the inner and outer corridors.

For the mineral development projects that may evolve over the life of the plan, it is unknown where these may occur or to what extent. This is because there are many factors that would influence development of mineral resources in the global marketplace, such as the price of mineral commodities and trade policy.

Non-subsistence use communities in the planning area would be most likely to be impacted by the direct expenditures to develop these mineral interests, given that most of the businesses and supporting industries that may be directly affected are in urban communities. The communities of Wiseman and Coldfoot may be indirectly affected through indirect and induced spending related to placer and lode mining, but their residents are not likely to be directly employed in locatable mining operations.

Lands ranked as high and moderate potential for locatable mineral development are in the Ray Mountain area where there are known deposits of rare earth minerals. Most of these lands are either selected or top-filed, which would limit mineral exploration and operation to existing mining claims. No new mineral claims would be authorized until the lands are conveyed to the State or Native corporations or the lands are released from selection. The relatively large portion of lands selected or top-filed by the State limits the extent of exploration and operations, regardless of mineral potential ranking or market conditions for the foreseeable future on these lands. It is unlikely that these minerals in the Ray Mountain area would be developed over the life of the plan under any of the alternatives

For Alternatives B and C1, locatable mineral development may be relatively unresponsive to global market demand in the short term. Lands ranked as high and moderate potential in the inner corridor are withdrawn from mineral location and entry due to the retention of PLO 5150; therefore, these lands are not open for mineral production. The development of lands ranked as high and moderate locatable mineral potential that are selected in the outer corridor would be constrained to existing claims until the State-selected lands are conveyed to the state or released from selection, regardless of global market demand or the value of gold.

Alternatives C2 and D may result in a greater level of mineral production over 10 years than Alternative A and hence have the larger economic impact due to revoking PLO 5150 in the inner corridor. This is because in the long term, Alternatives C2 and D would create more economically feasible mineral development opportunities with relatively lower costs, given the proximity of inner corridor lands to the Dalton Highway. The economic impacts would be similar in distribution to Alternative A, because Alternatives C2 and D would support the same industries and related communities as described under Alternative A; however, the magnitude of the economic impacts may be greater under Alternatives C2 and D.

Private industry may respond to relatively new mineral opportunities provided by revoking PLO 5150 in the inner corridor, increasing economic activity in the short term on existing claims and, given favorable market conditions, increasing in economic activity, jobs, and labor income in the long term upon the conveyance of lands ranked as high and moderate locatable mineral potential.

As described in this section, impacts on subsistence access and resources is a large part of impacts on social and economic conditions; readers are referred to the cumulative impacts on subsistence section for a full discussion. A few main projects would likely contribute the most to the impacts on subsistence already described in this section. For the communities of Nuiqsut and Anaktuvuk Pass, development of the Alaska Liquified Natural Gas Project would lead to subsistence restrictions. Alatna, Alakaket, Anaktuvuk Pass, Bettles, Coldfoot, and Wiseman would likely be affected by development of Ambler Road. Resource abundance and availability of game populations that subsistence users rely on, particularly moose, caribou, and Dall sheep, could be affected by increased levels of recreational hunting, especially along the Dalton Highway.

Habitat conditions that support the continued abundance of subsistence resources in the inner corridor may be at a heightened risk of degradation due to mineral development. Hence there could be a reduction in the availability of subsistence resources. In addition, under State management, recreational hunting in the Dalton Highway Corridor Management Area may be encouraged. This may further increase competition between subsistence and recreational hunters.

Lastly, the loss of priority subsistence access due to State selection of these lands would inhibit access to subsistence regions, increasing costs to secure subsistence resources. These pressures may result in an increase in the cost of living for subsistence use communities by increasing the time and distance travelled to harvest subsistence resources, compared with Alternative A.

Given the anticipated level of mineral development in the inner corridor that may arise under State ownership, potential impacts on the sport hunting opportunities and scenic character of the inner corridor may degrade the existing recreation opportunities related to primitive and semiprimitive recreation opportunities; hence, existing recreation and tourist patterns may be disrupted. Recreationists seeking these types of experience may opt to recreate in communities that can be more easily accessed via new roads that may be constructed in the planning area or by air service.

Under Alternative C2, is the BLM anticipates that a greater portion of recreationists would opt to visit communities in more remote locations than under Alternatives A, B, and C1; therefore, Alternatives C2 and D may result in a greater degree of economic development in recreation and tourism industries in such communities as Tanana, Bettles, Anaktuvuk Pass, Galena, Alatna, Allakaket, Stevens Village, and Venetie or Arctic Circle.

Recreation visitation and tourism would be largely driven by national and global economic conditions. Roads that may be developed across BLM-managed lands may increase the distribution of visitation to other communities in the planning area that are relatively close to new roads. This would be the case if they were eventually opened to the public, although this is not part of the current planning.

The high cost of fuel, combined with the long distance to markets, also contributes to higher food and fuel prices in rural markets. Fuel prices are driven by market conditions that that are beyond the scope of this decision, although actions in the planning area that may drive down rural fuel prices include the development of roads, such as the road to Ambler and the road to Umiat.

3.6 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are those that cannot be fully mitigated. These vary between alternatives; Alternative B generally has the least, while they are highest under Alternative D.

- Surface disturbance is the main indicator of unavoidable adverse impacts for the proposed CYRMP actions. Surface disturbance can cause soil erosion and dust emission; remove and alter vegetation communities; remove, alter, or fragment fish or wildlife habitat; or harm water quality. SOPs, required design features, and mitigation measures help reduce the degree and intensity of impacts.
- Management actions associated with increases in surface disturbance include locatable mineral development, mineral materials disposal, opening land to commercial timber harvest, cross-country OHV use, and development of ROW, roads, or trails.
- Mining and other developments can produce potentially non-negligible air emissions of criteria pollutants, can result in changes to the surrounding landscape that affect visual resources, and may involve human disturbance that causes wildlife to avoid certain areas.

3.7 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitments include effects that are permanent, such as species extinction, loss of cultural or paleontological sites, permanent alteration of a waterway, or exhausting a mineral resource. Irretrievable commitments involve short-term loss that could be regained over time. Restrictions, mitigation, or permits could reduce the intensity or duration of effects.

Irreversible effects could result from sizable surface disturbance, such as from ROW development or locatable mineral development, due to a reduction of water quality or permanent loss of vegetation, habitat, cultural resources, or paleontological resources. Removal of locatable mineral or mineral materials resources during mining operations is an irreversible commitment.

Irretrievable effects on air or water quality, vegetation, fisheries, or wildlife could result from surface disturbance from commercial timber harvest, seasonal OHV use, or wildland fires and prescribed burning.

3.8 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

This section discusses the short-term effects of the RMP alternatives versus the maintenance and enhancement of potential long-term productivity of the planning area's environmental resources.

Short-term impacts are those that revert to pre-project conditions within a few years. Long-term impacts take longer to revert or are permanent. Because the alternatives are management actions, most effects are long term and could have beneficial or adverse effects on productivity compared with current conditions. Long-term beneficial impacts on wildlife, fisheries, water and riparian resources, visual resources, and cultural resources are likely for Alternative B. Long-term adverse impacts on these could occur under Alternatives C1, C2, and D. Increased acres open to locatable mineral development and mineral materials disposal, and therefore increased mineral productivity, could occur under Alternatives C1, C2, and D. Short-term disturbances from actions such as vegetation treatments or visitor facility construction would be offset by the long-term benefits to the habitat or visitor enjoyment and economic opportunity.

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Glossary

100-year floodplain. The area inundated by the 100-year flood or the 1 percent annual exceedance probability flood. It is the flood that has a 1 percent chance of being equaled or exceeded in any single year. It is often mistakenly thought of as the flood that occurs once every 100 years. If a project is within the 100-year floodplain and the project life is expected to be 30 years, it would have a 25 percent chance of experiencing flood damage due to a 100-year flood. For a project with an anticipated life of 15 years, the chance of incurring flood damage due to a 100-year flood would be 14 percent.

The 100-year floodplain is difficult to accurately map without extensive ground surveys. On-the-ground surveys conducted in the Central Yukon planning area typically employ the valley width that corresponds to an elevation of three times maximum bankfull depth as an estimate of the 100-year floodplain (FEMA 2015).

17(d)(1) withdrawal. A withdrawal made under the authority of section 17(d)(1) of the Alaska Native Claims Settlement Act. The purpose is to determine the proper classification of the lands and to determine the public values of the lands that need protection.

acquisition. Acquisition of lands can be pursued to facilitate various resource management objectives. Acquisitions, including easements, can be completed through exchange, purchase, or donation.

active layer. Top layer of soil subject to annual thawing and freezing in areas underlain by permafrost.

aircraft. Fixed-wing and rotary wing aircraft.

Alaska National Interest Lands Conservation Act (ANILCA). A law passed in 1980, designating 104 million acres for conservation by establishing or expanding national parks, wildlife refuges, wild and scenic rivers, wilderness areas, forest monuments, conservation areas, recreation areas, and wilderness study areas to preserve them for future generations.

Alaska Native Claims Settlement Act (ANCSA). A law passed by Congress in 1971 to settle aboriginal land claims in Alaska. Under the settlement, the Natives received title to over 44 million acres, to be divided among some 220 Native villages and 12 Regional Corporations established by the act. The corporations shared in a payment of $962,500,000.

all-terrain vehicle (ATV). A wheeled vehicle other than a snowmobile that is defined as having a curb weight of 1,000 pounds or less, a maximum width of 50 inches or less, handlebar steering, three or more low-pressure tires, and a seat designed to be straddled by the operator.

ambient air quality standard. Air pollutant concentrations of the surrounding outside environment that cannot legally be exceeded during fixed time intervals and in a specific geographic area.

analysis area. Any lands, regardless of jurisdiction, for which the BLM synthesizes, analyzes, and interprets data and information that relates to planning for BLM-managed lands. Analyses that extend beyond the planning area boundary allow management decisions to be made within the context of overall resource conditions and trends in the surrounding area, considering local, state, other federal, and tribal plans. Examples of such information are the relative significance of BLM-managed lands for a certain resource (such as a threatened or endangered species) or the anticipated impacts on resources (such as air quality and socio-

economics), based on activities on BLM-managed lands. The analysis areas can be any size, can vary according to resource, and can be located anywhere in, around, partially outside, or completely outside the planning or decision areas.

anthropogenic. Effects, processes, objects, or materials derived from human activities, as opposed to those occurring in natural environments without human influences.

Arctic Circle. The invisible circle of latitude on earth's surface at 66°33' north, marking the southern limit of the area where the sun does not rise on the winter solstice, December 21, or set on the summer solstice, June 21.

areas of critical environmental concern (ACEC). Special area designation established through the BLM's land use planning process (43 CFR 1610.7-2). It designates where special management attention is required, when such areas are developed or used or where no development is required. The intent is 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. The level of allowable use within an ACEC is established through the collaborative planning process. Designation of an ACEC allows for resource use limitations to protect identified resources or values.

artifact. An object that was made, used, or transported by humans that provides information about human behavior in the past. Examples are pottery, stone tools, and bones with cut marks.

avoidance, mitigation. Avoiding an impact altogether by not taking a certain action or parts of an action (40 CFR 1508.20). It may also include avoiding the impact by moving a proposed action to a different time or location.

backcountry conservation area (BCA). Management allocation used to maintain and enhance habitat for recreationally important fish and wildlife species and to expand public access for hunting, angling, and other forms of wildlife-dependent recreation. When applied, they allow the BLM to prioritize habitat management actions, such as restoring riparian areas, controlling invasive species, managing vegetation, improving fish passage, and reducing wildfire risk.

baseline. The preexisting condition of a resource, at all relevant scales, which can be quantified by an appropriate metric. During environmental reviews, the baseline is considered the existing affected environment without a project. It is used to compare predictions of the effects of the proposed action or a reasonable range of alternatives.

BEACONs benchmark. Derived using the Boreal Ecosystem Analysis for Conservation Networks model.

benchmark area. Intact, hydrologically connected area large enough to accommodate natural disturbances.

benchmark polygon. A line indicating the outer boundary of a benchmark on a map.

benchmark network. Groups of benchmark areas that, collectively, are representative of key ecological indicators for an ecoregion.

best management practice (BMP). A suite of techniques that guide, or may be applied to, management actions to help achieve desired outcomes.

biodiversity. The genetic diversity, species diversity, and ecosystem diversity in an area of interest.

BLM-approved erosion and sediment control plan. Requires that the following plan components be addressed and to be updated in response to corrective actions: facility description and contact information, potential pollutant sources, stormwater control measures, schedules and procedures for monitoring, inspections, and plan modifications.

bluff. A high bank or bold headland, with a broad, precipitous, sometimes rounded cliff face overlooking a plain or body of water, especially on the outside of a stream meander; for example, a river bluff.

candidate species. Plant or animal species for which the U.S. Fish and Wildlife Service has sufficient information on its biological status and threats to propose it as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

casual use (mineral extraction). Activities ordinarily resulting in no or negligible disturbance of the public lands or resources.

casual use (recreation). Noncommercial or nonorganized group or individual activities on public land. Casual use complies with land use decisions and designations, does not award cash prizes, is not publicly advertised, poses minimal risk for damage to public land or related water resources, and generally requires no monitoring.

cave. Any naturally occurring void, cavity, recess, or system of interconnected passages beneath the surface of the earth or within a cliff or ledge large enough to permit an individual to enter, whether or not the entrance is naturally formed or human-made (FCRPA, Sec. 3(1)).

Central Dalton SRMA. Designated only under Alternative B, the Central Dalton SRMA is described as the inner corridor and is bounded by the Yukon River Crossing RMZ to the south, the Coldfoot RMZ to the north, and, for much of the SRMA, the BCA to the east and west. The Central Dalton SRMA would be managed to provide three RMZs: Yukon River Crossing, Dalton Uplands, and Coldfoot.

climate change. Any significant and extended (over decades or longer) change in measures of climate, such as temperature, precipitation, or wind regimes. Climate change may result from natural factors, natural processes, and human activities that change the atmosphere's composition and the land surface.

Code of Federal Regulations (CFR). A codification of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the federal government. The CFR is divided into 50 titles that represent broad areas subject to federal regulation. Each volume of the CFR is revised at least once each year and issued on a quarterly basis.

commercial recreational use. Recreational use of public lands and related waters for business or financial gain. The use is considered commercial when any person, group, or organization makes or attempts to make a profit, receive money, amortize equipment, or obtain goods or services as compensation from participants in recreation on public lands. An activity, service, or use is commercial if anyone collects a fee or receives other compensation that is not strictly a sharing of, or is in excess of, actual expenses incurred for the purpose of the activity, service, or use, such as guides, outfitters, and air taxi operators.

compensatory mitigation. Compensating for the remaining impacts after all appropriate and practicable avoidance and minimization measures have been applied, by replacing or providing substitute resources or

environments through the restoration, establishment, enhancement, or preservation of resources and their values, services, and functions (600 DM 6.C., citing 40 CFR 1508.20(e)).

compensatory mitigation project. Specific, on-the-ground action (mitigation measure) to improve habitats, such as chemical vegetation treatments.

compensatory mitigation site. The durable area where compensatory mitigation projects will occur.

connectivity. See *hydrologic connectivity*, *landscape connectivity*, and *general habitat connectivity*.

connectivity corridors. Components of a landscape that facilitate the movement of matter, energy, or organisms between elements of the landscape.

conservation system unit (CSU). ANILCA defines a CSU as any Alaska unit of National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers Systems, National Trails System, National Wilderness Preservation System, or a National Forest Monument.

conservation matrix model. A conceptual framework for the design of ecological networks to facilitate biodiversity, conservation, and sustainable use across a spectrum of opportunities.

conservation watershed. A watershed in which processes and functions occur in a relatively undisturbed and natural landscape setting.

continental-subarctic. North of the humid continental climate, from about 50 to 70 degrees north, in a broad swath extending from Alaska to Newfoundland in North America and from northern Scandinavia to Siberia in Eurasia are regions dominated by a long, bitterly cold period with short, clear days, relatively little precipitation (mostly in the form of snow), and low humidity. Mean monthly temperatures are below freezing for 6 to 8 months, with an average frost-free period of only 50–90 days per year, and snow remains on the ground for many months. Summers are short and mild, with long days and a prevalence of frontal precipitation associated with maritime tropical air within traveling cyclones. Annual precipitation totals are mostly less than 50 centimeters (20 inches), with a concentration in the summer.

conveyed. Title to land transferred from one party to another. The United States conveys title to land to Native corporations by patent and interim conveyance and to the State of Alaska by patent and tentative approval.

core caribou range. The portion of a caribou herd's total range that represents its main use area. The area is delineated using data from radio-collared caribou collected from 1982 to 2017 and represents approximately 75 percent of the total number of historical data locations for each herd.

core conservation area. An area, such as a park or wildlife refuge, that is managed primarily for conservation purposes.

core area. See *core conservation area*.

criteria air pollutants. The six air pollutants of concern identified in the Clean Air Act of 1970: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. They are the only air pollutants that national air quality standards define as having allowable concentrations in ambient air. States may adopt ambient air quality standards for additional pollutants of concern.

critical habitat. That which is necessary to maintain viable populations of wildlife during specific seasons or reproductive periods (BLM Manual 6780).

CSU benchmark. A benchmark consisting mostly lands inside conservation system units designated in the Alaska National Interest Lands Conservation Act.

cultural resources. These resources are in locations of human activity, occupation, or use. They include archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and locations of traditional cultural or religious importance to specified social or cultural groups.

curb weight. The weight of a vehicle with a full tank of fuel and all fluids full, but with no people or cargo loaded. It is synonymous with wet weight and operating weight.

Dall sheep habitat area (DSHA). BLM-managed lands identified as having the highest habitat conservation value in relation to Dall sheep.

Dall sheep movement corridor (DSMC). BLM-managed lands identified as having significant value to Dall sheep for accessing seasonal ranges, mineral sources, forage habitat, and escape terrain.

Dall sheep study area (DSSA). The remainder of the planning area that is known to be inhabited by Dall sheep but is not identified as DSHA or DSMC.

Dalton Corridor BCA. Designated only under Alternative B, the goal of the Dalton Corridor BCA is to conserve backcountry conservation management criteria areas and to provide for dispersed, wildlife-dependent recreation in order to meet wildlife objectives outlined in Appendix K. Commonly known as the "outer corridor" of the Dalton Corridor focusing on providing semi-primitive recreational hunting opportunities.

Dalton Corridor SRMA. Under the current management plan (Alternative A), the Dalton Corridor SRMA is designated as 2,213,000 acres and would continue to operate and be managed under the 1991 Recreation Area Management Plan, Dalton Highway.

Dalton ERMA. Designated only under Alternative C2, the Dalton ERMA would manage the existing values in a semi-primitive setting and enhance recreation opportunities for those desiring an undeveloped recreation experience.

Dalton Highway. A common reference for the James Dalton Highway, a 414-mile highway from Livengood, Alaska, to Prudhoe Bay.

Dalton Highway Corridor Management Area. A State of Alaska Department of Fish and Game unit that runs along the James Dalton Highway and has specific hunting regulations.

Dalton Highway Corridor SRMA. Designated only under Alternative C1, the Dalton Highway Corridor SRMA encompasses the area from the Yukon River Crossing at MP 56 to the northern edge of BLM-managed lands next to the Utility Corridor at MP 300. This SRMA has been divided into nine resource management zones (RMZs): Yukon River, Finger Mountain, Arctic Circle, Grayling Lake, Chapman Lake, Coldfoot, Brooks Range South, Brooks Range North/Galbraith Lake, and Outer Corridor. These include the inner utility corridor and the outer utility corridor, as described in the Utility Corridor RMP/EIS (BLM 1991). The RMZs include rural, frontcountry, backcountry, and semi-primitive recreation settings.

Dalton Highway SRMA. Under the current management plan (Alternative A) the Dalton Highway SRMA is designated as 801,000 acres and would continue to operate and be managed under the 1991 Recreation Area Management Plan, Dalton Highway.

Dalton SRMA. Designated only under Alternative C2, the Dalton SRMA includes the three RMZs in the Central Dalton SRMA (Yukon River Crossing, Dalton Uplands, and Coldfoot), as well as the Sukukpak Region SRMA. These lands would be managed as a mix of rural, frontcounty, and backcounty recreation settings.

Dalton Uplands RMZ. One of multiple resource management zones in the Central Dalton SRMA under Alternatives B and C2.

Dalton Utility Corridor. A common term for the area that is withdrawn under PLO 5150 for a utility and transportation corridor.

decision area. The lands in a planning area for which the BLM has authority to make land use and management decisions. In general, the BLM has jurisdiction over all BLM-managed lands (surface and subsurface) and over the subsurface minerals only in areas of split-estate (areas where the BLM manages federal subsurface minerals, but the surface is owned by a non-federal entity, such as a state trust land or private land).

designated trail. A narrow section of developed linear travel way, with an approved designation for traversing by means of human-powered, stock, or off-road vehicle transportation. Travel on designated trails allows a 100-foot-wide travel way (50 feet on either side of center line of trail). Motor vehicle designations include parking along designated routes and at facilities associated with designated routes when it is safe to do so and when not causing damage to resources. This provision recognizes that, from a practical standpoint, one vehicle width from the edge of the route surface may be necessary to park a vehicle, to perform a repair, or to allow another party to pass, to allow dispersed camping off the trail, and to allow enough area to navigate around obstacles until a trail can be repaired.

dispersed recreation. Unstructured recreation that is not confined to a specific location, such as a recreation site. Examples of these activities are hunting, fishing, off-road vehicle riding, hiking, and sightseeing.

disturbance. Alteration of the vegetative cover or ground surface. Human disturbance is caused by such activities as clearing, excavating, or introducing sources of invasive species. Natural disturbance is caused by natural events, such as lightning-caused wildfires or windstorms.

dry weight. The total weight of a vehicle without fluids.

ecological benchmark. An area that is representative of key ecological indicators for an ecoregion and, thus, can serve as a reference for understanding the natural dynamics of ecosystems and their response to human activities to facilitate adaptive management strategies.

ecological integrity. The state of an ecosystem where structure, composition, and function are characteristic for the region, ecological processes are intact and self-sustaining, and the ecosystem evolves naturally.

ecological function. The biological, geochemical, and physical processes and interactions that take place or occur within an ecosystem.

ecological trait. A distinguishing quality or characteristic of an ecological system or system component.

ecological value. Beneficial aspect of an ecological system or system component.

ecoregion. Geographical region characterized by specific ecological patterns, including soil types, flora and fauna, climatic conditions, and ecological functions.

effectiveness monitoring. Verifying that mitigation is achieving the required outcomes.

eligible river. A river or river segment found to meet criteria in Sections 1(b) and 2(b) of the Wild and Scenic Rivers Act of being free flowing and possessing one or more outstandingly remarkable value (BLM Manual 6400, Wild and Scenic Rivers—Policy and Program Direction for Identification, Evaluation, Planning, and Management).

endangered species. An animal or plant designated by the U.S. Fish and Wildlife Service to receive federal protection status because it is in danger of extinction throughout all or a significant portion of its natural range.

environmental impact statement (EIS). A detailed statement of a given project's environmental consequences, including unavoidable adverse environmental effects, alternatives to the proposed action, the relationship between local short-term uses and long-term productivity, and any irreversible or irretrievable commitment of resources.

environmental justice. The fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

executive order. A rule or order issued by the president and having the force of law.

extensive recreation management area (ERMA). A BLM-managed land unit identified in land use plans and containing all acreage not identified as an SRMA. Recreation management actions win an ERMA are limited to only those of a custodial nature.

Federal Land Policy and Management Act (FLPMA). A law passed in 1976 to establish public land policy, to provide guidelines for its administration, and to provide for the management, protection, development, and enhancement of public lands.

***Federal Register*.** A daily publication that reports presidential and federal agency documents.

fire frequency. The reoccurrence of wildland fire in each area over time. Also referred to as fire cycle.

fire regime. A description of the patterns of wildland fire occurrences, frequency, size, severity, and, sometimes, vegetation and fire effects, in each area or ecosystem. A fire regime is a generalization based on wildland fire histories at individual sites. There are five standard fire regimes, as follows:

- Fire Regime I—with a fire frequency of 0–35 years, surface fire to mixed fire type
- Fire Regime II—with a fire frequency of 0–35 years frequency, stand replacement fire type
- Fire Regime III—with a fire frequency of 35–100+ years, with a mixed fire type
- Fire Regime IV—with a fire frequency of 35–100+ years, with a stand replacement fire type
- Fire Regime V—with a fire frequency of 100+ years, with a stand replacement fire type

fugitive dust. Particles suspended randomly in the air, usually from road travel, excavation, or rock loading.

fundamental benchmark properties. These properties are intactness, hydrologic connectivity, size, and ecoregion representation. Areas that meet criteria for these properties are suitable to serve as ecological benchmarks.

general habitat connectivity. The degree to which movement is facilitated between or within elements of the environment, without specificity to species, life form, element, or process.

greenhouse gas. A gas that absorbs and emits thermal radiation in the lowest layers of the atmosphere. This process is the fundamental cause of the greenhouse effect. The primary greenhouse gases that are considered air pollutants are carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons.

habitat. The physical space in which a plant or animal lives and the abiotic and biotic entities (e.g., resources) it uses and selects in that space

harvest (with respect to timber and woody vegetation). Removing vegetation for the purpose of selling, bartering, or using the materials or for manipulating vegetation structure for an intended outcome. Harvest, as used herein, does not include stripping vegetation to develop an authorized mining operation or mineral material site where overburden is required to be stockpiled and reused for reclamation. Harvest, as used herein, does not include wanton injury or destruction of plants or taking of plant materials that are wasted.

hazardous air pollutants. Also known as toxic air pollutants, they are those that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects. The Environmental Protection Agency controls 187 hazardous air pollutants, including volatile organic compounds, heavy metals, and persistent bioaccumulative toxins. The most widespread volatile organic compounds commonly analyzed are benzene, ethylbenzene, toluene, xylene, n-hexane, and formaldehyde.

hydrologic cycle. Includes the fundamental components of precipitation, infiltration, runoff, and evaporation, which give one insight as to the origin of water. It is used to determine the downstream transfer of water, sediment, nutrients, and organic debris and ultimately defines the physical and biological character of the stream.

hydrologic regime. Variations in the state and characteristics of a waterbody that are regularly repeated in time and space and that pass-through phases, such as seasons.

ice road. A winter road that runs on a naturally frozen water surface. Ice roads are not passable when they are not frozen.

Inner Corridor. Referenced in section 2 of PLO 5150, this linear portion of PLO 5150 is the inner corridor of the PLO; it overlaps the Dalton Highway and the Trans-Alaska Pipeline.

intactness. The degree to which a natural landscape or ecosystem is unaltered.

key ecological indicator. Measurable trait that, by its presence or condition, indicates something about the attributes of an ecological system or system component.

land facet-based connectivity corridor. A region with a high degree of connectivity between locations, as determined by land facet analysis methods described by Beier and Brost (2010).

landscape. An entity with structural elements of patch, mosaic, and corridor, reflecting a mix of ecosystems, habitats, and land uses.

landscape adaptability. The ability of landscape components to adjust to change.

landscape connectivity. The degree to which landscape components facilitate or impede the movement of matter, energy, and organisms within and between elements of the environment.

landscape conservation. A collaborative approach to managing landscapes across jurisdictions to meet a desired combination of goals for ecological functionality, ecosystem services, and social, cultural, and economic benefits.

landscape resilience. The ability of landscape components to absorb change and persist after disturbance.

landscape-scale ecological processes. Fluxes and cycles of energy and nutrients and interactions of organisms with their environment that landscape patterns can affect.

least-cost pathway. The path that minimizes the cumulative resistance to moving between locations.

lentic area. Wetland or riparian area with standing water habitat, such as a lake, pond, seep, bog, and meadow.

linkages. See *connectivity corridors*.

listed species. A species, subspecies, or distinct vertebrate population segment that has been added to the federal lists of endangered and threatened wildlife and plants as they appear in 50 CFR 17.11 and 17.12.

mass wasting. Downward movement by gravity of rock and soil on the sloped top layers of earth's surface.

matrix. The area occupied by the predominant habitat, land cover, or land use in a landscape; the "background" within which patches and corridors of more intensive land uses or less disrupted habitats are distributed within a landscape mosaic.

minimize. To reduce harmful effects to a level that does not have significant adverse effects on wildlife populations or their habitat in the planning area or significantly reduce the public's opportunity for successful harvest or nonconsumptive use of wildlife.

minimum dynamic reserve. An estimate of the minimum reserve size required to incorporate natural disturbance and maintain ecological processes, relating the size of the dominant disturbance on a landscape to communities of species that may be differentially affected by this disturbance.

mitigation. Includes avoiding an impact altogether by not taking a certain action or parts of an action; minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources or environments (40 CFR 1508.20).

National Ambient Air Quality Standards (NAAQS). The Clean Air Act requires the U.S. Environmental Protection Agency to set national ambient air quality standards (codified in 40 CFR 50) for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards: Primary standards provide public health protection, including protecting the health of sensitive populations, such as asthmatics, children, and the elderly; secondary standards protect

public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. The EPA has set standards for six principal pollutants (see *criteria air pollutants*, above). Periodically, the standards are reviewed and may be revised.

National Wild and Scenic Rivers System (NWSRS). A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three types of streams: (1) recreational—rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundments or diversion in the past; (2) scenic—rivers or sections of rivers free of impoundments, with shorelines or watersheds still largely undeveloped but accessible in places by roads; and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

net benefit. When mitigation results in an improvement above baseline conditions.

no net loss. When mitigation results in no negative change to baseline conditions, such as when an impact is fully offset or balanced.

outcome. A clearly defined and measurable result that reflects the desired condition of a resource.

outstandingly remarkable values. Values among those listed in Section 1(b) of the Wild and Scenic Rivers Act of 1968: "scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values. . . ." Other similar values that may be considered are ecological, biological, or botanical.

no surface occupancy (NSO). A fluid mineral leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the NSO area.

objective. A description of a desired outcome for a resource.

Outer Corridor. The area of PLO 5150 not including the Inner Corridor.

paleontological resource. Any fossilized remains or traces of organisms that are preserved in or on the earth's crust, that are of scientific interest, and that provide information about the history of life.

particulate matter. Solid particles and liquid droplets found in the air. Particulate matter can be emitted directly or formed in the atmosphere. Primary particles are those released directly to the atmosphere. These include dust from roads and black or elemental carbon from combustion sources. Secondary particles are formed in the atmosphere from chemical reactions involving primary gaseous emissions. These particles can form at locations distant from the sources that release the precursor gases. Examples are sulfates formed from sulfur dioxide emissions from power plants and industrial facilities and nitrates formed from nitrogen oxides released from power plants, mobile sources, and other combustion sources.

performance standard. Observable or measurable metric used to determine if outcomes are met; it often includes defined time frames.

permafrost. Soil, sand, gravel, or bedrock that has remained below 32 degrees Fahrenheit for two or more years.

planning area. The geographic area within which the BLM will make decisions during planning. A planning area boundary includes all lands regardless of jurisdiction; however, the BLM will make decisions only on lands under its jurisdiction, including subsurface minerals. Unless the BLM State Director determines otherwise, the planning area for an RMP is the geographic area associated with a particular field office (43 CFR 1610.1(b)). BLM State Directors may also establish regional planning areas that encompass several field offices or states, as necessary.

PM_{10}. Particles that have aerodynamic diameters less than or equal to 10 microns.

$PM_{2.5}$. The subset of PM_{10} particles that have aerodynamic diameters less than or equal to 2.5 microns.

pollutant. Any substance introduced into the environment that adversely affects the usefulness of a resource or the health of humans, animals, or ecosystems.

potential areas of critical environmental concern (ACEC). Those ACECs for which nominated values were determined to be both relevant and important. They are considered for designation in at least one resource management plan alternative.

Potential Fossil Yield Classification (PFYC). A classification system the BLM uses to assess potential occurrences of paleontological resources in mapped geologic units. It provides classifications that may be used to assist in determining the need for further assessment or actions. The PFYC system is created from available geologic maps and assigns a class value to each geological unit, representing the potential abundance and significance of paleontological resources that occur in that geological unit. PFYC values range from Class 1, very low, to Class 5, very high, which indicate both the probability for the mapped unit to contain significant paleontological resources and the degree of management concern for the resource. Geologic units without enough information associated with them to assign a PFYC value may be assigned Class U, Unknown Potential. This classification does not reflect rare or isolated occurrences of significant fossils or individual localities, only the relative occurrence on a formation- or member-wide basis. Any rare occurrences may require additional assessment and mitigation if they fall within the area of anticipated impacts.

prescribed fire. A fire purposefully ignited to meet specific objectives. Before it is used, there must be a written, approved fire plan and legal requirements must be met. Also known as a prescribed burn.

public land use. The occupancy, use, development, or traversing of BLM-managed surface or mineral estate; may be BLM-proposed or externally proposed.

putrescible. Liable to decay.

priority species. A species in the planning area that is recognized as significant for at least one factor, such as density, diversity, size, public interest, remnant character, or age (BLM Handbook 1601).

proper functioning condition (PFC). The physical functioning of riparian-wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. PFC is a state of resiliency that will allow a riparian-wetland to hold together during times of high water flow, sustaining that system's ability to produce values related to both physical and biological attributes. A riparian-wetland area is considered to be in PFC where there is adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; where it filters sediment, captures bedload, and aids floodplain development; where it improves floodwater retention and groundwater recharge; develops root masses that stabilize streambanks against cutting action and diverse ponding and

channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and where it supports greater biodiversity.

prospecting. Exploring lands open for mineral entry to determine if a valuable mineral deposit exists.

reasonable access. Legal or physical access to subsistence resources is generally available to qualified rural residents (ANILCA 8.811).

reasonably related. To be demonstrably and rationally linked in terms of resource quantity, quality, and characteristics, as guided by the best available science.

recreation management zone (RMZ). SRMAs and ERMAs may be subdivided into RMZs to further delineate specific recreation opportunities and recreation setting characteristics.

recreational river. A rivers or section of a river that is readily accessible by road or railroad, that may have some development along its shorelines, and that may have undergone some impoundment or diversion in the past.

reference condition. The best estimate of biotic integrity, given the characteristics of aquatic sites that reflect minimal stress related to human activity. The acceptance of minimal stress recognizes that sampling sites that are truly undisturbed do not exist; for example, the condition in the presence of atmospheric contaminants that is well below the threshold for effects but nonetheless present. Reference condition describes not a single value but a distribution of values for a given index or metric that results from natural variability and sampling error, both in time and in space (adapted from Stoddard et al. 2006).

research natural area (RNA). A land management status that reserves the area for uses that are compatible with the resource of interest and research for which the area was designated.

resources (and their values, services, and functions). Natural, social, or cultural objects or qualities. Resource values are the importance, worth, or usefulness of resources; resource services are the benefits people derive from resources; and resource functions are the physical, chemical, and biological processes that involve resources.

riparian. Relating to or situated on the banks of a river.

riparian vegetation. Vegetation, habitats, or ecosystems that are associated with streams or lakes or that depend on the existence of perennial, intermittent, or ephemeral surface or subsurface water drainage.

scenic rivers. Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

sensitive soils. Those mapped by the BLM to be in one of the following categories: steep slopes, thaw-sensitive permafrost, or wetland soils or those that are highly susceptible to erosion or that have high moisture content.

sensitive species. All species that are under status review, that have small or declining populations, or that live in unique habitats, or any species requiring special management: threatened, endangered, or proposed species, as classified by the U.S Fish and Wildlife Service, or species designated by a state wildlife agency as needing special management (IM AK 2004-23).

site potential. The highest ecological status a riparian-wetland area can attain, given no political, social, or economic constraints; often referred to as the potential natural community (PNC). The PNC would be represented by the statistical distributions for a set of regional reference conditions. That portion of the distribution for a particular metric that excludes outliers and the upper or lower tail of the distribution would represent PNC.

slumping. Occurs when slopes are undercut by wave or stream action and the soft soil collapses, creating a "thaw slump."

snowmachine, snowmobile. A motorized vehicle that is designed for use over snow, that runs on a track or tracks and uses a ski or skis for steering, that has a curb weight of 1,000 pounds or less and a maximum width of 50-inches or less, is steered using handlebars, and has a seat designed to be straddled by the operator (does not include machinery used strictly for the grooming of nonmotorized trails).

special recreation management area (SRMA). A public land unit identified in land use plans. Its purpose is to direct recreation funding and personnel to fulfill commitments made to provide specific, structured recreation opportunities. Both land use plan decisions and subsequent implementing actions for recreation in each SRMA are geared to a strategically identified primary market—destination, community, or undeveloped.

special status species. Special status species include endangered species, threatened species, proposed species, candidate species, State-listed species, and BLM Alaska sensitive species. Species designated as BLM sensitive must be native species that occur on BLM-managed lands and for which the BLM has significant management capability to affect their conservation status. In addition, one of the following two criteria must also apply: (1) There is information that a species is known or predicted to undergo a downward trend such that its viability or a distinct population segment of the species is at risk across all or a significant portion of its range; or (2) the species depends on ecological refugia, specialized habitats, or unique habitats, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk.

subsidence. As ice in the permafrost thaws and contracts, it causes the ground to develop a localized depression.

subsistence uses. The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of inedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing for personal or family consumption; and for customary trade. This includes any use of surface transportation to access subsistence resources, as provided for under Alaska National Interest Lands Conservation Act (ANILCA), Sections 811 and 1110.

suitable river. An eligible river segment found, through administrative study, to meet the criteria for designation as a component of the National Wild and Scenic Rivers System, as specified in Section 4(a) of the Wild and Scenic Rivers Act (BLM Manual 6400, Wild and Scenic Rivers—Policy and Program Direction for Identification, Evaluation, Planning, and Management).

surface disturbance. See *surface-disturbing activities*.

surface-disturbing activities. All activities that involve excavation, earthwork, soil disturbance, soil compaction, stream bank alteration; an increase in soil erosion potential, vegetation removal, or vegetation damage extensive enough to affect vegetative health beyond one growing season.

thaw-sensitive permafrost. Permafrost soils with temperatures near 32 degrees Fahrenheit during the growing season.

thermokarst. Land surface characterized by very irregular surfaces of marshy hollows and small hummocks formed as ice-rich permafrost thaws.

threatened and endangered species. Plant or animal species listed by the U.S. Fish and Wildlife Service under the Endangered Species Act as in danger of becoming either extinct or threatened, to the degree that their continued existence is in question.

timber. All woody vegetation 5 inches in diameter at breast height (dbh) or larger. By industry convention, dbh is the diameter of the outside bark, measured 4.5 feet above the ground. This convention was the standard used for timber size in this RMP.

top-filed. Section 906(e) of ANILCA gave the State of Alaska the right to make top-filings (future selection applications) for its land entitlement selections, subject to valid existing rights and Native selection rights under ANSCA. Native selection rights could include individual Native allottees, as well as Village and Regional Corporations. A top-filing makes the State's claim to land fourth in line as a contingent selection. A valid existing right would also include any federal administrative withdrawals, such as the ANSCA PLOs being discussed herein. Top-filings prevent the land's adjudication as a "first in line" entitlement selection. This is because they are a future interest and not counted toward the State's total land entitlements; however, once Native selection rights under ANSCA are finalized and the withdrawal is revoked, the State's selection would automatically attach to the land as a selection and be ready for adjudication.

unmanned aerial vehicle (UAV). An unmanned aerial vehicle that differs from an unmanned aircraft system (see below) only in that it refers to the aircraft itself not the ground control and communications units.

unmanned aircraft system (UAS). An all-encompassing term for everything that makes a drone/UAV operate, such as the ground control station with pilot, communications, and support equipment.

where appropriate. Includes consideration of necessity, legal constraints, safety, funding, and feasibility.

wild and scenic study river. Rivers identified in Section 5 of the Wild and Scenic Rivers Act of 1968 for study as potential additions to the National Wild and Scenic Rivers System. The rivers are studied under the provisions of Section 4 of the act (BLM Manual 6400, Wild and Scenic Rivers—Policy and Program Direction for Identification, Evaluation, Planning, and Management).

wild river. A river or river section that is free of impoundments and is generally inaccessible except by trail, with watersheds or shorelines essentially primitive and unpolluted. Wild rivers represent the vestiges of primitive America.

wilderness characteristics. The area's size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation; they may also include supplemental values. Lands with wilderness characteristics are those that have been inventoried and determined by the BLM to possess wilderness characteristics, as defined in Section 2(c) of the Wilderness Act.

wildland fire. General term describing any nonstructural fire in the wild. It is categorized into two distinct types: wildfires (unplanned ignitions or prescribed fires that are declared wildfires) and prescribed fires (planned ignitions).

wildland urban interface. The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Describes an area on or next to private and public property, where mitigation actions can prevent damage or loss from wildfire.

woody vegetation. All perennial plant species characterized by structural support provided by secondary xylem and stems covered by a layer of bark, regardless of size. Woody vegetation includes timber but also other vegetation that does not meet the size requirements to be classified as timber.

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