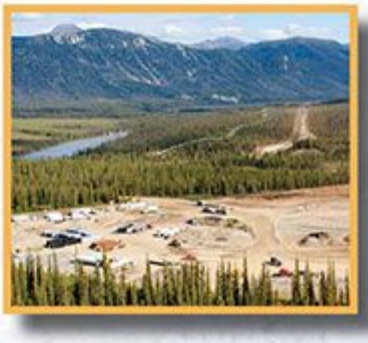

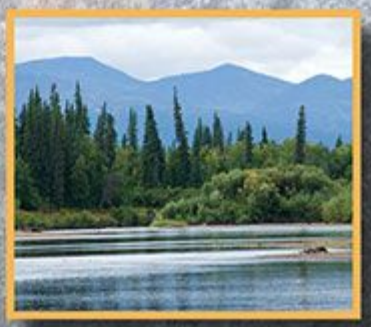

Analysis of Management Situation

Central Yukon

Resource Management Plan

Prepared by the
Bureau of Land Management
Central Yukon Field Office
Fairbanks, Alaska

April 2016

BLM

Alaska

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Chapter 1. Introduction

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1.1. Introduction

1.1.1. Purpose of and Need for the Resource Management Plan

The purpose of the Central Yukon Resource Management Plan (RMP) is to provide a comprehensive framework to guide management of public lands and interests within the Central Yukon planning area. The RMP will incorporate new data, address land use issues and conflicts, and specify where and under what circumstances particular activities will be allowed on BLM-managed public lands. The objectives, land use allocations and management decisions on public lands will be based on multiple use and sustained yield, except where a tract of such public land has been dedicated to specific uses according to any other provisions of law it will be managed in accordance with such law, in accordance with Section 103 of the Federal Land and Policy Management Act of 1976 (FLPMA).

The BLM Fairbanks District Office has determined that the two RMPs and one management framework plan (MFP) it relies on to manage the public land and federal mineral estate in the Central Yukon Planning Area need to be updated. Evaluations of these plans showed they were not responsive to current issues in the planning area. The evaluations also found that current plans lack the entire suite of decisions to be included in land use plans per BLM's Land Use Planning Handbook (H-1601-1, BLM 2005a). Additionally, some lands within the planning area are not covered by any planning document.

The Central Yukon revised RMP will replace all or portions of the following plans:

1. The Utility Corridor RMP/Record of Decision (ROD)
2. The Central Yukon RMP/ROD
3. The Southwest MFP

1.1.2. Purpose of the Analysis of the Management Situation

The purpose of this analysis of the management situation (AMS) is to describe the current conditions and trends of the resources and the uses/activities in the planning area in sufficient detail to create a framework from which to develop alternatives to resolve the planning issues.

1.1.3. Planning Area Description

Although there are multiple BLM jurisdictions within the planning area, the Central Yukon Field Office is the primary administrator. Portions of the Central Yukon Planning Area also fall within the Arctic and Eastern Interior field offices, all within the Fairbanks District. Other federal lands in the planning area include 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 planning area overlaps portions of the Northwest Arctic Borough, the North Slope Borough, the Denali Borough, and the Fairbanks North Star Borough. However, the majority of the planning area does not fall within any borough boundary. The planning area boundary includes 24 remote villages, 15 of which have tribal entities, and 3 Alaska Native Claims Settlement Act (ANCSA) Regional Corporation boundaries (Doyon Limited, Arctic Slope Regional Corporation, and NANA, Inc.).

The planning area (Figure 1.1) encompasses approximately 59 million acres, of which 11 million acres are unencumbered BLM-managed lands, 712,000 acres are selected by ANCSA Native Corporations, and 4.3 million acres are selected by the State of Alaska. The BLM manages a total of 16 million acres within the planning area.

The planning area is divided into four subunits for planning purposes: the Utility Corridor, Fairbanks, Middle Yukon, and Nulato Hills subunits (Figures 1, C.1, C.2, and C.3). During preparation of this document, management of the Nulato Hills Subunit was transferred from the Central Yukon Field Office to the Anchorage Field Office. The Nulato Hills Subunit will be incorporated into the Bering Sea-Western Interior Draft RMP/EIS and will not be addressed by future Central Yukon planning documents.

Table 1.1. Surface Management Responsibilities/Status

Surface Management Responsibility/Status [a]	Surface Acres	Percentage of the Planning Area
BLM Managed Lands		
BLM public lands	11,059,000	19
State-selected	4,300,000	7
ANCSA Native-selected	712,000	1
Total BLM	16,071,000	27
Other Lands		
State of Alaska	26,206,000	45
U.S. Fish and Wildlife Service	7,342,000	12.5
National Park Service	48,000	<1
Military	1,468,000	2.5
ANCSA Native corporations	7,526,000	13
Other Private	38,000	<1
Total Other Lands	42,628,000	73
Total All Lands	58,699,000	

[a]Includes the Nulato Hills Subunit

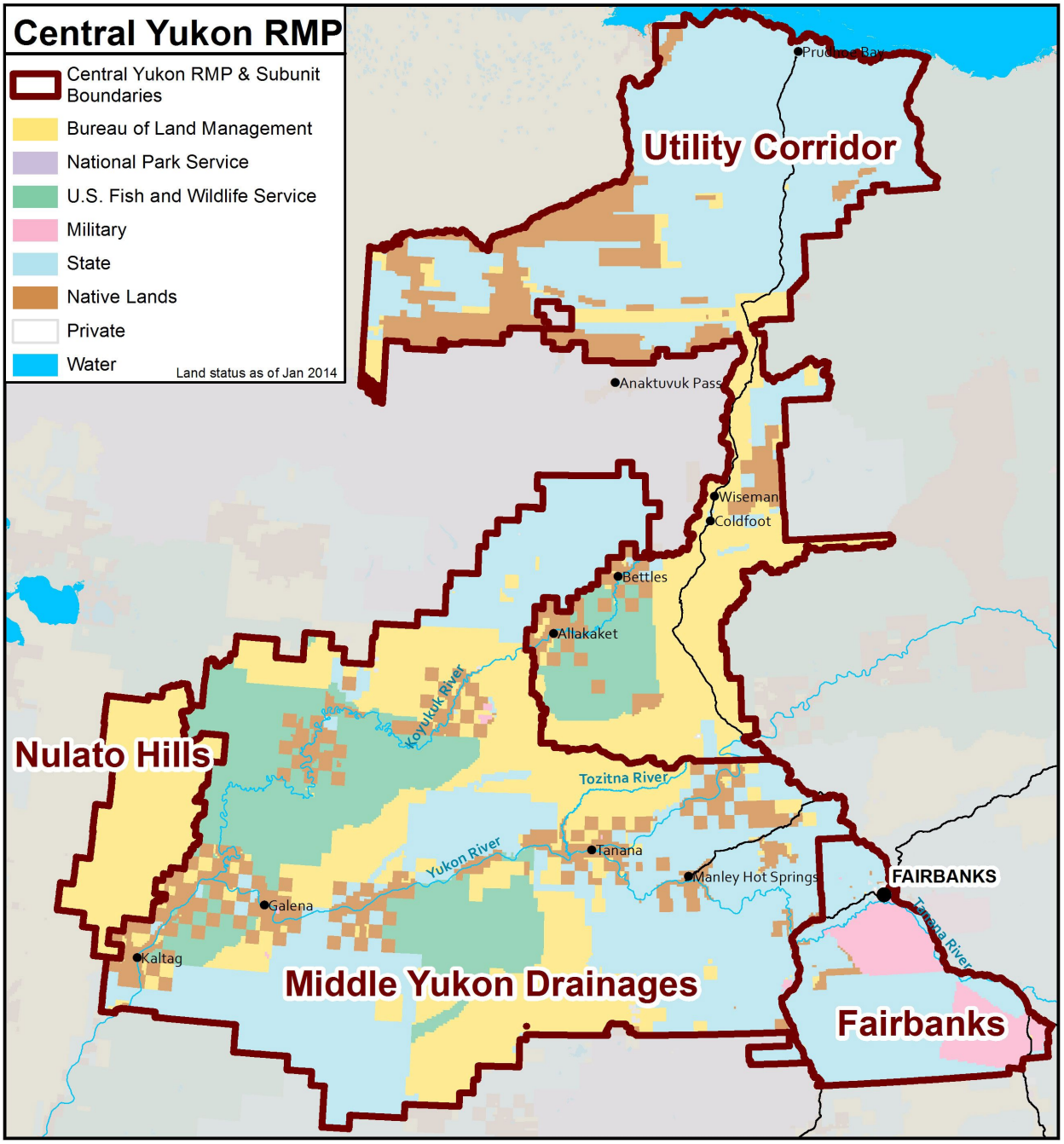


Figure 1.1. Map of Central Yukon Planning Area and Subunits

Chapter 2. Area Profile

This chapter describes the area profile, which is the existing condition of resources, resource uses, and other features in the Central Yukon Planning Area. The information provides the basis for the Affected Environment chapter of the Draft RMP/EIS.

2.1. Resources

2.1.1. Air Quality and Climate

2.1.1.1. Climate

Two climatic zones comprise the Central Yukon Planning Area: the continental subarctic and the northern polar. The continental subarctic encompasses lands in the planning area south of the Brooks Range. This area is considered the Yukon Forest Province by Bailey (1980) and is characterized by a series of broad valleys, dissected uplands, and lowland basins covered by alluvial deposits, which extends across interior Alaska between the Brooks and Alaska Ranges. The semiarid climate of this province has extreme temperatures where summers are short and hot, up to 100 degrees F (38 degrees C), and winters are severe, with temperatures as low as -70 degrees F (-60 degrees C) (Bailey 1980). Average annual precipitation is only 17 inches (425 mm), but varies slightly throughout the planning area due to microclimate conditions such as elevation and topography. The seasonal precipitation pattern is normally at a minimum in spring and at a maximum in late summer. Summer thunderstorms, which can often start wildfires, are common over the hills and upland areas. Climate strongly influences fire severity and frequency, with the greatest extent of burning occurring in the hottest, driest years. Snow cover and freezing temperatures typically persist from October through April. Local rivers normally begin freezing by the first week of October and melting of the river ice generally occurs in May.

The northern polar climate encompasses lands in the planning area north of the Brooks Range. It contains both the Arctic Tundra and Brooks Range Provinces (Bailey 1980). The Arctic Tundra province is characterized by a broad level plain with low elevations that gain altitude southward into the Brooks Range. The Brooks Range Province is characterized by its rugged mountains which reach elevations of 9,000 feet. (2,700 meters) and show evidence of glaciation. This climate is dominated by a lack of sunlight in the winter and long days in the summer. Winters are therefore long and cold with temperatures reaching -60 degrees F (-51 degrees C) and summers are short and cool. Average annual temperature is only 10 degrees F (-12 degrees C). The area has relatively little precipitation averaging 7 inches (180 mm) annually. The Brooks Range receives slightly more precipitation at higher elevations, averaging between 7 and 15 inches (180 to 390 mm). Monthly precipitation is fairly uniform, with slightly less in May and more in July and August. Streams and lakes are frozen for much of the year because of the long winter. Snow cover is common from October through May. Summers, while short and relatively cool near the coast, are longer and warmer inland. The onset of snowmelt and subsequent runoff often begins earlier in the foothills than in the rest of the area and moves north as the summer season progresses. Similarly, freeze-up usually begins first on the coastal plain and proceeds southward.

Climate Change in the Planning Area

Atmospheric concentrations of the greenhouse gases carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) have increased since 1750 due to human activity. In 2011, the concentrations of these greenhouse gases exceeded the pre-industrial levels by about 40, 150, and 20 percent, respectively (IPCC 2013). Concentrations of CO_2, CH_4, and N_2O now substantially exceed the

highest concentrations recorded in ice cores during the past 800,000 years. The mean rates of increase in atmospheric concentrations over the past century are, with very high confidence, unprecedented in the last 22,000 years (IPCC 2013). The relationship between greenhouse gas emissions and climate change is in its formative phase, and it is not yet possible to know with confidence the net impact of human-caused greenhouse gas emissions on climate. However, the Intergovernmental Panel on Climate Change (IPCC 2007) concluded that "Warming of the climate system is unequivocal…" and "Most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic (human-caused) greenhouse gas concentrations."

The global mean surface temperature has increased since the last half of the nineteenth century. Each of the past three decades has been successively warmer at the Earth's surface than any of the previous decades in the instrumental record, and the decade of the 2000s has been the warmest (IPCC 2013). Northern latitudes have experienced significant warming over the last half-century and observations and computer model predictions indicate that increases in temperature are likely to be greater at higher latitudes, such as in the Arctic, where the temperature increase may be more than double the global average. Some impacts of climate change are already visible in Alaska. These impacts include coastal erosion, increased storm effects, retreat of sea ice, and melting of permafrost (Hassol 2004). Other anticipated effects include changes in wildfire patterns and changes in species abundance and diversity.

Climate modeling has been conducted on areas adjacent to the planning area, NPR-A in the Arctic, and the BLM Eastern Interior Field Office in the interior of Alaska. These models give us insight on how climate change may affect resources in the planning area. Climate change is expected to increase the length of the summer season in the NPR-A by between three and six weeks (Scenarios Network for Alaska Planning 2011). Spring thaw dates are expected to shift one week earlier by mid-century and up to two weeks earlier by late century. Fall freeze dates are expected to undergo a more extreme transition. Freeze dates for the entire NPR-A historically occurred by mid-September. By the 2040s, coastal areas may not cross the freezing point until early October and southern regions by late September. By late century, coastal areas may not freeze until late October and southern areas may not freeze until early October. Eastern Interior Alaska is projected to become warmer and drier over the next century. Warmer temperatures and a longer growing season are expected to increase evapotranspiration enough to outweigh a regional increase in precipitation. Seasonal changes in climate will have profound impacts on the condition and health of wildlife habitat, lead to increased fire risk, and contribute to the likelihood of wetlands, streams, and lakes drying (Rupp and Springsteen 2009).

2.1.1.2. Air Quality

2.1.1.2.1. Indicator

Under the Federal Land Policy and Management Act (FLPMA) and the Clean Air Act, the BLM cannot conduct or authorize any activity that does not conform to all applicable Federal, tribal, State, and local air quality laws, statutes, regulations, standards, or implementation plans. To protect human health and welfare, air quality is regulated at the Federal level under the Clean Air Act of 1970. The Clean Air Act was amended in 1990, and requires the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that pose a risk to public health. Primary standards represent air quality levels, with an adequate safety margin, that are required to protect public health including the health of

"sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA has established standards for seven criteria pollutants: carbon monoxide (CO), ozone (O_3), particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and airborne lead (40 CFR 50). These standards and criteria are summarized in Table 2.1 below.

Table 2.1. National Ambient Air Quality Standards

Pollutant [Final Rule Citation]	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug. 31, 2011]	primary	8–hour	9 ppm	Not to be exceeded more than once per year
		1–hour	35 ppm	
Lead [73 FR 66964, Nov. 12, 2008]	primary and secondary	Rolling 3 month average	0.15 µg/m3[1]	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]	primary	1–hour	100 ppb	98th percentile, averaged over 3 years
	secondary	Annual	53 ppb [2]	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]	primary and secondary	8–hour	0.075 ppm [3]	Annual fourth-highest daily maximum 8–hour concentration, averaged over 3 years
Particle Pollution PM 2.5 [Dec. 14, 2012]	primary	Annual	12 µg/m3	Annual mean, averaged over 3 years
	secondary	Annual	15 µg/m3	Annual mean, averaged over 3 years
	primary and secondary	24–hour	35 µg/m3	98th percentile, averaged over 3 years
Particle Pollution PM 10 [Dec. 14, 2012]	primary and secondary	24–hour	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, June 22, 2010] [38 FR 25678, Sept. 14, 1973]	primary	1–hour	75 ppb [4]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	secondary	3–hour	0.5 ppm	Not to be exceeded more than once per year

[1] Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[2] The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

[3] Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under

that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

[4] Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

"Particulate matter," also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. The concern is about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects.

Smoke from wildfire is the primary air quality concern for the majority of the planning area, with particulate matter being the primary pollutant of concern in smoke. Particulate levels within the planning area due to smoke are generally well below the national standards except in extreme fire seasons. Complaints about "nuisance smoke," however, frequently occur. Prescribed and wildland fires are also a source of carbon monoxide, nitrogen dioxide, and sulfur dioxides, also regulated under the NAAQS; however, the amount of nitrogen dioxide and sulfur dioxides produced by wildland fuels is negligible.

Visibility and Regional Haze

Visibility is important to visitors who come to enjoy the scenic beauty of public lands in the planning area. Section 162 of the Clean Air Act established the goal of Prevention of Significant Deterioration of air quality in all international parks; national parks which exceeded 6,000 acres; and national wilderness areas and memorial parks which exceeded 5,000 acres if these areas were in existence on August 7, 1977. These areas were defined as mandatory Class I areas, while all other attainment or unclassifiable areas were defined as Class II areas. Prevention of Significant Deterioration Class I areas are areas where any appreciable deterioration of air quality would be considered significant. Class II areas are those where moderate, well-controlled growth, as well as some deterioration of air quality could be allowed. Under criteria established through the Clean Air Act, the planning area is designated as a Class II area.

No Class I areas are in the planning area, yet Denali National Park, which borders the southern portion of the planning area is a Class I area. Air quality is monitored in Denali National Park. The National Park Service (NPS) air quality monitoring network maintains a website (http://www2.nature.nps.gov/air/) that provides an overview of sample design and methods, as well as public access to validated data. NPS air quality data can be used as an indicator of regional air quality and may be broadly representative of air quality in the planning area.

2.1.1.2.2. Current Condition

The majority of the planning area is undeveloped with excellent air quality. Residential emissions occur in several small towns and villages within the planning area. Wildland fire is the largest

natural factor influencing air quality. During the summer months, visibility and air quality in the interior of Alaska are affected by smoke and particulate matter from wildland fire. Particulate matter and smoke created by these fires enter the atmosphere and reduce visibility and in extreme cases air quality. Particulate matter and smoke can travel great distances and can contribute to regional haze for days or weeks. Inter-annual variability in visibility and regional haze associated with wildland fires is driven by climatic conditions.

Anthropogenic air pollution emission sources in urban areas are concentrated along the southeast border of the planning area, including Delta Junction, North Pole, and Fairbanks. Within the planning area, vehicle emissions occur along the Parks, Dalton, Elliot, and Richardson Highways. Ice fog forms from water vapor at temperatures less than 30 degrees F. When this vapor interacts with particulate matter from wood burning and vehicle emissions it can cause dense fog creating visibilities of less than one-quarter mile. Analysis shows that local emissions from wood stoves, burning distillate oil, industrial sources, and mobile emissions contribute to particulate pollution. For planning purposes, PM2.5 is primarily a concern during the winter months (October through March) when extremely strong temperature inversions are frequent and human-caused air pollution impacts increase. A portion of the Fairbanks North Star Borough, including the City of Fairbanks and the City of North Pole, was designated as a PM2.5 non-attainment area in December 2009. These areas exceeded the health-based 24 hour exposure limit of 35 micrograms/cubic meter for fine particulate matter. Medical studies have shown a relationship between increases in particulate matter concentrations and rises in the number of clinic and hospital visits for upper respiratory infections, cardiac diseases, bronchitis, asthma, pneumonia, and emphysema. Somewhat surprisingly, the rural communities of Alaska are estimated to contribute over 95 percent of the statewide hydrocarbon emissions and 80 percent of the statewide particulate matter emissions even though they contain about 40 percent of the state's population (Delaney and Dulla 2007).

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). The wind becomes the long-range transport mechanism of anthropogenic pollution from sources on the Eurasian continent during the winter and early spring. These emissions are primarily sulfate aerosols and result in a phenomenon referred to as "Arctic haze."

Fairbanks has the sole air quality monitoring station in the planning area. However, an additional air quality monitoring station is located in adjoining Denali National Park. Based on regional monitoring in Fairbanks, Denali National Park, and reports from agency personnel, existing air quality in the planning area is generally excellent. In a survey of 346 monitoring stations located in United States parks from 2005 to 2009 only Denali National Park and Preserve fell into the "Indicator is in good condition" category for visibility (NPS Air Resources Division (ARD) 2013). It was also one of only two parks to show a significant improvement in ammonium concentrations. According to the U.S. Fish and Wildlife Service (2008), concentrations of regulated air pollutants in the Yukon Flats National Wildlife Refuge, adjacent to the planning area are considerably lower than the maximum concentrations allowed under the NAAQS and the Alaska Ambient Air Quality Standards.

2.1.1.2.3. Trends

Assessing trends in air quality is difficult due to the lack of air quality monitoring stations within the planning area. However, due to the lack of large communities or development throughout the majority of the planning area, air quality is expected to remain excellent.

Trends in Fairbanks

Fairbanks was designated non-attainment for carbon monoxide (CO) on November 15, 1990. The community developed a rigorous inspection and maintenance program to reduce tail pipe emissions from automobiles and the EPA required automobile manufacturers to reduce environmental pollution, both of which have helped improve air quality in the Fairbanks North Star Borough. Not having had any CO exceedances for several years, Fairbanks requested re-designation and was placed in CO maintenance status on July 23, 2004 (ADEC 2013). In December 2009, a portion of the Fairbanks North Star Borough, including the City of Fairbanks and the City of North Pole, was designated as a PM2.5 non-attainment area. These areas exceeded the health-based 24 hour exposure limit of 35 micrograms/cubic meter for fine particulate matter. The Fairbanks North Star Borough Air Program now operates and manages six monitoring stations: one State and Local Air Monitoring Site (SLAMS) for CO, one SLAMS site for PM2.5, one Speciation Trend Network (STN) site, and three Special Purpose Monitoring (SPM) sites for PM2.5. The Fairbanks and North Pole monitoring sites are located within the Northern Alaska Air Quality Control Region and the Fairbanks non-attainment area.

Trends in Denali National Park

The NPS Air Resources Division monitors air quality in Denali National Park. It examines key air quality measures of: visibility, ozone, and sulfur, nitrogen, and mercury deposition. Air quality trends are one way of demonstrating progress in reduced air pollution. To identify trends, NPS collected visibility, ozone, and deposition data from 2000 to 2009 (NPS ARD 2013). In that time period, Denali National Park showed statistically significant improvements in the air quality trend of concentrations of ammonium and nitrate and non-significant improvements in nitrogen concentrations. It was also the only location sampled to have a "Indicator is in Good Condition" in the visibility category.

2.1.1.2.4. Forecast

Air resources throughout the majority of the planning area are anticipated to remain in excellent condition. Under current management, permitted activities on BLM lands will conform to Federal and State laws, regulations and policies in relation to air quality.

The State of Alaska's Department of Labor and Workforce Development projects the population in the planning area will increase approximately 75 percent by 2035 (Huntsinger et al. 2012). Most of this increase will be in the Fairbanks North Star Borough with small population decreases within the Yukon and Koyukon areas. This will undoubtedly lead to an increase in vehicle emissions both in Fairbanks and along the highway corridors, wood and heating oil burning, and an increase in industrial facilities. With these increased pressures on air resources, the Fairbanks North Star Borough will continue to undergo air quality monitoring for CO and PM2.5 to ensure the borough maintains national and Alaska Ambient Air Quality Standards.

2.1.1.2.5. Key Features

The excellent quality of air resources throughout the majority of the planning area, with the exception of the Fairbanks North Star Borough, is in attainment with NAAQS and State of Alaska Air Quality Standards.

2.1.2. Soil Resources

Soils are the unconsolidated mineral or organic material on the immediate surface of the Earth that serves as a natural medium for the growth of land plants. They function to sustain biological diversity, regulate water flow, store and cycle nutrients, and filter organic and inorganic materials. Soil scientists recognize five major factors that influence soil formation: (1) parent material, (2) climate, (3) living organisms (especially native vegetation), (4) topography and (5) time. The combined influence of these soil-forming factors determines the properties of a soil and their degree of expression. Over long time periods, these processes, materials, and organisms create different soil types. These factors vary widely over the planning area from the mountainous areas of the Brooks Range to the lowland river valleys of the Yukon River.

Within the planning area, detailed soil surveys have only been performed in and around the Fairbanks area (USDA 2004). The U.S. Department of Agriculture (USDA) completed and published a broad-scale inventory of soils within Alaska in the Exploratory Survey of Alaska (1979). Within the planning area it identified six major land resource areas: the Interior Alaska Highlands; Interior Alaska Lowlands; Kuskokwim Highlands; Brooks Range; Arctic Foothills; and the Arctic Coastal Plain. The Interior Alaska Lowlands occupy broad valleys and lowlands bordering major rivers and their tributaries. Most of its soils formed in silty alluvium and loess derived from the flood plains of large rivers. The dominant soils are shallow over ice-rich permafrost but in a few well-drained soils on terraces the permafrost is deep or absent. The vegetation primarily consists of white spruce, cottonwood, and paper birch. The Kuskokwim Highlands and the Interior Alaska Highlands are associations occupying broad sloping uplands. The dominant soils formed in thick silty colluvial sediment over partially weathered bedrock and have a shallow permafrost table. The vegetation is mainly sedge tussocks, mosses, shrubs, and black spruce. The associations of the Brooks Range and Arctic Foothills occupy broad valleys, basins, foot slopes, and low rolling piedmont hills. Most areas are patterned with polygons, strips, and circular frost scars. Most of the soils consist of silty colluvial and residual material weathered from fine-grained, non-acid sedimentary rocks. The vegetation is tundra dominated by sedges mosses, lichens, and low shrubs. The Arctic Coastal Plain is dominated by nearly level tundra dotted with shallow thaw lakes. Most of the soils consist of sandy eolian, alluvial, and marine deposits, but a few are formed of loamy material. Poorly drained soils are accompanied with a shallow permafrost layer. The vegetation is mainly grasses, lichens low shrubs and forbs.

In all of these resource areas, the soils have common characteristics. They all developed under a cold temperature regime in which biological and chemical transformations are slow, and in which soil horizons or layers are subject to physical dislocations as a result of the freeze-thaw processes. Permafrost, where present, acts to retard internal drainage, which, combined with low soil temperatures has resulted in soils with wet, shallow, poorly differentiated profiles and significant organic components that are only minimally decomposed. In uplands, permafrost underlies most of the north-facing slopes and most lower elevation areas of south-facing slopes. In the lowlands, permafrost underlies much of the planning area except where major rivers, alluvial fans, or active floodplains exist. Due to these factors, these soils are highly susceptible to erosion or other soil movement caused by disturbance of the ground-covering vegetation and subsequent thawing of the permafrost. When authorizing activities, such as road construction or off-highway vehicle (OHV) use, in these areas site-specific mitigation measures must be implemented to minimize degradation of soil resources.

2.1.2.1. Indicator

Land heath and soil quality are interdependent. Management practices may affect the ability of soils to maintain their biological diversity, regulate water flow, store and cycle nutrients, and filter organic and inorganic materials. It is the BLM's responsibility to ensure that watersheds are in, or are making significant progress toward, a properly functioning physical condition that includes their upland, riparian, wetland, and aquatic areas. To ensure this for soil resources within watersheds, two objectives with success indicators are identified in the Bureau of Land Management – Alaska Statewide Land Health Standards (BLM 2004).

Objective 1: Protect the soil surface from erosion; avoid detention of overland flow; maintain infiltration and permeability that are consistent with the potential/capability of the site. Possible success indicators include:

- amount and distribution of plant cover (including forest canopy cover)
- amount and distribution of permafrost
- soil temperature/depth profile
- soil moisture
- amount and distribution of plant litter
- accumulation/incorporation of organic matter
- amount and distribution of bare ground
- amount and distribution of rock, stone, and gravel
- plant composition and community structure
- thickness and continuity of the first layer of soil containing organic matter
- character of micro-relief
- presence and integrity of biotic crusts
- root occupancy of the soil profile
- biological activity (plant, animal, and insect)
- absence of accelerated erosion and overland flow

Objective 2: Promote moisture storage by soil and plant conditions consistent with the potential/capability of the site. Possible success indicators include:

- amount and distribution of plant cover (including forest canopy cover)
- amount and distribution of plant litter
- accumulation/incorporation of organic matter
- plant composition and community structure
- snow depth/moisture content

In 2014, BLM Alaska developed a watershed condition classification system for lands within the planning area. Watershed condition is the state of the physical and biological characteristics and processes within a watershed that affect the hydrologic and soil functions supporting aquatic ecosystems (Potyondy and Geier 2011). When watersheds are functioning properly, they have terrestrial, riparian, and aquatic ecosystems that capture, store, and release water and sediment within their natural range of variability. In general, the greater the departure from the natural state, the more impaired the watershed function condition is likely to be (Potyondy and Geier 2011). This system offers a systematic, flexible means of classifying watersheds based on a core set of national watershed condition indicators. Indicators relating to soil resources are:

- road and trail density and maintenance
- soil contamination

- soil erosion
- channel shape and function
- vegetative condition
- fire regime condition class
- soil productivity
- terrestrial invasive species

2.1.2.2. Current Condition

Within the Central Yukon Planning Area, soil resources are largely in natural condition with little human-caused disturbance. The planning area is sparsely populated with few commercial facilities and roads to cause negative anthropogenic effects on soil resources. Summer wildfires can cause damage to soils and result in debris flows and landslides in steep areas in years after the fires until adequate vegetation is established. Mass wasting and frozen debris lodes occur on permafrost-stabilized slopes within the Brooks Range and its foothills. When permafrost soils warm on hillslopes, there is a loss in soil volume, structure, and strength. This results in greater susceptibility to erosion and mass wasting during thawing. These are of particular concern along the Utility Corridor, where they pose a potential direct hazard in the coming years and decades to the Dalton Highway and the Trans Alaska Pipeline (Daanen et al. 2012).

Surface mining, in the form of placer mining and gravel pits, is currently ongoing within the planning area and is concentrated in watersheds along the Dalton Highway and in the Hogatza River watershed. Surface mining has localized yet severe impacts on soil resources which can last for decades, if not longer. Surface mining involves drastic alteration of vegetation, soils, and subsurface materials. It can result in the complete loss of organic top soils and vegetation, which impairs water infiltration into the soils. This creates a subsequent alteration in surface and subsurface hydrology.

Invasive plants are present in the planning area and are concentrated along the road corridors. They can affect soils in many ways including changing soil pH, nutrient cycling, soil microbes, and increasing susceptibility to soil erosion. OHV use adversely affects soil resources. It damages vegetation and soil by abrading, compressing and shearing; and in ice-rich soils, by subsidence. Currently, Alaska Statute Sec. 19.40.210 prohibits the use of off-road vehicles on land within 5 miles of the right-of-way of the Dalton Highway north of the Yukon River, except for persons who hold a mining claim in the vicinity of the highway and who must use land within 5 miles of the right-of-way to gain access to the mining claim.

2.1.2.3. Trends

The majority of soils in the planning area remain in pristine condition; however, natural and human-caused factors continue to affect soil resources. Due to warming of soils and thawing of permafrost in the planning area in the past decades, mass wasting and frozen debris lodes have become more active (Daanen et al. 2012). This has resulted in more areas experiencing catastrophic downwasting.

Surface mining continues in the planning area with an increase in permitted operators in the past 5 years. This has resulted in more soils being negatively impacted by affecting infiltration and permeability rates, moisture storage, and stability of upland soils.

Invasive plants continue to spread in the planning area through transport by vehicles, OHV, and aircraft. This is changing vegetation from native to non-native species and changing soil functions. Limited treatments to remove invasive plant species, such as white sweetclover, are occurring along the Dalton Highway corridor. However, it is difficult to completely remove invasive plants or return native vegetative communities, and consequently, return native soil functions. The use of modern OHVs for hunting, transportation, and recreational activities has substantially increased since the 1980s. This use of OHVs on unhardened trails has caused severe damage to plants and increased soil erosion.

2.1.2.4. Forecast

Large-scale changes to soils management are not anticipated in the near future. Maintaining current soil resources will likely continue to be a priority. General resource protection measures should continue to prevent undue soil erosion and sedimentation of area streams and rivers, whenever possible.

Surface mining is expected to continue in the planning area and increase if gold prices increase. These activities will continue to negatively affect soil resources, especially in wetland and riparian areas.

Invasive plants are expected to continue to spread throughout the planning area, negatively affecting soils. It is anticipated that there will be in an increase in removal treatments to address the increased impact. This will result in localized improvements to soils and native vegetative communities. While localized improvement to soils and native vegetative communities will occur, without large-scale removal of invasive plant species, they will continue to spread across the planning area, negatively affecting soil resources. OHV use will continue and will probably increase in popularity. Increases in mining activity, or if Alaska Statute sec. 19.40.210 is overturned, will greatly increase OHV use within the Dalton Highway corridor. This will increase the area of soil erosion, compaction, and other soil functions. This damage could be limited by restricting OHV travel to specific trails and hardening the trail surfaces with geotextiles or other methods.

Forecasted warmer temperatures in the planning area will increase the depth to which permafrost thaws, known as the active layer. Climate model results, from the adjacent National Petroleum Reserve in Alaska (NPR-A), indicate the depth of the active layer across all areas of the NPR-A will increase by an average of 30–40 percent by late century (SNAP 2011). The active layer depth is an important factor that determines ecosystem structure and function. Only shallow-rooted plants can live in areas with a shallow active layer, while deeper-thawed soils permit better water drainage and the growth of woody plants. With a forecasted loss of permafrost in the planning area due to warming of soils, thermokarsting, slumping, and other significant changes in land morphology can be anticipated.

2.1.2.4.1. Key Features

Planning area soils are thin and fragile. Once damaged, recovery to an original state may require the span of several human lifetimes. Disturbance to ice and moisture-rich soils frequently results in extensive erosion, further retarding recovery. Thus, new trails and access routes should be located on non-permafrost soils.

Of particular importance are soils near streams and wetlands. Undisturbed soils are important for the stability of these features. These areas are heavily used by fish, wildlife, and humans alike.

2.1.3. Water Resources

Alaska's pristine waters distinguish Alaska as unique among the states. Within the planning area, there are 121,283 miles of stream with 31,432 miles on BLM-managed land. There are an additional 950,968 acres of lakes and ponds with 76,332 acres on BLM-managed lands. The planning area can be divided into two general areas: those rivers that flow from the Brooks Range north into the Beaufort Sea (Arctic Ocean) and the Yukon River watershed and its tributaries which ultimately flow into the Bering Sea (Pacific Ocean). The main-stem Yukon River and its smaller tributaries and its two major tributaries, the Koyukuk and Tanana Rivers, comprise the Yukon River watershed. Major tributaries to each of these major watersheds are listed in Table 2.2. Tributaries originating in the upper Koyukuk watershed, Alaska Range, and the northside of the Brooks Range are often from glacial sources and carry heavy levels of sediment in the summer. Except for these elevated sediment levels in summer due to glacial melting, water quality is generally good to excellent. Streams typically have low dissolved solids, dissolved oxygen near saturation, and neutral to moderately basic pH. Water temperatures during summer are typically less than 14 degrees C. Surface water quantity and quality vary with the season. Generally, maximum discharge occurs during spring breakup, which usually happens during the latter part of May south of the Brooks Range and during the middle of June north of the Brooks Range. The presence of permafrost decreases infiltration, increasing runoff peaks but reducing base flow rates. During winter, small streams are often frozen to the bed by midwinter. Flows in larger rivers are usually at a minimum in March and maximum in June, July, or August. Winter flows are generally about 20 percent of peak summer flows. Ice on lakes and larger streams is normally about 4 feet thick by March. Seasonal snowpack is the most important annual water storage component in the hydrologic cycle. River icings (aufeis) also store considerable quantities of water.

While the majority of water resources in the planning area are in a natural condition, human activities and natural events do negatively affect water quality. Maintaining good water quality can only be achieved when all sources of pollution in a watershed are taken into consideration. Potential sources of water pollution can be categorized into point and non-point pollution. Non-point source water pollution is water pollution that does not come from the end of pipe discharge. It is the leading cause of water pollution in the state (ADEC 2008). Non-point source water pollution can come from variety or origins both natural and anthropogenic. Of greatest concern in the planning area are areas where vegetation adjacent to waterbodies has been removed or degraded. Due to climatic conditions within the planning area surface water and soils are frozen in winter, thus, limiting pollution inputs into streams. In open water periods, spring snowmelt and summer rains allow pollutants to enter streams, thus, decreasing water quality. In the interior of Alaska, areas in which wildfire has recently occurred contribute minor to moderate excess sediment to local streams during the summer. OHV use disturbs soils and removes vegetation adjacent to streams, which allows sediment to enter streams. Historic and ongoing placer gold mining operations have often exposed soil adjacent to streams, which cause chronic sediment inputs into streams during snowmelt and rainfall events. Without retaining vegetation around streams, mitigation of non-point source pollution is difficult. By focusing on land health standards (i.e., upland soils, vegetation, riparian conditions, and water quality), the BLM can ensure its permitted land use activities are not degrading water quality.

Table 2.2. Major Watersheds Within the Central Yukon Planning Area

Watershed	Drainage Basin	Watershed Size within the Planning Area (acres)	% of Watershed within the Planning Area Managed by BLM
Tozitna River	Mainstem Yukon River	1,041,608	86.7
Nowitna River	Mainstem Yukon River	4,584,055	36.7
Melozitna River	Mainstem Yukon River	1,739,439	43.1
Tanana, River	Tanana River	10,539,808	7.5
South Fork Koyukuk River	Koyukuk River	1,476,895	71.8
Upper Koyukuk River	Koyukuk River	1,787,222	30.0
South Fork Koyukuk River	Koyukuk River	1,476,895	71.8
Kanuti River	Koyukuk River	2,145,960	51.0
Allakaket River	Koyukuk River	1,102,213	20.8
Huslia River	Koyukuk River	1,513,420	24.1
Dulbi River	Koyukuk River	936,184	51.3
Kateel River	Koyukuk River	2,011,437	59.1
Indian River	Koyukuk River	268,255	62.8
Hogatza River	Koyukuk River	997,872	67.0
Gisasa River	Koyukuk River	319,314	87.0
Kaparuk River	Beaufort Sea	2,759,438	3.9
Sagavanirktok River	Beaufort Sea	3,398,964.75	8.1
Colville River	Beaufort Sea	2,191,238	10.6

2.1.3.1. Indicator

The water quality standards for the State of Alaska are the standards the Alaska Department of Environmental Conservation (ADEC) uses to protect, maintain, or improve surface water resources in Alaska. These standards support other federal laws. The Clean Water Act of 1972, as amended, establishes the framework for regulating discharges of pollutants into waters of the United States and regulating quality standards for surface waters. The objective is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Under the Clean Water Act, the EPA has implemented pollution control standards for industry and contaminants in surface waters. The Safe Drinking Water Act is the principal federal law that protects the quality of drinking water in the United States. Under the Safe Drinking Water Act, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The law requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water. The Water Resorce Planning Act of 1962 established a Water Resources Council to be composed of Cabinet representatives, including the Secretary of the Interior. The Council was empowered to maintain a continuing assessment of the adequacy of water supplies in each region of the United States. In addition, the Council was mandated to establish principles and standards for federal participants in preparing river basin plans and in evaluating federal water projects. Upon receipt of a river basin plan, the Council was required to review the plan with respect to agricultural, urban, energy, industrial, recreational and fish and wildlife needs.

The ADEC water quality standards are used to ensure the protection of the beneficial uses of water including cold water fisheries, recreation, and agriculture. Alaska BLM adopted these water quality standards to protect public health and welfare and enhance the quality of the water on public lands within the State of Alaska. ADEC Water Quality Standards (18 AAC 70), amended as of April 8, 2012, for (1) Drinking Water, (2) Water Recreation-contact recreation, and (3)

Water Recreation-secondary recreation are summarized in Appendix B "ADEC Water Quality Standards for Designated Uses."

To ensure that surface water and groundwater quality complies with State water quality standards, BLM developed Alaska Land Health Standards in 2004 (BLM 2004). BLM Alaska Land Health Standards lists possible water quality success indicators as:

- water temperature
- dissolved oxygen
- fecal coliform
- turbidity
- pH
- populations of aquatic organisms
- effects on beneficial uses[1]
- specific conductivity
- water chemistry, including nutrients and metals
- total sediment yield including bed load
- levels of chemicals in bioassays
- change in trophic status

In 2014, BLM Alaska developed a watershed condition classification system for lands within the planning area. Watershed condition is the state of the physical and biological characteristics and processes within a watershed that affect the hydrologic and soil functions supporting aquatic ecosystems (Potyondy and Geier 2011). When watersheds are functioning properly, they have terrestrial, riparian, and aquatic ecosystems that capture, store, and release water and sediment within their natural range of variability. In general, the greater the departure from the natural state, the more impaired the watershed function condition is likely to be (Potyondy and Geier 2011). This system offers a systematic, flexible means of classifying watersheds based on a core set of national watershed condition indicators. Indicators relating to water resources are:

- impaired waters (303d)
- water quantity
- flow characteristics
- channel shape and function
- vegetative condition
- soil productivity, erosion, and contamination

2.1.3.2. Current Condition

Water quality data are not available for the majority of waterbodies in the planning area. This makes defining the current condition difficult. However, the majority of streams and lakes within the project area are undisturbed and have no anthropogenic impacts on water quantity, water quality, riparian function, and stream stability, so it is assumed these waterbodies are in a good condition. No streams on BLM-managed lands within the planning area are on the 303(d) list of impaired waters. A small number of streams in which surface-disturbing activities are or have been occurring experience elevated turbidity during spring snowmelt and rainfall events. Most watersheds in the planning area have mixed ownership with BLM managing only a portion of the watershed (Table 2.2). In mixed ownership watersheds, BLM has limited influence on the quality

[1] such as effects of management activities on beneficial uses as defined under the CWA and state regulations

of the water yielded by the watershed. This is particularly difficult in areas where surface mining activities occur upstream of BLM-managed lands.

Riparian vegetation plays a critical role in maintaining water quality. Riparian vegetation protects water quality by capturing, storing, and treating water through their soils before it gets to streams. Due to the lack of surface disturbance in the majority of the watershed, riparian vegetation is assumed to be intact and in proper functioning condition. Exceptions are areas which have had historic or ongoing surface mining, OHV trails, or recent high-intensity wildland fires.

Water quantity can only be discussed in general terms. Throughout the planning area, water quantity is adequate, and precipitation and snowpack are dependent on climate, which controls the timing and volume of peak flows. BLM has applied for federal instream flow reservations to preserve the flows necessary to protect fish and wildlife habitat, fish migration and propagation; and to maintain and improve recreational and subsistence opportunities. To date, within the planning area, BLM Alaska has applied for reservations on the Tozitna River, Jim River, Kanuti River, and Clear Creek (Hogatza River) and is in the process of completing applications for the South Fork Koyukuk River and Caribou Creek (Hogatza River). Water quantity in Arctic lakes has been affected by changing temperatures in Alaska in recent years where warmer temperatures lead to thinning and eventual breaching of permafrost beneath lakes, facilitating their draining (Smith et al. 2005).

2.1.3.3. Trends

Water quality, quantity, riparian function, and stream stability data are not available for the majority of waterbodies in the planning area. This makes interpreting trends difficult, if not impossible. However, the majority of streams and lakes within the project area are undisturbed and have no anthropogenic impacts on water quantity, water quality, riparian function, and stream stability, so it is assumed these waterbodies are trending in a positive direction. Certain anthropogenic activities are known to degrade water quality, riparian function, and stream stability from which we can infer water quality trends. Historic and ongoing mining in the planning area, especially along the Utility Corridor, has led to localized degradation and of water quality and riparian conditions. These mining operations have unstable stream channels and often lack adequate erosion control measures. The disturbance of stream banks and streambeds, associated with surface disturbance, lead to increased erosion, turbidity, and suspended solids. In recent years, water quality meters have been installed above and below mining operations on Gold and Marion Creeks during open water periods when mining operations are active to determine if water quality standards are being met. These meters indicate that these streams (Gold Creek 2012 and Marion Creek 2013) have exceeded State of Alaska Water Quality Standards for turbidity especially during high flow events. Increases in OHV use have caused localized degradation to water quality and riparian functions due to erosion and excessive sedimentation especially in and around stream crossings.

2.1.3.4. Forecast

The majority of BLM-managed waters within the Central Yukon Planning Area are forecasted to remain in proper functioning condition and meet State of Alaska Water Quality Standards. Mining operations will continue to degrade water quality due to loss of vegetation and sedimentation on a localized scale in some watersheds. New reclamation standards for placer-mined streams located on BLM Alaska lands are expected to better connect streams to their floodplain, thus,

reducing the amount of sediment eroding from the stream channel and improving water quality. Increased population growth within the planning area is forecasted and will result in increased OHV and recreational use in the planning area. This will increase impacts on water quality through increased erosion and sedimentation in areas open to OHV use in road-accessible areas.

2.1.3.4.1. Key Features

Key features for water resources are waterbodies important for human use and fish habitat. This includes all waterbodies within the planning area. Of particular importance are those streams used for human water consumption such as the Nulato River. Also important are those streams in which excellent water quality is required for the spawning, rearing, and feeding of diadromous and other important fish species. Most of these streams were previously designated as Areas of Critical Environmental Concern (ACECs) because of their high quality fish habitat. These waterbodies include the: Jim River, Galbraith Lake, Tozitna River, Inglutalik River, North River, Shaktoolik River, Kateel River, Gisasa River, Ungalik River, Unalakleet River, Sulukna River, Indian River, Hogatza River tributaries (Clear Creek, Caribou Creek, Klikhtentotzna Creek), Wheeler Creek, Teedriinjik (Chandalar) River, Sethkokna River, South Fork Koyukuk, Sagavanirktok River tributaries (Accomplishment Creek and Section Creek), and the Titna River. Also important are the hot springs in the planning area which include the Kanuti River Hot Springs, Melozitna River Hot Springs, and the Ishalitna Creek Hot Springs.

2.1.4. Vegetative Communities

Ecoregion units are used to describe the major ecosystems within the planning area. Thirty-two major ecosystems have been described for the State of Alaska as “ecoregions” by Nowacki et al. (2001). Ecoregion unit designations and descriptions were based on a combination of available datasets and the field experience of ecologists, biologists, geologists, and regional experts. Datasets incorporated into descriptions include climate parameters, vegetation, surficial geology and topography. Additional datasets incorporated in the mapping process are lithology, soils, permafrost, hydrography, fire regime and glaciation. The Central Yukon Resource Management Planning Area overlaps 14 of the 32 described ecoregions in Alaska. The Ray Mountains Ecoregion is represented to the greatest extent (approximately 34 percent of the BLM-managed lands). However, the Nulato Hills and Kuskokwim Mountains ecoregions each comprise approximately 17 percent of the area and Kobuk Ridges and Valleys Ecoregion comprises 14 percent. Eleven other ecoregions are represented within the planning area, but each comprises less than 10 percent of the planning area. The ecoregion descriptions for each of the 14 ecoregions represented in the planning area are listed below (from most to least represented on BLM-managed lands within the planning area).

The Ray Mountains (5 percent of planning area, 34 percent of BLM-managed lands in planning area) are an overlapping series of compact, east-west trending ranges underlain by the Ruby terrane. The metamorphic bedrock is usually covered with rubble, and soils are subsequently shallow and rocky. The Kobuk-Malamute fault essentially separates the Ray Mountains from the Brooks Range to the north. The area was largely unglaciated during Pleistocene ice ages, except for alpine glaciers that capped the highest peaks. Permafrost is generally discontinuous and ranges from thin to moderate thickness. The climate is strongly continental with dry, cold winters and somewhat moist, warm summers. The vegetation is dominated by black spruce woodlands, while white spruce, birch, and aspen usually are restricted to warm, south-facing slopes. Floodplains are dominated by white spruce, balsam poplar, alders, and willows. Shrub

birch and Dryas-lichen tundra prevail at higher elevations. Wildland fires occasionally occur in the summer. The clear headwater streams are important habitat for arctic grayling and of minor importance to king, chum, and coho salmon. Moose, brown bears, wolves, red fox, lynx, and marten are common land dwellers.

The Nulato Hills (6 percent of planning area, 17 percent of BLM-managed lands in planning area) are low rolling hills that are the remains of an ancient mountain range after extended periods of downcutting, weathering, and erosion. East of Norton Sound, these hills ripple inland in a southwest-northeast orientation with streams flowing in intervening valleys. Due to their modest elevation, most of these hills have been spared from recent glaciations and were part of the ice-free Beringia corridor linking North America and Asia. The climate is best classified as moist polar. The Bering Sea affords some climatic moderation; however, at this latitude, ice spans the sea early every winter, allowing direct passage of bitterly cold Siberian air. Permafrost is continuous but ranges from thin to moderately thick. Ecological affinities to Asia exist to this day with the presence of Eurasian birds (gray-headed chickadee, yellow and white wagtails, bluethroat), fishes (Alaska blackfish), and flora. Vegetation patterns generally follow the terrain, with Dryas-lichen and sedge-ericaceous shrub tundra on hilltops, grading into short, then tall, willow-birch-alder shrublands and eventually spruce and birch woodlands at progressively lower elevations. Moose, brown bears, caribou, arctic foxes, and Alaska hares are common. Ribbon seals and walruses comb the coastline, and huge summer runs of pink salmon ascend the Unalakleet drainage.

The Kuskokwim Mountains (8 percent of planning area, 17 percent of BLM-managed lands in planning area) is a subdued terrain composed of old, low rolling mountains that have eroded largely without the aid of recent past glaciations. A continental climate prevails with seasonal moisture provided by the Bering Sea during the summer. Mountains are composed of eroded bedrock and rubble, whereas intervening valleys and lowlands are composed of undifferentiated sediments. Thin to moderately thick permafrost underlies most of the area. Boreal forests dominate grading from white spruce, white birch, and trembling aspen on uplands to black spruce and tamarack in lowlands. Tall willow, birch, and alder shrub communities are scattered throughout, particularly where forest fires burned in the recent past. Rivers meander through this undulating landscape following fault lines and highly eroded bedrock seams. These mountains support abundant moose, bears, beavers, and scattered caribou herds.

The Kobuk Ridges and Valleys (8 percent of planning area, 14 percent of BLM-managed lands in planning area) are a series of paralleling ridges and valleys that radiate southward from the Brooks Range. This diagnostic feature is created in part by high-angle reverse faults and interceding troughs. This area was overridden by past ice sheets descending from the north. Today, immense U-shaped valleys harbor large rivers that originate in the Brooks Range. The broad valleys are lined with alluvial and glacial sediments whereas the intervening ridges are covered with rubble. Thin to moderately thick permafrost underlies most of the area. A dry continental climate prevails with long cold winters and short cool summers. Frigid conditions are reinforced during the winter as the valleys serve as cold-air drainages for the Brooks Range. Forests and woodlands dominate much of the valley bottoms and mountainsides with black spruce in wetland bogs, white spruce and balsam poplar along rivers, and white spruce, white birch, and trembling aspen on well-drained uplands. Tall and short shrublands of willow, birch, and alder communities occur on ridges. Trees become increasingly sparse, less robust, and restricted to lower elevations in the west – here forests are slowly invading along rivers and streams (e.g., lower Noatak River).

The Brooks Range (15 percent of planning area, 6 percent of BLM-managed lands in planning area) ecoregion includes the east-west trending range that represents the northern extension of

the Rocky Mountains, and includes the Brooks Range and British and Richardson Mountains. Accreted terranes originating from the Arctic Ocean underlie most of this range, ending at the Kobuk-Malamute fault system along its southern boundary. The high central portion possesses steep angular summits of sedimentary and metamorphic rock draped with rubble and scree. To the west and east, the topography becomes less rugged – for instance, the Richardson Mountains have flat-topped summits flanked by stepped slopes reflecting bedrock conditions. High-energy streams and rivers cut through narrow ravines with steep headwalls, etching a deeply-incised, dendritic pattern into the terrain. During the Pleistocene Epoch, mountain glaciers coalesced to cover the higher portions of the range – here only a few remnants in the form of small cirque glaciers still exist. The Richardson Mountains were ice-free during the last ice age and blocked the continental ice sheet advance from the east. The dry polar climate has short, cool summers and long, cold winters; and air temperatures decrease rapidly with rising elevation. Valleys and lower mountain slopes on the north side of the range are covered by mixed shrub-sedge tussock tundra with willow thickets along rivers and streams. Alpine tundra and barrens dominate at higher elevations along the entire crest of the range. On the south side, lower mountain slopes and valleys possess sedge tussocks and shrubs. The arctic tree line skirts across the range in Canada and is restricted to the south side of the range in Alaska. Here, sparse conifer-birch forests and tall shrublands occur in larger valleys. Dall sheep, gray wolves, brown bears, marmots, and caribou inhabit the mountains. Arctic grayling are found in groundwater-fed springs and streams.

The Yukon River Lowlands (5 percent of planning area, 5 percent of BLM-managed lands in planning area) are an expansive wetland system associated with the lower stretches of the Yukon and Koyukuk Rivers in west-central Alaska. Although this area was unglaciated, meltwater flushes deposited vast quantities of sediment within these riverine corridors during glacial retreat. As such, deep deposits of undifferentiated sediments underlie these floodplains and adjacent lowlands. A seasonally moist continental climate prevails with cool, moist summers and cold, dry winters. Permafrost is absent along the younger floodplains, but is thin, discontinuous, and relatively "warm" on the abandoned floodplains in the adjacent lowlands. Poor drainage caused by permafrost contributes to the prevalence of wet, organic-rich soils. Collapse-scar features from thawing permafrost are common. Water levels drop in the Yukon River and its tributaries in early fall during freeze-up and remain low until spring break-up when substantial ice-jam flooding can occur. The vegetation along the major rivers is highly productive and supports vigorous stands of white spruce and balsam poplar. Active floodplains and riverbars support tall stands of alders and willows. Robust wet sedge meadows and aquatic vegetation reside in infilling sloughs and oxbow ponds. The adjacent permafrost-dominated lowlands support black spruce woodlands, and birch-ericaceous shrubs and sedge-tussock bogs. Many flat organic surfaces are pockmarked with dense concentrations of lakes and ponds. These areas support large populations of moose and black bear, the oxbow sloughs and thaw ponds support abundant waterfowl, and the lowland forests are important to furbearers. The large rivers support important runs of Chinook, chum, and coho salmon. This unit is distinguished from the Tanana-Kuskokwim Lowlands by having lower elevations, a slightly wetter climate, and more robust vegetation.

The Brooks Foothills (11 percent of planning area, 5 percent of BLM-managed lands in planning area) are gently rolling hills and broad exposed ridges that form the northern flank of the Brooks Range. Narrow alluvial valleys and glacial moraines and outwash are interspersed among long linear ridges, buttes, and mesas composed of tightly folded sedimentary rocks. Most of the surface is mantled with colluvial and eolian deposits. A dry polar climate dominates the land, but is somewhat warmer and wetter than the Beaufort Coastal Plain. The surface is underlain by thick continuous permafrost and slope-related periglacial features, such as solifluction lobes and stone stripes, are common. Because the permafrost impedes drainage, soils in the active

layer are usually saturated and have fairly thick organic horizons. The lower foothills tend to be calcareous, whereas the upper foothills are frequently acidic. Many braided streams and rivers with highly variable seasonal discharge are present – their clear waters teem with arctic char and arctic grayling. Lakes are infrequent. Some streams freeze solid to their bottoms, causing large aufeis deposits that last well into summer and provide refuge for caribou from voracious mosquitoes. Vegetation is dominated by vast expanses of mixed shrub-sedge tussock tundra, interspersed with willow thickets along rivers and small drainages and Dryas tundra on ridges. Calcareous areas support sedge-Dryas tundra. The area is important to caribou, muskox, arctic ground squirrels, peregrine falcons, wolves, and brown bears.

The Seward Peninsula (5 percent of planning area, 1 percent of BLM-managed lands in planning area) is a cold, wind-swept landmass jutting out into the Bering Sea and represents the southernmost haunt of polar bears on mainland Alaska. Sedimentary, metamorphic, and volcanic rocks intertwine to form a landscape mosaic of coastal lowlands, expansive convex hills with scattered broad valleys, and small, isolated groups of rugged mountains. Vegetation is principally tundra, with alpine Dryas-lichen tundra and barrens at high elevations and moist sedge-tussock tundra at lower elevations. Patches of low-growing ericaceous and willow-birch shrubs occur on better-drained areas. Permafrost is continuous, but ranges from thin to moderately thick. Soils are often wet, shallow, and organic because of permafrost. Ice-related features such as pingos and patterned ground (raised polygons outlined by rock-filled ditches) are present. The climate is best classified as moist polar. The Chukchi Sea and Bering Strait afford very little climatic moderation since ice spans these waters during much of the year, allowing direct passage of bitterly cold air from Siberia. Persistent cold, windy conditions occur in the winter and fog blankets the coastlines in the summer. At its height, Pleistocene glaciation covered only the highest mountains. Back then, the peninsula was part of an important ice-free migration corridor between North America and Asia. Strong ecological affinities to Asia remain to this day with the presence of Eurasian birds (gray-headed chickadee, yellow and white wagtails, bluethroat), fishes (Alaska blackfish), and flora. Streams occupy all larger valleys, and many lakes lie in broad inland valleys. Dense concentrations of lakes and ponds support abundant waterfowl (including the rare arctic loon) and nesting birds (e.g., spectacled eiders and ruddy and black turnstones) occur within coastal plains. Bears, caribou, snowy owls, arctic foxes, and Alaska hares are common. Ribbon seals and walruses are often observed along shorelines and adjacent ice floes.

The Tanana-Kuskokwim Lowlands (6 percent of planning area, 1 percent of BLM-managed lands in planning area) is an alluvial plain that slopes gently northward from the Alaska Range. The undifferentiated sediments of fluvial and glaciofluvial origin are capped by varying thicknesses of eolian silts and organic soils. Sand dune fields and glacial moraines occur in some areas. A dry continental climate prevails with cool summers and cold winters. Even though a rain shadow exists due to the neighboring Alaska Range, surface moisture is rather abundant due to the gentle topography, patches of impermeable permafrost, and poor soil drainage. Permafrost is thin and discontinuous, and temperatures are near the melting point. Collapse-scar bogs and fens caused by retreating permafrost are frequent and related to climate warming since the Little Ice Age. Streams flowing across this north-sloping plain ultimately drain into one of two large river systems — the Tanana or Kuskokwim. Groundwater-charged seeps and springs are common in gravel deposits. Boreal forests dominate the landscape with black spruce in bogs, white spruce and balsam poplar along rivers, and white spruce, white birch, and trembling aspen on south-facing slopes. The coldest, wettest areas on permafrost flats support birch-ericaceous shrubs and sedge tussocks. Tall willow, birch, and alder communities are scattered throughout. The mosaic of habitats supports moose, black bears, beavers, porcupines, trumpeter swans, and numerous other waterfowl.

The Yukon-Old Crow Basin (7 percent of planning area, less than 1 percent of BLM-managed lands in planning area) is a gently sloping basin along the Porcupine River that is composed of depositional fans, terraces, pediments, and mountain toeslopes that ring the Yukon and Old Crow Flats. The surfaces surrounding the flats are largely unglaciated and products of millions of years of weathering of the surrounding mountains. Here, deep deposits of colluvial, alluvial, and eolian origin are underlain by continuous masses of permafrost. The marshy flats have developed in deep alluvial and glaciolacustrine deposits underlain by discontinuous permafrost. The poorly drained flats and terraces harbor vast wetlands pockmarked with dense concentrations of thaw lakes and ponds. On the flats, water levels of lakes are often maintained by spring flooding rather than precipitation. Active fluvial processes are etched throughout the topography featuring deltaic fans, terraces, and floodplains. Opaque with glacial silts and shoreline mud, the Yukon River forms an aquatic maze of islands, sandbars, meander sloughs, and oxbow lakes as it crisscrosses the lower flats. The rich aquatic habitats support tremendous concentrations of nesting waterfowl (in the millions!) and other migratory birds and an abundance of moose, bears, furbearers, northern pike and salmon. A dry continental climate prevails with considerable seasonal temperature variation. Arctic high-pressure systems prevail during the winter, bringing clear and frigid weather. In contrast, summers are short but relatively warm. Vegetation varies with soil drainage grading from wet grass marshes and low shrub swamps to open black spruce forests to closed spruce-aspen-birch forests on better-drained uplands. Summer wildland fires are common.

The Davidson Mountains (3 percent of planning area, less than 1 percent of BLM-managed lands in planning area) is an area along the south flank of the eastern Brooks Range where rugged mountains are dissected by broad floodplains of glacial origin. The mountains are draped by course rubble, whereas river valleys and floodplains are lined with unconsolidated glacial and alluvial sediments. Continuous permafrost from thin to moderate thickness underlies most of the area. Boreal forests cover much of the terrain with black spruce in bogs; white spruce and balsam poplar along rivers; and white spruce, paper birch, and trembling aspen on uplands. Tall willow, birch, and alder communities also occur. Wildland fires are frequent. A strong continental climate prevails with long, cold winters and short, cool summers. These mountains are home to moose, bears, wintering caribou, and various furbearers.

The Alaska Range (10 percent of planning area, less than 1 percent of BLM-managed lands in planning area) is a series of accreted terranes conveyed from the Pacific Ocean fused to form this arcing mountain range. In turn, these towering mountains harbor a complex mix of folded, faulted, and deformed metamorphic rocks. Landslides and avalanches frequently sweep the steep, scree-lined slopes. Discontinuous permafrost underlies shallow and rocky soils. Because of the Alaska Range's height, a cold continental climate prevails and much of the area is barren of vegetation. Occasional streams of Pacific moisture are intercepted by the highest mountains and help feed small icefields and glaciers. At the glacier's termini, swift glacial streams with heavy sediment loads course down mountain ravines and braid across valley bottoms. Alpine tundra supports populations of Dall sheep and pikas on mid and upper slopes. Shrub communities of willow, birch, and alder occupy lower slopes and valley bottoms. Forests are rare and relegated to the low-elevation drainages. Brown bears, gray wolves, caribou, Dall sheep, and wolverines are common denizens in the Alaska Range.

Yukon-Tanana Uplands (10 percent of planning area, less than 1 percent of BLM-managed lands in planning area) are broad, rounded mountains of moderate height that are underlain by the metasedimentary Yukon-Tanana terrane. This terrane is a composite of transported crust blocks that includes former volcanic island arcs and continental shelf deposits. Most surfaces are composed of bedrock and coarse rubble on ridges, colluvium on lower slopes, and alluvium

in the deeply incised, narrow valleys. Climate is strongly continental with warm summers and very cold winters. The region is underlain by discontinuous permafrost on north-facing slopes and valley bottoms. In valley bottoms, permafrost is thin, ice-rich, and relatively "warm." Vegetation is dominated by white spruce, birch and aspen on south-facing slopes, black spruce on north-facing slopes, and black spruce woodlands and tussock and scrub bogs in valley bottoms. Floodplains of headwater streams support white spruce, balsam poplar, alder, and willows. Above treeline, low birch-ericaceous shrubs and Dryas-lichen tundra dominate. This area has the highest incidence of lightning strikes in Alaska and the Yukon Territory, causing frequent wildland fires. Caribou, moose, snowshoe hares, marten, lynx, and black and brown bears are plentiful. The area's abundant cliffs are important to peregrine falcons. The clear headwater streams are important spawning areas for Chinook, chum, and coho salmon.

The Beaufort Coastal Plain (5 percent of planning area, less than 1 percent of BLM-managed lands in planning area) is a treeless, wind-swept plain which gradually ascends from the Beaufort Sea coast southward to the foothills of the Brooks Range. This flat to undulating coastal plain is underlain by unconsolidated deposits of marine, fluvial, glaciofluvial, and eolian origin and lacks bedrock control. A dry, polar climate dominates throughout the year, with short, cool summers and long, cold winters. Proximity to the Arctic Ocean and abundant sea ice contribute to the cool, frequently foggy, summers. Annual precipitation is low and mostly falls as snow during the winter. Due to low temperatures, permafrost is continuous across the region, except under large rivers and thaw lakes. Permafrost and frost processes contribute to a large variety of surface features such as pingos, ice-wedge polygons, and oriented thaw lakes. The presence of permafrost prevents surface drainage so soils typically are saturated and have thick organic horizons. Due to the abundance of thaw lakes (covering up to 50 percent of the surface) and saturated soils, nearly the entire region supports wetland communities. Vegetation is dominated by wet sedge tundra in drained lake basins, swales, and floodplains, and by tussock tundra and sedge-Dryas tundra on gentle ridges. Low willow thickets grow on well-drained riverbanks. Although drainage over most of the area is poorly integrated, there are numerous large, braided rivers that originate in the Brooks Range and drain northward to cross the coastal plain. Anadromous arctic cisco, broad whitefish, least cisco, and Dolly Varden char overwinter in these larger rivers and migrate to nearshore waters for the summer. Smaller streams often dry up or freeze completely during the winter. The coastal plain supports large caribou herds and is an important calving area. Important hervibores include muskoxen, lemmings, and arctic ground squirrels, while important predators include arctic foxes, gray wolves, and brown bears. Polar bears occasionally den on the coastal plain. The region also is important for breeding waterfowl, including a wide variety of shorebirds, ducks, geese, swans, and passerines.

For the purposes of this planning effort the National Land Cover Database 2001 (NLCD 2001, Homer et al. 2007) has been selected for depicting and analyzing major vegetation communities. The NLCD 2001 is a 16-class (additional four classes in Alaska only) land cover classification scheme that has been applied consistently across all 50 states and Puerto Rico at a spatial resolution of 30 meters. Vegetation communities in the planning area have been classified to a finer resolution in some areas, by a series of vegetation mapping projects, including efforts by Ducks Unlimited and LANDFIRE.

2.1.4.1. Indicator

BLM Healthy Lands

The 2004 Alaska Land Health Standards and Guidelines Instruction Memorandum (IM) (BLM 2004) provides specific Land Health Standards and Guidelines to be implemented in the land use planning process. The Standards described are intended to "promote healthy, sustainable ecosystems that support a wide range of public values and uses, reflective of the BLM multiple use land management mission. The BLM further intends to provide for a wide variety of public land uses without compromising the long-term health and diversity of the land and without sacrificing significant natural, cultural, and historical resource values."

The Ecological Processes Standard in the Health Standards and Guidelines IM (BLM 2004) focuses in part on the presence of healthy plant communities on the landscape is implicit in the promotion of "healthy, sustainable ecosystems":

"*Plants play an important role in soil development and watershed functions. Plants also provide habitat for wildlife and human economic use. Nutrients necessary for plant growth come from the atmosphere, the weathering of rocks, and from insects, bacteria and fungi that metabolize organic matter. The soil transports nutrients through plant uptake, leaching, and rodent, insect, and microbial activity. Conveyance follows cyclical patterns as nutrients are used and reused by living organisms. The ability of the land to supply resources and satisfy social and economic needs depends upon the buildup and cycling of nutrients over time. Interrupting or slowing nutrient cycling can lead to site degradation since lands may become deficient in the nutrients that plants require. Consider the role of fire in natural ecosystems, whether it acts as a primary force or as only one of many factors. It may play a significant role in both nutrient cycling and energy flows.*"

The corresponding goal of the Ecological Processes Standard is to ensure that water and nutrient cycling and energy flow support healthy, productive, and diverse natural communities. Water and nutrient cycling and energy flow occur effectively to support healthy, productive, diverse communities at levels appropriate to the potential/capability of the site.

To achieve this goal, two objectives related to vegetative communities should be achieved. First, photosynthesis should be effectively occurring throughout the growing season, consistent with the potential/capability of the site. Successful achievement of this objective would be indicated based on observed plant composition and community structure. The second objective would be that nutrient cycling is occurring effectively, consistent with the potential capability of the site. The subset of possible indicators (related specifically to vegetation) that this objective is being successfully achieved include: (a) plant composition and community structure, (b) fire history mapping, (c) fire return rate, (d) fire severity distribution, (e) accumulation, distribution, incorporation of plant litter and organic matter into the soil, (f) root occupancy in the soil profile, and (g) biological activity including plant growth. While indicators (e) and (f) are challenging to quantify for large-scale planning efforts and there is a minimal amount of information to support models of these, the other indicators may be quantified and inform planning efforts.

Wildland Fire, Insects and Disease

Wildland fires can exert a landscape-level influence on vegetation structure and composition, permafrost dynamics, water and air quality, nutrient cycling, wildlife habitat, and biodiversity. In the absence of fire in boreal forests, organic matter accumulates and insulates the ground, causing

the permafrost table to rise. Wildland fires usually remove portions of the accumulated organic layer that can warm the soils, lower the permafrost table, and increase active layer depth (Van Cleve and Viereck 1981). Soil temperature directly affects nutrient availability (Smithwick et al. 2005) and therefore, ecosystem productivity (Van Cleve and Viereck 1981). Wildland fire-related changes to nutrient cycling, cycling, trophic dynamics, and species composition may occur to such an extent that post-fire communities may be completely different from the original pre-fire community (Johnstone and Chapin 2006).

Wildland fires are the predominant driver of successional vegetation community shifts in the planning area. They occur in each of the ecoregions represented within the planning area; however, their frequency, size and severity vary depending on vegetation (fuel) availability, climatic conditions and topography. Post-fire vegetation communities are a function of several factors including pre-fire vegetation community structure, fire severity, and the spatial extent (patchiness) of fire activity. Each of these factors influence post-fire vegetation regeneration and available seed stock. The vast majority of the wildland fires that occur in the planning area are caused by lightning. A smaller percentage of the area burned annually in the planning area is the result of human activity. Human-caused wildland fires are generally localized to areas surrounding human infrastructure including towns and road corridors. Regardless of cause, most wildland fires that start near human-inhabited areas are subject to fire suppression activities and limited in size.

Most wildland fire activity in Alaska has been tracked and recorded by the BLM Alaska Fire Service since the 1950s. Based on these records, it is possible to make some deductions about historic fire frequency for a given section of the planning area. Knowledge of fire frequency allows for classification of fire frequency per given area into Fire Regime Condition Classes, which can be useful as an indicator of landscape condition (as recommended in the Alaska Land Health Standards and Guidelines IM). However, wildland fire records do not include information on fire severity or spatial extent (e.g., patchiness) on the landscape. Therefore, landscape-scale effects on vegetation and post-fire successional pathways cannot be deduced from fire records. More detailed mapping of the spatial coverage and severity of individual wildland fires may be warranted, particularly if projected shifts in fire regime occur in response to changing climatic conditions. Insects and disease do affect vegetation communities within the planning area but have not been noted as a management concern to date.

Burn Severity

In Alaska's boreal forest and tundra ecosystems, burn severity strongly impacts post-fire vegetation patterns and succession (Sorbel and Allen 2005). If burn severity is low or moderate, above-ground plant material may be singed or burned, but much of the vegetation will be able to regenerate quickly from roots and stems. In contrast, severe fires burn deeper into organic soils, which may kill off the underground root structure of some shrubs and herbaceous plants. Therefore, in severely burned areas, plant reproduction may be more dependent on seed establishment or deep-rooted plants than in low or moderately burned areas. This may in turn slow or alter the post-fire vegetation successional trajectory (Bernhardt et al. 2011, Johnstone and Chapin 2006, Sorbel and Allen 2005). The ecosystems of Alaska are fire-adapted ecosystems, and are characterized by a mosaic of different-aged landscapes that are maintained by wildland fire. Within this system, burn severity strongly influences vegetation patterns and succession after wildland fire. Since many of the plant species are rooted in the organic forest floor mat, the amount of consumption of the organic mat will determine whether vegetation regeneration occurs through seeding or re-sprouting post fire (Viereck 1983). For tree establishment, seed source and seedbed conditions at the micro-site scale in the immediate post-disturbance period are major

drivers of recruitment (Zasada and Gregory 1972, Johnstone and Chapin 2006). If fire severity is low to moderate, above-ground portions of plants may be top-killed, but minimal organic mat or duff is burned and regeneration can occur quickly through re-sprouting from roots and stems for species such as aspen, paper birch, Labrador tea, willow, resin birch, rose, fireweed, tussocks or northern blue joint grass (Viereck and Schandelmeier 1980, Foote 1983, Racine et al. 1987). On the other hand, severe burns will consume most of the organic layer and may kill more of the underground root structure of shrubs and herbaceous plants, such that reproduction will occur more often by seed. As a result, severity will influence the plant species composition at a site.

Boreal Forest Fire Effects

Periodic wildland fires in the boreal forests of Gates of the Arctic have shaped the ecosystem so that many plants and animals exhibit fire-adapted traits. For instance, white spruce colonizes mineral soil seedbeds after intense ground fires that remove organic soil layers, and black spruce is partially dependent upon fire activity for sexual reproduction. Aspen and birch trees also respond rapidly to fire; burned areas are often colonized by dense stands of these species, which provide good habitat for some wildlife species.

Tundra Wildland Fire Effects

Relatively few studies have documented the effects of wildland fire and burn severity in tundra ecosystems. Unless wildland fires are severe, most shrub-tussock tundra types re-vegetate rapidly, sometimes within a few weeks after a fire event (Racine et al. 1987, Racine et al. 2004). On the other hand, high-severity fires may either decrease or eliminate tussock cottongrass (*Eriophorum vaginatum* L.). Fire is important in maintaining the long-term growth and survival of tussock cottongrass. In the absence of wildland fire, tussock-shrub tundra undergoes a series of autogenic successional changes. These changes involve the accumulation of peat and burial or submergence of tussocks by dwarf shrubs, mosses, and lichens. This results in raised permafrost levels, reduced frost action, and senescence of tussocks. Frost action prevents such changes by churning soils, incorporating organics, and preventing the build-up of dwarf shrubs, mosses, and lichens. Frost action is renewed when enough organics are burned so that thaw depth reaches into mineral soils. Tussock cottongrass survives wildland fire because its growing points are insulated by tightly bunched dead and live tillers, stem sheaths, and scales. The elevated position of tussocks increases resistance to ground fire. Wildland fire provides an opportunity for seedling establishment. Since sheathed cotton-sedge has both shallowly and deeply buried seed, some viable seed is available regardless of depth of burn into the peat horizon. Burned peat is an ideal seedbed. In a comparison of sheathed cotton-sedge seedling emergence on different substrates, burned peat showed highest rates of emergence.

Habitat Wildland Fire Effects

Changes in vegetation due to wildland fires, in turn, affect wildlife distribution and habitat use. Patchy fires create a mosaic of habitats frequently used by snowshoe hares and martens, while moose often browse on resprouting willow and other shrubs (Sorbel and Allen 2005). Small mammals such as voles often thrive in recently burned areas, creating large colonies in the remaining duff and feeding on new vegetation. In the winter, caribou often avoid recently burned areas because they lack sufficient lichen for winter forage (Joly et al. 2010).

Human Activity

Direct human impacts to vegetation within the BLM-managed sections of the planning area (including but not limited to placer mining, gravel extraction, ice road and trail development and use) are largely localized to developed areas and road corridors. The Dalton Highway provides public access from Fairbanks to the North Slope and is used for access to adjacent lands. OHV use in the Dalton Highway area is limited by BLM seasonal/winter use (with definitive snow and ice depth parameters) restrictions that reduce the amount of impact to vegetation communities as a result of roads and trails. OHV use in other portions of the planning area is largely centered around communities that are not connected to a larger road system. For the most part, these communities are surrounded in an immediate sense by non-BLM-managed lands. Thus, most OHV use and associated damage to vegetation is minimal on BLM-managed lands within the planning area. Soil erosion can damage vegetation communities and has been directly associated with winter roads and trails, which have been, either poorly maintained or inappropriately used.

Other disturbances that affect vegetation include mineral and gravel extraction. To track the cumulative impacts of vegetation clearing and disturbance on vegetation communities, it is important to annually or periodically track and analyze the spatial extent of disturbance from permitted activities that disturb vegetation. Sensitive bird habitat, migratory bird nesting habitat, and rare plant species should be given special consideration when vegetation clearing is proposed by permitted activities.

Studies and Mapping Efforts

Large-scale plant composition and community structure in the planning area is depicted by vegetation coarse vegetation maps including the National Land Cover Database 2001 (NLCD 2001) as well as more detailed maps such as those produced by Ducks Unlimited, LANDFIRE, and others. Although these vegetation maps provide baseline information from which gross-scale deductions about vegetation communities may be drawn, questions about smaller scale vegetation community structure and detection of change often requires more specific information than has been provided thus far. Ideally, an improved Alaska-wide map of vegetation communities at the finest possible scale will become available. In the meantime, particularly for specific questions of land management importance (e.g., lichen cover for caribou habitat, willow tall shrub cover for moose habitat) site-specific imagery to detect specific vegetation communities is warranted.

At a more localized (plot) scale, large-scale vegetation inventory and monitoring have not been comprehensively conducted in the planning area. However, some quantitative monitoring of vegetation condition and change over time has been conducted by the BLM in recent decades. Most notably, caribou winter range monitoring plots were established in the tundra ecosystem of the Nulato Hills in 1981 and have been revisited approximately every 5 years since. Several publications resulted from this long-term monitoring project and provide some baseline information on caribou habitat in relation to climate change projections and fire activity. Other, shorter term, studies of vegetation condition have been conducted in the planning area by the BLM which include; (1) an impact analysis of overland vehicle traffic and (2) an exclosure (fenced-in area) study designed to track post-disturbance vegetation recovery. Further monitoring and reporting on these latter two projects may help inform future management decisions.

The planning area includes the Toolik Field Station, which is an arctic research laboratory and science support facility. The field station is the site of extensive research and several studies focused on northern Alaska boreal and tundra vegetation community structure and dynamics;

some specifically relate to disturbance, climate change and permafrost dynamics. It is highly likely that information provided by the research conducted at the Toolik Field Station will be useful in this land use plan.

Finally, it is important to note that the planning area is vast and ecologically varied. It is probable that other studies of vegetation communities have and will be conducted that will be useful in this planning effort.

2.1.4.2. Current Condition

Vegetative communities in this vast and largely roadless planning area are currently in a predominantly undisturbed state. It is therefore possible to emphasize protection of intact vegetation communities and habitats rather than restoration in this planning effort.

Wildland Fire: Wildland fire is an important natural process in all of the ecoregions represented in this planning area, but it plays a particularly large role in driving vegetation succession in the areas dominated by boreal forest vegetation communities. On an area basis, wildland fire has the greatest impact of all disturbance factors on vegetative communities represented in the planning area. The vast majority of the acreage burned is the product of lightning-caused wildland fires. Human-caused wildland fires are generally localized to the relatively low proportion of the planning area with roads or communities and, in most years, are the source of only a small proportion of the total area burned. Therefore, BLM lands within the planning area are predominantly classified in the "limited fire management option" that allows fires to burn largely unchecked, barring special circumstances (e.g., lands managed by BLM but selected by other entities, lands adjacent to communities).

An annual average of 389,657 acres burns within the 58,697,532 acre planning area based on records from 1950 to present. Climate, terrain, and vegetation strongly influence the occurrence and extent of wildland fires in the planning area where both the boreal forest and tundra ecosystems are subject to periodic fires. In the planning area, thunderstorm activity, accompanied by high temperatures and low precipitation, is common during June and July. This combination of weather factors is conducive to both fire starts and continued fire activity. It follows that the vast majority of fire starts and fire activity in this region occur in June and July. The most frequent and largest wildland fires on record have occurred in the forested portions of the planning area.

Manned Vehicle: Vegetation communities are susceptible to damage by vehicular traffic. Depending on the type of vegetation community as well as the duration and frequency of traffic, impacts to vegetation can perceptibly persist for extended time periods. Recreational vehicle use in this planning area includes summer overland travel via OHV, but use is generally concentrated around the few human communities, most of which are not connected to a road system and are surrounded largely by non-BLM-managed lands. Most OHV use on BLM-managed lands in the planning area occurs near the Dalton Highway and is limited by BLM seasonal/winter use (with definitive snow and ice depth parameters) restrictions, which reduces the amount of impact to vegetation communities.

Mining and Gravel Extraction: Placer mining has impacted riparian vegetation, especially in the Dalton Highway Corridor Management Area (DHCMA), but has directly affected only a small proportion of riparian vegetation within the planning area. Gravel extraction requires vegetation clearing and impacts a relatively small proportion of the vegetation in the planning area in areas immediately adjacent to roads.

2.1.4.3. Trends

Wildland Fire and Climate Change: Formal statistical analysis of changes in area burned over the course of the last six decades has not been conducted; however, preliminary analyses do not strongly indicate that fire activity has significantly increased within the planning area.

Prior to 1980, it was policy that all wildland fires in the state would be completely and aggressively suppressed (Alaska Interagency Wildland Fire Management Plan 1998); however, given the vast area and regular occurrence of wildland fire on the landscape, most suppression activity was (and continues to be) localized to areas around human communities and infrastructure. Following completion of Interagency Wildland Fire Management plans (between 1980 and 1988), much of the planning area was placed in "limited" (where fires were typically not suppressed) or "modified" units (where fires starting after July 10 were typically not suppressed). A small proportion of the planning area is within 100 miles of fire bases in Fairbanks and Galena, and fire suppression (though not complete) may have been effective enough to change the distribution of seral communities on the landscape; older seral stages are likely more predominant than they would have been without fire suppression efforts. Climate change is likely related to changes in elevational and latitudinal treeline changes in the planning area (Lloyd et al. 2005, Rupp et al. 2001). Other climate-related changes in vegetation, including increased shrub cover and shrub expansion in tundra areas, have also likely been occurring in the planning area.

Human Use Impacts: It is challenging to predict the extent of future changes in human activity and their relative impacts on vegetation communities, particularly for activities such as placer mining and events like human-caused fires. Changes in requirements for reclaiming placer mined lands initiated in 1981 have generally resulted in more rapid revegetation of mined sites. The establishment, maintenance, and access from public and/or private roads has likely been the human-related factor that has most impacted vegetation in the planning area.

2.1.4.4. Forecast

Climate change is predicted to result in changes to wildland fire characteristics and occurrence, which could result in significant changes to vegetative communities. However, it is important to note that although there is evidence to indicate a warming climate, it is difficult to predict precipitation regime and associated effects on fire regime in future decades. Additionally, predictions of wildland fire activity and associated vegetation changes are difficult to assess for reliability. Knowledge of fire frequency allows for classifying fire frequency for a given area into Fire Regime Condition Classes, which can be a useful indicator of landscape condition. However, management decisions should not assume a static fire regime because future climate changes may preclude current fire condition.

There is also some evidence that climate change may also promote continued rising of treeline (Rupp et al. 2001) and increased shrub cover and expansion. However, while planning efforts should take potential changes related to climate into consideration, the forecasted changes in vegetation community are not likely to occur rapidly enough to impact planning decisions within the 20 year lifetime of this plan.

Management efforts to protect key vegetation communities that provide essential habitat, particularly for species of management concern, should be considered if environmental shifts leads to habitat loss on a scale that could be to the detriment of wildlife populations.

The construction, maintenance, and increased access to previously largely inaccessible areas, that would be associated with new roads in the planning area will most likely be the largest factors affecting vegetation communities within the 20 year lifetime of this plan.

2.1.5. Nonnative Invasive Species

For this analysis, the nonnative, invasive species category encompasses insects, animals, pathogens and plants; only nonnative, invasive plants are known to occur in the planning area to date. Nonnative, invasive plants, defined in accordance with Executive Order 13112, are those plants whose introduction is likely to cause economic or environmental harm or harm to human health. According to the BLM, nonnative plants are undesirable for their (1) toxicity, (2) lack of forage value, (3) invasiveness or the invisibility of the predominant ecotype (DOI BLM 1996; DOI BLM 2004). Of the 26 nonnative, invasive insect species known to be established in Interior Alaska (Kruse 2014), none are documented within the planning area; nor are there any known pathogens or invasive terrestrial or aquatic animals. The extent of the range of the established populations of nonnative, invasive insects is unknown. The coverage of insects in this section will be limited to listing the species composition, with the remaining focus on invasive plants.

2.1.5.1. Indicator

The BLM Alaska Land Health Standards and Guidelines IMAK2004023 is a framework for following practices and procedures to achieve the required standards. Qualitative indicators are intended for monitoring whether management is achieving maintenance of, or a trend toward, or away from the standard. The standards are (A) watershed function-uplands, (B) watershed function-riparian, wetland, and aquatic areas, (C) ecological processes, (D) threatened, endangered, native, and locally important species, and (E) water quality and yield.

Watershed function—uplands

Upland watershed functions in the infested ecosystems within the planning area, such as the infiltration and permeability rates, moisture storage, and stability of upland soils, are appropriate to the watershed's soil, climate, and landform. Erosion is not a problem except in areas where the vegetation cover is disturbed or stream channel morphology is altered. Where physical control of invasive plants is successfully applied, the impacts on water resources would be beneficial. Where physical control methods are not successful in managing invasive plant infestations, herbicide treatment may be considered.

Herbicides applied in terrestrial settings *do have the potential* to reach surface and ground water. The four primary means of off-site movement of herbicides are run off, drift, misapplication or spills, and leaching. Surface water could be affected by any of these means. Groundwater potentially would be affected only by leaching; however, herbicides must be relatively persistent in the environment to leach or run off (non-persistent herbicides do not stay active long enough to create a risk). Adherence to the design features, standard operating procedures, and mitigation measures listed in section 2.1.1.1 in the Dalton Area Integrated Invasive Plant Management Strategic Plan Environmental Assessment (EA) should reduce the risk of off-site movement and subsequent effect to upland watershed function.

The goal of this standard is to ensure that upland watersheds are in, or are making significant progress toward, a properly functioning physical condition that includes their upland, riparian,

wetland, and aquatic areas. To achieve this goal, the following objectives will be met: (1) protect the soil surface from erosion, (2) avoid detention of overland flow, (3) maintain infiltration and permeability, and (4) promote moisture storage by soil and plants. Possible indicators of success are listed in the table below.

Objective	Possible success indicators
Protect the soil surface from erosion	Amount and distribution of plant cover; amount and distribution of bare ground; plant composition and community structure; character of micro-relief; presence and integrity of biotic crusts; biological activity; absence of accelerated erosion and overland flow; moisture content
Avoid detention of overland flow	
Maintain infiltration and permeability	
Promote moisture storage by soil and plants	

Watershed function — riparian, wetland, and aquatic areas

Riparian, wetland, and aquatic watershed function in the infested ecosystems within the planning area are functioning properly at levels appropriate to the watershed's soil, climate, and landform. Currently, no impacts have been observed that can be linked directly to the presence of invasive plants. However, infestations are known to occur at or near the intersection of the following waterways with the Dalton Highway: the Kanuti River, Bonanza Creek (including Fish Creek), the Koyukuk River (including Tramway Bar, Rosie Creek, Slate Creek, Marion Creek and Minnie Creek), the Jim River (including Prospect Creek and Douglas Creek), the Hammond River, and the Yukon River. These infestations are of management concern due to the potential for water transport of invasive plant propagules and the possible establishment of *M. alba* or *V. cracca* on gravel bars downstream (Wurtz et al. 2008).

If herbicides are chosen as a method of control, they do have the potential to enter waterbodies and affect aquatic organisms (1) through direct application into aquatic environments (of herbicides approved for use in these habitats), (2) through accidental spraying, or (3) through the movement of herbicides from upland areas to nearby waterbodies as discussed above. At low concentrations, herbicides typically may have little or no effect on aquatic organisms. At moderate concentrations, herbicides may not kill aquatic organisms, but could be detrimental to the survival, growth, reproduction, or behavior of certain organisms (chronic effects). At high concentrations, some herbicides can be lethal to aquatic organisms (acute effects).

The EA stated that there would be negligible direct toxic impacts to fish from herbicide applications because of the small size of the treatment sites; the precautions that would be taken to prevent runoff in rainwater; the lack of off-site drift from the backpack, hand, or ground-based boom sprayers that would be used; and the generally rapid degradation of the herbicides after application. Herbicides would not adversely affect fish habitat because native riparian vegetation would not be treated and the lack of drift or runoff of herbicides would minimize any unintended impacts to riparian plants, should they occur near a treatment site.

According to the design features in the EA (section 2.1.1) rivers and streams that chum, Chinook and coho salmon inhabit are considered essential fish habitat (EFH). To protect EFH of the DHCMA, herbicides could be applied no closer to the water than 200 feet beyond the outer edge of the floodplain (BLM 2013). Buffer distances, measured horizontally on a line perpendicular to the waterbody beginning at the water line, would be marked, and approved before application to ensure compliance with this standard. Secondary buffer zones may be required if the slope adjacent to the stream or waterbody is greater than 5 percent. This buffer also applies to ephemeral streams (a stream or portion of a stream that flows only in direct response to

precipitation). Adverse impacts on EFH are addressed in the Dalton Invasive Species Invasive Plant Management Strategic Plan. For additional guidance, refer to appendix G of the Final EIS for Essential Fish Habitat Identification and Conservation in Alaska – April 2005.

The goal of this standard is to ensure that watersheds are in, or are making significant progress toward, a properly functioning physical condition. To achieve this goal, the following objectives will be met: (1) hydrologic, vegetative, and erosion or depositional processes support physical functioning; (2) avoid detention of overland flow; (3) maintain infiltration and permeability; and (4) promote moisture storage by soil and plants. Possible indicators of success are listed in the table below.

Objective	Possible success indicators
Hydrologic, vegetative, and erosion/depositional processes support physical functioning	Frequency of floodplain/wetland inundation; amount and distribution of permafrost/aufeis; plant composition, age class distribution and community structure; point bars revegetating; streambank stability; watershed conditions of adjacent uplands; frequency/duration of soil saturation; water table fluctuations; gradient; pool size and frequency
Stream channel or lake bed characteristics	

Ecological Process

The infested area is highly disturbed, and therefore, the ecological processes of these infested ecosystems within the planning area are not intact. Spread into intact, naturally vegetated areas could result in substantial effects on soil quality through changes in organic matter content, diversity and abundance of soil organisms, reduced soil productivity, accelerated erosion, altered fire regimes, and changes in water and nutrient cycling. The goal of this standard is to conserve the ability of the land to ensure the continued supply important provisioning, regulating and supporting ecological processes. To achieve this goal, the following objectives will be met: (1) photosynthesis is effectively occurring throughout the growing season, and (2) nutrient cycling is occurring effectively.

Objective	Possible success indicators
Photosynthesis is effectively occurring throughout the growing season	Plant composition and community structure; fire history mapping; fire return rate; fire severity distribution; accumulation, distribution, incorporation of plant litter and organic matter in soil; biological activity such as plant growth, herbivory, and rodent, insect and microbial activity;
Nutrient cycling is occurring effectively	

Water quality and quantity

Water quality and quantity in the infested ecosystems within the planning area are at levels appropriate to the watershed's soil, climate, and landform; except during high water events and downstream from some construction projects and placer mining operations. Although none have been documented to date, the establishment of riparian invasive plants does have the potential to alter water quality due to flooding caused by infestations blocking channels or culverts. An indirect effect of invasive plant removal would be sedimentation and turbidity in local watersheds down-gradient of treated sites. There would be negligible impacts to local fisheries because the

sites and control operations are at a small scale. Therefore, there would be no indirect adverse impacts to any fish-eating mammals or birds.

If herbicides are the minimum tool necessary to reduce the impacts to water quality and quantity in infested ecosystems, it has been determined that there would be low risk to drinking water in areas treated with glyphosate or imazapyr, even if these herbicides were accidentally spilled in streams, ponds, or lakes used by humans (BLM 2013). The risk to drinking water associated with 2,4-D or triclopyr applications, however, would be moderate to high (BLM, 2007). Herbicide applications near aquatic systems would not directly modify water quantity. However, indirect impacts to water quantity could occur if non-target native vegetation is removed and resulted in reduced plant uptake of water, thereby increasing the amount of available water.

The following design features (section 2.1.1 of EA) are intended to preserve the watershed function of infested riparian, wetland and aquatic areas that might be considered for treatment with herbicides.

- Herbicides would not be applied within 200 feet of any surface waterbody (temporary, flowing, or standing). Distance to waterbodies would be measured, marked, and approved before application to ensure compliance with this standard.

- Water quality monitoring would be implemented to determine whether current buffers are adequate to protect water quality and aquatic resources.

Objective	Possible success indicators
Conservation of essential habitat elements	Populations of aquatic organisms; effects on beneficial uses (i.e., effects of management activities as defined under the Clean Water Act and State regulations); water chemistry, including nutrients and metals; levels of chemicals in bioassays; change in trophic status

Threatened, endangered, native, and locally important species

Invasive plants within the planning area could affect the BLM's future ability to sustain the desirable levels of ecosystem health as it pertains to threatened, endangered, native, and locally important species; however, no special status species habitat is known to occur within the infested area. The goal is to ensure that habitats support healthy, productive, and diverse populations and communities of native plants and animals. To achieve this goal, it is necessary to retain natural populations and restore viability to native plant and animal communities. This could be complicated by the fact that the affected habitat is highly disturbed, and restoring native vegetation at sustainable population levels may be limited by other factors such as road maintenance, construction, and resource development.

Objective	Possible success indicators
Conservation of essential habitat elements	Plant community composition, age class distribution, and productivity; animal community composition and productivity; habitat elements; spatial distribution of habitat; habitat connectivity; population stability and resilience within natural population cycles; fire history

Guidelines

On a case-by-case basis, plans of operation along with mitigation measures will be required for all proposed activities and appropriate stipulations will be examined through the National Environmental Policy Act (NEPA) process and incorporated before permits are issued. Consultation with specialists concerning locations of sensitive plants would be necessary to ensure protection of those species, particularly in ACECs. The following guidelines will help to ensure that the land health standards for watershed and water quality are met, while considering cultural and local economic needs:

- Overland movement of equipment, materials, and supplies is allowed when soils are frozen and sufficient snow cover is available to reduce surface disturbance and invasive plant establishment.
- Roads and trails are to be engineered, constructed, and maintained in a manner that minimizes the potential for becoming a vector for invasive plants.
- Treatments to alter the vegetative composition, such as mechanical/manual control, herbicide application, prescribed burning, seeding, or planting will be based on the potential of the site and will help to ensure: (a) water quality protection; (b) prevention of the introduction and spread of invasive plants; (c) contribution to the diversity of plant communities, and plant community composition and structure; and (d) support for the conservation of threatened and endangered, other special status species, and species of local importance.
- Seeding and planting nonnative vegetation will only be used in those cases where native species are not available in sufficient quantities, where native species are incapable of achieving the standards, or where nonnative species are essential to the functional integrity of the site.
- Projects for treatment that affect water and associated resources will be designed to protect ecological functions and processes.
- To eliminate, minimize, or limit the spread of noxious weeds, only certified feed will be permitted.
- Local, state and federal agencies, Native corporations, and other private landowners and interest groups will be given meaningful opportunities to participate in the invasive plant management process.

2.1.5.2. Current Condition

The bulk of the known infestations of invasive plants in the planning area are documented within the DHCMA. The Dalton Highway is the primary vector for invasive plants into the DHCMA. The highway transects the northern boreal forest, the Brooks Range, and the tundra of the North Slope and Arctic Coastal Plain. The headwaters of all the major watersheds in the DHCMA are located in the Brooks Range or its foothills. Exceptions are those rivers in the southern portion of the DHCMA with headwaters located in the Kokrine-Hodzana Highlands. Drainages north of the Continental Divide flow north into the Beaufort Sea (Arctic Ocean). Those drainages south of the Continental Divide flow into the Yukon River, and eventually, the Bering Sea.

The accelerating increase of invasive plants in Alaska is broadly recognized as a threat to biodiversity. Often highly competitive with native plant species, invasive plants can have

significant ecosystem-level effects due to the resulting changes to plant community composition and diversity. At least 120 species of invasive plants have been detected in Alaska (AKNHP AKEPIC database 2014), 28 of which have been observed within the DHCMA. To date, no alteration of landscape-level vegetation community structure and function resulting from invasive plants has been observed in the planning area on BLM-managed lands. Ongoing monitoring efforts to track the invasive plant species composition and population distribution have been and should continue to be a management priority to avoid unintended impacts to natural ecological communities.

Invasive plants in the DHCMA occur in disturbed sites along roadways, trails, airstrips, and in communities,. Some invasive plants have been recorded within natural fire boundaries along the Dalton Highway (Villano 2008) and on riverine gravel bars (Wurtz et al. 2008, Gronquist 2008). Impacts to water resources from past, present, and reasonably foreseeable future actions related to invasive plants in the planning area are substantial and considered moderate overall in the DHCMA. The additive effects of control activities as authorized by the Dalton Invasive Species Invasive Plant Management Environmental Assessment (EA) Record of Decision signed in 2013 have been determined not to result in increased impacts to the cumulative case.

Species Composition

The following table lists the common and scientific names for the invasive plants slated for treatment in the planning area, as identified in the Dalton Area Integrated Invasive Plant Management Strategic Plan EA. To date, the majority of, but not all of the listed plant species (see table footnote) have been detected in the planning area.

Table 2.3. Nonnative, Invasive Plants identified for treatment in the Dalton Highway Corridor Management Area 2012-2013

Common name	Scientific name
Yellow toadflax	*Linaria vulgaris*
Common tansy	*Tanacetum vulgare*
Ox-eye daisy	*Leucanthemum vulgare*
Perennial sowthistle	*Sonchus arvensis*
Birdsfoot trefoil	*Lotus corniculatus*
Iceland poppy	*Papaver nudicanle*
Purple sand spurry	*Spergularia rubra*
Spreading bluegrass	*Poa pratensis* var. *irrigata*
Common pepperweed	*Lepidium densiflorum*
Bird vetch	*Vicia cracca*
Herb sophia	*Descurainia sophia*
Meadow foxtail	*Alopecurus pratensis*
Smooth brome	*Bromus inermus*
Narrowleaf hawkweed	*Hieracium umbellatum*
White/yellow sweetclover	*Melilotus officinalis*
Alfalfa	*Medicago sativa* ssp. *sativa*
Alsike clover	*Trifolium hybridum*
Narrowleaf hawksbeard	*Crepis tectorum*
Foxtail barley	*Hordeum jubatum*
Shepherd's purse	*Capsella bursa-pastoris*
Lamb's quarters	*Chenopodium album*
Bluegrass	*Poa pratensis* var. *pratensis*
Prostrate knotweed	*Polygonum aviculare*
Dandelion	*Taraxacum officinale*

Common name	Scientific name
Pineapple weed	*Matricaria discoidea*
Common plantain	*Plantago major*
European stickweed	*Lappula squarrosa*
Slender wheatgrass	*Agropyron* sp.
Spotted knapweed[a]	*Centaurea stoebe*
Canada thistle[a]	*Cirsium arvense*

[a] This species has not been detected in the planning area to date but is demarcated for treatment if detected.

The following table lists the common and scientific names for the nonnative, invasive insects that are established in Interior Alaska forests and which may occur in the planning area (unpublished report, Kruse 2014).

Table 2.4. Nonnative, Invasive Insects in Interior Alaska Forests 2014

Scientific Name	Common Name	Established Range	Host	Date Introduced
[Hymenoptera: Tenthredinidae]; *Pristiphora erichsonii*	Larch sawfly	Throughout interior AK and recently introduced into south-central AK	Tamarack (*Larix larcinia*) and Siberian larch (*larix siberica*);	1968
[Hymenoptera: Tenthredinidae]; *Monsoma pulveratum*	Alder sawfly	Fairbanks through SE, most damaging in SC and MatSu;	Alnus tenuifolia	unknown, but probably during 1990s
[Hymenoptera: Tenthredinidae]; *Eriocampa ovata*	Alder woolly sawfly	Throughout southeast Alaska on *Alnus rubra* and south-central Alaska	*Alnus incana*	unknown but probably in late 1980s
[Hymenoptera: Tenthredinidae]; *Profenusa thomsoni*	Amber-marked birch leafminer	Common in south-central Alaska, also occurs in Fairbanks and Haines (SE Alaska)	native and ornamental *Betula* sp.	probably introduced in the early 1990s.
[Hymenoptera: Tenthredinidae]; *Fenusa pusilla*	Birch leafminer	European origin, occurs infrequently in south-central Alaska	native and ornamental *Betula* sp.	probably introduced in the early 1990s
[Hymenoptera: Tenthredinidae]; *Heterarthrus nemoratus*	Birch edge leafminer	Occurs infrequently in south-central AK	native and ornamental *Betula* sp.	probably introduced in the early 1990s
[Hymenoptera: Ichneumonidae]; *Lathrolestes thomsoni*	Birch leafminer parasitoids			introduced to Anchorage and Fairbanks 2004 – 2011 via Alberta, Canada
Curculionidae, *Otiorhynchus ovatus*	Root (seedling) weevil	Picea, Pinus, Tsuga	root feeder	

Population Distribution

Well-established populations of both *M. alba* and *V. cracca* have been documented in disturbed areas along the Dalton Highway corridor. Records show that by 2003, there was a nearly continuous canopy of *M. alba* along the Dalton Highway north of the Yukon River Bridge from Milepost 56 to about Milepost 70. Newly established populations were observed in 2004, at the Kanuti River crossing at Milepost 106, and by 2005, the continuous infestation had advanced to Milepost 85. In 2009, an estimated 215 acres within the planning area were said to be infested.

It is currently estimated that at least 350 acres of the DHCMA is infested. The northernmost infestation of *M. alba* was observed in 2014 at Milepost 196.

In 2006, patches of *V. cracca* were documented along the Dalton Highway and at one site — Tramway Bar — downstream from the highway on the Koyukuk River. Evidence of *V. cracca* spreading away from the roadside has been observed in recent years, encroaching upon fire scars (Milepost 61) and other areas of anthropogenic disturbance as far north as Milepost 184. Infestations at the road-river interface at Rosie Creek (Milepost 168) and North Bonanza Creek (Milepost 121) are of key management concern.

Treatment

In 2009, 141 acres were recommended for herbicidal treatment or a combination of herbicide, manual, or mechanical control. Up to 300 of the total 350 estimated acres of infestation may be treated with herbicide. Prior to 2009, manual treatment in 2006 removed a total of 2,575 pounds of *M. alba* and *V. cracca* (Dalton Highway Mileposts 104 to 175), including smaller, isolated, point infestations of *Leucanthenum vulgare* (oxeye daisy), *Linaria vulgaris* (yellow toadflax), *Tanacetum vulgare* (common tansy) *and Lotus corniculatus* (birdsfoot trefoil). In 2007, a total of approximately 7,000 pounds of the same target species were removed, having incorporated mechanical methods. In 2008, approximately 1,700 pounds were removed over the same area. Since 2009, although the amount of plants removed has not been quantified, the cooperative manual treatment has continued from 2010 to 2015, and should remain a priority. Future treatment and monitoring of infestations will be considered on a case-by-case basis and plans will be tailored to the specific ecosystem in accordance with the BLM Alaska Land Health Standards and Guidelines (BLM 2004) by which the diversity and ecological health will be measured.

2.1.5.3. Trends

Ongoing inventory and monitoring efforts have been critical in identifying infestation trends. These trends have been observed to correlate with both human and natural roadside disturbances.

Inventory

Inventories can provide fundamental information for assessing trends in invasive plant management by determining the presence, relative abundance, status and distribution of invasive plants. In 2004, the BLM and the University of Alaska Fairbanks Cooperative Extension conducted the first inventory in the DHCMA from the Yukon River Bridge to Milepost 295 (northern extent of BLM lands) with funding from the National Fish and Wildlife Foundation Pulling Together Initiative. In 2006, an invasive plant survey for the Dalton Highway and adjacent lands affected by the 2004 and 2005 wildland fires was conducted in cooperation with the Alaska Natural Heritage Program (AKNHP). The inventory covered a total of five wildland fires: Fort Hamlin Hills (2004), Ray River (2005), Dall City (2004), North Bonanza (2005), and Chapman Creek (2005). The 2004 Evansville Burn was excluded from the surveys because there was no road access to it. Secondary roads and trails were also surveyed for up to 1 mile or until no more invasive species were found. Additional sites included trailheads, fire access roads, and pipeline access roads. A total of 24 nonnative species belonging to 7 families were recorded in the approximately 120 miles of highway and roughly 214 acres of roadside and adjacent lands inventoried.

Before developing a project-level plan for treatment, an updated comprehensive inventory of the *M. alba* and *V. cracca* north of the Yukon River was completed in the 2013 and 2014 field seasons. For the *M. alba* inventory, a rapid assessment approach was taken due to the scope of the infestation. A single observer estimated percent cover in 0.2 mile increments along 8-foot-wide east and west roadside transects. The percent cover was averaged by highway mile and ordered by percent cover class. For the *V. cracca* inventory, an areal approach was taken to give a more precise picture of the current extent of the infestation.

Monitoring

Monitoring efforts have been conducted from 2005 to present. Partners that have contributed include Friends of Alaska National Wildlife Refuges, USFWS, NPS, Committee for Noxious and Invasive Plants Management (CNIPM), AKNHP, Alaska Department of Transportation and Public Facilities (ADO&TPF) and the Alyeska Pipeline Service Company. Ongoing monitoring will prioritize (1) infestations of species that have already been detected spreading into fire-disturbed sites and undisturbed, native communities, (2) populations of highly aggressive species located near a forest clearing, a burned site, or a waterway, giving precedence to those sites with high propagule pressure, and (3) northern advancement. Additionally, following each growing season, each infestation treated should be monitored using photo point referencing, whether it is manual, mechanical, or chemical treatment, to determine if the control method accomplished the goals established for each species. Also, the effectiveness, costs/benefits versus cost/benefit of other alternatives, and projected costs of no action will be considered.

The BLM has not conducted any monitoring focused on the nonnative, invasive insects.

Disturbance Trends

Human disturbance: Public use and commercial traffic combined have contributed to the existing trend of introduction and spread in the planning area. Vectors include vehicle tires and undercarriage, heavy equipment, aviation and boat traffic, as well as foot traffic via clothing, footwear, packs, and tents. Additionally, the transport of contaminated fill material for road maintenance and other activities may contribute to the spread of invasive plants. Invasive plants are also known to spread along vectors such as trails, spur roads, and other heavy use areas including gravel pits, rest stops, airstrips, and mine sites.

Natural disturbance: Wildland fire scars adjacent to roads are considered particularly vulnerable to infestation (Villano and Mulder 2008). Approximately 1,269,000 acres have burned in the DHCMA over the past decade, many of which could be susceptible to invasion by invasive plants for up to 20 years post-fire (CNIPM, 2007). This could be cause for management concern because invasive plants have the potential to out-compete native primary successional plants, altering the course of post-fire vegetation regrowth (Spellman and Wurtz 2010).

Burn scars from wildland fires in recent decades that are adjacent to or intersect the Dalton Highway are: Evansville (2004), Fort Hamlin Hills (2004), Ray River (2005), Dall City (2004), North Bonanza (2005), and Chapman Creek (2005). The invasive plants observed in burn scars in 2007 were *M. alba, V. cracca, B. inermis, C.tectorum, H. umbellatum,* and *M. alba* (Cortés-Burns et al. 2007; Villano 2008; BLM observation 2013). For instance*, M. alba* had spread from the highway's right-of-way into the adjacent, undisturbed shrub understory of a burned black spruce forest in the Jim River Department of Transportation station area (Site #342-2007, North Bonanza

Burn). Similarly, a *V. cracca* population was recorded in 2006, in the Fort Hamlin Hills Burn, which started to colonize the surrounding burned, barren organic/humus soils in 2007.

Nonnative invasive insects are not necessarily associated with disturbance trends in the way nonnative invasive plants are, therefore, are not be addressed here.

2.1.5.4. Forecast

Alaska's cold climate, short growing seasons, and limited human population were once thought to restrict the movement of nonnative, invasive plants. Today, climate models predict that the planning area will be disproportionately impacted by the warming climate in the coming century. The length of summer season is projected to increase and winters conversely are projected to shorten. Striking increases in growing season length are projected across the Interior and northern regions of the state (UAF 2008). With the predicted warming climate and greater levels of both anthropogenic and natural disturbance, boreal habitats in the planning area are forecasted, with considerable uncertainty, to become increasingly vulnerable to invasive plant species. A warming climate could lead to an upward elevational and latitudinal migration of plant species formerly restricted to warmer areas (Tausch 2008). Given the current rate of spread and recent shifts in seasonal patterns of precipitation and temperature, it is expected that infestations will continue to expand north along the Dalton Highway.

Fire frequency and intensity is another factor that could impact nonnative plant infestations in the future. The climate-change-driven increase in frequency of lightning-induced fires has the potential to result in an increase in the number of invasive species populations that move off the human footprint into native ecosystems in the future (Cortés-Burns et al. 2007). The resulting increase in fuel loads associated with the infestation has been shown to lead to increased fire intensity; invasive plants can also decrease fire intensity when they lead to vegetation type conversions that result in plant assemblages with lower fuel loads or less flammable fuels (Brooks et al. 2004). It is unknown whether current infestations in the DHCMA have the potential to contribute to the fuel load.

Resource development trends in the sub-arctic and arctic regions of Alaska suggest an increased risk of spread of invasive plants away from the Dalton Highway. Future oil and gas development could involve new infrastructure of roads, pipelines, power plants, processing facilities, loading docks, camps, airstrips, gravel pits, utility lines, and landfills. New plans for roads to access resources and communities such as the roads to Umiat, Stevens Village (winter only), and Ambler are potential future vectors for the movement of invasive plants. Stipulations to prevent the expansion of the current infestation into previously undisturbed areas are critical for maintaining current levels of ecosystem health. The proposed route to Ambler will follow the existing winter road to Bettles and across State and NPS lands to mining operations near the villages of Kobuk, Shungnak, and Ambler, which are located outside the planning area, and there is potential to extend the road to Nome and the Seward Peninsula. If the road is open to the public, there could be a dramatic increase in propagule pressure extending from the Dalton Highway.

Overall, the Dalton Highway is expected to remain a destination for recreational travelers and commercial users of the area. In addition to anticipated increases in road travel, the intensification of non-motorized modes of travel including recreational boating, cycling, and hiking are also predicted. Since the Dalton Highway provides the only road access to the North Slope and many unique areas found only in Alaska, the demand for public access and recreational activities,

including the intensification of non-motorized modes of travel including recreational boating, cycling, and hiking, are also predicted.

The forecast for nonnative, invasive insects is uncertain.

2.1.5.5. Key Features

The geographic location, distribution, and types of resources affected by nonnative, invasive plant and insect species are described in this section. Nonnative, invasive plants found within the planning area are limited mainly to the Utility Corridor. Areas within the Utility Corridor that are impacted by the growing infestations include, but are not limited to: mineral material extraction sites (gravel pits), commercial and residential in-holdings, trails, and pipeline access roads. These features contribute to the distribution and spread of invasive plants in the region. The risk of introduction and spread should be considered in management decisions involving the affected resources. As for nonnative, invasive insects, no resources are known to be affected, therefore, the geographic location, distribution and types of resources are unknown.

2.1.6. Riparian–Wetland Resources

Value and Background

Within the Central Yukon Planning Area, riparian-wetlands associated with streams and lakes are estimated to make up only 2.4 and 0.7 percent of BLM-managed land respectively. These areas, although small on a special scale, are responsible for some very fundamental ecological functions that extend far beyond their immediate boundaries and the planning area, with region-wide and even statewide implications. In addition to the riparian-wetlands associated with streams and lakes, permafrost-controlled wetlands make up a large portion of BLM lands within the planning area. These areas can extend far beyond the borders of streams and lakes due to the hydrologic connections provided by the permafrost, and the boundary between riparian-wetlands and uplands is not always easy to distinguish.

The BLM defines riparian-wetlands as:

An area that is saturated or inundated at a frequency and duration sufficient to produce vegetation typically adapted for life in saturated soil conditions. It is also a transitional area between permanently saturated wetlands and upland areas often referred to as a riparian area. This transition area has vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Wetlands and wetland transitions are usually managed as a unit. These systems can be either nonjurisdictional or jurisdictional (Pritchard et al. 2003).

Riparian-wetlands constitute some of the most productive lands managed by the BLM and can be thought of as of providing a life-support role (NRC 2002). On a unit area basis, the number and value of biological and physical functions carried out by riparian-wetlands is disproportionate and typically far greater than that of upland areas lacking riparian-wetland characteristics.

The natural functions that riparian-wetlands perform fall into three major categories: (1) hydrology and sediment dynamics, (2) biogeochemistry and nutrient cycling, and (3) habitat and food web maintenance (NRC 2002). These functions are displayed in a variety of services to which society has assigned value. These services include: the maintenance of water quality and water quantity; fish and wildlife production; flood protection; recreational opportunities and

aesthetic value; wildlife viewing opportunities; maintenance of a diverse species composition of plants, animals, birds, fish, insects, and microorganisms; production of wood (for fuel and building material); a moderating influence on the microclimate of streams and forests and related wildland fire behavior; lake shoreline and streambank erosion control; maintenance of stream form; floodplain connectivity; hyporheic and ground water connectivity; exchange of nutrients; and the counter-balancing function of methane release and carbon sequestration as it relates to overall greenhouse gas emission.

The important functions and services that riparian-wetlands carry out have long been recognized. This has resulted in the formulation of regulations and policy directed at their protection. The Federal Land Policy and Management Act of 1976 (FLPMA), the legal foundation for all of the BLM's management actions, identifies the protection of environmental values as a criterion for all management activities. In Title 1, clause (8) FLPMA states: "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; and that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use." To a large degree, the manner in which riparian-wetlands are managed in the future will dictate the BLM's ability to protect the environmental values and elements as mandated by FLPMA. Because of this, it is the BLM's policy to protect and maintain riparian-wetlands so that they are in — or in the case of an impaired condition, improved or restored to — a *proper functioning condition* (BLM manuals 1737 and 1740 and BLM Alaska Land Health Standards; see glossary for definition of proper functioning condition).

In addition to FLMPA, two other important laws direct the BLM regarding management of riparian-wetland habitat. These laws are Executive Order (EO) 11990 — *Protection of Wetlands* and EO 11988 — *Floodplain Management*. Since many riparian-wetlands are located within the floodplain, EO 11988 applies. Both of these executive orders are aimed at protecting riparian-wetlands. EO 11990 requires that federal agencies take action to minimize the destruction, loss, or degradation of wetlands and avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands. In a similar manner, EO 11988, directs federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. In addition to avoidance, EO 11988 has a requirement to minimize, restore, and preserve floodplain function. *Minimize* is a demanding standard that requires the agency to minimize harm to the smallest possible degree (U.S. Water Resources Council 1978). *Restore* focuses on conditions exiting as a result of prior actions, while *preserve* focuses upon the impacts of an action when the floodplain cannot be avoided.

A third law, the Clean Water Act, promotes the protection of riparian-wetlands in section 404 (administered by the Army Corps of Engineers) and section 319. Section 319 directs each state to come up with a non-point source pollution control strategy. In Alaska, the Department of Environmental Conservation leads coordination efforts aimed at meeting the goals of the State's strategy. The strategy acknowledges the importance of everyone working together to meet the goals of the strategy and the Clean Water Act. Federal agencies are identified as cooperators that are responsible for a variety of roles ranging from the protection of water quality and implementation of the Clean Water Act, to federal oversight of fisheries, wildlife, and wetlands on federal lands. The BLM is one of the cooperating agencies in Alaska.

As part of Alaska's overall non-point source pollution control strategy, it is recognized that appropriate land use planning is necessary to meet the desired protection of sensitive ecological areas, minimize land disturbance, and retain natural drainage and vegetation whenever possible. In addition, the State's strategy identifies specific goals for reducing non-point source pollution from hydro-modification. This is important because hydrology is one of the formative processes dictating riparian-wetland form and function. The goals addressed in Alaska's non-point source pollution control strategy for hydro-modification include: maintaining water quality and quantity in watersheds and maintaining healthy populations of plant and animal species through maintenance of aquatic and riparian habitats necessary to sustain them.

Beyond the protective requirements established by law and policy, the high degree of uncertainty associated with climate change will be a guiding consideration in how the BLM manages its riparian-wetlands. Given current climate predictions for Alaska and the role that riparian-wetlands play in maintaining water quality, moderating thermal conditions, and maintaining linkages to more suitable habitats in the form of travel corridors for fish and wildlife, riparian-wetlands are expected to play a key role in the BLM's ability to meet its FLPMA protection and sustained yield mandates.

2.1.6.1. Indicator

Riparian-wetlands are a key component of, and dependent on, the overall ecological condition of the watershed as a whole. Because riparian-wetlands are a transitional area between terrestrial uplands and the aquatic environment, they are strongly influenced by the land management prescriptions in the upper watershed. Upslope management can significantly alter the magnitude, timing, and duration of overland flow; the production of sediment; and the quality of water arriving in downslope riparian-wetland areas. This, in turn, dictates whether a riparian-wetland can provide the services it would normally be capable of providing when functioning at its full potential.

As a means of quantifying the current and projected functional status of riparian-wetlands within the planning area, the method of watershed condition classification developed by the U.S. Department of Agriculture (USDA), Forest Service was applied (USDA 2011 and Potyondy and Geier 2011). The USDA's classification framework defines watershed condition in terms of geomorphic, hydrologic, and biotic functionality relative to potential natural condition. The USDA's classification matrix was modified for application to the Central Yukon Planning Area by reducing the number of watershed condition indicators from 12 to 8 (section 2.1.7, Table 2.5). The indicators are surrogate variables representing the underlying ecological, hydrological, and geomorphic functions and processes that affect watershed condition and drive the processes that ultimately dictate the form and function of riparian-wetlands. Some of the USDA indicators used in the original classification were eliminated because they were not applicable to the planning area (for example the *rangeland vegetation condition* indicator). Other indicators were modified to allow their use with available data, as was done for *soil condition*.

The watershed classification will be conducted at the scale of the 6th level hydrologic unit and is automated to the extent possible using existing data and ArcGIS, version 10.1. The classification is anticipated to be complete by spring of 2016.

2.1.6.2. Current Condition

One of the objectives of conducting the watershed condition classification is to determine the current functional status of riparian-wetlands within the planning area. Upon completion of the classification, watersheds (6th level hydrologic units) having BLM-managed lands will have been placed in one of three categories: those functioning at their natural potential, those functioning-at-risk, and those in an impaired condition. At the conclusion of the classification, the proportion of each category will be calculated and provide a complete picture of the current functional status of riparian-wetlands on BLM-managed lands within the planning area.

In general, most of the planning area is not accessible by road, and therefore, has not been exposed to land use activities normally associated with disturbance to riparian-wetlands. A majority of the at-risk or impaired watersheds are expected to be located along major transportation corridors such as the Dalton Highway.

2.1.6.3. Trends

Since about the mid to late-1980s (the time in which the current Central Yukon and Utility Corridor resource management plans were approved), there has been a declining trend in watershed condition and the associated functioning status of riparian-wetlands on BLM-managed lands within the planning area. To a large degree, this has been the result of a relatively slow but continuous authorization of land use activities that have modified the fundamental geomorphic and hydrologic processes that create and maintain riparian-wetlands. The slow but steady pace of development in conjunction with the slow rate of riparian-wetland recovery has resulted in the declining trend.

Rates of recovery on disturbed sites are quite variable and are influenced not only by the natural conditions that define the subarctic environment but by the post-land use rehabilitation practices used. The subarctic environment is characterized by having a short growing season; low temperature; nutrient poor soils; and relatively low precipitation (Chapin III et al. 2006) which all act to limit plant growth. These already limiting conditions, coupled with the more common passive rehabilitation practices (e.g., allowing for natural revegetation), can dramatically prolong riparian-wetland recovery.

In the absence of human intervention, the time required for a riparian-wetland area to attain proper functioning condition after major disturbance is dictated by the pace of natural processes and is commonly considered to be within a multi-decadal time scale (Tidwell et al. 2000, Arnett 2005, Viereck et al. 1993; Hupp and Simon 1991). In some cases, land use activities have resulted in an irretrievable loss of riparian-wetlands, such as when a permafrost layer is altered and the hydrologic conditions that supported the riparian-wetland no longer exist.

The fundamental geomorphic processes that form and maintain riparian-wetlands are erosion, transport, and deposition of water, sediment, solutes, and organic material. The basic hydrologic processes include: surface and subsurface water flow, infiltration, exfiltration, and evapotranspiration. Under natural conditions, the hydrologic processes control the frequency, intensity, duration, and spatial extent of the geomorphic processes, but also supply riparian-wetlands with water through a system of surface and groundwater connections (Naiman et al. 2005). Anthropogenic (human-caused) disturbances to riparian-wetlands alter the natural regime of hydrologic and geomorphic processes, resulting in the loss or reduced functional capability of riparian-wetland communities.

Since the authorization of the current land use plans (Central Yukon and the Utility Corridor), the land use activities that have been most detrimental to riparian-wetlands are mining and infrastructure construction. Included in the last category would be land clearing and the associated construction of roads, trails, buildings, storage areas, parking areas, airstrips, flood control structures, and other artificial structure. In addition to mining and construction, climate change is predicted to play a major role in determining the future form and function of riparian-wetlands. Within this century, Alaska is projected to undergo substantial increases in air temperature and precipitation (Karl et al. 2009; SNAP 2013). If these projections prove to be accurate, then we can expect substantial changes to the current patterns of erosion, water and sediment transport/deposition, and the frequency, duration, intensity, and timing of flooding. These changes could define a very different (and highly uncertain) landscape in terms of the special extent, functions, and the services provided by riparian-wetlands.

2.1.6.4. Forecast

In light of the lengthy recovery times associated with riparian-wetlands, and the fact that certain permafrost-controlled non-riparian wetlands cannot be rehabilitated following disturbance, the forecasted trend for riparian-wetlands, given current management prescriptions and land use allocations, is for a continued downward trend. The rate at which the downward trend continues will be dictated by changes in climate, the type and amount of land use, and the vulnerability of the watershed to disturbance. Changes in technology, improved access, and population growth will influence the intensity and pattern of land use. The anthropogenic drivers of change will be similar as to those described under *Trend*.

The vulnerability of watersheds to future disturbance will be evaluated at the scale of the 6th level hydrologic unit and using the same method, but different attributes as used in the watershed condition classification described under *Indicators*. Watershed vulnerability was classified based on the following attributes: average valley slope, presence of permafrost, ratio of valley width to floodplain width, average hillslope within the watershed, aquatic habitat loss due to change in water temperature (based on climate change models), presence of valid existing rights (e.g., mining claims), presence of rights-of-way, status of navigability, proportion of watershed available for resource extraction and development, proportion of watershed with formal protected status, potential of land conversion (percent) from its natural condition, and mineral potential.

2.1.6.5. Key Features

The geographic location and distribution of riparian-wetlands can be described as transition zones between the aquatic environment of streams, rivers, lakes, and ponds and the terrestrial uplands. In addition, those areas underlain by permafrost generally meet the definition of a riparian-wetland. The riparian-wetland transition zones are defined by vegetation or physical characteristics reflective of permanent surface or subsurface water influence. In addition to the immediate area defining the riparian-wetland, their form and function depends on the overall ecological condition of the watershed. Because riparian-wetlands are a transitional area between terrestrial uplands and the aquatic environment, they are strongly influenced by the land management prescriptions in the upper watershed.

2.1.7. Fish and Aquatic Species

2.1.7.1. Indicator

Fisheries Value and Watershed Condition indexes are being developed for the Central Yukon Field Office in conjunction with this plan as indicators of the value and current status of aquatic resources and habitat. Watersheds will be evaluated for each index after they are segregated by area using 6th level hydrologic units codes. The hydrologic unit system is being used because it provides a framework that delineates watersheds using an accepted national standard hierarchical system based on surface hydrologic features.

Parameters to be used in the fisheries value rating include presence or absence of: special status species, essential fish habitat, non-salmon diadromous (migratory between salt and fresh waters) species, important recreational fisheries, subsistence use areas, and unique or rare fishery habitat/resources. Fish species diversity (number of species) will also be used to evaluate quality within the watershed. Current watershed condition will be evaluated as a measure of aquatic habitat health. The indicators to be used in the evaluation were adapted from a Forest Service Watershed Condition Classification Technical Guide (Potyondy and Geier 2011). Modifications and additional indicators were formulated by BLM Central Yukon Fisheries Biologists. Attributes used to define watershed health include eight physical and biological indicators found in aquatic and terrestrial environments (Table 2.5). Each indicator will be evaluated using a defined set of attributes. The number of attributes selected to evaluate the indicators varies from as few as one to as many as four. It is anticipated that the ranking of fisheries values and watershed condition will be complete in time to incorporate the findings into the plan alternative formulation process.

Table 2.5. Description of Watershed Condition Indicators

Aquatic Physical Indicators	**Description of Indicator**
Water Quality	This indicator addresses the expressed alteration of physical, chemical, and biological components of water quality.
Water Quantity	This indicator addresses changes to the natural flow regime with respect to the magnitude, duration, or timing of the natural streamflow hydrograph.
Aquatic Habitat	This indicator addresses aquatic habitat condition with respect to habitat fragmentation, large woody debris, and channel shape and function.
Aquatic Biological Indicators	**Description of Indicator**
Aquatic Biota	This indicator addresses the distribution, structure, and density of native and introduced aquatic fauna.
Riparian/Wetland Vegetation	This indicator addresses the function and condition of riparian vegetation along streams, waterbodies, and wetlands.
Terrestrial Physical Indicators	**Description of Indicator**
Roads and Trails	This indicator addresses changes to the hydrologic and sediment regimes because of the density, location, distribution, and maintenance of the road and trail network.
Soils	This indicator addresses alteration to natural soil condition, including productivity, erosion, and chemical contamination.
Terrestrial Biological Indicators	**Description of Indicator**
Terrestrial Invasive Species	This indicator addresses potential effects on soil, vegetation, and water resources because of terrestrial invasive species (including vertebrates, invertebrates, and plants).

2.1.7.2. Current Condition

A variety of fish habitat exists due to the wide range of geography and climate conditions of the planning area. Lakes and rivers are located over diverse terrain. Drainages north of the Brooks Range discharge to the Arctic Ocean, and the majority of drainages south of the Brooks Range drain into the Yukon River and eventually discharge to the Bering Sea. A few watersheds drain into either Kotzebue Sound or Kuskokwim Bay. High-gradient streams exist in the mountains and foothills, while slow meandering streams flow through the relatively flat lowland areas. The origin and geomorphology of lake basins influence their productivity and subsequent use by fish. Due to high habitat diversity, a majority of the fish species native to Interior Alaska inhabit waters on BLM-managed land. Table 2.6 below lists the 25 species of fish, representing 9 different families, known to exist on BLM-managed land in the planning area.

Table 2.6. Fish species present in BLM-managed watersheds in the Central Yukon Planning Area.

Family	Scientific name	Common name
Catostomidae	*Catostomus catostomus*	longnose sucker
Cottidae	*Cottus cognatus*	slimy sculpin
Cyprinidae	*Couesius plumbeus*	lake chub
Esocidae	*Esox lucius*	northern pike
Gadidae	*Lota lota*	burbot
Gasterosteidae	*Pungitius pungitius*	ninespine stickleback
Petromyzontidae	*Lampetra camtschatica*	arctic lamprey
Salmonidae	*Coregonus nelsoni*	Alaska whitefish
	Coregonus autumnalis	arctic cisco
	Coregonus laurettae	Bering cisco
	Coregonus nasus	broad whitefish
	Coregonus pidschian	humpback whitefish
	Coregonus sardinella	least cisco
	Prosopium cylindraceum	round whitefish
	Stenodus leucichthys	sheefish/inconnu
	Oncorhynchus gorbuscha	pink salmon
	Oncorhynchus keta	chum salmon
	Oncorhynchus kisutch	coho salmon
	Oncorhynchus nerka	sockeye salmon
	Oncorhynchus tshawytscha	Chinook salmon
	Salvelinus alpinus	arctic char
	Salvelinus malma	Dolly Varden
	Salvelinus namaycush	lake trout
	Thymallus arcticus	arctic grayling
Umbridae	*Dallia pectoralis*	Alaska blackfish

Species Status

The BLM's fisheries program is responsible for protecting fish habitat. The State of Alaska, Department of Fish and Game (ADFG) has management authority over commercial, sport, and personal use fisheries in the State of Alaska. Subsistence fisheries are managed by ADFG in State waters and by the Federal Subsistence Board in federal public waters.

Currently, fish populations appear to be sustaining themselves, though population data are limited. Fish are harvested in select areas that support sport, subsistence, and commercial fisheries.

Sustainable harvest is due, in large part, to the fact that most of the aquatic habitat in the planning area is in pristine condition, while harvest is relatively light and not concentrated geographically. Resident species, including primarily arctic grayling, northern pike, Dolly Varden, arctic char, and lake trout are able to support active sport fisheries that occur mainly along the Dalton Highway. Populations of anadromous and resident fish support subsistence harvest, though low chum and Chinook salmon returns have necessitated restrictions on both commercial and subsistence fishing over portions of the life of the current plans. There is no ongoing harvest of fish for commercial purposes on BLM-managed lands. However, BLM-managed waters do produce fish (i.e., salmon) that are subsequently caught and sold in the Yukon River commercial fishery.

None of the fish species present in the planning area are listed as threatened, endangered, or sensitive. The special status species selection process for BLM Alaska, last updated in 2010, did identify several species for which data were insufficient to satisfy the Special Status Species Manual eligibility criteria. Population concerns did provide justification to re-evaluate their status in the future. These species are referred to as "watch species," because the BLM needs additional data to determine their status. Watch species exhibit one or more of the following characteristics:

- Insufficient or contradictory data exists to reasonably assess population or habitat trends;
- Regional adaptations are expressed that may ultimately be determined by the scientific community as distinctive and important for overall species conservation;
- Potential threats to the species are poorly understood;
- Species are rare and do not occur within several kilometers of BLM-managed lands, but potential habitat may exist on BLM-managed lands.

The Central Yukon Planning Area includes one watch list fish species, chum salmon, which occurs on Clear Creek in the Hogatza River drainage.

As part of their management obligations, ADFG is responsible for determining and maintaining a list of endangered species in Alaska under AS 16.20.190. Currently, there are no fish species on this list (ADFG 2013a).

The Policy for the Management of Sustainable Salmon Fisheries (SSFP; 5 AAC 39.222, effective 2000, amended 2001) directs the ADFG to provide the Alaska Board of Fisheries with reports on the status of salmon stocks and to identify any salmon stock that presents a concern. The SSFP defines three levels of concern (yield, management, and conservation) with yield being the lowest level of concern and conservation the highest level of concern. 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 2013b).

Habitat Condition

Based on current lands status, the BLM estimates there are 121,283 miles of stream with 31,432 miles on BLM-managed land. There are also approximately 950,968 acres of lakes and ponds with 76,332 acres on BLM-managed lands. Though not all of these waterbodies support fish, the planning area contains numerous streams inhabited by resident and diadromous (includes anadromous) fish species. In addition, there are many lakes and off-channel habitats in the planning area that support native fish species.

Waterbodies cataloged as anadromous are defined through the State of Alaska's *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (ADFG 2014). Waterbodies in the Anadromous Waters Catalog reflect the extent of habitat use documented

through fish surveys, but do not necessarily represent the actual limits of species habitat. A comprehensive catalog of habitat used by resident fish species is not available.

Habitat requirements for fish include a healthy functioning aquatic ecosystem consisting of a biological community, as well as the proper physical and chemical attributes (Beechie et al. 2010). The majority of the aquatic habitats the BLM manages within the planning area are in natural or near natural condition. In those locations, some of the more important attributes such as channel shape and function, lake bank/shore integrity, soil condition, water quality and quantity, floodplains, and riparian areas are considered as functioning properly and meeting site potential. Each of these parameters has an important role in maintaining a stable aquatic environment that allows fish to live and reproduce. Given the lack of habitat degradation, the portion of the biological community that includes aquatic plants (producers), bacteria and fungi (decomposers), and invertebrates (consumers) is also anticipated to be functioning at site potential.

A small percentage of the watersheds in the planning area has been disturbed by anthropogenic activity. Most of these watersheds are near inhabited areas and/or in locations where access has been developed. Some examples of human presence are described below.

There are 24 villages located within the planning area. They have varying degrees of development with most located along a waterway. Some of the villages are connected by seasonal trails that parallel and cross streams. The Trans-Alaska Pipeline System and the infrastructure to support it, namely the Dalton Highway, pump stations, spur roads, buried communication cables, and gravel pits, is the most extensive area of development in the planning area. There are also roads and trails, most of which are located in the vicinity of the Dalton Highway, which provide access to placer gold mining operations, communication and research sites, and public service areas. One road provides winter access from the City of Bettles to the Dalton Highway. Active placer gold mining operations, the majority of which are located in the Koyukuk drainage, are also a source of disturbance.

Fish resources are impacted to varying degrees in the disturbed watersheds based on the type, extent, and duration of development. Placer gold mining is currently the activity that impacts aquatic resources to the greatest degree within the planning watersheds. In general, placer gold mining practices often alter stream channels, floodplains, and riparian vegetation. This leads to increased sediment input into streams with concurrent impacts to water quality and fish resources. These impacts remain until channels and floodplains are reestablished and vegetation can become rooted with sufficient density and mass to stabilize the disturbed stream banks and floodplains. The return of the habitat to a functioning condition, in turn, allows the biological resources, including fish, to reestablish use patterns similar to what they were when the site was undisturbed.

During the life of the Central Yukon and Utility Corridor plans, reclamation at mechanized placer mining sites has consisted largely of leaving the stream in either its bypass channel or returning it to a newly built channel when the stream is mined. The overburden and tailings are contoured to the surrounding topography. Operations that did not disturb the channel have been required to reshape and contour the disturbed ground. Post-reclamation recovery, especially within disturbed channels, is still in progress, and may take decades (Tidwell et al., 2000, Arnett 2005), as a series of adjustments to sediment inflow/outflow, channel slope, and sinuosity occur and vegetation reestablishes itself in the floodplain.

In any given watershed, there will likely be discontinuous blocks of disturbed ground within the floodplains of the mined streams for as long as mining occurs. Though there is a known reduction in available fisheries habitat in mined streams, the full extent to which mining activities have

impacted fish populations is unknown because pre-mining fisheries data are unavailable for many streams.

The Trans-Alaska Pipeline System and associated development, the Dalton Highway, off-highway roads and trails, gravel pits, and staging and public service areas also impact fish habitat and resources. Sediment that reaches streams from these ground-disturbing activities affect fish directly when suspended in the water column and impact fish habitat downstream of the source. Using effective mitigation and avoiding ground disturbance that would lead to concentrated runoff are measures being used to minimize or eliminate sediment delivery. Impacts from erosion for these activities are less than in placer mining operations, except in areas where the vegetation cover is heavily disturbed near a waterway or where stream channel or lake morphology is altered.

As discussed in this section, changes to freshwater habitat influence the productivity of resident and anadromous fish populations. It is worth noting that fish species that spend part of their life in salt water (diadromous species) face additional influences. Due to their life cycle, these fish are exposed to a fluctuating ocean environment. These conditions, all of which can affect their production, are not controlled by BLM management.

2.1.7.3. Trends

Since the signing of the Utility Corridor Plan Record of Decision (ROD) in 1991, and the Central Yukon ROD in 1986, disturbed watersheds within the planning areas that are managed primarily by the BLM have experienced downward trends in fish habitat condition. This is due in large part to a steady increase in development. Most of the impact is tied to locatable mineral extraction occurring along the Dalton Highway and at remote sites scattered throughout the planning area. With the rise in gold prices between 2009 and 2013, the BLM has seen greater interest in placer mine development. New starts of mechanized operations on Marion Creek (previously undisturbed) and additional mining and access requests on the South Fork Koyukuk are two examples.

When written, the Utility Corridor RMP (1989) outlined current (as of 1987) and projected placer mining activity over the 10-year life of the plan. In 1987, there were 33 active operations with a projection for 36 active operations during the life of the plan. At the start of 2014, there were 58 open case files (33 active) tied to the Utility Corridor RMP area (Tyler Cole, BLM 3809 Compliance per comm.) and another 11 open case files for the Central Yukon RMP area. The mining activity from these 69 open case files, plus activity from an unknown number of case files that have been closed over the life of these two plans, represents disturbance to the land that is still in various stages of recovery.

As discussed in the previous section, post-reclamation recovery of mine sites to a condition usable by fish can take decades. It is reasonable to assume, especially within channels disturbed over the life of these two plans, that fish habitat recovery is still in progress, as a series of adjustments to channel slope and sinuosity occur, sediment loads balance, banks stabilize, and vegetation reestablishes itself in the floodplain and valley benches.

Other development activities, including the Trans-Alaska Pipeline System and associated development, the Dalton Highway, off-highway roads and trails, gravel pits, and staging and public service areas also contribute lesser amounts of fine sediment to aquatic habitat. Use of mechanized equipment and transport of petroleum products via the pipeline and along the Dalton Highway are ongoing potential sources of spills that can impact fish and other aquatic resources.

2.1.7.4. Forecast

The majority of the aquatic habitats that BLM manages within the planning area are in natural or near natural condition and fish populations are overall, in good condition. As human activity increases, especially in road-accessible areas, an increasing number of watersheds and accompanying fish habitat and populations may be negatively affected. Future drivers related to access and development that could change aquatic conditions include building new mineral and oil and gas transportation routes, pipeline construction, as well as continuation of ongoing mining, road maintenance, and oil transportation activities. These land uses often lead to increased erosion, channel alterations, fuel spills, changes in water quality, and riparian vegetation loss that are key factors influencing the status of fish populations. Though not controlled by BLM management, climate change is also a likely driver of change to fish and their habitat. Some specific examples of future drivers of change and predicted alteration in the condition of fish resources are presented below.

The Utility Corridor has received interest from the State of Alaska and private entities in recent years for transporting natural gas from the North Slope. If this interest materializes to construction, the BLM will need to permit gravel extraction and the building of roads, pipeline, and facilities. Stream crossings and water withdrawal are a necessary part of construction. At a minimum, there will be short-term impacts to fish habitat.

The development of road systems accessing the Dalton Highway as part of plans to extract minerals west of the Dalton Highway is also an emerging concern. The Ambler Road proposal, though not finalized, has one route that would cross BLM-managed land at the South Fork Koyukuk and Jim Rivers along the Bettles Road. The proposed Umiat Road, with an alternative that leaves the Dalton Highway in the vicinity of Toolik Lake, would traverse west on BLM-managed land towards Umiat. Stream crossings and potential gravel pit development are a necessary part of construction. At a minimum, there will be short-term impacts to fish habitat.

BLM Alaska is undertaking an evaluation of mining reclamation practices that may lead to recommendations for improved management practices. As these changes are incorporated into future management, the success of mining reclamation should improve, thereby improving the quality of fisheries habitat and the status of fish populations in the planning area.

If, as predicted, climate change warms aquatic habitat in Alaska, there will be changes to water quality and quantity. Changes in water temperature and hydrology will directly affect habitat suitability, and ultimately, the distribution of fish species (Clark et al. 2010).

In addition to the Fisheries Value and Watershed Condition indexes described in the Indicator section, the Central Yukon Field Office is also developing a suite of vulnerability criteria that measure the susceptibility of the watershed to change. Watershed vulnerability will be assessed based on the following attributes: average valley slope, presence of permafrost, ratio of valley width to floodplain width, average hillslope within the watershed, aquatic habitat loss due to change in water temperature (based on climate change models), presence of valid existing rights (e.g., mining claims), presence of rights-of-way, status of navigability, proportion of watershed available for resource extraction and development, proportion of watershed with formal protected status, potential of land conversion (percent) from its natural condition, and mineral potential. It is anticipated that the ranking process will be complete in time to incorporate the findings into the development of alternatives and management prescriptions.

2.1.7.5. Key Features

Key areas for fish are those habitats that support specific life stages and provide connectivity as fish move between habitat types as part of their life cycle. Human use of fish through subsistence, commercial, and sport harvest also guides land use allocation and management.

Known important watersheds include those with streams that were previously designated as ACECs in the Central Yukon and Utility Corridor plans because of their high quality fish habitat. Additional streams such as Accomplishment Creek, Section Creek, South Fork Koyukuk River, Teedriinjik (Chandalar) River, Wheeler Creek, Klikhtentotzna Creek, and Sethkokna River also have a high level of importance either as habitat or to users.

The fish resource values within each 6th level watershed located in the planning area will be determined through the Fisheries Value rating index developed for the Central Yukon Field Office in conjunction with this plan. Once completed, these data will help guide land use allocation and management decisions related to aquatic resources.

2.1.8. Wildlife

Wildlife management is a subactivity (6500) of the BLM Manual and includes management of wildlife habitat on public lands. It is BLM policy to manage habitat with emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on public lands. Except in special cases, responsibility for managing wildlife populations rests with the State of Alaska. Marine mammals, migratory birds, and federally listed threatened or endangered species are, in part, the responsibility of the federal government. In Alaska, subsistence harvest management and co-management of subsistence species populations on federal lands are also federal responsibilities. Co-management of wildlife is a feature unique to federal lands in Alaska. BLM can only manage subsistence wildlife species on federal lands; outside of federal lands, wildlife population management is under the authority of the ADFG. For subsistence game species on federal lands, BLM should manage populations to sustain viable populations for subsistence use. BLM must ensure close cooperation with ADFG to manage sustainable populations.

The objective of wildlife habitat management on public lands is the conservation and rehabilitation of fish, wildlife, and plant resources consistent with multiple use management principles. Additional program-specific goals are found in the 6500 Manual series (BLM 1988a) and are: *to ensure optimum populations and a natural abundance and diversity of wildlife resources on public lands by restoring, maintaining, and enhancing habitat conditions; ensure that big game and upland game species on public lands are provided habitat of sufficient quantity and quality to sustain identified economic and social contributions to the American people; help perpetuate a diversity and abundance of waterfowl for the Nation by managing the wetlands and other habitats on the public lands that are of importance to the maintenance of waterfowl; provide suitable habitat conditions for birds of prey on public lands through the conservation and management of essential habitat components, including prey species, especially in areas where birds of prey concentrate during some period of the year, or in important habitats where populations are suppressed; and manage riparian areas to achieve a healthy and productive condition for longterm benefits and values.*

In the planning area, wildlife habitat management focuses on conservation and monitoring efforts rather than rehabilitation, because few resources are impacted to the extent that rehabilitation

work is necessary. Exceptions to this are areas in the planning area, specifically in the Dalton Highway corridor, where human activities such as mining have locally impacted fish and wildlife habitat. In addition to emphasizing wildlife habitat management that is consistent with the State of Alaska's wildlife population management objectives, the Central Yukon Field Office conducts wildlife population monitoring to support the goals of the Federal Subsistence Management Program, which include providing for continued opportunities to pursue a subsistence lifestyle for rural Alaskans on federal public lands and waters, and maintaining healthy populations of subsistence fish and wildlife resources.

2.1.8.1. Indicator

The Threatened and Endangered, Native, and Locally Important Species Standard in the BLM Alaska Land Health Standards and Guidelines (BLM 2004) focuses on retaining natural populations and restoring viable native plant and animal species, populations, and communities. The corresponding goal of this standard is to ensure that *habitats support healthy, productive, and diverse populations and communities of native plants and animals (including threatened, endangered, and other special status species of local importance, e.g. those used for subsistence)*. To achieve this goal, the BLM should ensure that essential habitat elements for species, populations, and communities are present and available to the extent that they are consistent with the potential/capability of the landscape. Potential success indicators that ensure this objective is being met include: plant community composition and productivity, animal community composition and productivity, habitat elements, spatial distribution of habitat, habitat connectivity, population stability and resilience, and disturbance regimes such as wildland fire history.

There are 26 Game Management Units in Alaska. The Central Yukon Planning Area includes part or all of 6 Game Management Units, with the majority of BLM-managed lands in units 20, 21, 24, and 26B. The ADFG establishes species-specific goals and objectives for each Game Management Unit or subunit. When possible, the ADFG establishes a target harvestable surplus goal using sustained yield principles. These goals, along with a summary of population-monitoring activities, population trends, and harvest data, are included in Inventory and Management (I&M) reports published periodically (every 2 to 5 years) by the ADFG. Specific indicators of wildlife community composition health and productivity include animal distribution, population estimates and trends, sex/age demographics, recruitment and survival rates, and indicators of nutritional health such as animal weight, reproductive rates and range use. Habitat quality evaluation may include seasonal browse studies or forage monitoring, determining nutritional quality, evaluating natural fire regime impacts on habitat, and monitoring changes in habitat over time. ADFG I&M reports are available on the ADFG website at http://www.adfg.alaska.gov/index.cfm?adfg=librarypublications.wildlifemanagement.

2.1.8.2. Current Condition

Moose (*Alces alces*)

Moose are present throughout the planning area at elevations below 3,000 feet. They are generally associated with deciduous shrub, wetland, and riparian habitats. The North Slope is the northern range extent of moose in North America. Moose are valued as a subsistence food resource by both rural and non-rural residents, and many moose hunters travel great distances in pursuit of this animal. Moose populations are carefully monitored, particularly in areas where hunting pressure or demand are high.

The current condition of moose in the planning area varies by region. At the northern extent of the species' range in Unit 26B, moose populations are limited naturally by poor browse quality and consequent malnourishment, mineral deficiency, and disease, as well as predation, and resource competition with snowshoe hares (Carroll 1998, Lenart 2010). Moose tend to be concentrated in the northern foothills of the Brooks Range, and in limited habitat available along riparian corridors on the North Slope. Moose densities in the upper Koyukuk River drainage (Units 24A and B) are low (less than 1 moose per square mile). Densities in the lower Koyukuk drainage and middle Yukon River (Units 21 and 24C and D) are moderate to high (3 to 15 moose per square mile) (Hollis 2011) and moose can be locally abundant. High predation rates by bears and wolves maintain populations at low densities in Units 24B, 20F, and parts of Unit 21 (Gasaway et al. 1992, Boertje et al. 2009, Hollis 2010b). Habitat quality and quantity are high in both Unit 21 and 24, evident by high twinning rates, low browse removal rates, and healthy animals. Harvest pressure in Unit 24 is low due to limited access and low densities. The lower Koyukuk drainage and tributaries of the Yukon River in Units 24 and 21 receive substantially higher hunting pressure from both local and non-local hunters.

User conflict and the need for regulation change precipitated the establishment of the Koyukuk River Moose Hunters' Working Group in the late 1990s. ADFG, in cooperation with the working group, published the Koyukuk River Moose Management Plan in 2001, which was designed to maintain harvest opportunities and balance the interests of diverse user groups while still adhering to sustained yield mandates. Many of the management goals and objectives established for moose in Units 21 and 24 are a result of the Koyukuk River Moose Hunter's Working Group.

Most Game Management Unit specific management goals and objectives established by ADFG for the planning area focus on maintaining or exceeding a minimum population size, achieving appropriate sex and age class ratios, providing for sustained harvest rates, and implementing projects to locally enhance moose habitat. Most of these objectives are being met for Units 26B, 24, 21, and 20F, with the exception of (1) population objective for Units 24, and (2) implementing habitat enhancement projects for Units 21B and 24 (Hollis 2010b, Hollis 2011, Lenart 2010).

BLM program management goals relevant to moose include *ensur[ing] a natural abundance and diversity of wildlife resources on public lands by restoring, maintaining*, and *enhancing habitat conditions and ensur[ing] that big game on public lands are provided habitat of sufficient quantity and quality to sustain identified economic and social contributions to the American people.* Alaska is unique in that ecosystems are generally intact and large-scale habitat rehabilitation efforts are not necessary to reestablish natural abundance and diversity of wildlife on public lands. As such, these goals are being met. However, coordinating with ADFG to enhance local habitat conditions, which is a BLM mandate and frequently a State Game Management Unit specific management objective, is an opportunity that should be explored further.

There are a number of federal and state moose hunts in the planning area. The most common access methods are by boat, airplane, and non-motorized access from the Dalton Highway. Bow hunting in the DHCMA (Unit 24A) is currently under a draw hunt. Unit 26 lands in the planning area are closed to moose hunting under both state and federal regulations. The BLM administers one federal moose hunt in Unit 24 (FM2405), and co-manages a federal winter moose hunt in Unit 21 (FM2106) in cooperation with the USFWS.

Caribou *(Rangifer tarandus)*

Caribou are large, social ungulates that inhabit arctic and alpine tundra and the boreal forest. There are four subspecies of caribou in North America, and one, the barren ground caribou, is present in Alaska. Caribou herd populations are naturally cyclic, but the timing and extent of population growth and decline is difficult to predict. Population decline can be influenced by overhunting, varying weather patterns and inter-annual seasonal variability in phenology, population density, predation by wolves and bears, and disease outbreaks (ADFG 2013c). Caribou herd ranges often overlap, but because caribou have high fidelity to calving grounds they are distinguished as separate herds based on distinct calving grounds.

Caribou in the planning area are an important subsistence resource. They can be abundant, but their movements are subject to high inter-annual variability, particularly in the periphery of their winter range. Many rural communities in the planning area are located in this outer range (Figure C.4), and experience challenges associated with finding food substitutes for caribou in years when they are locally absent. Caribou are also important game species for non-local hunters. User conflict between rural residents, non-local hunters, guides, and transporters persist as challenges in herd management. Most of the user conflict is outside the planning area in Unit 23. However, these issues affect wildlife resources that utilize BLM-managed lands in the Central Yukon region, and localized user conflict there is occasionally problematic.

Eleven caribou herds are present in the planning area either seasonally or year-round (Figure C.4). Four large (50,000+ animals), migratory herds, the Western Arctic and Central Arctic, and to a lesser extent, the Teshekpuk and Porcupine herds, occupy lands in the planning area as part of their winter range. These herds migrate hundreds of miles between their summer and winter ranges. During winter, scattered groups of these animals range throughout the Utility Corridor and Middle Yukon Drainages subunits. The Galena Mountain, Wolf Mountain, Ray Mountains, and Hodzana Hills herds range entirely within the planning area. These herds are small (less than 2,000 animals) and have relatively small home ranges associated with isolated alpine regions north of the Yukon River. The majority of the Sunshine Mountains and Denali ranges are in the Bering Sea-Western Interior (BSWI), and the Delta herd range is in the Central Yukon Planning Area but does not include BLM-managed land.

Western Arctic Caribou Herd

The Western Arctic Caribou Herd (WAH) ranges over 157,000 square miles of northwestern and Interior Alaska (Figure C.4). The calving grounds are located outside the planning area in the NPR-A, which is managed by the BLM Arctic Field Office and addressed in the NPR-A Integrated Activity Plan (2008). While western portions of the Utility Corridor Subunit are in the summer range, the WAH is present on BLM-managed lands in the Central Yukon Planning Area in the winter.

The WAH is a vital resource for many rural communities in northwestern Alaska, and the herd is carefully monitored and studied as a result. The size of the herd has fluctuated over the last 40 years. The lowest recorded population estimate was 75,000 animals in 1976. The herd grew steadily until 2003, when it reached a record size of 490,000 animals (Dau 2011). Since then, the population has been in decline. The last population estimate was 325,000 animals in 2011. Present management concerns include identifying causes of the decline and adopting more conservative harvest regulations to minimize anthropogenic impacts on herd size and demography. Specifically, this strategy includes maintaining cow numbers to retain adequate parturition and recruitment. ADFG hypothesizes that this decline is, in part, caused by increased predation, adverse weather

conditions (e.g., rain-on-snow events which impair access to winter food resources), and, to a lesser extent, local habitat degradation and vegetation change. Additional management concerns include user conflict between local and non-local hunters, guides, and transporters, addressing caribou-reindeer conflict on the Seward Peninsula, understanding and mitigating impacts of large-scale development on the herd, and accurately documenting harvest.

ADFG and the NPS actively monitor population trends and seasonal movements using satellite and radiotelemetry collar data. ADFG conducts a herd census every 2 to 3 years. BLM has historically supported these efforts through fuel purchase and aviation support, data downloads and collar purchase, and personnel support, as needed. The BLM established long-term winter vegetation transects to monitor habitat change and impacts of grazing in the WAH range over time. This study, located outside the planning area, was initiated in the 1981. Transects are revisited every 5 years. Joly et al. (2006) and others documented a decline in winter forage (lichen) abundance since the 1980s. This decline is purportedly due to grazing, wildland fire, and vegetation changes due to climate change.

The Western Arctic Caribou Herd Working Group was established in 1997, and reflects the importance of caribou in northwest and Interior Alaska. The group is composed of stakeholder representatives with direct interest, knowledge, and concern in the management of the herd. The purpose of the group is to provide input and recommend management strategies for the WAH and the habitat within their range to ADFG and federal land management agencies. There are 14 communities in the Central Yukon Planning Area that fall within the limits of the WAH range (Figure C.4). Four local representatives that live within the planning area are voting members of the Western Arctic Caribou Herd Working Group. BLM staff serve on the group's technical committee, attend the annual meeting, and provide funding in support of group functions.

Central Arctic Caribou Herd

The Central Arctic Caribou Herd (CAH) range straddles the Dalton Highway corridor from Prudhoe Bay to the Central Brooks Range (Figure C.4). These animals traditionally calve between the Sagavanirktok and Canning Rivers, and between the Colville and Kuparuk Rivers. They spend the summer on the Arctic coastal plain, often in the vicinity of oil infrastructure and development on the North Slope and coast. The CAH winter range extends south of the Continental Divide in the Brooks Range, west of Anaktuvuk Pass, and east of Arctic Village. CAH animals occupy BLM-managed lands in the Utility Corridor and Central Arctic Management Area (CAMA) subunits within the planning area during winter. Managing harvest pressure from the Dalton Highway and determining the effects of energy development activities on the herd are the primary management issues affecting the herd.

The size of the CAH has increased rapidly in recent years. This increase is attributed to high parturition and calf survival rates, and low adult mortality (Lenart 2011a). ADFG has established a population objective of 28,000 to 32,000 caribou. The last reported census of the herd was in 2010, and 70,034 caribou were counted, fulfilling this goal (Lenart 2011a). State hunting regulations have been modified to accommodate the changes in herd size and demographics.

Central Arctic caribou are often seen from the Dalton Highway, and contribute to the quality of wildlife viewing and photography opportunities within the DHCMA. The Utility Corridor is popular for archery hunters in the DHCMA and rifle hunting beyond the 5-mile corridor. Local hunters from Kaktovik, Nuiqsut, and Wiseman pursue this herd as well. Hunting in the Utility Corridor occurs most often in the fall, but winter and spring hunts are popular as well. ADFG recognizes the importance of this herd as an opportunity to view wildlife along the Dalton

Highway. The ADFG has established a management goal to reduce conflicts between consumptive and non-consumptive uses of caribou in Unit 26B. While user contact at the Arctic Interagency Visitor Center provides BLM staff an opportunity to educate the public, additional opportunities to engage and inform the public on CAH dynamics and varied human uses could be pursued.

Galena Mountain and Wolf Mountain Caribou Herds

The Galena Mountain Caribou Herd (GMH) ranges northeast of Galena in the Galena Mountains and Kokrines Hills. Members of the herd migrate to alpine areas in the Kokrines Hills to calve. They spend the summer in these alpine areas, and winter in the vicinity of the Hozatka Lakes on the Koyukuk National Wildlife Refuge. The herd size is less than 125 animals (Hollis 2011). Currently, there is no open hunting season because the herd does not have a harvestable surplus of animals. The season has been closed since 2005.

The Wolf Mountain Caribou Herd (WMH) ranges northeast of Wolf Mountain in the headwaters of Hot Springs Creek and the Little Melozitna River. The herd calves in the Kokrines Hills (east of the GMH calving grounds), and spends the summer in the vicinity of Wolf Mountain. They migrate north toward the Melozitna River, where they winter near Lost Lake (Hollis 2011). Most of the herd range is on State land. The most recent population estimate is 434 individuals, counted in 2009.

The origin of these herds is unknown, but it is suspected that they are relic populations of large migratory herds. Both the GMH and WMH live in remote areas and harvest (even when the GMH was open to hunting) has always been low and opportunistic. The herd sizes are thought to be limited by predation, with predation of calves by wolves and bears limiting adult recruitment (Hollis 2011). The BLM has monitored these herds in cooperation with ADFG and USFWS since the mid-1980s.

The Central Yukon RMP (1980) established an ACEC for crucial caribou caving habitat in the range of the GMH. Since its establishment, movements and seasonal distribution of the GMH are better understood. BLM staff have recommended changes to the ACEC boundaries to better address resource needs.

Ray Mountains and Hodzana Hills Caribou Herds

The Ray Mountain Caribou Herd (RMH) occupies the geographically isolated alpine regions in the Ray Mountains north of the Yukon River (Figure C.4). It was first identified as a herd in the 1970s, and has been regularly monitored by ADFG and the BLM through radiotelemetry efforts and herd composition surveys since the 1980s (Robinson 1985). In 2014, 853 animals were counted, but historic population estimates have been around 1,200 animals (Hollis 2011).

Prior to 2005, small groups of caribou in the Hodzana Hills east of the Dalton Highway were considered part of the RMH. Since 2003, ADFG, the BLM, and USFWS have made an effort to study these caribou to better define their range and habits. Radiotelemetry data have since confirmed that the RMH and the animals ranging adjacent to and east of the Dalton Highway are two distinct herds (Horne et al. 2014). Today, this herd is known as the Hodzana Hills Caribou Herd (HHH). Like the RMH, Hodzana Hills caribou occupy geographically isolated alpine habitats. They calve primarily in the hills at the headwaters of the Hodzana, Kanuti, and Dall Rivers (Hollis 2007). A herd composition count documented 662 animals in 2014. Further investigation of the HHH is ongoing, and the BLM continues to be actively involved in this effort.

Hunting pressure on these caribou herds is low due to limited access, particularly in the Ray Mountains where access is limited to lengthy snowmobile trips or aircraft access on a small number of suitable ridgetop landing sites. Although formal mortality studies have not been conducted, low recruitment as indicated by low calf percentages suggests that predation is the limiting factor for growth of these herds (Hollis 2011a). Both herds are considered healthy.

The Central Yukon RMP (1980) established the Tozitna ACEC, which consisted of two subunits, for crucial caribou caving habitat in the RMH range. Since its establishment, movements and seasonal distribution of the RMH are better understood. BLM staff have recommended changes to the ACEC boundaries to better address resource needs, and have proposed renaming the ACEC the Ray Mountains Caribou ACEC to avoid confusion between the similarly named Tozitna River ACEC which was designated for fisheries resource values.

Other Caribou Herds

The Teshekpuk Caribou Herd (TCH) calves near Teshekpuk Lake and inhabits the central Arctic coastal plain during spring and summer. The winter range extends across broad areas of northwestern and north central Alaska and overlaps considerably with the winter ranges of the WAH and CAH (Figure C.4, Person et al. 2007, Yokel et al. 2009). Much of the herd range falls within the boundaries of the NPR-A, which is managed by the BLM Arctic Field Office and addressed in the NPR-A Integrated Activity Plan (2008). However, the TCH winter range extends into the Utility Corridor Subunit of the Central Yukon Planning Area. The last published herd census was in 2008, when 64,106 animals were counted (Parrett 2011). The herd is healthy. The size of the herd has increased dramatically in recent years, but ADFG anticipates that a decline will be forthcoming. Most harvest of Teshekpuk caribou is by local hunters because the herd range is remote and difficult to access compared to other large herds (such as the WAH and CAH). However, non-local hunters do occasionally hunt the TCH in the Colville River drainage (Unit 26A).

The Porcupine Caribou Herd (PCH) range is mostly east of the planning area, although the winter range does extended onto BLM-managed lands west of Venetie (Figure C.4). The PCH ranges into Canada, and fulfilling international treaty obligations is an integral part of herd management. The herd is an important subsistence resource for communities in northeastern Alaska and the Yukon Territory. ADFG maintains a management objective of 135,000 animals. The most recent herd census was done in 2010 and 169,000 caribou were counted (Caikoski 2011).

The Sunshine Mountains Caribou Herd (SMH) is a small herd that ranges northeast of McGrath. Its winter range extends onto BLM-managed lands within the Fairbanks Subunit of the planning area (Unit 19D). The estimated size of the SMH is between 100 to 125 individuals. The population is considered stable and hunting pressure is light (< 10 caribou harvested in the past 5 years, Seavoy 2011).

The Delta Caribou Herd and Denali Caribou Herd ranges extend into the planning area, but the herds do not use BLM-managed lands. Both herds are relatively small (less than 3,000 animals).

Dall Sheep *(Ovis dalli)*

Dall sheep are among the most high profile wildlife species in the planning area. They inhabit high-elevation areas primarily along the Dalton Highway corridor where the highway transects the Brooks Range (Figure C.5); this area is referred to as the Dalton Highway Corridor Management Area (DHCMA). Within the planning area, areas outside of the DHCMA (especially

the Ray Mountains and Kokrine Hills areas) have been identified as having potentially suitable sheep habitat and may have been historically occupied by sheep. The concept of introducing, or reintroducing, sheep to these areas has been explored and may be implemented in the future.

In the DHCMA, Dall sheep inhabit BLMmanaged lands in high-elevation areas on both the east and west sides of the highway. Sheep in most areas of the DHCMA make frequent use of mineral licks even though the licks may be located away from preferred escape habitat. Aerial minimum count sheep surveys have been conducted in the DHCMA since 2000. However, the survey methodology and study area has varied over the course of the study. The area most frequently surveyed since 2000 is centered on the Snowden Mountain ACEC, which is home to the likely highest density of sheep in the DHCMA. In this portion of the survey area, approximately 1,400 sheep were recorded in the 422 square mile area in 2012 and 2013. Compilation of previous years' data for this and other areas surveyed in the DHCMA is in progress for the purpose of trend analysis.

The Snowden Mountain ACEC, where survey efforts have been largely centered, was designated specifically because the area contains important lambing areas and mineral licks for sheep. Other ACECs in the DHCMA that were designated specifically because of lambing areas and mineral licks are the West Fork Atigun River ACEC, Poss Mountain ACEC, and Nugget Creek ACEC. Additionally, the presence of lambing areas within the designated Galbraith Lake ACEC is one of suite of reasons for its designation.

A recent study of Dall sheep in the DHCMA was conducted to estimate annual survival and recruitment rates. Twenty-nine adult Dall sheep ewes and 62 lambs were radiocollared. Analyses also used radio collar location data to identify important habitats and potential effects of human activity on sheep distribution and movements.

The study suggested high annual survival of ewes (0.77–0.88) but lamb survival appeared to decline annually (0.68, 0.48, and 0.28 for cohorts born in 2009–2011, respectively). Eleven ewes died as a result of predation during the course of the study, primarily by wolves and grizzly bears. For lambs, drowning, wolverine predation and golden eagle predation were the most common causes of mortality. Secondarily, grizzly and wolf predation and falls or accidents contributed to lamb mortality. As stated above, strong conclusions about population trends in the area are difficult to draw based on historic survey information. However, decreasing lamb survival during this study and low lamb abundance during both 2012 and 2013 suggests that the rate of population growth may be slowing. Results from this study highlight certain adjustments to ACECs pertinent to this planning effort. The authors suggest that these adjustments would likely contribute to more effective management of the sheep population in this region. Specifically, the study recommends that Snowden Mountain ACEC should be extended to encompass the headwaters of Matthews Creek, an area that all collared sheep in that subpopulation used frequently: "to adequately protect important sheep habitat, the Snowden ACEC should be extended eastward to the boundary of BLM lands near Matthews Creek."

Additionally, the study results and the authors' conclusions suggest that two other sheep subpopulations within the DHCMA may warrant special management attention that could include (1) the expansion of the Poss Mountain ACEC and (2) the establishment of an additional ACEC near the community of Wiseman. First, a mineral lick located at a relatively low elevation and near an active mining claim on Gold Creek was frequented by the Poss Mountain ACEC subpopulation of sheep, but is not currently within the boundary of the Poss Mountain ACEC. Second, the seasonally migratory subpopulation of sheep near Wiseman travels through a

relatively low-elevation area to traverse between Midnight Dome and Smith Dome. Although this low-elevation area does fall within mining claims, unless their development impedes sheep movement between the two domes, development in this area is not likely to be detrimental to this subpopulation. However, both Smith and Midnight Domes fall within a large block of mining claims that have yet to be developed. If the mining claims on these domes were to become active, it would likely be detrimental to this subpopulation near the community of Wiseman. Subsistence and sport hunter conflicts related to sheep harvest have been ongoing and, especially if sheep populations in the region exhibit a decline in population, require management attention.

Brown (Grizzly) Bear *(Ursus arctos)*

Alaska contains over 98 percent of the U.S. population of brown bears, and more than 70 percent of the North American population (Eide and Miller 1994). Brown bears are found throughout the planning area. They are most common in alpine and subalpine areas in the Interior. However, they do occur sporadically in forested lowland areas where they are often associated with muskegs and open meadows. They range throughout the North Slope, but are most common in the foothills of the Brooks Range and along major river valleys (ADFG 1973). With the exception of the Fairbanks Subunit, their historic range is largely intact.

Brown bears are solitary except for females with cubs, aggregations at concentrated food resources, and mating pairs. Mating takes place from May through July. The fertilized egg does not implant in the uterine wall until the fall, at which time there is a gestation period of four months. One to three cubs are born in the winter den. The cubs spend two to three years with the sow, and the interval between litters is often in excess of three years, particularly in areas where food availability is low.

Brown bear densities within the planning area vary depending on topography and habitat quality. However, density in many parts of the planning area is not well documented, and available data are often a number of years old. Habitat classification is often used as a supplement to estimating density in areas where population data are lacking. Low densities are considered to be below 1 brown bear per 100 square miles, moderate densities are considered 1.1 – 3.2 bears per 100 square miles, and high densities are considered to be greater than 3.3 bears per 100 square miles (Lenart 2011). Brown bear densities range from 3.3 per 100 square miles in Unit 24B to 1 per 100 square miles in Units 21A and 21B (Ballard et al. 1988, Reynolds 1992). A 1992 study of brown bears north of the Brooks Range estimated 1.8bears per 100 square miles in Unit 26B, and 2.8 bears per 100 square miles in Unit 26B (Reynolds 1992). Very little information exists for the Ray Mountains area (Unit 20F), but Eagan (1995) classified most of the Unit as having medium quality habitat and likely moderate bear densities.

Harvest within the planning area varies depending on ease of access and proximity to population centers. Harvest and population data are generally obtained from sealing documents from bears harvested and sealed by ADFG.

Black Bear *(Ursus americanus)*

Black bears occur throughout the planning area, with the exception of the North Slope. They typically inhabit forested areas, but can be found in a range of habitats depending on food availability. Black bears are omnivorous, and exhibit seasonal food use patterns. In the spring, they typically rely on newly sprouted green vegetation, and also will scavenge animals that were killed or died during the winter months. Both black and grizzly bears are capable predators of

moose, particularly calves less than 5 months old. Black bears take advantage of seasonal fish availability, particularly in tributaries of the Yukon and Koyukuk Rivers within the planning area where salmon spawn. In the fall, berries are an important part of their diet.

Black bears breed in early summer (June and July), and delayed fertilization occurs in October. One to four cubs are born during the winter denning period. They are born helpless, and weigh under a pound. They emerge from the den with the sow in May, and weigh approximately 5 pounds. Cubs will remain with their mother through their first winter, but can remain with the sow longer, particularly in areas of Northern Alaska (such as those in the planning area) that have a shorter growing season and less food availability. Black bears reach sexual maturity at 3 to 6 years of age (ADFG 1994). With the exception of the breeding season and sows with cubs, they are solitary animals.

Gray Wolf *(Canis lupus)*

Despite populations throughout the rest of North America being reduced by humans, wolves still occupy most of their historic range in Alaska. They range throughout the planning area, but occur in greatest densities in Units 20 and 21. Population numbers are closely linked to prey availability.

Wolves are highly social animals, and live in packs that can range in size from 2 to 20 animals, with 7 to 10 individuals being common (ADFG 1994). Pack structure is dictated by social hierarchy, which is characterized by an alpha pair and subordinate offspring and other individuals. Wolf packs occupy a territorial home range that depends on habitat and prey availability. Pack ranges can be from 300 to 1,000 square miles (ADFG 1994). Areas with high prey densities can support more wolf packs with smaller home ranges. Occasional overlap in pack home ranges can exist, but territorial disputes are common between packs when this is the case. Packs are highly mobile, and travel great distances within their home range in search of food (Mech 1999). Their primary source of food in Interior Alaska is large ungulates such as moose and caribou, but they are also known to prey on Dall sheep, small mammals, birds, and fish (Wilson and Ruff 1999).

Wolves breed in February and March, and pups are born in May and early June. Litters of four to seven pups are common. Pups are born in a den, where they spend the first couple weeks of their lives. They are weaned about nine weeks after birth, and are capable of hunting with the pack by early winter.

Wolf densities in the planning area range from 4.8 wolves per 1000 square miles in Unit 26 to 15-23 wolves per 1000 square miles in Unit 20 and 18-24 wolves per 1,000 square miles in Unit 21D. Most populations are considered stable. Currently, state hunting regulations are liberal (5 to 10 wolves in possession under state hunting regulations; no limit on trapping wolves). State management goals for wolves in Game Management Units currently focus on maintaining stable populations, providing for a range of human uses and value of wolves, and maintaining harvestable populations of moose and caribou through intensive management. There is also an effort to increase public awareness of the conservation and management of wolves and their prey in Alaska (Stout 2009).

Wolves in the planning area are important for their value as a furbearer, both for subsistence and commercial purposes. They are an important part of boreal and arctic ecosystems, where they regulate prey densities, particularly in the absence of human harvest. The aesthetic value of observing and being aware of wolves in their natural environment is also recognized as an important human use of wolves. Wolf sightings and other wildlife observations enhance visitor

experiences along the Dalton Highway; one of the most common questions asked by visitors at the Arctic Interagency Visitor Center is where wolves can be sighted (Karen Deatherage, BLM Interpreter, pers. comm.).

Muskoxen *(Ovibos moschatus)*

Although native to western Alaska, muskoxen disappeared in Alaska in the late 1800s (Lent 1998). Multiple efforts to reintroduce muskoxen in various parts of the state have taken place since the 1930s, when animals from Greenland were transplanted to Nunivak Island (MacDonald and Cook 2009). Muskoxen are social animals, and live in family groups composed of females, their offspring, and subadults (Reynolds et al. 2001). Males are often solitary in summer and form small groups in winter. Females produce a single calf in in April or May, and generally breed every other year (Reynolds 2001). In summer, muskoxen live near riparian areas where they feed on shrubs, sedges, and grasses. In the winter, family groups seek out hilltops and other windblown areas where snow is less likely to impede their mobility (Nowak 1991). They subsist on low-quality forage, and rely on energy conservation as a primary survival strategy (Wilson and Ruff 1999). They reduce activity and movements during winter, and often spend most of the winter in a localized area.

Muskoxen are present in the Corridor Subunit of the planning area in Unit 26B. Thirteen animals were released on the North Slope (Unit 26C) in 1970. Since then, their range has expanded east into Canada and west into Units 26A and 26B. The population was considered stable from the mid-1990s through 2003, and the Unit 26B population was estimated to be around 300 animals. In 2006, the population declined to about 215 animals. Most recently, population surveys from 2007 to 2010 have reported the population of Unit 26B to be around 200 muskoxen. Although the population is smaller than in the early 2000s, it is considered stable (Lenart 2011c). Recruitment for the Unit 26B population is low, and predation on muskox calves by brown (grizzly) bears is considered the main cause of population decline.

The ADFG management goal for muskoxen in Unit 26 is to maintain healthy, stable populations while providing opportunities for harvest. The ADFG developed the North Slope Muskox Harvest Plan to guide sustainable harvest of muskoxen in Unit 26B and provide reasonable opportunity for subsistence harvest west of the Dalton Highway (ADFG 1999). Management goals for Unit 26 include maintaining healthy, stable populations; minimizing detrimental effects that muskoxen may have on caribou and caribou hunting; cooperating and sharing information about muskoxen to user groups, state, and federal agencies; and providing opportunities to view and photograph muskoxen (Lenart 2011c).

Furbearers

Furbearers include those species of mammals that are sought by licensed trappers who place commercial value on the animals' pelts. Furbearers that inhabit the planning area include beaver, red fox, lynx, marten, mink, muskrat, river otter, coyote, wolverine, and wolf. Furbearer harvest (by both hunting and trapping) in the planning area is conducted by both subsistence and recreational users. Some harvest is conducted opportunistically while users are engaged in other activities.

Since definitive species population and distribution information is not available, ADFG wildlife biologists rely on annual trapper harvest reports and personal feedback, as well as field observations by department personnel. Harvest reports to ADFG are only required for a subset of

furbearer species; lynx, river otter, wolf and wolverine must be sealed (marked with a metal tag) by ADFG employees; therefore, ADFG reports most accurately represent take of these species. Historically, in Interior Alaska as well as in Arctic and Western Alaska, less than 30 percent of the trappers provided information via questionnaire that lends insight into take of species for which sealing is not required. Therefore, the information presented in the following table (Table 2.7) must be taken with the caveat that no broad-scale inventory or monitoring biological surveys for any of these species have been conducted in the planning area. It is likely that some data presented in the table does not represent true population abundance or trends (e.g., red squirrels are shown to be common in Interior Alaska, but abundant in Arctic and Western Alaska, which is not likely the case, based on red squirrel habitat distribution in these regions). Regardless, the information provided here is the most current and accurate information available for these species and does suggest that several furbearer species populations should be taken into consideration for management purposes.

Table 2.7. Relative Abundance of Furbearers

Common Name	Interior Alaska			Arctic and Western Alaska			Average Raw Fur Price	
	Relative Abundance	Trend	Importance	Relative Abundance	Trend	Importance	2012-2013	% Change in Market Price (2008 to 2013)
Arctic Fox	scarce	n/c[a]	12	scarce	n/c	12	$59.97	64%
Beaver	common	n/c	7	abundant	n/c	6	$32.56	35%
Coyote	common	n/c	6	scarce	n/c	10	$76.27	68%
Ermine	common	n/c	8	common	n/c	11	$3.43	-2%
Lynx	scarce	-	2	common	-	1	$205.11	54%
Marten	common	-	1	common	-	4	$143.81	71%
Mink	scarce	n/c	9	common	-	8	$27.90	64%
Muskrat	scarce	n/c	11	scarce	n/c	9	$12.53	75%
Red Fox	scarce	n/c	5	common	n/c	2	$59.97	64%
Red Squirrel	common	n/c	*[b]	abundant	n/c	*[b]	$0.74	-62%
River Otter	abundant	n/c	10	scarce	n/c	7	$100.75	67%
Wolf	common	n/c	3	scarce	n/c	5	$215.84	33%
Wolverine	scarce	n/c	4	scarce	n/c	3	$271.35	14%

[a]n/c = no change

[b]No data available

For instance, lynx pelts are a valuable commodity and increasing in value; however, populations appear to be declining in both Interior Alaska and Arctic and Western Alaska regions. This species was listed on the BLM 2004 Sensitive Species List, but was removed when the list was updated in 2010. Lynx are the only indigenous wild cat of Alaska. Once found throughout northern North America, lynx were federally listed in 2003 as a threatened species in the northern Rocky Mountains of the lower 48 states due to overharvesting and their inability to successfully compete with more opportunistic predators. Lynx are found throughout the planning area where suitable habitat and prey populations exist. The best lynx habitat occurs where wildland fires or other disturbances create early succession vegetation communities with snowshoe hare habitat and other small prey. Marten are another high-value species that appears to be in decline in the planning area. Wolverine are scarce across the planning area, but high value and important to trappers in the area. There is some suggestion that climate change, potentially in combination with harvest pressure, could negatively affect this species at a population level.

Arctic ground squirrel, hoary marmot, and pika all inhabit higher elevation areas within the planning area. Alpine habitat is predicted to be most rapidly affected by climate warming based on current climate projections, so these species may be most immediately affected by climate change.

Birds

All birds that occur in the planning area are classified as migratory birds under the Migratory Bird Treaty Act, with the exception of ptarmigan and grouse (which are classified as game birds). In the planning area, these birds include rock and whitetailed ptarmigan, and ruffed, spruce, and sharptailed grouse.

Raptors — Birds of Prey

Numerous species of raptors inhabit the planning area including: golden eagle, bald eagle, peregrine falcon, osprey, gyrfalcon, northern harrier, American kestrel, merlin, sharpshinned hawk, northern goshawk, roughlegged hawk, great horned owl, great gray owl, northern hawk owl, shorteared owl and boreal owl. All are classified as migratory birds, but some remain resident through the year, including gyrfalcon and several owls (great horned, great gray, hawk, and boreal). Those considered special status species are discussed in more detail in that section. Because these species occupy a wide variety of habitats, it is difficult to generalize habitat condition. However, most of the planning area is in a natural state and permitted activities are minimal.

Bald and golden eagles are protected by the Bald and Golden Eagle Protection Act and both are present in the planning area. The BLM has conducted several raptor surveys in the DHCMA primarily for the purpose of determining nest locations for golden eagles, but also including records of other stick nests and raptors observed. Other raptor surveys have been conducted within the planning area as well. The farthest north recorded breeding population of American kestrels is located in the DHCMA; the BLM maintains nestboxes that are frequently used by both kestrels and boreal owls along the Dalton Highway north of the community of Coldfoot, Alaska.

Waterfowl and Other Wetland Birds

Within the planning area, scattered wetland habitat is used by a variety of waterfowl including ducks, geese, swans, loons, grebes, and shorebirds. More detailed information on those identified as special status species is provided in that section. Since these species occupy a wide variety of habitats, it is difficult to generalize habitat condition. However, most of the planning area is in a natural state and permitted activities are minimal.

Passerine (perching) Birds

According to ADFG, 471 bird species have been positively identified in Alaska (Wings over Alaska, http://www.birding.alaska.gov/). Many of these species occur in the planning area. Because of the variety of habitats preferred by the many species of birds that migrate to Alaska each year, migratory birds are known to occupy every habitat type within the planning area including riparian, wetland, forest, shrub, and alpine tundra. Given Alaska's short summers, the success of breeding birds depends greatly on their ability to locate suitable nesting habitat in a timely fashion, endure infrequent adverse weather conditions, evade predators, and avoid disruption of their normal routine. Suitable nesting habitat is especially critical to the success of breeding birds, as it enables them to meet the specific needs of rearing young while expending as little energy as possible in the process. Migratory birds that are considered special status

species or birds of conservation concern are considered in further detail elsewhere in this document. Because bird species occupy a wide variety of habitats, it is difficult to generalize habitat condition. However, most of the planning area is free of human disturbance and has not likely impacted any particular bird species at a population level.

Bird Species of Conservation Concern

In addition to bird species listed by the BLM as Sensitive in 2010 (those which occur in the planning area are further discussed in section 2.1.9 Special Status Species), other species inhabit the planning area and are listed as of conservation concern by the USFWS, U.S. Geological Society (USGS) and the State of Alaska. These species should be considered in the planning process. Table 2.8 provides a summary of bird species of conservation concern, their designation, and the reason for their designation (e.g., declining population, unknown population, lack of information).

Table 2.8. Bird Species of Conservation Concern

Bird Species	BLM Alaska Sensitive	State of AK (SOA) Species of Concern (SSOC)	SOA Wildlife Conservation Strategy Featured	USFWS Conservation Concern	AK Boreal Partners in Flight Priority
Alder flycatcher					PR
American three-toed woodpecker			FM		
American tree sparrow					PR
Arctic tern			PD	BCC; BCR	
Bald eagle			CA		PR
Bank swallow			LTD		
Bar-tailed godwit				BCC; BCR	
Belted kingfisher			LTD		
Black guillemot					
Black scoter			PD		
Black-backed woodpecker			LTD		PR
Blackpoll warbler	Sensitive	SSOC	PPD		
Bohemian waxwing					PR
Boreal chickadee			FM		
Boreal owl			RE		
Bristle-thighed curlew			DE	BCC; BCR	
Buff-breasted sandpiper			PD	BCC; BCR	
Cliff swallow			LTD		
Pacific common eider			SD		
Dark-eyed junco			LTD		
Dunlin				BCC; BCR	
Eskimo curlew		Endangered		LE	
Fox sparrow					PR
Golden-crowned sparrow					PR
Golden eagle	Sensitive		DE		
Gray-cheeked thrush		SSOC			
Great gray owl			UNK		
Great horned owl			UNK		
Gyrfalcon			UNK		PR
Hairy woodpecker			FM		

Bird Species	BLM Alaska Sensitive	State of AK (SOA) Species of Concern (SSOC)	SOA Wildlife Conservation Strategy Featured	USFWS Conservation Concern	AK Boreal Partners in Flight Priority
Hermit thrush			LTD		
Hoary redpoll					PR
Horned grebe			DE	BCC; BCR	
Hudsonian godwit				BCC; BCR	
King eider			SD		
Lapland longspur					PR
Lesser yellowlegs			SD	BCC; BCR	
Lincoln sparrow					PR
Long-tailed duck			PD	BCR	
Merlin			CA		
Northern harrier			DE		
Northern flicker			FM		
Northern goshawk			DE	BCC	
Northern hawk owl			DE		
Northern shrike					PR
Olive-sided flycatcher	Sensitive	SSOC	SRD	BCC; BCR	MA
Osprey			CA		
Peregrine falcon			CA	BCC; BCR	PR
Pine grosbeak			LTD		PR
Red-necked grebe			PD		
Red-throated loon			SD	BCC; BCR	
Rock ptarmigan					PR
Rough-legged hawk			UNK		PR
Rusty blackbird	Sensitive		LTD	BCC; BCR	MA
Sharp-shinned hawk			UNK		
Short-eared owl	Sensitive		UNK		MA
Smith's longspur			SPRB	BCC; BCR	PR
Snow bunting					PR
Snowy owl			UNK		PR
Solitary sandpiper			PD	BCC; BCR	
Spruce grouse					PR
Surf scoter			PD		
Swainson hawk					MA
Townsend's warbler		SSOC	FM		
Trumpeter swan	Sensitive				
Upland sandpiper				BCR	
Varied thrush			FM		PR
Violet green swallow			LTD		
Whimbrel				BCC; BCR	
White-winged scoter			PD		
White-crowned sparrow			LTD		
White-winged crossbill			FM		PR
Willow ptarmigan					PR
Wilson's warbler			LTD		
Yellow-billed loon	Sensitive			BCC; BCR	

Codes for State of Alaska Wildlife Conservation Strategy Featured Species:

- E = Endangered
- CA = Contaminant affected

- DE = Decline elsewhere, AK unknown
- FM = Sensitive to forest management
- LTD = Long term declines
- PD = population in decline in AK and elsewhere
- PPD = Precipitous population decline
- RE = Reduced numbers
- SD = Steep decline
- SPRB = Small population and restricted breeding
- UNK = Unknown

Codes for U.S Fish and Wildlife Service Listed Birds of Conservation Concern:

- LE = Listed endangered species
- PS = Partial status
- C = Candidate species
- PT = Proposed threatened
- BCC = Birds of Conservation concern
- BCR = Regional concern????

Codes for Alaska Boreal Partners in Flight Priority Species in Alaska:

- IM = Immediate Action
- MA = Management
- PR = Long-term Planning and Responsibility

2.1.8.3. Trends

Moose

Moose populations in the planning area are impacted by hunting pressure, predation pressure, and habitat dynamics associated with landscape-level disturbances such as flooding and wildland fire. In many parts of the planning area, moose densities are well below levels that the habitat is capable of supporting due to predation by wolves and bears. This is referred to as Low Density Dynamic Equilibrium (LDDE), and is characteristic of many populations in the planning area, particularly remote areas with low human population densities that result in low hunting and trapping pressure on predator populations (Gasaway et al. 1992). LDDE systems are characterized by moose densities that range from 0.1-1.0 moose per square mile. Despite being a natural part of many boreal ecosystems, LDDE can be problematic in areas near villages where local residents rely heavily on moose as a subsistence resource. In the event that residents are severely impacted by LDDE moose populations, intensive management of these populations may be implemented. There is currently one intensive management program ongoing in the planning area (Unit 24B). Intensive management activities are not taking place on BLM-managed lands. No new intensive management programs in the planning area are being proposed.

Vegetative succession associated with floodplains and burned areas results in a landscape that constantly changes in terms of its quality as moose habitat. Moose distribution naturally fluctuates in response to these dynamic processes. Areas that were considered to be prime moose habitat when the Utility Corridor and Central Yukon resource management plans were written may not be capable of sustaining high densities of moose today. Habitat characteristics are impacted most broadly by fire management policies and fire suppression efforts in the planning area, but suppression efforts are typically localized around villages and human infrastructure. Areas where

wildland fire is allowed to burn under a Limited fire management option often produce good moose habitat. Wildland Fire Ecology and Management are discussed in section 2.1.10.

Caribou

Caribou populations naturally fluctuate. Based on past census data trends, the WACH is predicted to decline, PCH numbers are increasing, and the TCH and CAH populations are increasing with the potential to decline in the near future (Dau 2011, Lenart, 2011a, Parrett 2011). The small herds in the planning area undergo similar fluctuations, but localized stochastic events have the potential to more dramatically impact these herds because of their small population size and dependence on small, patchy habitats in their home ranges. Climate change could potentially increase population fluctuations, and contribute to long-term population decline if populations cannot recover from low population levels that exceed the normal range.

Natural variation is present in seasonal ranges of caribou, particularly in the periphery of their winter habitat ranges, which includes many areas in the Central Yukon Planning Area. Caribou may be present in an area for successive winters, and then be absent in years following. This is often a topic of concern for rural residents who rely on migrating caribou populations despite inconsistent and unreliable migration patterns.

Intensive management of caribou in Units 20A and 20D has been implemented in the past, but is currently inactive. There are no plans to initiate intensive management efforts for caribou in the planning area.

Dall Sheep

Aerial minimum count sheep surveys have been conducted in the DHCMA since 2000. However, the survey methodology and study area have varied over the course of the study. Compilation of previous years' data for this and other areas surveyed in the DHCMA is in progress for the purpose of trend analysis. Strong conclusions about population trends in the area are difficult to draw based on historic survey information. However, low lamb survival estimates and low lamb abundance during 2012 and 2013 suggests a lower rate of population growth than previously estimated for the region.

Gray Wolf

Wolf numbers fluctuate with prey densities and availability, and will continue to do so in the planning area except in areas where predator control (intensive management) is being implemented and where wolf hunting and trapping is high. Wolf populations in Units 19D and 24B are the subject of population control actions in an effort to increase harvest of game species, primarily moose, in these areas where wolf predation is impacting harvest success. Past population control efforts associated with intensive management programs in Units 20A and 20D are no longer active. Wolf populations have the ability to rebound quickly after reduction efforts are implemented, and can be expected to do so to a certain degree when control efforts desist.

Dog lice (*Teichodectes canis*) was identified in Unit 20A (Fairbanks Subunit) in 2004. Currently, it is only found in Unit 20 in the planning area, but it is likely that the prevalence of lice in wolves will continue to increase and spread through other areas in Interior Alaska. Results of a study initiated in 2005 by ADFG suggest that lice control efforts can be successful if the infestation is identified and treated early, but this could be difficult in many areas of the planning

area that are remote, and where wolf sealing and reporting is not required by ADFG (Gardner and Beckmen 2008).

Other Species

Trends in wildlife populations fluctuate in response to predator-prey dynamics and habitat conditions. Trend information for furbearers is difficult to deduce since few monitoring studies have been conducted and population status is for the large part deduced from non-standardized trapper reports. Habitat within the planning area remains relatively undisturbed, so populations likely fluctuate within normal levels. However, some species of migratory bird are impacted by factors outside of the planning area (i.e., wintering grounds) and are exhibiting declines at a population level within the planning area. Bird and other animal species of concern are discussed in the Special Status Species Section 2.1.9.

2.1.8.4. Forecast

Moose

Moose will continue to be an important food resource for Alaskans. Maintaining healthy populations, providing hunting opportunities for local and non-local hunters, and balancing user needs will continue to be priorities for ADFG. In areas where predators maintain moose populations at levels in which sustainable human harvest is not possible, intensive management may be considered as a potential approach to fulfilling rural subsistence needs. The State may approach the BLM and request that BLM-managed lands be included in intensive management efforts. IM AK-2010-007 directs the BLM to defer to the State for predator control activities "unless such activities conflict with on-going or anticipated BLM authorized actions, land use plan decisions for a given area, or create a threat to public safety (BLM 2010)." The current Utility Corridor and Central Yukon resource management plans do not address predator control and predator control is not considered a planning decision.

Changes and fluctuations in local moose densities will occur over the life of the plan in response to harvest pressure, predation pressure, and changes in local habitat dynamics as a result of natural processes (wildfire, flooding) and human activities (mining, firewood harvest, road and trail maintenance). Areas that are currently identified as prime moose habitat may decline in quality as vegetative succession occurs. Similarly, moose habitat quality in other areas may increase.

Climate change is predicted to result in decreased fire return interval and an increase in fire severity and the frequency of large (over 1,000 square kilometer) fires (Kasischke et al. 2010, Kasischke and Turetsky 2006). These changes are predicted to be advantageous to moose, as younger seral vegetation communities are expected to be maintained at higher proportions on the landscape through decreased fire return interval, and shrub expansion in the Arctic and alpine regions is predicted to increase (Tape et al. 2006). Expansion of shrub communities on the North Slope could increase habitat availability in Unit 26, and malnutrition associated with poor habitat may be alleviated as a result.

Infrastructure development in the planning area may contribute to habitat fragmentation, although habitat fragmentation is not anticipated to disrupt ecosystem functioning on a landscape scale during the life of the plan. Fulfilling BLM mandates for moose habitat management is expected to be similar to the current condition, although the importance of local habitat enhancement projects

for moose may increase in the future. Increased access to remote lands via road development in the planning area may result in a need to change state and federal hunting regulations in areas where moose populations cannot sustain elevated hunting pressure and harvest. The mechanisms for reviewing and adopting hunting proposals through the State Board of Game and Federal Subsistence Board should be able to accommodate these changes as they occur.

Caribou

Climate change has the potential to negatively impact caribou population size and distribution across the planning area. Winter forage composed primarily of fruticose lichens is associated with old growth spruce forest communities. If the fire return interval for Interior Alaska decreases, old growth stands and their associated lichen communities may become increasingly rare on the landscape, and unable to sustain caribou populations at the levels at which they exist today. A study by Rupp et al. (2006) illustrated this by modeling changes in caribou winter habitat in response to four different fire return intervals. A 30 percent decrease in the fire return interval resulted in a 41 percent decrease in the amount of spruce-lichen forest available on the landscape (Rupp et al. 2006). This could be detrimental to caribou herds that rely on this habitat during the winter months, and could limit or dramatically change their distribution. Additionally, changes in plant phenology associated with climate change could result in mismatches between the emergence of nutritious food sources (specifically sedge emergence) in the spring and the timing of calving after the spring migration (Post and Forchhammer 2008). Warming in the Arctic could also increase the frequency of icing events in winter, which could change snow depths and hinder movements in winter and during the spring migration.

There is concern that resource development, road construction, and increased human activity in areas within caribou ranges could impact migration timing and routes. Of most concern in the planning area is the road to Ambler, which traverses the winter ranges of the WACH, CAH, and TCH. Studies on caribou movements and interactions with existing roads and resource development are ongoing (Joly et al. 2006, Cameron et al. 2004, Dau and Cameron 1986).

Dall Sheep

Climate change may have a major impact on sheep habitat and population levels. Severe winter weather (especially deep snows, extended winters, and spring flooding) can have a notable effects on sheep populations. Climate change is predicted to significantly alter seasonality and vegetation community, particularly in higher elevation areas. Habitat conditions and availability, as well as hunting pressures on road-accessible populations, will determine sheep population dynamics. The habitat across most of the species range is largely intact and undisturbed.

Gray Wolf

Wolf numbers will continue to fluctuate and respond to changing prey densities in localized areas, except in areas where predator control efforts dictate wolf population size. It is likely that the prevalence of dog lice in wolves will continue to increase and spread through other areas in Interior Alaska. There is concern that if dog lice spreads into other areas of Alaska, not only wolf populations will be impacted, but prey populations have the potential to be impacted because wolf pelts infected with lice have little commercial value. Residents will be less inclined to trap wolves and prey populations could be negatively impacted as a result of decreased trapping pressure (Young 2009).

Other species

Since trend information is very limited, it is difficult to forecast how furbearer populations will change in the future. Several species, in particular lynx and marten, appear to be declining and warrant management attention including special consideration of habitat protection. A vast array of bird species occupies the planning area, most of which are not exhibiting notable declines in population and are not considered in need of management attention. Several bird and mammal species are considered to be of management concern for a variety of reasons and are discussed in more detail in the Special Status Species section 2.1.9.

2.1.9. Special Status Species

Management objectives for special status species on public lands are to ensure that: (1) listed species and the ecosystems on which they depend are conserved; (2) required BLM authorizations or approvals are consistent with the conservation needs of listed species; and (3) approved activities do not contribute to the need to list any special status species, either under provisions of the Endangered Species Act or other authority (BLM 2008b). BLM special status species are designated where management is capable of significantly affecting the conservation status; such as those species that (1) could become endangered in or extirpated from the State, or within a significant portion of its distribution; (2) are undergoing significant current or predicted downward trends in habitat or populations such that Federal or State listed status may become necessary; (3) have small and widely dispersed populations inhabiting ecological refugia or other specialized or unique habitats; and (4) are listed by the State of Alaska but may be better conserved through application of BLM sensitive species status (BLM 2010).

To develop special status species lists for Alaskan plants, birds, mammals and fish, BLM Alaska has relied on the State and global rarity ranking system NatureServe (2014). This method ensures rank consistency and transparency between all rare species within Alaska and between other Natural Heritage Programs. The Alaska Natural Heritage Program (AKNHP) is responsible for assigning a state conservation rank (S rank), while NatureServe assigns a global conservation rank (G rank) based on the ranking information provided by all of the Natural Heritage Programs where the species exist. A conservation status rank is calculated for a species based on its range extent, area of occupancy, number of occurrences, population sizes and trends, and threats to the species.

Table 2.9. Alaska Natural Heritage Program Global (G#) and State (S#) Ranking Criteria

Rank	Definition	Rank	Definition
G1	Critically imperiled globally or endangered throughout its range due to extreme rarity or because highly vulnerable to extinction	S1	Critically imperiled or endangered throughout the state due to extreme rarity or some factor making it highly vulnerable to extinction
G2	Imperiled globally or endangered throughout its range because of rarity or because of other factors demonstrably making it very vulnerable to extinction	S2	Imperiled in the state because of rarity or because of other factors making it very vulnerable to extirpation from the state
G3	Either very rare and threatened throughout its range or found locally in a restricted range	S3	Rare or uncommon in the state
G4	Widespread and apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery	S4	Apparently secure in state, but with cause for long term concern
G5	Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery	SP	Occurring in nearby state or province; not yet reported in state, but probably will be encountered with further inventory

Rank	Definition	Rank	Definition
G#G#	Global rank of species uncertain, best described as a range between the two ranks	S#S#	State rank of species uncertain, best described as a range between the two ranks
G#T#	Global rank of the species, and global rank of the described subspecies or variety	GNR	Global rank not yet assessed
G#Q	Taxonomic distinctiveness is questionable; resolution of uncertainty may result in change from a species to a subspecies or hybrid, or the inclusion of this taxon in another taxon with a lower conservation priority	G#?	Inexact numeric rank

2.1.9.1. Indicator

Management should conserve essential habitat elements for species, populations, and communities that are present and available to the extent they are consistent with the potential of the landscape. This requires identifying factors that describe resource condition. The BLM Alaska Land Health Standards and Guidelines (IMAK2004023) ensures this by defining qualitative indicators intended for monitoring progress toward or away from the standards (BLM 2004). The standards are (A) watershed function-uplands, (B) watershed function-riparian, wetland and aquatic areas, (C) ecological processes, (D) threatened, endangered, native, and locally important species, and (E) water quality and yield.

2.1.9.1.1. Special Status Plants – Indicator

The Alaska Statewide Land Health Standards includes the following goals, objectives, and guidelines.

Goal: To ensure that habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance, e.g., those used for subsistence).

Objective: Essential habitat elements for species, populations, and communities are present and available to the extent they are consistent with the potential/capability of the landscape.

Guideline: Where practical, use will be redirected, as necessary, to protect Federal and State listed and candidate Threatened and Endangered species habitat, to enhance indigenous animal population, and to otherwise maintain public land health through avoidance of sensitive habitat.

Guideline: Fish and wildlife resources and habitat will be managed to ensure compliance with the Endangered Species Act (ESA) and to ensure progress towards recovery of listed threatened or endangered species.

Indicators for special status species as a whole have not been established for Alaska or the planning area. Indicators for individual special status species in the planning area have also not been established. Potential indicators for special status species (SSS) might include the following.

Central Yukon Planning areawide SSS indicators are:

- The number of SSS which require listing as threatened or endangered under the ESA.
- The number of SSS that are removed from special status due to increasing population trend.

Individual SSS indicators (these could be combined for an overall program indicator)

- Population trend of individual special status species.

- Percent of surface disturbance in special status species range or habitat.
- AKHNP/Natureserve SRank remaining stable or improving.

With few exceptions, quantitative information that would allow detection of a population trend is not available for most sensitive species. By their nature, they are typically uncommon and difficult to census. In some cases, such as sensitive plants, efforts have focused on detecting whether species occur on BLMmanaged lands and have not progressed to estimating population sizes or trends.

2.1.9.1.2. Special Status Animals – Indicator

See section 2.1.9.1.1 (Special Status Plants — Indicator) for discussion of Special Status Species Indicators.

2.1.9.2. Current Condition

The BLM Alaska special status species includes those that are listed, proposed for listing, or designated as candidates for listing as threatened or endangered under the provisions of the Endangered Species Act. Also included are species listed by the State of Alaska as being endangered or threatened. Additionally, several species have been identified as having insufficient data to satisfy the eligibility criteria that are termed *watch species* (BLM 2008b). These special status species may warrant additional data collection to more accurately determine their status, as funding and time allow. The following sections will describe the location, extent, and current condition of the special status plant and animal species in the planning area.

2.1.9.2.1. Special Status Plants – Current Condition

The BLMAlaska special status plant species list includes those listed in table 2.10 that may occur within the planning area. In addition to the BLM sensitive and watch species, this list includes those ranked as imperiled or endangered throughout Alaska due to rarity or some factor making it highly vulnerable to extirpation from the state (NatureServe 2014). Species that are known to occur on BLM-managed lands are indicated. High priority species (*) are described in further detail in this section.

Table 2.10. State and Global Rank of Special Status Plants Possibly Occurring in the Planning Area

Common Name	Scientific Name	State Rank	Global Rank	BLM Status
Clavate bentgrass	*Agrostis clavata* Trin.	S1S2	G4G5	Watch
Low sandwort	*Arenaria longipedunculata* Hulton	S3S4	G3G4Q	Watch
	Artemisia laciniata auct. Non Wiild.	S3	G4?	*Sensitive
	Aster pygmaeus (Synonym: Symphyotrichum pygmaeum)	S2	G2G4	Sensitive
Dewey sedge	*Carex deweyana* Schwein. var. deweyana	S2S3	G5	
Hudson Bay sedge	*Carex heleonastes* Ehrh. ex L.	S3	G4	Watch
Peck's sedge	*Carex peckii* Howe	S2*	G4G5	
Manyhead sedge	*Carex sychnocephala* J. Carey	S2	G4	
Alaskan bugseed	*Corispermum ochotense* var. alaskanum Ignatov	S3	G3G4	Watch
	Cypripedium parviflorum var. exiliens Sheviak	S2S3	G5	

Common Name	Scientific Name	State Rank	Global Rank	BLM Status
Tall draba	*Draba praealta* Greene	S1Q	G5	
Ellesmereland whitlograss	*Draba subcapitata* Simmons	S1S2	G4	Watch
Great Lakes wheatgrass	*Elymus lanceolatus* ssp. psammophilus J. M. Gillett & H. Senn	S1S2	G3G4	
Muir's fleabane	*Erigeron muirii* A. Gray	S2S3	G2	*Sensitive
Buff fleabane	*Erigeron ochroleucus* Nutt.	S1S2	G5	Watch
Largeflower fleabane	*Erigeron porsildii* G.L.Nesom & D.F.Murray	S3S4	G3G4	Watch
Yukon fleabane	*Erigeron yukonensis* Rydberg	SU	G2G4	*Sensitive
Knotted rush	*Juncus nodosus* L.	S1S2	G5	
Prairie junegrass	*Koeleria macrantha* (Ledeb.) Schult.	S1	G5	
Yukon lupine	*Lupinus kuschei* Eastw.	S2	G3G4	Watch
Bostock's miner's-lettuce	*Montia vassilievii* subsp. vassilievii / *Montia bostockii*	S3Q	GNRTNR	*Sensitive
Kamchatka buttercup	*Oxygraphis glacialis* (Fisch.) Bunge	S3	G4G5	Watch
Arctic locoweed	*Oxytropis arctica* var. barnebyana S.L. Welsh	SU	G4?T2Q	Sensitive
Korkrines Oxytrope	*Oxytropis kokrinensis* A.E. Porsild	S3	G3	Watch
	Oxytropis tananensis Jurtz.	S3S4Q	GNR	Watch
Hairy lousewort	*Pedicularis hirsuta* L.	S1	G5?	*Sensitive
Spiny phlox	*Phlox hoodia* Richardson	S3Q	G5	Watch
False/Nodding semaphoregrass	*Pleuropogon sabinei* R. Br.	S1S2	G4G5	*Sensitive
Sandberg bluegrass	*Poa secunda* J. Presl ssp. secunda	S1S2	G5TNR	
Yenisei River pondweed	*Potamogeton subsibiricu*s	S3S4	G3G4	Watch
Anderson's alkaligrass	*Puccinellia andersonii* Swallen	S1S2	G3G5	
Narrow alkaligrass	*Puccinellia angustata* (R. Br.) E.L. Rand & Redfield	S1	G4Q	
	Puccinellia vahliana (Liebm.) Scribn. & Merr.	S3	G4	Watch
Wrights alkaligrass	*Puccinellia wrightii* ssp. wrightii	S3	G3G4TNR	*Sensitive
	Ranunculus camissonis Schltdl.	S3	GNR	*Sensitive
Turner's buttercup	*Ranunculus turneri* ssp. turneri Greene	S2	G3TNR	*Sensitive
Curvepod yellowcress	*Rorippa curvisiliqua* Hooker Bessey ex Britton	S1S2	G5	
Wood's rose	*Rosa woodsii* Lindl. ssp. woodsii	S2S3	G5T5	
Athabasca willow	*Salix athabascensis* Raup.	S2	G4G5	
Diamondleaf willow	*Salix planifolia* Pursh	S2	G5T5	
Small saxifrage	*Saxifraga adscendens* ssp. oregonensis (Raf.) Bacig.	S2S3	G5T4T5	
Yellow mountain saxifrage	*Saxifraga aizoides* L.	S1	G5	
Strict blue-eyed grass	*Sisyrinchium montanum* Greene var. montanum	S1	G5	
	Symphyotrichum pygmaeum (Lindl.) Brouillet & S.Selliah	S2	G2G4	*Sensitive
Yukon aster	*Symphyotrichum yukonense* (Cronquist) G.L. Nesom	S3	G3	Watch
Siberian false-oats	*Trisetum sibiricum* subsp. litorale Rupr. ex Roshev.	S3	G5T4Q	*Sensitive
American vetch	*Vicia americana* Muhl. ex Willd.	S2	G5	

2.1.9.2.2. Special Status Animals – Current Condition

Threatened and Endangered (and Candidate) Wildlife Species

Several species that inhabit the planning area are listed or proposed to be listed under the Endangered Species Act (ESA).

Polar Bear (*Ursus maritimus*) The only mammal that inhabiting the planning area that is currently cited under the ESA is the polar bear, which is listed as a threatened species because dependence on sea ice is likely to cause population declines in the future. Current and predicted future declines in sea ice led the USFWS to find that the polar bear should be listed as threatened throughout its range. Thinner ice and longer ice-free periods in summer may reduce the length of time polar bears have to hunt and result in a decreasing population. NatureServe lists the species as globally vulnerable (G3) as well as vulnerable within the State of Alaska (S3). The planning area does include current inhabited polar bear habitat along the Beaufort Sea, however, little BLM-managed land is included in this inhabited area. That being said, some polar bears have been observed inland (near lands likely to be managed by the BLM) and it is possible that this occasional occurrence may become more common in the future as habitat becomes limited in the species' historic coastal range. Therefore, the polar bear is of potential management concern for this land use plan.

Spectacled eider (*Somateria fischeri*) This large sea duck is the only avian species inhabiting the planning area that is currently under the ESA as threatened. NatureServe lists the species as globally vulnerable (G3) and the breeding population within Alaska is considered imperiled (S2B). Current nesting population is approximately 8,000 breeding pairs in Alaska and approximately 140,000 individuals in Russia. The population of spectacled eiders has declined significantly since the 1960s, but the cause of this decline remains unknown. Threats to the spectacled eider include lead poisoning, predation, overharvest, reduced prey availability, and catastrophic events. The planning area does include current inhabited polar bear habitat along the Beaufort Sea; however, little BLM-managed land is included in this inhabited area. The species spends 9 to 12 months of the year in marine habitat, and while some of the breeding range does overlap the current planning area, no BLM-managed land falls within in known breeding range.

Yellow-billed loon(*Gavia adamsii*) is a BLM-listed sensitive species with a global population estimated between 16,650 and 21,000 (Fair 2002, Earnst 2004). Yellow-billed loons are poorly documented and population estimates across the state likely represent a small percentage of the total population. The species' range significantly overlaps the Central Yukon RMP Planning Area; over 1,700 nests have been reported in the planning area since 1983. However, only a small (less than 10) subset of these nests have been reported on BLM-managed lands within the planning area. Breeding habitat is restricted to large lakes (over 7 hectares) (North and Ryan 1989) in the Arctic coastal plain of Alaska north of the Brooks Range and in western Alaska on the Seward Peninsula. Due to its small population size and restricted distribution, the USFWS is currently evaluating a petition to list this species as threatened or endangered under the ESA. The species is listed by NatureServe as G4 (globally apparently secure) and S2S3B (on a state-wide level imperiled to vulnerable for the breeding population) and S3N (on a state-wide level vulnerable for the nonbreeding population). Contaminant studies of many loon species have been ongoing in Alaska. As a piscivorous species, yellow-billed loons are top predators in lake ecosystems. They are harvested for human subsistence and are of concern because they may bioaccumulate contaminant loads (i.e., mercury, PCPs) (Schmutz pers. comm. 2008). In addition, they may be

indicators of water quality and may provide insight into the movement of marine-derived nutrients and shifts in riparian or coastal communities.

Wood bison (*Bison bison athabascae*) is a federally listed threatened species with a range that once overlapped much of the planning area. This species is not currently present in Alaska, but reintroduction of free-ranging herds to three areas within the planning area has been considered. In 2013, the USFWS published a proposed rule under the ESA to establish a nonessential experimentall population of wood bison in Alaska. Three areas are being considered for potential release: Yukon Flats, Minto Flats and Innoko River. The Yukon Flats and Innoko River proposed areas overlap the Central Yukon RMP planning area to some degree and the Minto Flats proposed release area is entirely within the planning area. Management of the bison herd(s) would be delegated to the ADFG, who would manage them in accordance with the final rule, the final EA, and site-specific management plans that will be developed in coordination with landowners and other stakeholders (e.g., BLM*)*. It is expected these populations would eventually be hunted for subsistence and/or sport purposes. The ESA requires that any non-essential experimental population animals occurring on BLM lands must be treated as if they had "Proposed" status under the ESA. Therefore although the species does not currently inhabit the planning area, it is of potentially high management concern within the anticipated 20-year anticipated timeframe of this plan.

Other special status species with current ranges that overlap (or may have overlapped) the planning area should be mentioned, but are not likely to be focal in this land use plan. The Eskimo curlew is a shorebird with a historic range that likely had significant overlap with the planning area, however this species is currently believed to be extinct with the last confirmed siting in 1996. Bearded and ringed seals as well as walruses are sea mammals with coastal habitat ranges included within the planning area; however, because these animals are predominantly marine species and no BLM-managed lands within the planning area overlap their ranges, they are unlikely to be analyzed in detail in this plan or become an issue within the 20-year anticipated timeframe of this plan.

BLM Alaska Listed Sensitive Species

The BLM Alaska has listed a number of species as sensitive. Seven bird and two mammal species that are currently listed by BLM as sensitive inhabit the planning area. These species are not federally listed threatened and endangered species, but the BLM has identified them as being high priority for a variety of reasons.

Table 2.11. BLM Alaska Sensitive Species Known to Occur in the Planning Area

	Scientific Name	Common Name	AKNHP Global Conservation Status Ranking	AKNHP State Conservation Status Ranking
Bird	*Gavia adamsii*	Yellow-billed loon	G4	S2S3B
	Cygnus buccinator	Trumpeter swan	G4	-
	Aquila chrysaetos	Golden eagle	G5	S4B,S3N
	Asio flammeus	Short-eared owl	G5	-
	Contopus cooperi	Olive-sided flycatcher	G4	S4S5B
	Dendroica striata	Blackpoll warbler	G5	S4B
	Euphagus carolinus	Rusty blackbird	G4	S4B,S3N
Mammal	*Lepus othus*	Alaskan hare	G3G4	S3S4
	Sorex yukonicus	Alaskan tiny shrew	GU	S3

2.1.9.3. Trends

To meet conservation goals on public lands, an understanding of population trends is key to developing appropriate management strategies. The following sections describe the trends of special status plant and animal species in the planning area. The following trends in special status plant and animal species describe the degree and direction of change and the drivers of change. These changes may be based on either quantitative or qualitative information.

2.1.9.3.1. Special Status Plants – Trends

Trends for the special status plant species are unknown for the planning area. Most occur in habitats which are presently undisturbed and largely intact. With few exceptions, quantitative information, which would allow detection of a population trend, is not available for most species. By their nature, special status plants are typically uncommon and difficult to census. Historic efforts have focused on detecting whether species occur on BLM-managed lands and have not progressed to estimating population sizes or trends. Ongoing changes in climate further compounds the uncertainty regarding the direction of these trends in the future.

2.1.9.4. Forecast

Future development and other ground-disturbing activities in the planning area are expected to increase. With new investment on the North Slope, traffic along the Dalton Highway is also projected to increase (Slaten 2014). Although the Dalton Highway is the only major highway in the planning area, expansion of the road network, particularly for accessing remote resources and villages, is being explored for future construction. Both paved and winter ice roads are under consideration for development in the future, such as roads to Umiat, Stevens Village, and Ambler. These and others have the potential to impact special status species, and appropriate stipulations and analysis should be conducted before permits are issued.

2.1.9.4.1. Special Status Plants – Forecast

It is not possible to predict future statuses for the special status plant species. Most occur in habitats that are not expected to be the site of ground-disturbing activities. The unknown effects of shifts in future climate conditions may either positively or negatively affect the presence and prevalence of these species in the planning area.

2.1.9.5. Key Features

Key features of special status plants and animals describe the geographic location, distribution, areas or types of resource features that should guide land use allocation or management decisions.

2.1.9.5.1. Special Status Plants – Key Features

BLM-managed lands within the planning area are known to support populations of the special status plant species. Their geographic locations in the planning area are generalized below (Table 2.12). Specific locations of the populations are unknown. Notably, not all areas have been inventoried for special status species, therefore, lack of listing in this document does *not imply* that no populations exist in the planning area. Data availability is limited on these special status

plant species and further inventorying would be necessary to ensure that populations are managed properly. The limited current population data available for these species were retrieved for this analysis from the AKNHP online rare plants data portal and the Alaska Rare Plant Field Guide (Nawrocki et al. 2013). The AKNHP data had been gathered from field inventories, publications, reports, herbaria specimens, and the knowledge of various botanists and taxonomic experts. Additional data were collected as part of an agreement between the BLM and the University of Alaska Museum Herbarium to search for rare plants in the Toolik and Galbraith Lake Areas of Environmental Concern (ACEC) in the northern foothills of Alaska's Brooks Range. *Montia vassilievii* was found during the inventory in the Toolik Lake ACEC, which revealed that this plant is more common in the area than previously thought. *M. vassilievii* was found in several vegetation complexes, but most frequently in the moist and dry, non-acidic tundra complexes (Carroll et al. 2003).

Documented special status plant species are distributed in areas of open tundra and boreal forest. These ecosystems provide specialized habitats with key features that support these isolated populations. Understanding what key features are critical to the conservation of these special status plant species will help to inform future land use and management decisions. Habitat type information is also included below, if it is known.

Table 2.12. Geographic Location of Special Status Plants in the Planning Area

Special Status Plant Name	Alaska Distribution/ Habitat Description	Ecoregion Occupied	Population Estimates	Geographic Location[a]	
				Lati-tude	Longitude
Low sandwort *Arenaria longipedunculata* Hulton	Moist sand, gravel, frost boils, rock crevices and moist places in the mountains	This is a western North American endemic, limited to interior and northern Alaska and the Canadian Rocky Mountains	There are likely more than 60 locations known in Alaska and western Canada, all widely scattered.	67.4 67.6	-150.1 -149.7
Hudson Bay sedge *Carex heleonastes* Ehrh. ex L.	Arctic Tundra, Bering Tundra, Intermontane Boreal, Alaska Range Transition	Brooks Range, Seward Peninsula, Davidson Mountains, Kobuk Ridges and Valleys, Tanana-Kuskokwim Lowlands, Alaska Range, Cook Inlet Basin	Nine known occurrences in Alaska; population sizes unknown	66.9	-151.5
Cypripedium parviflorum var. exiliens Sheviak	Arctic Tundra, Intermontane Boreal	Brooks Range, Yukon-Old Crow Basin, North Ogilvie Mountains	Nine known occurrences in Alaska; a population in an open spruce forest on calcareous substrate consisted of 100 individuals	67.3 67.6	-156.9 -149.6
Tall draba *Draba praealta* Greene				65.7	-151.3

Special Status Plant Name	Alaska Distribution/ Habitat Description	Ecoregion Occupied	Population Estimates	Geographic Location[a]	
				Latitude	Longitude
Muir's fleabane *Erigeron muirii* A. Gray	Arctic tundra	Beaufort Coastal Plain, Brooks Foothills, Brooks Range	16 known occurrences in Alaska; at least two occurrences are locally common with 500 to 1,000 individuals		
Yukon fleabane *Erigeron yukonensis* Rydberg	Arctic tundra	Northwest Territory, Nunavut, Yukon and Alaska		No data available	
Knotted rush *Juncus nodosus* L.				65.2	-154.7
Yukon lupine *Lupinus kuschei* Eastw.	Intermontane Boreal, Alaska Range Transition, Coastal Mountains Transition	Copper River Basin, Tanana-Kuskokwim Lowlands, Kluane Ranges, Yukon-Tanana Uplands; disjunct in Kobuk Ridges and Valleys, Yukon River Lowlands	There are 15 known occurrences in Alaska; population sizes range from a few individuals to locally common	66.8	-158.3
Bostock's miner's-lettuce *Montia vassilievii* subsp. vassilievii / *Montia bostockii*	Arctic tundra, intermontane boreal, Alaska Range transition, coastal mountains transitions, coastal rainforests	Brooks Foothills, Yukon-Tanana Uplands, Alaska Range, Wrangell Mountains, Kluane Ranges, Chugach-St. Elias Mountains	29 known occurrences in Alaska with population sizes ranging from scattered individuals to locally abundant.	68.6	-149.6
				68.6	-149.7
				68.6	-149.5
Kamchatka buttercup *Oxygraphis glacialis* (Fisch.) Bunge	Arctic Tundra, Bering Tundra, Alaska Range Transition, Bering Taiga, Aleutian Meadows	Brooks Foothills, Brooks Range, Seward Peninsula, Alaska Range, Ahklun Mountains, Alaska Peninsula, Aleutian Islands	There are 20 known occurrences in Alaska; no information available for population sizes	69.1	-161.2
				69.1	-158.1
Arctic locoweed *Oxytropis arctica* var. *barnebyana* S.L. Welsh				No data available	
Korkrines Oxytrope *Oxytropis kokrinensis* A.E. Porsild	Arctic Tundra, Bering Tundra, Bering Taiga, Intermontane Boreal	Brooks Foothills, Brooks Range, Seward Peninsula, Nulato Hills, Kobuk Ridges and Valleys, Ray Mountains	There are 25 known occurrences in Alaska; population sizes unknown	65.7	-156.7
				66.6	-155.3
				67.2	-158.2
				65.7	-151.5
				65.7	-151.3
				65.7	-151.2
				65.7	-151.1
Oxytropis tananensis Jurtz.	Dry gravels and xeric bluffs of Interior Alaska		Restricted to a small geographic area, though it is often common on the sites where it is found	67.4	-150.1

Special Status Plant Name	Alaska Distribution/ Habitat Description	Ecoregion Occupied	Population Estimates	Geographic Location[a]	
				Lati-tude	Longitude
False/Nodding semaphoregrass *Pleuropogon sabinei* R. Br	Arctic tundra	Beaufort Coastal Plane	There are 7 known occurrences in Alaska and the population sizes are unknown	70.8	-153.1
				70.6	-152.7
				70.6	-152.5
Yenisei River pondweed *Potamogeton subsibiricu*s				69	-148.7
				68.7	-148.8
				69.3	-152.1
Wrights alkaligrass *Puccinellia wrightii* ssp. wrightii	Rare in Southern arctic tundra; frequent in shrub tundra, bordering boreal or alpine	Rare in Western Alaska and Northern Alaska-Yukon		68.9	-153.8
				65.9	-161.1
Ranunculus camissonis Schltdl.	Arctic tundra, Bering tundra and Intermontane boreal	Brooks Range, Kotzebue Sound Lowlands, Seward Peninsula, Bering Sea Islands, Ray Mountains, Yukon-Tanana Uplands	16 known occurrences in Alaska; locally abundant in at least two localities, an occurrence on St. Lawrence Island consisted of approximately 40 individuals	65.7	-151.2
Turner's buttercup *Ranunculus turneri* ssp. turneri Greene	Arctic tundra, Bering tundra, Intermontane Boreal	Brooks Foothills, Bering Sea Islands, Ray Mountains, North Ogilvie Mountains	There are 10 known occurrences in Alaska; two populations along rocky stream banks on St. Lawrence Island were estimated at 5,000 and 1,000 individuals	65.4	-151.1
Yukon aster *Symphyotrichum yukonense* (Cronquist) G.L. Nesom	Arctic Tundra, Intermontane Boreal	Tramway Bar, Koyukuk River; Brooks Range, Kobuk Ridges and Valleys	There are 39 known occurrences in Alaska; populations range in size from 20 individuals to locally abundant	67.4	-151.1
				67	-151.1
				67	-151
				67	-150.9
				67	-150.8
				67	-150.7
				67	-150.6
				67	-150.5
				67	-150.4
				66.8	-151.7
				68.1	-150.1

[a]Coordinates are purposely generalized

2.1.9.5.2. Special Status Animals – Key Features

Wetlands and riparian areas as well as actual waterbodies (e.g., lakes, ponds, rivers/streams, and associated shorelines) are likely to provide important habitat for one or more designated sensitive bird species (e.g., rusty blackbirds, yellow-billed loons, olive-sided flycatchers, blackpoll warblers, and trumpeter swans) and should be given special consideration in planning. Bluff habitat provides important nesting and perching areas for raptors, including golden eagles. To ensure the health of these designated sensitive bird species, their respective habitats should be

considered in this planning effort, particularly for specially designated areas such as ACECs. Habitat associations for the two known sensitive mammal species that inhabit the planning area (i.e., the Alaskan hare and the Alaskan tiny shrew) are not as well-studied, therefore, important habitat is not easily identified.

2.1.10. Wildland Fire Ecology and Management

Introduction

Wildland fire management is made up of three major components: wildland fire, fuels management, and prevention. Wildland fire management is the management of wildland fire in such a manner that fire is allowed to play its key role in the ecosystem, while protecting identified values at risk. Fuels management is the development and implementation of prescribed fire, mechanical, or chemical treatments to fuels in a given area(s). Fuels management projects will be designed to meet desired future conditions in areas where wildland fire is being suppressed or acreage minimized due to values at risk. Fuels projects can be used to protect site-specific values at risk or be large landscape-scale projects designed to benefit multiple resources. Prevention is the reduction and elimination of human-caused fires. Wildland fire is an important mechanism of change in the planning area. Management strategies will be developed for each of the three components of wildland fire management to meet those goals and objectives.

Fire ecology in the planning area is relatively complex and a primary driver of the vegetative communities. A discussion of the fire ecology for the planning area is included in the Vegetative Communities Section 2.1.4.

National fire management goals are found in Federal Wildland Fire Management Policy and Program Review, December 1995, and Review and Update of the 1995 Wildland Fire Management Policy, January 2001. There are many fire management goals found in these two documents. Among the most important are: protect human life and identified property; use wildland fire and fuels treatments to meet resource objectives; reduce the risk and cost of uncontrolled wildland fires through wildland fire and fuels treatments; and reduce the adverse effects of fire management activities and continue interagency cooperation and collaboration.

Department of the Interior (DOI) goals are found in U.S. Department of Interior Strategic Plan 2009-2014. Several of the goals directly relate to fire management: Improve health of watersheds, landscapes and marine resources that are DOI managed or influenced in a manner consistent with obligations regarding the allocation and use of water; sustain biological communities on DOI-managed and influenced lands and water in a manner consistent with obligations regarding the allocation and use of water; protect lives, resources, and property. The way to achieve these goals is to use wildland fire and fuels projects to restore and maintain fire-adapted ecosystems and to reduce hazardous fuels while protecting human life, cultural resources, and other identified values at risk. DOI fire management policy is found in Departmental Manual, Part 620 and BLM Manual section 9200.

BLM goals are found in Bureau of Land Management Strategic Plan, 2010-2015. The goals that relate to fire management are: Preserve natural and cultural resources; reduce threats to public health, safety and property; and restore at-risk resources and maintain functioning systems. A way to achieve these goals is also to use wildland fire and fuels projects to restore and maintain fire-adapted ecosystems and to reduce hazardous fuels while protecting human life, cultural

resources, and other identified values at risk. BLM Fire Management Policy is found in BLM manual section 9200.

BLM Alaska goals are found in Bureau of Land Management-Alaska Statewide Land Health Standards (BLM 2004). Because wildland fire is such an important disturbance factor in boreal ecosystems, the uses of wildland fire and fuels treatments are key to meet most of the goals stated in the statewide land health standards.

There are numerous other documents that plan or lay out strategies for fire management. These are discussed in the following section. They do not change the above-stated goals, but reiterate, clarify, and give guidance on how to accomplish them.

Current Planning Documents and Management Practices

In the 1980s, interagency fire planning documents were prepared for 13 geographic areas covering the entire state of Alaska. Seven of these 13 fire planning areas overlap the planning area:

- Tanana/Minchumina Planning Area 1982 and Amendment 1984
- Arctic Slope Planning Area, March 1986
- Upper Yukon/Tanana Planning Area, April 1984
- Kobuk Planning Area, April 1984
- Seward Peninsula Planning Area, April 1984
- Yukon/Togiak Planning Area, June 1983
- Kuskokwim/Illiamna Planning Area, June 1983

In 1998, the 13 original fire plans were consolidated into one document: the Alaska Interagency Wildland Fire Management Plan (AIWFMP 1998). This consolidation updated language, eliminated the boundaries of the 13 original plans, and combined common elements into a single operational document. The AIWFMP was updated in 2010 to incorporate the use of wildland fire as a tool to benefit resources and update policy language. The 2010 AIWFMP does not supersede the BLM Wildland Fire Management Plan (2005), rather the principles from the AIWFMP (2010) are incorporated into the BLM Wildland Fire Management Plan (2005).

BLM completed the Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska Environmental Assessment (July 2005) to meet NEPA planning requirements for wildland fire and fuels management in existing RMPs. After this, the BLM Alaska Wildland Fire Management Plan (September 2005) was written to provide direction for wildland fire management in future planning efforts on BLM lands in Alaska. Both of these documents embrace the principles outlined in the Alaska Interagency Wildland Fire Management Plan (AIWFMP 2010).

Prior to fire planning in the 1980s, BLM policy directed all fires to be suppressed in Alaska. The 13 original fire plans and the AIWFMPs recognized that this policy was costly, of questionable effectiveness, and had a negative effect on the diversity and productivity of the fire-dependent ecosystems of Alaska. In addition, during periods of high fire activity it was not possible to provide immediate and effective suppression on many fires because of the shortage of personnel, equipment, supplies, and aircraft. An improved system was needed for establishing priorities and levels of suppression. Once fire protection needs were determined, the lands were placed in Critical, Full, Modified, or Limited management option. Option selections were based on land manager/owner(s) values to be protected as well as land and resource management objectives. The management strategies described below are implemented in the planning area.

The wildland fire management strategies selected vary from initial attack and sustained suppression efforts in the Critical and Full management areas to surveillance in the Limited management areas. This categorization and ensuing prioritization ensures that: (1) human life, private property, and identified resources receive an appropriate level of protection with available firefighting resources; (2) the cost of the suppression effort is commensurate with values identified for protection; and (3) the ability of land manager/owner(s) to achieve their individual management objectives is optimized.

Management options (Critical, Full, Limited, and Modified) are reviewed annually and adjustments are made to ensure goals and objectives are being met. Fire management options and descriptions can be found in appendix D.

BLM Alaska has a cabin/structure protection policy that outlines protection priorities. The policy identifies its number one priority as safety of the public and fire suppression personnel. The policy delineates criteria for protection. It can be found in appendix C.

Regional Context

The natural fire regime in the planning area is fairly intact. More information on the fire ecology of the planning area is included in section 2.1.4 Vegetative Communities. The BLM did not actively suppress wildland fires for long enough to have excluded wildland fire for multiple fire return intervals. Large portions of the planning area are in the Limited management option where wildland fires are monitored rather than suppressed. Vegetative impacts from fire suppression are likely occurring near villages where suppression has occurred. Much of the suppression has occurred on village and regional corporation land; however, BLM does manage some lands in the Modified and Full management options that should be evaluated for impacts of fire exclusion.

2.1.10.1. Indicator

The best indicator of fire management resources is Fire Regime and Condition Class (FRCC). FRCC maps generated by the nationwide LANDFIRE vegetation mapping effort may be used for this plan. More information on LANDFIRE and vegetation mapping is included in section 2.1.4 Vegetative Communities.

2.1.10.2. Current Condition

Information about the FRCC for the planning area will be a component of the Existing Environment section of the Central Yukon Draft EIS when it is developed. More information on the ecological condition of the planning area is included in section 2.1.4 Vegetative Communities.

2.1.10.3. Trends

The trend from past to present is to manage wildland fires to meet resource objectives rather than attempting to eliminate wildland fire as a source of disturbance. This was accomplished by changing large areas of the Full and Modified management options to the Limited management option. For much of the planning area, BLM can meet resource objectives and contain costs by using the Limited wildland fire management option.. More information on vegetative trends including current impacts associated with climate change is included in section 2.1.4 Vegetative Communities.

2.1.10.4. Forecast

The BLM has the ability to use the appropriate management response on any given wildland fire or change pre-planned wildland fire response through the fire management options as resource needs change. In general, areas that are converted to the Limited management option from the Full or Modified management options will trend toward a natural fire regime. In the absence of fuels treatments, areas that are in a Critical, Full, or Modified fire management option will trend away from a natural regime due to fire suppression efforts. More information on the future impacts of wildland fire and climate change on the vegetation can be found in section 2.1.4 Vegetative Communities.

2.1.11. Cultural Resources

2.1.11.1. Indicator

This section seeks to identify the factors that are used to describe the resource condition for cultural resources on BLM-managed lands within the planning area.

The term "Cultural Resource" is not uniformly defined by the many laws that guide the federal management of resources that are "cultural" or "historical." While the National Historic Preservation Act (NHPA) is concerned primarily with "historic properties" or those districts, sites, buildings, structures, and objects that have been determined eligible for inclusion on the National Register of Historic Places (NRHP), the National Environmental Policy Act (NEPA) requires federal agencies to account for the effect to the "human environment" and could include a variety of historic and prehistoric resources regardless of NRHP eligibility. Other acts such as the Archeological Resources Protection Act prohibit the excavation of any item of archeological interest on federal or Indian land without a permit, and the Native American Graves and Repatriation Act is concerned with such things as human remains, items of cultural patrimony, and Native American cultural items. As such, "Cultural Resources" has come to designate a broad spectrum of tangible resources and locations important to the human past and present that are accounted for by a variety of federal laws and regulations. Of all the federal legislation governing the use and management of cultural resources, the NHPA, is the most comprehensive and most heavily relied upon by federal land managers. As such, a brief discussion of how Section 106 of the NHPA is used to determine condition and significance of cultural resources is necessary.

Section 106 Review and Historic Properties

The NHPA's Section *106 Review Process* is an integral aspect of most the federal land and resource management decisions. Section 106 provides a workflow and consultative process that accounts for impacts to cultural resources by federal undertakings with the term "undertaking" defined as an action that is funded or approved by the federal government. The process is consultative in that the federal land manger is required to consult throughout the process with the State Historic preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), interested parties identified by the process, and the Advisory Council on Historic Preservation. Section 106 requires the federal land manager to identify historic properties that are likely to be affected by a given federal undertaking and take steps to avoid, minimize and or mitigate effects to those historic properties. The term "historic property" is used to identify those cultural

resources (districts, sites, buildings, or structures) that have been determined eligible for inclusion on the National Register of Historic Places.

Once the federal land manager has identified an undertaking, such as a new resource management plan, permit, or expenditure of federal funds with the potential to impacts historic properties, the land manager must take steps to identify all historic properties that may be affected (36 CFR §800.4). This effort involves identifying an area of potential effect, literature reviews and possibly on-the-ground inventory to identify all cultural resources in excess of 50 years of age that may be impacted by the proposed undertaking. The Section 106 Identification Phase is followed by an Evaluation Phase in which the land manager applies the National Register Eligibility Criteria (36 CFR §63) to determine whether a resource is eligible for inclusion on the NRHP and is to be considered an "historic property." The agency determination is forwarded to the SHPO/THPO for concurrence or modification.

To be considered eligible for inclusion on the NRHP, any property must typically be older than 50 years **and** be determined "significant" based upon one or more of the following four criteria:

- Criterion A, **Event**: is it associated "with events that have made a significant contribution to the broad patterns of our history";
- Criterion B, **Person**: is it associated "with the lives of persons significant in our past";
- Criterion C, **Design/Construction**: the property embodies "the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction";
- Criterion D, **Information Potential**: the property has "yielded, or may be likely to yield, information important in prehistory or history."

Two additional criteria are available when considering if a property is eligible for inclusion as a National Historic Landmark, a status authorized under the Historic Sites Act (1935).

In addition to meeting at least one of the four eligibility criteria a property must also have "integrity." A property either has integrity, or it does not. The NRHP recognizes seven aspects or qualities of integrity. Most properties that are eligible for inclusion to the NRHP typically need to meet or demonstrate several of these seven aspects. Aspects of integrity are often qualitative or subjective in nature, and need to be demonstrated relative to both the specific property in question and the criterion or criteria under which it is being nominated. The seven aspects of integrity, along with their definitions (NPS 1991: 4445), are:

1. *Location*: "Location is the place where the historic property was constructed or the place where the historic event occurred";
2. *Design*: "Design is the combination of elements that create the form, plan, space, structure, and style of a property";
3. *Setting*: "Setting is the physical environment of a historic property";
4. *Materials*: "Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property";

5. *Workmanship*: "Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory";

6. *Feeling*: "Feeling is a property's expression of the aesthetic or historic sense of a particular period of time";

7. *Association*: "Association is the direct link between an important historic event or person and a historic property."

Most "historic properties" within the Central Yukon Planning Area will have been determined eligible under Criterion D, Information Potential, based upon the property's potential to yield data that addresses specific research questions. A property determined eligible under Criterion D will be assessed largely in terms of whether the site is likely to yield the appropriate quantity, quality, and type of information necessary to address specified research questions and the resulting information must be deemed significant at the local, regional, or national level.

Once the historic properties have been identified within the area of potential effect, the federal land manager must conduct an *Assessment of Adverse Effects*, whereby the extent of likely impacts to historic properties is determined. Once the likely impacts to the resources are identified, the consulting parties determine whether impacts can be avoided or minimized either through project modification or by taking actions such as defining buffer zones and other protective measures. If an *adverse effect* to historic properties cannot be avoided, the federal land manager may elect to join the consulting parties to identify measures that serve to mitigate the impacts to historic properties. It is important to note that potential adverse effects to historic properties must be considered in the concurrent NEPA process. If the undertaking proceeds at this point, any number of mitigation strategies can be used to offset the damage to or destruction of historic properties; mitigation could include such things as archeological excavation, construction of interpretive exhibits, creation of publications and other media, or off-site projects that serve to interpret cultural resources to the public or protect threatened resources.

As noted, the Section 106 process is just one tool for determining the significance of cultural resources. Cultural resources that do not fulfill the NRHP eligibility requirements may be determined significant through the NEPA process that is implemented alongside Section 106 review. While this rarely happens on BLM—managed lands in Alaska, it is possible for a property to be protected or preserved for such things as future research, retention of cultural or historic values, educational, interpretive uses, or recreation purposes regardless of NRHP eligibility status.

2.1.11.2. Current Condition

This section describes the location, extent, and current condition of the resources in the planning area. This assessment is largely limited to site presence, density, and type throughout the planning area, regardless of land status or ownership. This information is presented with the understanding that the vast majority of the planning area has not been subjected to any kind of cultural resources inventory and NRHP eligibility is not routinely determined unless a site is subject to a federal undertaking. As such, the following is more a record of where cultural resources inventories have taken place across this vast portion of Alaska and not a comprehensive analysis of site condition and significance. Much of the following data are gained from the Alaska Heritage Resources Survey database, a statewide clearinghouse of cultural and paleontological resources maintained by the State of Alaska, Department of Natural Resources, Division of Parks and Outdoor Recreation, Office of History and Archeology.

Location and Extent

As of the time of this printing, 3,437 historic and prehistoric cultural resources have been identified within the planning boundary of the Central Yukon RMP. For ease of interpretation, these sites are broken down into three distinct regions: the North Slope; Haul Road; and Yukon Basin (Figure 2.1).

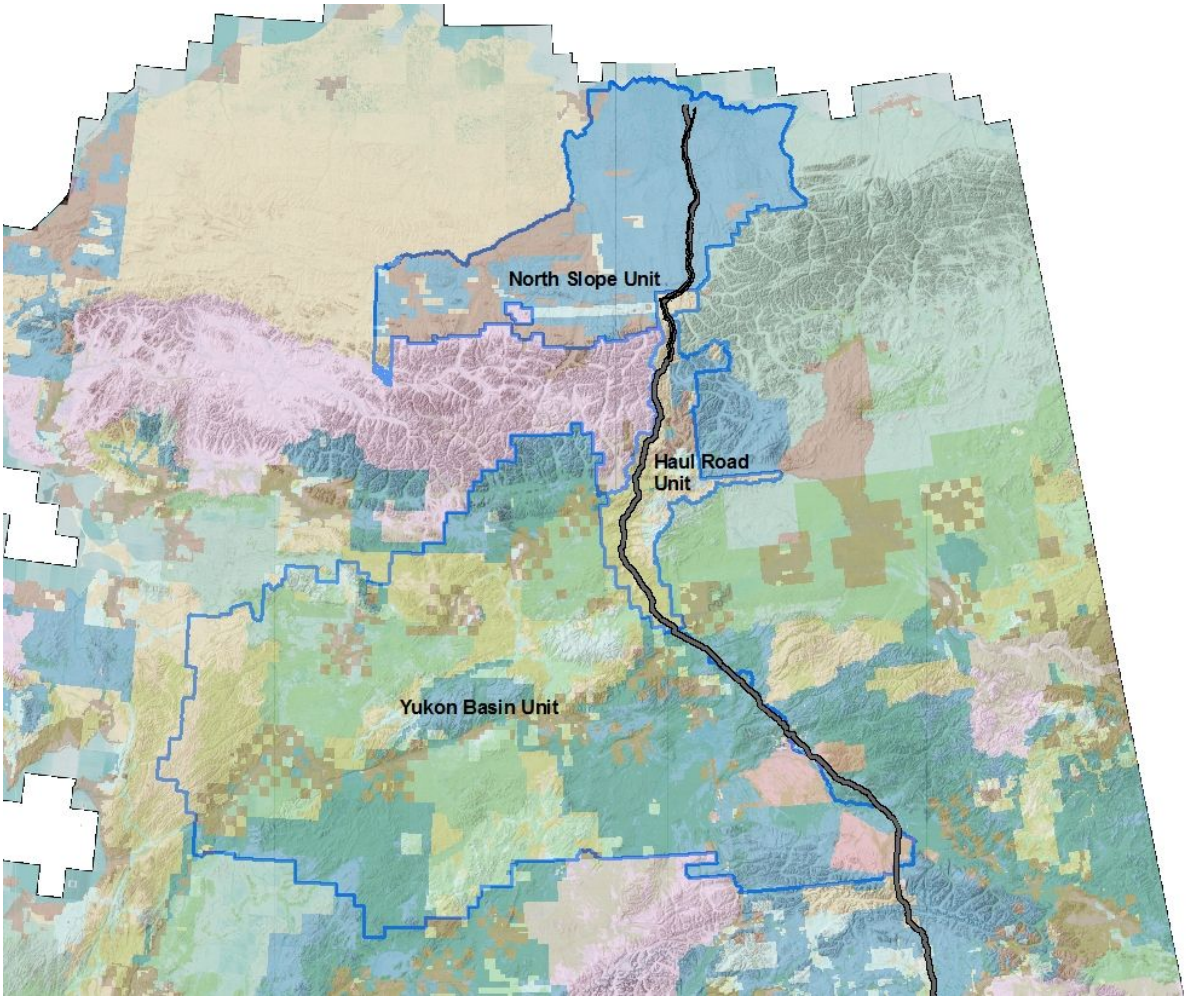


Figure 2.1. Location of Analyzed Subunits Within the Central Yukon Planning Area.

Table 2.13 presents some general information concerning site numbers, types, and densities per unit within the larger planning area. Total number of cultural resources per unit, period attributable to sites (historic, prehistoric, prehistoric/historic,unknown), aerial extent of units, and density of known sites are accounted for within these large units. The "Site Total" column conveys the total number of known sites within the unit and what percentage of the planning area total of 3,437 sites the unit represents.

Table 2.13. Numbers and Densities of Known Cultural Resources in the Central Yukon Planning Area, as of November 2013. Density Figures are the Number of Known Sites Per Square Mile.

Subunit	Area (Sq. Miles)	Sites Total	Density (Sites per Sq. Mile)	Historic Sites	Prehistoric Sites	Prehistoric/ Historic	Period NA
North Slope	19,583 (21%)	527 (15%)	0.03	118 (22%)	323 (61%)	25 (5%)	61 (12%)
Haul Road	5,918 (6%)	498 (14%)	0.08	110 (22%)	298 (60%)	1 (0.2%)	89 (18%)
Yukon Basin	65,947 (72%)	2,412 (70%)	0.04	1,227 (51%)	955 (40%)	20 (0.8%)	210 (8%)

The above table provides the basic numbers of sites and some general idea of site types in the area, but is of little utility for characterizing the true nature of site distribution and type across these vast areas. A more detailed view of each subunit provided by Table 2.14 indicates that there are real differences in site numbers, types, and densities within each unit. The primary drivers behind the observable differences in site distribution across the planning area are:

1. An area's history of archeological inventory driven by:
   a. Development of industry and infrastructure.
   b. Land management inventory, planning, and scientific research.
2. An area's intensity of historic and prehistoric land use driven by:
   a. Access afforded to industrial and subsistence resources.
   b. Community development and access to commercial goods and services.
   c. Military and other government facilities and infrastructure.

An area's history of archeological inventory is a key determinant in site presence and density of sites in a given area. While certain geologic and environmental factors play a key role in site density, relatively few areas of Alaska are devoid of cultural resources of one kind or another. Areas of low subsistence or economic resource potential or vast tracts of monotonous or difficult terrain such as high alpine settings, wet tundra, or featureless black spruce forests tend to produce low numbers of sites and a low density of sites. Conversely, areas that offer access to water, transportation, animal resources, or economic resources such as mineable minerals tend to produce higher site numbers and site densities. Areas that offer the most diversity of resource and economic opportunities through time tend to produce the highest site numbers and densities. Concerning site types, the factors that would lead to a high density of prehistoric sites, such as short-term hunting camps, is very different than those factors that would produce a high density of historic mining sites or long-term village sites. With this much variability in the factors that lead to differences in site density and type across the planning area, the single most important factor explaining site presence or absence remains whether an area has been subjected to archeological inventory.

Whether an area is subjected to costly archeological inventory in Alaska, is tied closely to economic forces and government regulations. Inventories are typically carried out as a result of federal requirements under Sections 106 [54 USC 306108] and 110 of the National Historic Preservation Act of 1966. While Section 106 requires that a federal agency account for any impacts to *historic properties* that may result from federally funded or permitted actions, Section 110 requires federal land managers to inventory the cultural resources under their jurisdiction. As Section 106 is tied closely to development, the Section 106 obligation is implemented fairly

uniformly across jurisdictional boundaries. Section 110, on the other hand, is implemented very differently depending on the land-managing agency's mission, management priorities, and funding levels. While an agency such as the NPS, leads in Section 110 inventory of its lands in Alaska, the BLM, with its multiple-use mandate, conducts far more Section 106 inventory, often through cultural resources consultants employed by project proponents.

Table 2.14. Archeological Site Type and Distribution in the Yukon Basin Unit

Area	Area (Sq. Miles)	Sites Total[a]	Density (Sites per Sq. Mile)	Historic Sites[b]	Prehis-toric Sites	Prehistoric/ Historic	Period NA
Yukon Basin Unit	65,947	2,412	0.04	1,227	955	20	210
Fairbanks Rural	750 (0.1%)	180 (7%)	0.7	22 (12%)	135 (75%)	13 (7%)	22 (12%)
Fairbanks Metro	17 (0.03%)	350 (15%)	20	340 (97%)	0	1 (<1%)	9 (3%)
Army Fort Wainwright	17 (0.03%)	259 (11%)	15	250 (97%)	7 (3%)	0	2 (<1%)
Army Tanana Flats Training Area	1,100 (2%)	159 (7%)	0.1	16 (10%)	126 (79%)	3 (2%)	14 (9%)
Army Donnelly East	178 (0.2%)	482 (20%)	3	119 (25%)	353 (73%)	1 (<1%)	9 (2%)
Army Donnelly West	870 (1%)	78 (3%)	0.09	3 (4%)	71 (91%)	0	4 (5%)
Healy/Nenana Uplands	450 (0.6%)	160 (7%)	0.4	45 (28%)	111 (69%)	1 (<1%)	3 (2%)
Indian River	200 (0.3%)	97 (4%)	0.5	1 (1%)	88 (91%)	0	8 (8%)

[a]Site total percentage denotes portion of Unit total.

[b]Site type percentages denote portion of sites within each Area.

Fairbanks Area

The vast Yukon Basin subunit includes the major drainages of the Yukon River watershed and major centers of population, industry, and the built environment of the Alaskan Interior. The highest site densities in the subunit are, not surprisingly, found near Fairbanks, Alaska's second largest city. Fairbanks began as a commercial center serving the Interior gold mining industry in 1903, and grew throughout the twentieth century to become the transportation and commercial hub of Interior Alaska. The Fairbanks area also has a history of strategic military importance, first in support of the Lend–Lease program of World War II, then as a significant Cold War base of operations, and now as an active area for air and ground military training. As such, there is both a significant density of historic sites and an active history of Section 106-driven resource inventory. The result is that fully 80 percent of the known cultural resources within the Yukon Basin subunit lie within 100 miles of Fairbanks. The highest site densities within this area are found within the Fairbanks metro area and the adjacent Fort Wainwright cantonment (Post administrative and housing center); the vast majority of these sites are historic in nature including the *East Side Residential Historic District, Downtown Fairbanks Commercial District, and Ladd Field National Historic Landmark*.

Army Training Lands

Another significant density of sites is found within the Army's Donnelly East Training Area located south of the community of Delta Junction. The 482 sites of Donnelly East represent approximately 20 percent of the known sites in the subunit; sites are predominantly prehistoric in nature with the majority being identified since aggressive range development began in 2002. Prior to archeological work done in advance of range developments, this area was subjected to archeological research targeting a known density of very early sites identified near Donnelly Dome. This work, done primarily in the 1970s, resulted in the creation of the *Donnelly Ridge Archeological District* on lands managed by the BLM and the U.S. Army.

Work done on the Donnelly West Training Area, while not as comprehensive as that done in Donnelly East, has demonstrated the presence of some significant site densities in this area as well as several large tracts of high probability terrain for containing prehistoric archeological sites. Areas of special concern include over 100 square miles of hilly broken terrain and small lakes in the vicinity of the Little Delta River and Delta Creek that have not yet been inventoried for cultural resources. Work in this area is complicated by the presence of military impact areas. Given the consistent military use of this area, known site densities and presence of significant tracts of high probability terrain, cultural resources in this area are not sufficiently accounted for and are currently considered threatened.

The Tanana Flats Training Area (TFTA) has been subjected to several archeological inventory efforts, beginning in the 1970s with work targeting a number of prominences in the area. Archeological sites were identified on all of these formations. More recently, archeologists employed by the U.S. Army have undertaken work on less prominent landforms using more aggressive sub-surface sampling methods. This work has resulted in the identification of significant site densities in the TFTA. At this time, the only special designation in the TFTA is the Blair Lakes Archeological District in the vicinity of Blair Lakes in the southeastern portion of the training area; no doubt, additional designations are warranted.

Impacts to archeological sites on military training lands prior to Section 106 Review were once common, as prehistoric site locations were often situated on the same ground as desirable helispots and observation points. While a number of sites have been destroyed or severely impacted by this kind of use, these kinds of impacts are much less common since the development of cultural resources programs within the Department of the Army.

Livengood, the Nenana Uplands, and Indian River

Other areas of site densities within the Yukon Basin subunit occur near Livengood; within the northern foothills of the Alaska Range (Nenana Uplands); and along the Indian River of the Koyukuk River drainage. The Livengood area contains a large number of historic sites attributable to gold mining in the area as well as a fair number of prehistoric sites such as those comprising the Rosebud Knob Archeological District. Site identification in this area has been driven largely by construction of the Trans-Alaska Pipeline System and other pipeline planning surveys, and the inventory of federal mining claims.

Unlike other site clusters within the subunit, archeological research has played a significant role in site identification in these areas. While construction along the Parks Highway and presence of Denali/McKinley Park have played a role in site identification efforts in the Nenana Uplands, research driven by the identification of a number of sites attributable to some of the earliest

archeological cultures in Alaska in the 1970s and 1980s also played a role in site discovery in this region. Work in the Indian River drainage located in the western portion of the Yukon Basin subunit lead to the creation of the Batza Tena Archeological District, where research conducted from the late 1970s into the 1990s by both academic researchers and BLM archeologists targeted a number of obsidian outcrops containing prehistoric sites exhibiting northern fluted points and a variety of other prehistoric features.

Other relatively common classes of sites of the Yukon Basin subunit are historically known village, cemetery, subsistence camp sites, and historic structures found distributed along the major rivers, often adjacent to or within modern villages. Many of these sites have been identified as the result of infrastructure development in villages and Bureau of Indian Affairs surveys targeting Alaska Native allotments and ANCSA land selections.

Table 2.15. Archeological Site Type and Distribution in the Haul Road Unit

Area	Area (Sq. Miles)	Sites Total[a]	Density (Sites per Sq. Mile)	Historic Sites[b]	Prehistoric Sites	Prehis-toric/His-toric	Period NA
Haul Road Unit	5,918	498	0.08	110	298	1	89
Atigun River	48 (<1%)	136 (27%)	2.8	6 (4%)	74 (54%)	12 (8%)	42 (30%)
Toolik Lake	1 (<1%)	17 (3%)	17	3 (18%)	8 (47%)	5 (29%)	1 (6%)
Upper Koyukuk River	750 (13%)	183 (37%)	0.2	88 (48%)	80 (44%)	1 (<1%)	14 (8%)
Jim River	90 (2%)	33 (7%)	0.4	2 (6%)	29 (88%)	1 (3%)	1 (3%)
Bonanza Creek	30 (<1%)	36 (7%)	1.1	0	35 (97%)	0	1 (3%)
Kanuti Headwaters	30 (<1%)	36 (7%)	1.2	1 (3%)	35 (97%)	0	0

[a]Site total percentage denotes portion of Unit total.
[b]Site type percentages denote portion of sites within each Area.

The identification of cultural resources within the Haul Road subunit has been almost entirely driven by Section 106 compliance surveys resulting from the Trans-Alaskan Pipeline System, Dalton Highway construction and maintenance, proposed gas lines, material source development, and gold mining on federal mining claims.

Atigun River

The highest site density in the Haul Road subunit is found in the vicinity of the Atigun River and Galbraith Lake. Many of the sites in this area were initially recorded in the late 1960s and early 1970s as a result of environmental work ahead of the construction of the Trans-Alaskan Pipeline System. Sites are predominantly shallowly buried prehistoric sites representing the last 10,000 years or so of human occupation of the area. A number of sites in this area have been subjected to a great deal of testing and excavation, and continue to be impacted by periodic Section 106-driven work. The large number of sites unassigned to historic or prehistoric periods in Table 2.15 is because many of the site records for this area are old and in need of updating. The cultural and scientific significance of the cultural resources of this area resulted in the creation

of the Galbraith Lake ACEC. Management of impacts to the sites of the Atigun drainage will continue to pose a management challenge.

Just to the north of the Galbraith Lake ACEC lies Toolik Lake, which was also the site of significant use during the initial Trans-Alaskan Pipeline System construction. Again, archeological survey during the late 1960s and early 1970s identified most of the archeological sites near Toolik Lake. Like other sites in the region, sites tend to be shallow and prehistoric with historic components not uncommon and attributable to Nunamiut Eskimo occupation of the area within the historic period. The cultural resources of Toolik Lake and surrounding lands fall largely within the Toolik Lake Research Natural Area (RNA), an area used extensively by the University of Alaska's Toolik Field Station and an increasing number of researchers funded by the National Science Foundation. Like most other areas within the planning area, archeological inventory within the Toolik Lake RNA is incomplete. As such, the combination of increasing land use and presence of high probability terrain for containing archeological sites ensures that this area will continue to be inventoried on a periodic basis unless some comprehensive Section 106 inventory program is initiated.

Upper Koyukuk River

The remaining site density areas along the Haul Road are found between the Bettles River and the Kanuti Headwaters approximately 100 miles to the south. Again, many of the sites within this corridor were identified as a result of the Trans-Alaskan Pipeline System and other utility and energy projects along the Dalton Highway since the early 1970s. An exception is found in the resources of the Upper Koyukuk area between the Bettles River and the South Fork of the Koyukuk River where site identification has also been driven by the development of federal mining claims.

The historic importance of gold mining in the Upper Koyukuk is played out in the density and type of cultural resources identified in this region where more than half of the known sites are attributable to the historic period. A variety of mining remains including cabins, equipment, and domestic trash scatters are found along the many creeks of the area. Prehistoric sites tend to occur on promontories above the creeks and on the many glacial moraine features found between the Middle and South forks of the Koyukuk. Many of the active mining claims of this region have been inventoried over the last two decades, and two comprehensive inventories and several small-scale excavations have taken place in recent years. Mining and utility work associated with the Dalton Highway will continue to drive periodic Section 106 inventory and site discovery in this region.

The remaining site densities along the Haul Road include those of the Jim River, Bonanza Creek, and Kanuti River drainages. Site type and density are similar in these three areas with sites being dominated by prehistoric sites that are often shallow lithic scatters located on prominences near water. While recent linear survey has taken place along the Dalton Highway, there have not been any significant inventories in this area in recent years. Sites are concentrated near the Dalton Highway, Trans-Alaskan Pipeline System facilities, and mineral material sources. Survey conducted away from the Dalton Highway will surely result in the identification of additional areas of significant site densities in all three of these areas. The significance of archeological resources and presence of high probability terrain for containing cultural resources was a key to the designation of the Jim River ACEC.

Table 2.16. Archeological Site Type and Distribution in the North Slope Unit

Area	Area (Sq. Miles)	Sites Total[a]	Density (Sites per Sq. Mile)	Historic Sites [b]	Prehistoric Sites	Prehistoric/ Historic	Period NA
North Slope Unit	19,853	527	0.03	118	323	25	61
Arctic Coast	130 (<1%)	66 (13%)	0.5	38 (58%)	5 (8%)	7 (10%)	16 (24%)
Lower Colville	100 (<1%)	20 (4%)	0.2	15 (75%)	1 (5%)	2 (10%)	0
Iteriak Creek	60 (<1%)	28 (5%)	0.5	1 (3%)	27 (>99%)	0	0
Killik River	20 (<1%)	12 (2%)	0.6	2 (17%)	10 (83%)	0	0
Karupa lake	10 (<1%)	22 (4%)	2.2	2 (9%)	19 (86%)	1 (5%)	0
Anaktuvuk River	40 (1%)	12 (2%)	0.3	1 (8%)	8 (67%)	3 (25%)	0
Itkillik River	350 (2%)	130 (25%)	0.4	12 (9%)	114 (88%)	0	1 (<1%)
Itkillik Uplands	27 (<1%)	24 (5%)	0.9	6 (27%)	18 (75%)	0	0
Sagavanirk-tok River	500 (3%)	92 (17%)	0.2	13 (14%)	65 (70%)	6 (7%)	8 (9%)

[a]Site total percentage denotes portion of Unit total.

[b]Site type percentages denote portion of sites within each Area.

The identification of cultural resources on that portion of the North Slope lying within the planning area has been driven by a variety of factors. Where the Dalton Highway and the Trans-Alaskan Pipeline System cross this area, the primary driver has been Trans-Alaskan Pipeline System construction, highway maintenance, and proposed gas line development. Elsewhere, inventory has been driven by oil and gas exploration and clean-up, while in the upper drainages of the subunit, west of the Dalton Highway, resource identification has been driven largely by Section 110 federal inventory and research.

Arctic Coast and Lower Colville River

The Arctic coast portion of the subunit is composed of those lands within approximately one mile of the coast of the Beaufort Sea and offshore islands. The identification of cultural resources in this area has been driven largely by oil and gas exploration. Site density along the coast is not particularly high with sites or small clusters of sites situated every few miles and located near river outlets and freshwater lagoons and ponds. A large proportion of sites in this area have a historic or late prehistoric component, many of which are structural remains such as "sod houses." There are also a significant number of cemetery sites in this region. It is thought that coastal erosion in this area has led to the erosion of earlier prehistoric sites and a number of sites are currently threatened by these same forces. Sites of the lower Colville River are similar in nature and distribution.

Foothills Drainages

Significant site densities are known from portions of several drainages as they descend from the Brooks Range onto the coastal plain. Of particular significance are Iteriak Creek, Karupa Lake, Killik River, Anaktuvuk River, Itkillik River, and Sagavanirktok River. In terms of the drivers of resource identification in these areas, all but the Sagavanirktok River have seen intensive

inventory work done by archeologists employed by the BLM or NPS fulfilling Section 110 and land-use planning obligations. While resource identification in the Sagavanirktok drainage was driven largely by the same actions that drove resource inventories elsewhere along the Haul Road: Trans-Alaskan Pipeline System construction, highway construction and maintenance, and other utility and pipeline-related projects.

Of the total 3,437 archeological sites or cultural resources identified within the Central Yukon Planning Area, 1,287 sites are located on lands under BLM management; 719 of these sites are located on public lands withdrawn by the Department of Defense to be used as training lands and actively managed by the U.S. Army. Of the remaining 568 sites, 30 are located in the North Slope subunit, 75 in the Yukon Basin subunit, and 463 within the Haul Road subunit. The vast majority of cultural resources located on BLM lands have not been formally evaluated for NRHP eligibility; this is typically only done when sites lie within the area of potential effect of a proposed undertaking. The most significant density of formally evaluated cultural resources within the planning area is located within the U.S. Army's Donnelly East Training Area near Delta Junction, where archeological survey and testing has taken place ahead of range improvements since 2002. Baseline data relating to site location, characteristics, and condition exist for most BLM-managed sites. This information is available to qualified users through both the BLM's internal Archeology Data System and the State of Alaska's online Alaska Heritage Resources Survey.

Condition

Cultural resources in the planning area can be adversely affected by two broad categories of agents of change: (1) those caused by people, and (2) those caused by nature. Those agents that are *caused by people* include (a) actions permitted or authorized by the BLM (e.g., mining, gravel extraction, archaeological excavation), as well as (b) those that are not authorized and are, in fact, illegal (e.g., vandalism, unauthorized collection of artifacts). Examples of agents that are *caused by nature* include wildland fires, river/stream and hillside erosion, inadvertent animal disturbance, and natural weathering. Common actions that involve permitted impacts to cultural resources include such things as mining for sand and gravel, placer mining for gold, and linear construction projects such as those related to utility and energy projects.

Natural weathering and degradation occurs continuously, and affects the wooden and other organic materials present in historic sites much more than the surface lithic sites that, in all but a few cases, comprise the known prehistoric sites in the planning area. The vast majority of the buildings and structures that are present at the historic sites in the planning area have already collapsed, while only a few are standing with intact roofs. The overwhelming majority of known prehistoric sites in the planning area (i.e., sites with only lithic and charcoal artifacts and ecofacts) are not being, or else are no longer being, seriously affected by the weathering process. Likewise, many of the artifacts and features in the historic sites are essentially stable in this subarctic environment and undergoing little appreciable change from year to year. Such items and features include historic trails, roads, airstrips, mining prospects, other pits, shafts, adits, and ditches, cairns, durable metal artifacts and equipment on the surface, and graves/cemeteries. Likewise, now that the majority of historic buildings and structures in the planning area have completely or partially collapsed, they have essentially stabilized in their present state. It is noted, however, that a number of archeological sites along the Arctic coast, on lands not managed by the BLM, a number of archeological sites are being rapidly consumed by shoreline erosion. In sum, natural degradation continues at most if not all sites on public lands, but is not currently an overwhelmingly negative process affecting the resource. Most sites in the planning area have stabilized, and primarily require monitoring or, at most, manageable levels of maintenance and Section 106 review.

Wildland fires are an annual event in Interior Alaska with the ability to profoundly affect the contents and integrity of cultural resource sites. Depending upon a host of factors, including but not limited to available local fuels, short-term prior local precipitation history, and intensity and duration of burning, most organic artifacts, ecofacts, and features are likely to be partially or wholly consumed if burned over by a wildland fire. Metallic and even lithic artifacts can be affected by fire, depending upon, again, the intensity and duration of the blaze. Sites in a boreal forest setting can also be indirectly affected by fires, as when trees topple over onto features and when subsurface deposits are disturbed when trees topple over and their root systems are ripped from the ground.

Owing to the short fire return interval in Interior Alaska, it may be assumed that most if not all surface prehistoric sites in the boreal forest ecological zone have already been burned over by wildland fires at least once, if not multiple times in the past. Even the contents of *buried* prehistoric sites in woodland settings are likely to have been affected by wildland fires prior to their burial, and even by tree throws.

Wildland fires have affected cultural resources in the planning area. Prehistoric sites are affected to a lesser degree, owing to the nature of the durable artifacts present at these kinds of sites. Subsurface disturbance cannot be ruled out at such sites, although this depends more upon the surface vegetation at any particular site and the intensity of the blaze. Despite the ability of wildland fires to radically alter an historic cabin site (the most prevalent type of known historic site) by thoroughly consuming above-ground architectural and other organic remains, such sites do not necessarily lose their integrity, and can still be eligible for nomination to the NRHP. The fact that one class of data has been removed from the site (i.e., organic surface remains) does not mean that the remaining artifacts, as well as buried artifacts and structural remains, are not enough to still make the site eligible.

Agents of change caused by people include both permitted and non-permitted actions, the latter including vandalism and illegal collection of artifacts. While there are known instances of illegal collection causing damage to some sites, the BLM knows of no instances of wanton vandalism or destruction at any cultural sites in the planning area, either recently or in the past. Without a doubt, artifacts have been collected in the past without a permit, from many sites. For instance, very few, if any, historic sites have unbroken bottles visible on the surface. It can be assumed that such easily visible, attractable, and portable artifacts have been transported away by people at some point.

Legal agents of change performed by people (e.g., permitted development, contracted archaeological survey, research excavation) have affected resources primarily in the Haul Road Unit where a large number of prehistoric sites were excavated, recorded, and destroyed during the construction of the Trans-Alaska Pipeline System. Likewise, a number of historic sites have been impacted to some degree by mining on federal mining claims in the vicinity of Colfoot and Wiseman. While the reporting of Trans-Alaskan Pipeline System archeology is notoriously poor, the BLM has significantly invested in artifact curation and site records resulting from pipeline-related excavation and testing in the hope that an adequate accounting of these impacts will eventually be produced.

Lastly, the BLM permits many actions annually that could affect cultural resources (including wholesale destruction of sites) such as gravel extraction, mining, and linear undertakings such as pipelines and rights-of-way. The BLM has an efficient process in which the field office archaeologist reviews all potential permitted actions that could affect cultural resources before

the field office manager approves the action. When sites are identified that may be affected by such actions, avoidance is the preferred option, if possible, and the applicant is usually willing and able to avoid impacting any sites in question. In a few instances over the past decade, cultural sites could not be avoided by permitted actions. In all cases, the BLM consulted with the State Historic Preservation Office (SHPO) and either agreed that the sites in question were not eligible to the NRHP, or else agreed that they were eligible and then developed a mitigation plan to deal with the adverse effects.

2.1.11.3. Trends

Much of this topic was covered under section 2.1.13.2 Current Condition. The main drivers or agents of change of cultural resources are the same as those already outlined above:

(1) those caused by people, and (2) those caused by nature. Those agents that are caused by people include (a) actions permitted or authorized by the BLM, as well as (b) those that are not authorized. Examples of agents that are caused by nature include wildland fires, erosion, and natural weathering.

The desired condition of cultural resources on federal lands is that they remain stabilized and not adversely affected by natural and cultural processes. As reviewed above, the current trend of the vast majority of sites in the planning area is that they are stabilized and are not, in large measure, being adversely affected. The integrity of the overwhelming majority of sites has not been, and is not being, compromised.

2.1.11.4. Forecast

Gold mining, communication, energy, pipelines, transportation, and mineral exploration projects are the main drivers or agents of change of cultural resources in the planning area.

Interest in gold mining has increased in recent years on both State and federal lands, as the price of this commodity dramatically increased due to global economic conditions and processes. Current BLM management, regulations, and policies permit mining wherever it is legally allowable and where it does not adversely affect critical environmental, biological, or other resources. As a result, more mining on BLM-managed lands is occurring than only a few years ago when prices were lower.

The Utility Corridor has witnessed an uptick in gas pipeline projects in recent years and it is expected that this interest will continue. While the use of existing archeological inventory data will eliminate the need for some survey along the Dalton Highway, additional surveys will undoubtedly be needed to facilitate planning and permitting of future pipeline projects.

The development of road systems that depart the Dalton Highway are an emerging concern. The proposed Umiat Road project, with a preferred alternative that leaves the Dalton Highway near Galbraith Lake and the Galbraith Lake ACEC has already resulted in some recent archeological inventories and the identification of new archeological sites on State land west of the Dalton Highway. Any project that begins from the Dalton Highway and requires a BLM permit will be subjected to the Section 106 Review process over the entire extent of the project prior to BLM permitting. While there are no current plans, a second road project is foreseeable that begins on the Dalton Highway and proceeds east to the village of Stevens Village. Current plans involve only an ice road to accommodate winter transport. The winter access is focused on portions of

an existing winter road and wetlands. A third project with more current momentum relates to a proposed road that would leave the Dalton, perhaps in the vicinity of the Kanuti or Koyukuk Drainage, and proceed west toward the Kobuk River village of Ambler. Again, if this project were to originate at the Dalton Highway the BLM would require Section 106 Review of the entire project prior to authorization.

2.1.11.5. Key Features

This section describes the geographic location, distribution, areas or types of resource features that should guide land use allocation or management decisions. There are two ways to do this: (1) identify those specific cultural resource sites that could/should proactively affect future management decisions, and/or (2) describe specific landscape features and locations that management needs to pay special attention to when making land use decisions.

All sites in the planning area meeting the 50-year threshold that possess integrity and have the potential to contribute to significant local, regional, and national questions may be eligible to the NRHP, and should be taken into account during land use allocations and management decisions.

In addition, there are certain common locations on the landscape where prehistoric and historic sites are more prevalent, essentially owing to the presence of *resource concentrations*. Historic mining and trapping, domestic, and work sites, the most prevalent forms of historic sites in the planning area, are found immediately adjacent to watercourses, typically less than 50 feet away. Historic placer gold creeks are known and are historically well documented. Trapping and mining prospecting sites, however, could be located along just about any watercourse in the planning area.

The Haul Road Unit poses the most resource management challenges concerning cultural resources. With high site densities in several locations alongside intensive resource extraction and planned infrastructure, the Haul Road will continue to provide the largest permitting workload and need for regular Section 106 review of undertakings. Of special interest are the many existing material sources, new material sources, placer mining between the South Fork of the Koyukuk and the Bettles River, and planned energy infrastructure along the Dalton Highway in the vicinity north of Atigun Pass.

Lastly, increasing use of the University of Alaska's Toolik Field Station (TFS), located north of Galbraith Lake and accessible from the Dalton highway, poses several resource management and permitting challenges to the BLM. The use of TFS and the BLM-managed public lands surrounding it have grown exponentially over the last decade as research interest in the Arctic and desire to understand the effects of climate change have grown. Currently, the TFS conducts experiments and manages research plots throughout the Toolik Lake Research Natural Area and beyond. Cooperative work has just begun between the field station and university staff, BLM, and the National Science Foundation to address cultural resource inventory needs and develop a comprehensive cultural resource management plan and streamlined Section 106 review process for the many research permits that the BLM issues. Continued cooperative efforts will be necessary to avoid impacts to cultural resources in this area.

2.1.12. Paleontological Resources

2.1.12.1. Indicator

The Legal Framework

Paleontological resources include a variety of preserved remains or traces of animals, plants, and other organisms ranging in size from single-cell bacteria to trees and dinosaurs measuring tens of feet and weighing several tons.

The BLM's general responsibility to manage paleontological resources on BLM lands are presented in the Federal Land Policy and Management Act (FLPMA), and effects to paleontological resources resulting from BLM actions are broadly accounted for under the National Environmental Policy Act (NEPA). The first piece of legislation focused solely on paleontological resources is the Paleontological Resources Protection Act (PRPA) of 2009. Though implementing regulations (to be contained in 43 CFR 8200) such as inventory, monitoring, and appropriate use of resources are not yet complete, the law (16 U.S.C. 470aaa) provides basic permitting requirements, protections, and penalties associated with paleontological resources on federal lands.

Consistent with current BLM management under FLMPA, the PRPA allows casual-use level collection of invertebrate and plant fossils from BLM and Forest Service lands excepting rare and scientifically significant specimens. The act prohibits collection of any fossils on lands managed by the National Park Service, Fish and Wildlife Service, and Bureau of Reclamation. The PRPA prohibits the collection of any vertebrate fossils on federal land or the sale of any fossils collected from federal lands.

In addition to permit and curation requirements, the PRPA identifies prohibited acts as well as criminal and civil penalties for the unauthorized use, removal, or destruction of resources. Finally, the act protects paleontological data from any public distribution that could threaten the resources; including distribution per 5 U.S.C. 552 (Freedom of Information Act).

Paleontological Resources Within the Planning Area

Little work has been done to inventory paleontological materials on BLM-managed lands in the planning area. The BLM has conducted no program of baseline inventory, nor any compilation of existing information, for more than 20 years. In 1986, the BLM contracted for a collection of data on paleontological resources on BLM-managed lands (Lindsey 1986). The following discussion is based primarily on this information and from personal communication with University of Alaska paleontologist Dr. Patrick Druckenmiller.

The nature of the paleontological resources in the planning area spans the breadth of the Paleozoic Era (approximately 540 to 250 million years ago), the Mesozoic Era (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 thousand years ago).

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 those activities that are producing the field samples and finds (i.e., placer mining, USGS sampling), and should not be taken as representative of the entire area. It is useful to first discuss the geologic time scale as it pertains to Alaskan fossil finds. The following section, with a small amount of editing is gathered from "The Paleontology Portal" website (http://www.paleoportal.org/index.php?globalnav=time_space&sectionnav=state&name=Alaska). The Paleontology Portal is funded primarily by the National Science Foundation and contributed to by recognized authorities on the subject of paleontology. The text authors and editors of the Alaska section include: Roland Gangloff, Sarah Rieboldt, Judy Scotchmoor, and Dale Springer.

Geologic Time and Alaskan Paleontology

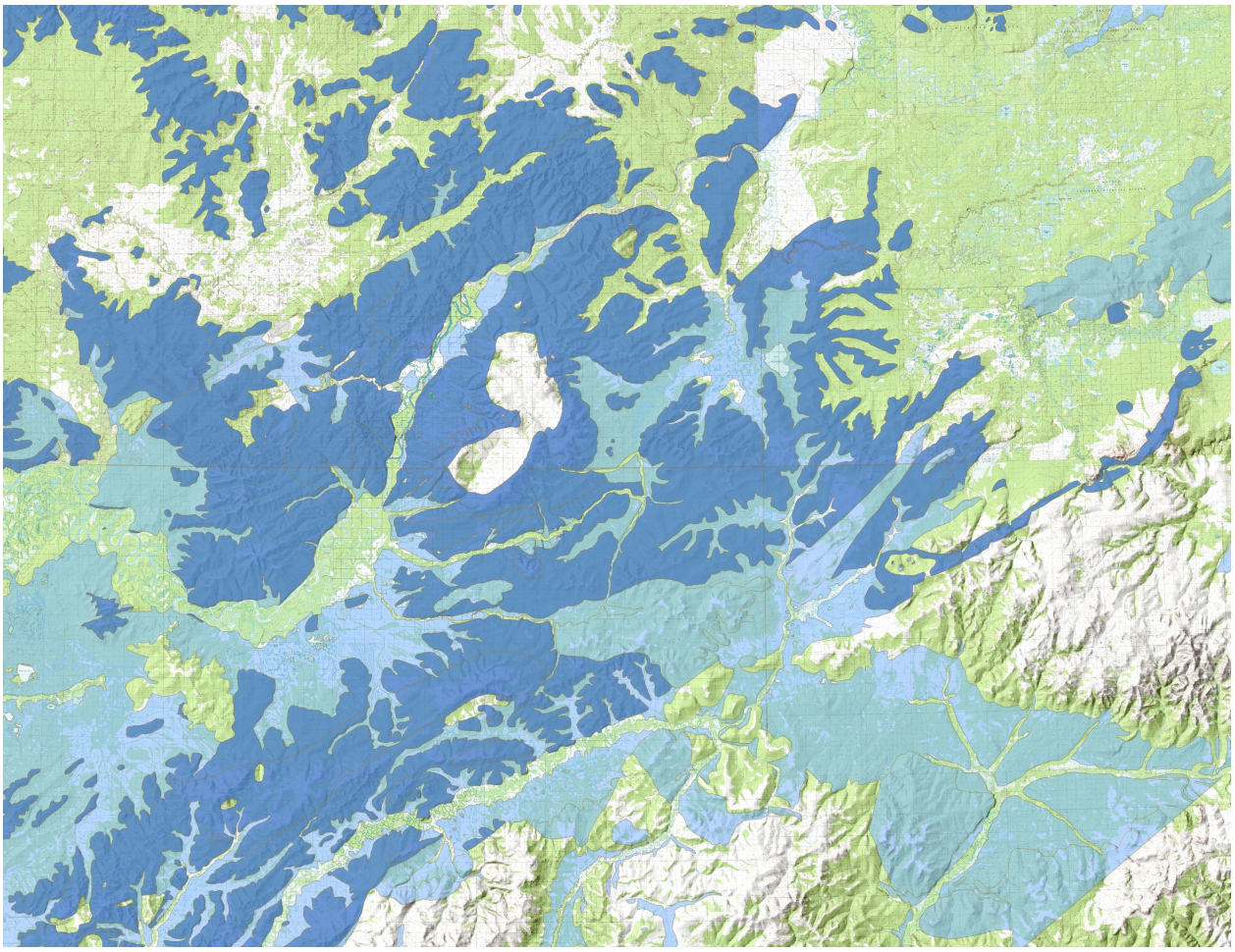
*Additions/Editing to original Paleontology Portal text is *italicized*.

The Precambrian: *The Precambrian Eon includes the very earliest geologic deposits on Earth and spans the period from 4.6 billion years ago to 541 million years ago.* Precambrian rocks are relatively rare in Alaska, and most of these are highly metamorphosed. Stromatolites and fossil bacteria in some Late Precambrian rocks indicate the presence of a shallow sea during this time.

The Paleozoic Era *(541 to 252 million years ago)*: During the Paleozoic, most of what would become Alaska was under water. Fossils of trilobites, brachiopods, and many other marine animals indicate the presence of a broad, shallow carbonate platform in the Cambrian. These rocks are particularly well-preserved in the east-central part of the state. Tectonic activity during the Ordovician and Silurian produced a series of volcanic islands in what is now eastern Alaska. Fossil corals and other organisms provide a record of the reefs that built up around these islands. During the Devonian, marine conditions continued in the northern third of the state, while the small slivers of continental crust and pieces of volcanic island arcs that would one day become south-central Alaska were as yet scattered or non-existent. Fossils of corals, brachiopods, ammonites, and gastropods, particularly abundant in the northern third of the state, indicate that a variety of marine environments existed in Alaska during the Carboniferous and Permian.

The Mesozoic Era *(252 to 66 million years ago)*: The Mesozoic Era is divided into the Triassic, Jurassic, and Cretaceous periods. The various pieces of continental crust that would constitute modern Alaska began to assemble during the Mesozoic. Fossils of molluscs, icthyosaurs, bony fish, and other marine organisms record the presence of shallow marine conditions in the southern part of the state during the Triassic; deep marine waters covered the northern third of the state at this time. Volcanic activity was common. The Jurassic began an interval of intense tectonic activity in Alaska, and extensive volcanic eruptions generated igneous rocks that now form a belt through central Alaska. Fossil ammonites and crinoids indicate that the sea still covered parts of the state at this time. Throughout the Cretaceous, a series of continental and oceanic plates slammed into the state, adding to its landmass. The Brooks Range and other mountains rose and erosion of these mountains dumped huge amounts of sediment into low-lying areas. The fossil record indicates the presence of both marine and terrestrial environments. Dinosaur fossils have been found in Cretaceous rocks in Alaska.

The Cenozoic Era *(66 million years ago to present)*: Tectonic activity continued into the Cenozoic. Volcanism built up the Aleutian Islands during the Tertiary, and fluctuations in sea level intermittently exposed the Bering Land Bridge between Asia and Alaska. Glaciers covered much of Alaska during the Quaternary, but low sea levels exposed a corridor of land along the Bering Land Bridge, enabling migrations of animals and plants between Asia and North America. Volcanic activity continued in the Aleutians and what is now the Alaskan Peninsula.



This map represents approximately 10,000 square miles of geologically mapped terrain centered on the Koyukuk River drainage. Polygons represent known fossil-bearing deposits of any age. Dark blue polygons indicate presence of Cretaceous Period with potential of containing Pre-Pleistocene vertebrate fossil deposits.

Figure 2.2. Fossil Bearing Deposits Centered on the Koyukuk River Drainage

2.1.12.2. Current Condition

Fossil-bearing deposits occur throughout the planning area. The complexity of geology across this vast area, however, precludes any reasonably informative break-down of mineral types, ages, and fossil content by area. A wide range of plant and invertebrate fossils are known across the planning area. Of particular significance are vertebrate fossils. Vertebrate fossils within the planning area typically fall within the Pleistocene or Cretaceous age classes with the earlier Cretaceous being much rarer.

As previously mentioned, the mapping of geologic deposits and fossil-bearing deposits is incomplete in the planning area; that said, recent work by the University of Alaska Museum of the North has identified significant vertebrate fossil deposits of Cretaceous age within the planning area. Of particular interest are fossil bone beds and dinosaur footprints identified along the Yukon River between Ruby and the southern terminus of the Nulato Hills, and vertebrate deposits along the Dalton Highway in the vicinity of the Brooks Range. While these deposits are not fully documented, they are considered to be scientifically significant. The fossil deposits are considered

to be intact, in good condition, and not currently threatened by natural or human-caused impacts. This is primarily because these locations are only recently discovered and are not yet known to amateur collectors.

Another significant class of vertebrate fossils known within the planning area are those attributable to the late Pleistocene or Ice-Age time period. Pleistocene fossil finds of extinct large mammals are relatively common within portions of the planning area subjected to placer mining. Fossilized or partially fossilized vertebrate remains have been known from placer mining deposits throughout Alaska for over a century. As such, a large number of samples have been collected, described, and dated scientifically. Pleistocene fossils continue to be excavated from placer deposits near Fairbanks, Livengood, and Wiseman within the planning area. It is likely that nearly all of these finds are destroyed, sold, and otherwise removed from their geologic context without any scientific documentation. Pleistocene fossils are relatively common in the drainages of the planning area that have not been subjected to intensive post-depositional glacial-ice scouring.

2.1.12.3. Trends

Given current staffing and demonstrated research interest, it is anticipated that the University of Alaska Museum (UA Museum) will continue paleontological fieldwork within the planning area and potentially on BLM-managed lands.

Placer mining has increased in portions of the planning area for the last several years, and is anticipated to continue at current or increased levels as long as the price of gold remains relatively high.

2.1.12.4. Forecast

Continued work by the UA Museum will likely result in additional significant fossil finds within the planning area. UA Museum work will result in large amounts of important geospatial and tabular resource data, site and find documentation, and potentially in additional federal collections. It is also likely that amateur collectors and recreationalists will begin to learn the location of newly discovered fossil beds within the planning area, particularly those areas along the Yukon River and others on BLM-managed lands along the Dalton Highway. The potential for unauthorized collection of vertebrate fossils is likely to increase over the life of the proposed RMP.

As placer mining activity continues so will the inadvertent discovery and destruction of Pleistocene fossil deposits.

2.1.12.5. Key Features

While the 1986 Lindsey work resulted in the mapping of several known fossil deposits and areas of high probability for containing fossils, there is not yet a comprehensive BLM database of fossil localities. Unlike archeological data, the BLM does not yet have a database containing geospatial data related to where researchers have looked for fossils, descriptions of fossils identified, and extent of finds. Efforts should be undertaken in cooperation with the University of Alaska and State of Alaska's Office of History and Archeology to remedy this situation.

Regarding the removal and or destruction of Pleistocene fossils found on BLM-managed federal mining claims within the planning area, current management practices are likely not in accordance with the PRPA. Currently, the BLM either does not address paleontological issues in

placer mining NEPA documents or has developed ad hoc stipulations such as requiring miners to set vertebrate fossil finds aside or giving the miner general guidance on identifying significant finds, such as complete or nearly complete skeletons or unusually well-preserved remains, with the direction to notify the authorized officer when such finds are made. Whether the BLM, in making these stipulations, is acting within the confines of the PRPA is a question that should be addressed. As it is not likely that current BLM management regarding Pleistocene fossil finds is in accordance with the law, a protocol should be established or exemption be sought that reconciles 16 U.S.C 470aaa with the BLM need to permit and monitor placer mining activity.

2.1.13. Visual Resources

Visual Resource Management (VRM) addresses the visual quality of landscapes for views of natural landscapes and unique areas with high visual quality. The BLM is required to manage lands in a manner that will preserve scenic values by a broad range of authorities. The FLPMA and NEPA include federal mandates for visual resources. Other guidance includes BLM Manual 8400 Visual Resource Management and BLM handbooks H-8410-1 Visual Resource Inventory and H-1601-1 Land Use Planning (BLM 2005a).

The BLM's visual resource classification system consists of three phases: the visual resource inventory, which considers the existing scenic quality and public sensitivity of a landscape; the establishment of management classes through land use plans; and the analysis of site-specific management actions to ensure compliance through Visual Resource Contrast Rating, which looks at landscape characteristics of form, line, color, and texture. The VRM classes are established through the RMP, and adjustments are made to reflect resource allocation decisions made in the RMP. The intent is to minimize the visual impacts of all ground-disturbing activities, regardless of the class in which they occur.

Given the vast size of the Central Yukon Planning Area, the BLM modified the inventory process outlined in the manual and handbooks. The BLM-managed lands in the planning area consist of many discrete blocks of land mixed with private, state, and other federal government lands. Over 90 percent of the planning area is roadless and accessible primarily by air and in some cases by river. The BLM visual resource inventory process requires the use of key observation points that are usually located along commonly traveled ground routes such as roads, trails, or rivers. There are very few roads or summer trails in the planning area. Although there are hundreds of rivers, not all are navigable and only a small subset are commonly traveled.

Due to these factors as well as budget and time limitations, the visual resource inventory was done mostly by fixed-wing aircraft. The flight path was recorded using geographical position systems and filmed with video cameras. On a few occasions helicopters were used. This inventory will be documented in a visual resource inventory report and will publicly available when completed.

2.1.13.1. Indicator

The BLM categorizes visual resources into four management classes, based on scenic quality evaluations, sensitivity level analysis, and delineation of distance zones:

VRM Class I: Preserves the existing character of the landscape where changes are generally not seen, do not attract attention, and do not change or modify the existing character of the landscape.

VRM Class II: Preserves the existing character of the landscape where changes may be seen but should not attract the attention of the casual observer. Changes must repeat the basic elements of form, line, color, and texture evident in the characteristic landscape.

VRM Class III: Allows moderate changes in the basic elements of form, line, color, and texture that may be evident in the characteristic landscape; however, changes may attract the attention, but should not dominate the view, of the casual observer. Changes should repeat the basic elements of form, line, color, and texture found in the predominate natural landscape features.

VRM Class IV: Allows for major modification of the existing character of the landscape. Changes may dominate the view and be the major focus of viewer attention. Every attempt should be made to minimize the impact of these modifications through careful location, minimal disturbance, and repeating the basic landscape characteristics of form, line, color, and texture.

2.1.13.2. Current Condition

Scenic quality is a measure of the visual appeal of the land. The scenic quality evaluation done as part of the visual resource inventory describes the characteristic landscape and assigns scenic quality ratings for the visual resources. Scenic quality class A is the highest rating and has a great deal of visual variety, contrast, and harmony. Scenic quality class C has the least visual variety, contrast, and harmony.

Utility Corridor RMP (1991)

VRM classes for the Utility Corridor were established with the Utility Corridor RMP (BLM 1991a). Within the Utility Corridor, the RMP assigns VRM Class IV to the inner corridor and VRM Class III to the outer corridor. The visual resource inventory completed during preparation of the Utility Corridor RMP; however, assigned a Scenic Quality class A within both the inner and outer corridor from Wiseman north to Galbraith Lake, and to the southern end of the corridor including the north shore of the Yukon River. Even though the corridor is designated as management class III or IV, every effort is put forth to meet the next lower classification or better if possible due to the large number of known observation points along the Dalton Highway.

The following physiographic provinces are present in the Utility Corridor Subunit and generally describe the visual resources of the area.

The Spruce/Hardwood Forests province occurs south of the Brooks Range and is made up of spruce, birch, and aspen trees in low-lying hills and valleys of the Yukon, Koyukuk, Dietrich Rivers and their tributaries. Elevations range from 300 feet in the valleys to 3,200 feet in the mountainous areas. In some areas, treeless tundra can be found above 2,000 feet. Some of the prominent scenic features within this province are the Yukon River, Fort Hamlin Hills, Finger Mountain, Olsons Lake, Arctic Circle, Gobbler's Knob, and Grayling Lake.

The Arctic Mountain province has alpine tundra made up of dwarf birch, willow, alder, and heath shrubs. Some rugged barren peaks reach 7,000 feet. Some of the major land features include Sukupak, Dillion, and Snowden Mountains; Atigun Pass; and Atigun Valley.

The Arctic Foothills province arises north of the Brooks Range. Vegetation consists of treeless and mostly moist tundra made up of dwarf shrubs, sedges, cotton grass tussocks, mosses and lichens. Toolik Lake, Slope Mountain, and tributaries of the Saganvanirktok River are compelling scenic features within this province.

Central Yukon RMP (1986)

The areas within the Central Yukon RMP do not have a VRM classification, but they have been assigned a scenic quality classification. The Central Yukon Record of Decision identifies areas of outstanding scenic value in the Ray Mountains to be managed to retain the existing character of the landscape. Other areas would be managed to lessen impacts to visual resources.

The following subunits were used in the 1986 Central Yukon RMP. A general description of the visual resources and scenic quality is provided for each subunit.

Nulato Hills Subunit: In general, this area consists of northeast-trending, even crested ridges, from 1,000 to 2,000 feet in elevation, with gentle slopes and rounded summits. A number of river drainages flow generally in a northeast pattern. The Box, Kateel, and Nulato Rivers are some of the larger streams in the area. Most of the subunit is rated Class B scenic quality.

Dulbi-Kaiyuh Mountain Subunit: This area consists of even-topped, rounded highland ridges 2,000 to 3,000 feet in elevation. These highlands divide the drainage from the Yukon River to Koyukuk watershed. In the northern portion of the subunit, the Dulbi River drains into the Koyukuk, while the remaining area flows into the Yukon River. The scenic quality for this subunit is Class B.

North Kuskokwin Subunit: This area has a uniform series of northeast-trending ridges, with rounded to flat summits 1,500 to 2,000 feet in elevation. Rugged mountains with a few higher peaks of 3,000 to 4,500 feet can be found in the area. This subunit is drained by the North Fork of the Kuskokwim River to the south and the Titna River, a tributary of the Nowitna River, to the north. Low-lying valleys have sparse thaw lakes. In the upland areas, the scenic quality is Class B. In the lowlands in the central and northern portions of the subunit it is Class C.

Tozitna Subunit: The Ray Mountains dominate this subunit. This area has been identified as a scenic complex representing glacial geological features uncommon to the region (Gordon and Shane 1979). Peaks range from 4,000 to 5,500 feet in elevation. There are unique features such as partially glaciated upper valleys, north-facing cirques, tarns, and oddly shaped rocky crags and tors. In the lowlands there are a few thaw lakes and river drainages. Scenic quality for the Ray Mountains is rated Class A, while the lowlands and river bottoms are Class B.

Hughes Subunit: This subunit is an area of diversified topography. Compact groups of hills and low mountains rise to 4,000 feet in elevation, surrounded by rolling plateaus 500 to 1,500 feet in elevation and broad lowland flats 5 to 10 miles across. The Indian and Hogatza rivers and Hughes Creek flow through large broad lowland flats with heavy concentrations of thaw lakes, the largest being Lake Tokhakklanten. Scenic quality for most of the area is Class B, with Class C along the Hogatza River flats between the Babantaltlin and Kokhila Hills.

2.1.13.3. Trends

The majority of the planning area is remote and access is limited. However, there are dispersed developments such as small communities and associated roads and scattered placer mines. As the demand for commodities increase, visual impacts will likely increase as well. There has been an increase in flight seeing and access to remote areas for a variety of recreational values such as hunting, fishing, river floating, and hiking.

Visual resources in the Utility Corridor are influenced largely by the North Slope oil fields, Trans-Alaska Pipeline System, Dalton Highway, and associated gravel pits. The trend is for more development and infrastructure. Currently, there are proposals for a natural gas pipeline paralleling the Trans-Alaska Pipeline System. As additional infrastructure is approved, the need for gravel will also increase significantly. Other than gravel pits and linear features such as pipelines, development has generally been limited to discrete points along the highway such as the Yukon River crossing. Tourism along the Dalton Highway has increased since approval of the Utility Corridor RMP and the development of visitor facilities. Many of these visitors are attracted by the visual resources of the area.

2.1.13.4. Forecast

The constant demand for North Slope production is expected to influence the visual resources within the Utility Corridor in a number of ways including: steady growth in highway traffic, continual road and pipeline maintenance, and the need for gravel pits. Additional impacts will occur from construction and maintenance of visitor facilities, increased vehicle traffic associated with tourism, and possible commercial development to support tourism.

Other activities that could impact the visual quality of the planning area include the modification or revocation of withdrawals from mineral entry with subsequent staking and development of mining claims and other mineral extraction operations. Also, development on adjacent state and private lands and development of transportation or Utility Corridors to private lands both inside and outside the planning area.

The Utility Corridor Subunit is closed to off-highway vehicle use (with few exceptions for permitted activities) by state statute and is, therefore, less susceptible to increased route development. A trail designation, in conjunction with a comprehensive travel management plan, could prevent or mitigate some of these potential impacts should the restrictions be lifted. In the areas outside of the Utility Corridor, off-highway vehicle use is limited. Trails are usually associated with mining activity, hunting, or travel between communities. These trails are often visible from the air or elevated locations.

2.1.13.5. Key Features

Primary locations possessing outstanding scenic quality include, but are not limited to:

- Galbraith Lake (Utility Corridor)
- Jim River valley (Utility Corridor)
- Nigu and Iteriak Rivers (North Slope)
- Sukakpak Mountain (Utility Corridor)
- Ray Mountains, including Spooky Valley (Central Yukon)
- Finger Mountain and Kanuti valley (Utility Corridor)
- Beaver Slide (Utility Corridor)
- Brooks Range vistas (Utility Corridor)
- Fish Creek valley (Utility Corridor)
- Gobbler's Knob Jack White Mountain Range (Utility Corridor)
- Koyukuk River valley
- Dietrich River valley (Utility Corridor)
- Atigun Pass – Continental Divide (Utility Corridor)
- Atigun River valley (Utility Corridor)

2.1.14. Wilderness Characteristics

With its vast, roadless, and pristine mountain ranges, forests, wetlands, and river systems, almost all of the planning area meets the criteria for lands with wilderness characteristics as defined in BLM Manual 6310 "Conducting Wilderness Characteristics Inventory on BLM Lands." The planning area does not contain any congressionally designated wilderness, but does include the Central Arctic Management Area (CAMA) Wilderness Study Area (WSA), which is discussed in section 2.3.2. The CAMA WSA is the only area currently being managed for wilderness characteristics.

Almost 12 million acres of BLM-managed lands within the planning area have so far been inventoried for wilderness characteristics, pursuant to new guidance issued in March 2012, and detailed in BLM Manual 6310 "Conducting Wilderness Characteristics Inventory on BLM Lands." As of September 2013, 23 units totaling 11,781,258 acres have been identified as lands with wilderness characteristics. This process is ongoing and the inventory will be published and incorporated by reference into the Draft RMP/EIS. The following sections include a general description of the current condition of the planning area in regard to wilderness characteristics and BLM policies directing inventory.

2.1.14.1. Indicator

According to BLM Manual 6310, the inventory and analysis evaluates wilderness characteristics as defined in section 2(c) of the Wilderness Act (1964) and incorporated in the Federal Land Policy and Management Act of 1976 (FLPMA). The four criteria for lands possessing wilderness characteristics are:

1. Generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;

2. Has outstanding opportunities for solitude or a primitive and unconfined type of recreation;

3. Has at least 5,000 acres of land or is sufficient size to make practicable its preservation and use in an unimpaired condition;

4. May also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Inventory of Lands with Wilderness Characteristics

Almost all BLM-managed lands in the planning area meet the criteria for wilderness as defined by the Wilderness Act of 1964. Section 201 of FLPMA requires the BLM to maintain, on a continuing basis, an inventory of all public lands and their resources and other values. This inventory requirement includes maintaining information regarding wilderness characteristics. Section 201 also provides that the preparation and maintenance of the inventory shall not, of itself, change or prevent change of the management or use of the lands.

Prior to 2011, no inventories had been conducted in the planning area and management did not address wilderness characteristics. The Central Yukon Field Office initiated an inventory of lands with wilderness characteristics in 2011, following the issuance of WO-IM No. 2011-154, which directed offices to continue to conduct and maintain inventories regarding the presence or absence

of wilderness characteristics, and to consider identified lands with wilderness characteristics in land use plans and when analyzing projects under NEPA.

The BLM issued Manual 6310 "Conducting Wilderness Characteristics Inventory on BLM Lands" in March 2012. This Manual supersedes BLM Manual Section 6301. The Central Yukon Field Office inventory process follows the guidelines in Manual 6310. Additional guidance specifically for BLM-managed lands in Alaska has been established by IM AK-2012-015 "Alaska Policy on Lands with Wilderness Characteristics Inventory" and by Wilderness.net. The Alaska National Interest Lands Conservation Act of 1980 (ANILCA) lists several types of developments that specifically may be allowed in Alaskan wilderness areas whose presence would not automatically preclude finding wilderness characteristics present in an inventory area, as might be the case on BLM-managed lands in other states. This includes public use cabins and shelters, snowmobile travel with adequate snow cover, airplane use including primitive landing areas, motorboat use, and temporary structures or equipment for hunting, fishing, and trapping. The BLM considers these uses as compatible with lands with wilderness characteristics in Alaska (IM AK-2012-015).

Since December 2011, approximately 11,783,180 acres, excluding the Nonwilderness Assessment in the Utility Corridor Subunit, have been inventoried and all but 1,925 acres (less than 0.02 percent) were determined to have wilderness characteristics, however, the inventory is not complete.

Size

The minimum size as defined by the BLM Manual 6310 is 5,000 contiguous acres. Inventory units include contiguous undeveloped lands managed by the BLM. Lands exhibiting "checkerboard" ownership (e.g., every other township) are not considered contiguous. Lands that have been selected, but not yet conveyed, by the State of Alaska or Alaska Native entities, are included in the units because they remain under BLM management until conveyed. This means that as conveyances proceed, boundaries of units identified as having wilderness characteristics will change. Units smaller than 5,000 acres may still be considered if they are contiguous with other lands formally determined to have wilderness values, potential wilderness values, or are federal lands managed to protect wilderness characteristics. Roadless islands less than 5,000 acres may fit the other criteria of naturalness and opportunities for solitude or primitive types of recreation.

Boundaries for inventory units were established using criteria in Manual 6310, which lists roads, land ownership, developed rights-of-way, valid R.S. 2477 rights-of-way, and popular rivers or trails that are incompatible with the "primitive recreation" requirement. In Alaska, the BLM allows watersheds or other topographic features to divide multi-million-acre units into manageable pieces (Barns, 2011). For some very large inventory units, BLM Alaska uses hydrologic units as boundaries, especially where they divide major watersheds such as the Yukon and Koyukuk Rivers.

Naturalness

Recent BLM guidance on criteria for wilderness characteristics (Barns, 2011) clarifies the definition of "natural" as follows:

- to the average visitor, not trained biologist
- not "pristine" or total ecological integrity
- relatively unaffected by modern human activities (not including climate change)

- nonnative species do not automatically disqualify

The area should look natural. Any human developments should be substantially unnoticeable. One issue in the planning area concerns old or rarely used "cat trails" (tractor trails) and winter trails. Ground disturbance in cold, wet soils often leads to compaction, softening, erosion, and subsequent changes in the drainage and vegetation complex, which are essentially permanent. The change in vegetation is often in striking contrast to surrounding, undisturbed vegetation and outlines the old routes in very noticeable ways such as long, straight lines that are clearly unnatural. The magnitude of these changes must be considered in the overall analysis of wilderness characteristics.

Opportunities for Solitude or Primitive and Unconfined Recreation

An area only has to possess solitude or primitive and unconfined recreation. It may possess outstanding opportunities for both, but one is sufficient. An area does not have to have outstanding opportunities on every acre; it is not disqualified because outstanding opportunities exist in only a portion of it. For example, solitude or primitive recreation may be limited at a trailhead that is next to a busy road, while being "outstanding" in the interior of a wilderness.

Primitive recreation is dispersed, undeveloped recreation that does not require facilities, or use motor vehicles, motorized equipment, or mechanized transport. Bicycles are considered mechanized transport. An area might possess outstanding opportunities for primitive recreation through either the diversity of primitive recreational activities possible in the area, or the outstanding quality of one particular activity.

Supplemental Values

Supplemental values include those specifically mentioned in the Wilderness Act: ecological, geological, or other features of scientific, educational, scenic, or historical value. Such values are not required to be present for an inventoried area to be considered as having wilderness characteristics, but their presence should be documented where they exist.

Wilderness Inventory Unit Boundaries

Under current guidance provided by BLM Manual 6310, boundaries of inventory units are set by roads, land ownership, or developed rights-of-way or leases. The BLM's policy uses the definition of "road" from the House of Representative's Report 94-1163 of May 15, 1976:

"The word 'roadless' refers to the absence of roads which have been improved and maintained by mechanical means to insure relatively regular and continuous use. A way maintained solely by the passage of vehicles does not constitute a road."

For a route to meet the definition of "wilderness inventory road" it must meet the requirements that:

- It be improved and maintained
- Improvement and maintenance must be by mechanical means
- It must have relatively regular and continuous use

R.S. 2477 rights-of-way that have been found valid through adjudication are excluded from wilderness characteristics inventory areas, regardless of any construction or maintenance that may

or may not have taken place. R.S. 2477s that are only asserted — that is, not yet proven to be valid — are considered roads only if they meet the wilderness inventory road definition.

Other features may be used to determine boundaries of lands with wilderness characteristics. In Alaska, ANILCA Section 103(b) specifies "Whenever possible, boundaries shall follow hydrographic divides or embrace other topographic or natural features." Other linear features may be used, such as a popular trail that has a use incompatible with the requirement for primitive recreation.

Nonwilderness Assessment

The BLM conducted a Nonwilderness Assessment on BLM lands within the Utility Corridor in 1980 (BLM 1980). This was a special project approved by the Director of the BLM and conducted "to expedite Northwest Alaskan Pipeline Company's application to construct a natural gas pipeline system…" The assessment identified BLM-managed lands that lacked wilderness characteristics as defined in the Wilderness Act of 1964 and was conducted in a manner that met the requirements of Section 603 of FLPMA.

The nonwilderness assessment area was divided into nine segments including land managed by the BLM along the Trans-Alaska Pipeline System corridor north of Dalton Highway milepost 56 (Yukon River). Four of these segments are still under BLM management (Table 2.17).

Table 2.17. Utility Corridor 1980 Non-wilderness Assessment

Nonwilderness Segments on current BLM-managed lands: south to north	Dalton Highway Mileposts (approx.)	Description	Segment length in miles (1980)	Acres assessed in 1980	Acres not meeting wilderness criteria in 1980	Acres needing future inventory
Yukon	Elliott Hwy to MP 76	Just north of Washington Creek (Elliott Hwy) to Ft. Hamlin Hills Creek	99	725,000	497,000	191,300
Prospect	MP 76-175	Ft. Hamlin Hills Creek to Coldfoot	98	555,000	302,300	249,000
Atigun	MP 175-270	Coldfoot to Atigun Bridge #2	94	528,000	223,000	305,000
Sagavanirktok	MP 270-360	Just south of Atigun Bridge #2 to just north of Pump Station 2 at the Sag/Ivishak confluence	87	512,000	325,000	187,000
Total			**378**	**2,320,000**	**1,347,300**	**932,300**

Reasons for removing these lands from wilderness characteristics were land status and various human improvements, including roads, pipelines, airfields, pump stations, power lines, developed material sites, camps, fences, water and sewer lines, mining areas, communications towers, and ancillary facilities connected with such developments. The acreage identified as "needing future inventory" are undergoing evaluation for eligibility as part of the current inventory process.

The Nonwilderness Assessment as it applies to current BLM-managed lands in the planning area will be reviewed under current guidelines for lands with wilderness characteristics. For the Nonwilderness Assessment, boundaries were determined on the basis of three characteristics: "topographic features; along a line where man-made features were judged to become not substantially noticeable; or to define lands that do not offer outstanding opportunities for solitude and recreation." These three criteria were not well-defined or applied in a rigorous, defensible manner. For example, an area can have outstanding opportunities for solitude or primitive recreation; it need not have both to qualify. Under newer guidance provided by BLM Manual 6310 and Barns (2011) the criteria for wilderness characteristics are more carefully defined. Wilderness characteristics inventory unit boundaries now include land status or change in ownership, developed rights-of-way or leases, developed R.S. 2477 rights-of-way, and developed or mechanically maintained roads. New criteria define and distinguish between "wilderness inventory roads", trails, road segments ("cherrystems" and "donuts"), and primitive routes.

The Nonwilderness Assessment asserted that "it is not reasonable to expect these improvements (listed above) to return or be returned to a substantially unnoticeable condition, either by natural processes or by hand labor." This assumption could be challenged. The BLM requires that certain kinds of permitted activities restore an area to natural condition when completed: an example of this is the Valdez Creek Mine in the Alaska Range (Diel and Banet, 2004). Infrastructure such as communications towers may be downsized or removed. Numerous old winter roads and trails, unused for 40 or 50 years or more, are visible from the air, but can no longer be discerned by a person on the ground, the standard by which they are now judged. An example is the access road to a mining site on the west slope of Sukakpak Mountain opened during early pipeline construction (mid-1970s). It was re-vegetated (Brown and Krieg, 1983) and after 25 years was substantially unnoticeable (personal observation). Advances in technology and in understanding of environmental, social, and health and safety concerns have led to reduced footprints for some kinds of development.

While lands that are near the above-ground sections of the Trans-Alaska Pipeline, Dalton Highway, and active mining claims and mineral materials pits are clearly lacking in naturalness, many nearby areas exhibit terrain that effectively isolates them from these developments and activities. An area can have wilderness characteristics even though every acre within the area may not meet all the criteria (Barns 2011). BLM Manual 6320 "Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process" also states that "The fact that incompatible activities or uses can be seen or heard from areas possessing wilderness characteristics should not be a determining factor when analyzing the manageability of such areas unless these impacts are pervasive and omnipresent." The nonwilderness assessment lands should be inventoried again with more rigorously applied criteria.

2.1.14.2. Current Condition

Most of the planning area is vast, roadless, undeveloped land in pristine or near-pristine condition. In areas off the road system, human activity and development are generally confined to a zone extending a few miles around small villages along major waterways such as the Yukon and Koyukuk Rivers. Village residents generally access the surrounding areas in summer by motorized boat and off-road vehicle and in winter by off-road vehicle, snowmobile, or less commonly, dog team. For most non-local visitors, access is by personal aircraft or by regional airline to a hub village and then by air taxi or charter aircraft to the final destination.

Major Roads

There are four state highways within the planning area. The Dalton Highway (Alaska Highway #11) runs north for 414 miles from Livengood, at Elliott Highway milepost 73, to Deadhorse at the Arctic Ocean. The Dalton Highway, originally called the Haul Road, was built in 1974 to facilitate construction of the Trans-Alaska Pipeline System, which was completed in 1977. The pipeline is 48 inches in diameter and there are both buried and above-ground sections. The above-ground sections are visible from a distance, depending on terrain and vegetation. The Dalton Highway is open year-round and is used primarily by industrial traffic serving the oilfields on the Arctic Ocean coast. For BLM-managed lands in the planning area, most development occurs along the Dalton Highway. Commercial businesses are limited to four development nodes located at Yukon Crossing (milepost 56), Coldfoot (milepost 175), Chandalar Shelf (milepost 239), and Happy Valley (milepost 335). Coldfoot and Happy Valley are located on State-conveyed lands. Currently the businesses at the Yukon River (milepost 56) and milepost 60 are closed in winter. There are no commercial businesses at Chandalar Shelf. The unincorporated village of Wiseman (year-round population about 12 to 15 people) is approximately 15 road miles north of Coldfoot.

The Elliott Highway (Alaska Highway #2) begins in Fox, 10 miles north of Fairbanks and leads northwest to Livengood. From there it turns southwest and ends at Manley Hot Springs, milepost 151. A spur road at milepost 109 leads 11 miles to the village of Minto.

The Richardson Highway (Alaska Highway #4) forms the southeastern border of the planning area and leads from Fairbanks to the port of Valdez on Prince William Sound.

The George Parks Highway (Alaska Highway #3) is the main artery between the cities of Fairbanks and Anchorage, and runs through the southeastern portion of the planning area, passing through the towns of Ester, Anderson, and Healy.

Wilderness Inventory Roads

The following roads were inventoried and found to meet the criteria for wilderness inventory roads. Documentation will be included in the wilderness inventory report when completed.

Bettles Winter Road

The Bettles Winter Road is a spur road leading west to the village of Bettles (Evansville) from the Dalton Highway at milepost 136. The first mile is open to the public in summer. The remaining 30 unpaved and largely unimproved miles are open in winter only when the ground is frozen and the road is declared safe to travel by the mayor of Bettles and the BLM.

Coldfoot-Chandalar Lake and Coldfoot-Caro Trails

The Coldfoot-Chandalar Lake and Coldfoot-Caro Trails are State-identified R.S. 2477 Rights-of-way to which the BLM granted the State a permanent easement but did not validate the right-of-way. In this particular case the BLM treats the rights-of-way as if it were valid. The final judgment rendered by the U.S. District Court for the District of Alaska (2007) said:

"Except with regard to the question of the width, the public highway right-of-way quieted in the State of Alaska in paragraph 1 of this final judgment shall be treated as if it were a right-of-way established pursuant to R.S. 2477 (43 USC sec. 932, repealed with savings clause) for purposes

of determining scope of property rights, permissible uses and extent of any federal regulatory authority."

Ruby-Poorman and Hog River Roads

Two wilderness inventory roads occur as isolated "donuts", that is, they have no connection to the state highway network. The town of Ruby on the Yukon River is the northern end of a historic mining road known as the Ruby-Poorman Road. This primitive gravel road once extended approximately 60 miles south to the mining town of Poorman. The State of Alaska Department of Transportation currently maintains about 41 miles from Ruby south. The Hogatza River (also known as Hog River) Road starts a short distance upstream from the mouth of the Hogatza River, which empties into the Koyukuk River at Hog Landing (Section 13, T7N, R16E, KM). From Hog Landing, it runs 28 miles approximately northwest and then north, and crosses BLM lands for approximately 12 miles. The road is clearly marked on the USGS Hughes, Alaska quadrangle, dated 1956 (with limited revisions in 1982). Both roads provide access to active mining claims.

Other Wilderness Inventory Roads

Other documented wilderness inventory roads include those used for mining access from the Dalton Highway to active claims via the Prospect Creek, Chapman Creek, Myrtle Creek, Nolan, Hammond River, Marion Creek, Gold Creek, and Linda Creek roads. These roads are "cherrystems" connected to the Dalton Highway at one end. They are closed to motorized vehicle access from the Dalton Highway except for miners with valid claims and to federally qualified subsistence hunters, who may use snowmobiles.

Lands Outside the Utility Corridor

Except for the Utility Corridor, which is accessed by the Dalton Highway, BLM-managed lands in the planning area determined to have wilderness characteristics receive little visitation or resource use. Village residents are the primary users, participating in subsistence activities such as hunting, fishing, trapping, berry-picking, harvesting house logs, and gathering firewood. In many cases, these activities take place on Native-owned lands that are near or adjacent to BLM-managed lands with wilderness characteristics and may extend onto BLM-managed lands.

With no developed recreational trails and with access to much of the area limited to single-engine aircraft, most of the inventoried units see very low levels of recreational use. This appears to be particularly true of extremely remote areas such as the North Fork Kuskokwim River, Nulato Hills, and Ray Mountains.

Because lands with wilderness characteristics in the planning area in general support wildlife such as moose, caribou, Dall sheep, and grizzly, they are visited by both guided and non-guided hunters. Hunters are likely to be in small groups that set up a "spike camp" for several days from which they make forays for up to 2 miles (K. Egger, pers. comm.). There are no permitted guides for multi-day recreational floating or backpacking trips, but some independent travelers probably visit the planning area in low numbers to float the rivers, backpack/packraft, ski, snowmobile, or run dog teams. This kind of travel is more likely to be point-to-point or out-and-back rather than centered in one location.

Utility Corridor and Dalton Highway

The Dalton Highway crosses the Brooks Range, one of the most scenic and road-accessible portions of the entire planning area. Gates of the Arctic National Park and Preserve is located to the west: 64 percent of the 8,400,000-acre park is designated wilderness, including the area bordering the Utility Corridor from approximately Dalton Highway milepost 160 (Chapman Lake) to Atigun Pass (milepost 244). The Arctic National Wildlife Refuge lies east of the highway and much of it, including the Brooks Range subunit bordering the Utility Corridor, has been recommended for wilderness designation (USFWS, 2011). State of Alaska Statute 19.40.210 prohibits motorized vehicles within 5 miles of the highway. The statute allows people to drive snowmobiles across this 10-mile-wide corridor but they may not begin or end their trips on the highway. The Alaska Department of Fish and Game prohibits the use of firearms for hunting within 5 miles of the highway; however, local residents who qualify for federal subsistence hunting permits may use both rifles and snowmobiles within 5 miles of the highway.

As a result of these land designations and regulations, recreation along the highway is, by default, of a primitive and unconfined nature.

Most of the documented recreational use on BLM lands in the planning area occurs along the Dalton Highway and includes permitted tour operators and hunting guides as well as independent travelers. Records kept by the Arctic Interagency Visitor Center in Coldfoot going back to 1989 compare numbers of guided with non-guided visitors. Staff began counting visitors hiking from the Dalton Highway to Gates of the Arctic National Park in 2000, to the Arctic National Wildlife Refuge in 2002, and to BLM-managed Utility Corridor lands in 2005 (BLM 1989–2008). Numbers for Gates of the Arctic are relatively accurate because the NPS requires backcountry registration. Numbers for the other areas are based on voluntary registration and casual observation and represent an unknown fraction of actual visitors. Trends in Dalton Highway recreation use are presented in section 2.2.6.1.3, Forecast or Anticipated Demand.

Backcountry recreation that starts from the highway occurs throughout the year: in summer and fall visitors are mostly day-hiking, backpacking/packrafting, and hunting while in winter, visitors travel by skis or dog teams. Winter use includes hunters since the season for caribou is open much of the winter. In some years, a human-powered ultra-endurance race called the “Alaska Mountain Wilderness Ski Classic” takes place in the Brooks Range partly on Utility Corridor lands: the race generally has fewer than 20 entrants. The BLM has not attempted to collect information or data about backcountry use in a systematic way.

The Dalton Highway is increasingly popular with non-local hunters, both Alaska residents and non-residents (personal observations by BLM staff, 1999-2010). The State restrictions on off-highway vehicles and rifle hunting within 5 miles, along with a long season and liberal harvest of caribou, create a unique opportunity and growing reputation for a road-accessible yet relatively uncrowded hunting experience. Most caribou hunters travel north of the Brooks Range, where the Central Arctic Herd generally migrates and where the terrain is treeless and less rugged than the Brooks Range. Hunters seeking Dall sheep use the highway to gain access to the mountainous terrain of the Brooks Range that sheep prefer.

The University of Alaska Fairbanks operates Toolik Field Station, an internationally recognized arctic research facility located on the North Slope at Dalton Highway milepost 284, north of Galbraith Lake. Most summer research staff and visiting educators recreationally hike in the mountains around the Dalton Highway. These trips may add up to several hundred visitor/days per season and preferred routes include Slope Mountain and the Atigun Gorge, among other

places (Toolik Field Station staff and J. Reed, pers. comm.). Hiking parties may include as many as 15 people, described on websites such as PolarTREC (Teachers and Researchers Exploring and Collaborating: http://www.polartrec.com/).

Dalton Highway Access to the Arctic National Wildlife Refuge

In 2009, the number of documented recreational visitors traveling into the Arctic National Wildlife Refuge was estimated at 1,000, about 12 percent of whom voluntarily reported traveling from the Dalton Highway (USFWS, 2011). The spectacular Atigun Gorge, which is just east of the highway and about 0.5 mile beyond BLM-managed land at milepost 271, appears to be a major destination for hikers and whitewater boaters. It was among the top five entry/exit points for the Arctic Refuge in a 2008 visitor survey (Christensen and Christensen, 2009). The survey found that about 8.5 percent of hunters hiked in from the highway, but hunters were less likely than non-hunters to use the Atigun Gorge. This may be due to the ruggedness of the terrain and extremely challenging whitewater (Class III-IV) on the Atigun and Sagavanirktok Rivers. However, the survey took place from June 1 to September 30, 2008, so it did not include the winter/spring hunting season for caribou, which is preferred by many skiers and dog mushers who use the Gorge to get beyond the State's 5-mile restriction on rifle-hunting.

BLM Recreation Plans

The Utility Corridor Recreation Area Management Plan (BLM 1991a) proposed more recreational development, including designated trails and signed trailheads. While possibly increasing opportunities for primitive recreation, trails would funnel people into specific drainages, causing more impacts and loss of solitude in those areas. In sensitive environments such as arctic tundra, relatively few visitors can create social trails which then draw even more visitors: the Arctic National Wildlife Refuge is studying a social trail that begins on BLM lands on the Dalton Highway and leads into the refuge at Atigun Gorge (Monz, et al., 2012). Currently, there are no designated or developed trails, but there are no limitations on non-motorized recreational access in the planning area. At the Arctic Interagency Visitor Center, the policy is to encourage visitors to actively research and plan their own route to maximize the experience of true wilderness exploration.

2.1.14.3. Trends

Since 2001, casual observation by staff at the Arctic Interagency Visitor Center indicates a steady increase in the number of visitors traveling on the Dalton Highway. Paving of the Dalton as well as the Elliott Highways began in 2001, and is still underway. Prior to 2001, the entire route north from Fairbanks was rough gravel surface beginning at Elliott milepost 28. A trip to Coldfoot, a distance of 260 miles, took 8 hours under good conditions. As of 2013, all of the Elliott Highway section is paved, as well as over 170 miles of the Dalton Highway. Consequently, Coldfoot can be reached in about 6 hours and with less risk of damage to passenger vehicles. Visitor center personnel frequently hear visitors say that the trip is not nearly as rough or time-consuming as they had expected.

The Dalton Highway and the surrounding public lands are attracting a growing number of travelers from around the world. The increase is driven at least partly by the tourism industry, media, and adventure travelers publishing stories in print and social media. The Internet provides easy access to information, photo tours, blogs, and forums that give instant reviews and for

anyone in the world. Increasingly, various social media document hunting, backpacking, packrafting, river trips, and winter treks by recreational users who cross BLM-managed lands in the Utility Corridor (see for example Skurka 2011, Gates 2013, and Cantor 2014).

There has been a relatively rapid increase in non-subsistence hunting activity along the Dalton Highway, particularly among caribou hunters. This is likely in response to a long and liberal season for caribou beginning with the rapid population growth of the Central Arctic Caribou Herd documented in 2008 (ADFG, 2011) This increase has resulted in a higher concentration of bow hunters close to the road (rifle hunters must be a minimum of 5 miles from the highway), mostly north of the Brooks Range where the animals sometimes concentrate. At times, the number and distribution of hunters may result in a temporary loss of solitude in areas with wilderness characteristics. Whether this condition will grow worse or better depends in part on the future health of the Central Arctic Herd and the allowable harvest.

Recent films and reality-TV programs, notably the long-running series "Ice Road Truckers," have drawn national and international attention to the Dalton Highway, making it a destination for many Alaska visitors. However, it is likely that very few of these visitors venture away from the highway. Other reality-TV shows about rural Alaska (e.g., "Life Below Zero" based in the village of Wiseman and "Yukon Men" based in the village of Tanana) may draw visitors to remote parts of the planning area. In general, no immediate impact on lands with wilderness characteristics is anticipated from this publicity. However, if popular media feature a specific locale, that place can become a magnet for visitors, which can then impact naturalness and opportunities for solitude. Well-known examples include the spectacular Arrigetch Peaks in Gates of the Arctic National Park, and Caribou Pass in the Arctic National Wildlife Refuge where numerous guided and unguided visitors concentrate in late June to see the annual migration of the Porcupine Caribou Herd.

The rapid expansion of scientific research activities and associated structures in and beyond the Toolik Lake Research Natural Area reduces the opportunities for solitude and the naturalness of adjacent areas with wilderness characteristics. Activities include field crews and helicopter traffic and the structures include such things as field camps, monitoring towers, sampling stations, weirs, exclosures, boardwalks, and weather gauges that are highly visible in the open tundra environment of the North Slope. Postings on the PolarTREC website mentioned above include stories of groups of Toolik hikers approaching Dall sheep and active bird nests, including those of raptors. Ignorance or disregard of Leave No Trace techniques may affect other users' opportunities for solitude and may impact naturalness in areas with wilderness characteristics near the Toolik Lake Research Natural Area.

2.1.14.4. Forecast

The majority of the lands in the planning area are expected to retain their wilderness characteristics due to their remoteness, lack of access, and the limited demand for ground-disturbing activities at this time.

Several ongoing or reasonably foreseeable activities could impact lands with wilderness characteristics, particularly along the Dalton Highway and on the North Slope. These are discussed below.

- If the State statute prohibiting off-highway vehicles (19.40.210) is ever lifted, the BLM under the current Dalton Highway Recreation Area Management Plan (RAMP) would implement

OHV limitations and designate specific trails. OHV use could lead to degradation of natural conditions in sensitive environments and in areas not designated but subject to unauthorized use. Snowmobiles in particular would allow access far into the backcountry and could reduce opportunities for solitude, although BLM policy for Alaska considers snowmobile use compatible with lands with wilderness characteristics. There have been numerous attempts to lift the ban, but public sentiment has been strongly in support of retaining it.

- Adjacent lands in Gates of the Arctic National Park and the Arctic National Wildlife Refuge are designated or proposed wilderness. BLM-managed lands in the Utility Corridor serve as their "front country" so resource development or changes in management of off-highway vehicles on BLM-managed lands could affect how, when, and where those lands are accessed.

- Continued expansion of research sites beyond the Toolik Lake RNA onto surrounding areas that have wilderness characteristics could impact naturalness and opportunities for solitude via cumulative effects.

- If the State of Alaska develops its "Roads to Resources," specifically the Umiat and Ambler roads, access to lands in the planning area would immediately increase. Should these roads be open to the public, they could increase opportunities for primitive recreation. However, impacts on naturalness or opportunities for solitude or non-mechanized recreation could be serious enough to impair wilderness characteristics, especially if off-road vehicle use is allowed.

- The BLM and other agencies have documented 28 non-native plant species in the Dalton Weed Management Area (BLM 2013). Some of these species have spread rapidly throughout disturbed areas in the past years and some have moved off the highway right-of-way into undisturbed habitats. If they become highly visible or cause changes in the natural ecosystem that are noticeable to the general public, they could reduce apparent naturalness, one of the key criteria defining lands with wilderness characteristics.

- There is increasing interest in rare earth elements and the potential in Alaska and the Spooky Valley area of the Ray Mountains in particular (Lasley, 2011). The Alaska Division of Geophysical Surveys conducted sampling programs to assess strategic and critical mineral potential in 2011 and 2012, in the Melozitna and Ray Mountains-Dalton Highway areas (ADNR 2012). About 27 percent of the planning area is currently closed to mineral location (staking of mining claims) under withdrawals enacted in the early 1970s. Additionally, these withdrawals close the vast majority of the BLM lands in the planning area to mineral leasing (such as oil and gas). The BLM may recommend opening some of these lands to mineral location and/or mineral leasing in the Central Yukon RMP. If the Secretary of the Interior acted on the BLM's recommendation, and depending on access and mineral potential, this could lead to some level of mineral exploration and mineral development. Construction of mining access roads could result in lands currently found to have wilderness characteristics no longer meeting the 5,000 acre size threshold. Mineral exploration and development would lead, at a minimum, to a loss of naturalness for the life of the mine and until reclamation is completed. Outstanding opportunities for solitude or primitive recreation would be reduced near mines when mining is ongoing. Alternatively, road access for mining activities may also increase opportunities for primitive recreation by increasing access to nearby, currently roadless areas.

2.1.14.5. Key Features

BLM staff has compiled a preliminary list of areas which have a combination of high value resources associated with wilderness characteristics. They include:

- Ray Mountains/Spooky Valley: very unusual and spectacular geology with many granite tors, pristine, remote with outstanding opportunities for solitude and primitive recreation (hiking, hunting), supplemental values as an ecological island between the Alaska Range and Brooks Range; BLM-designated Research Natural Area.

- Jim River watershed: rugged and scenic mountains, pristine watershed, outstanding opportunities for solitude and primitive recreation (hiking, fishing, hunting), supplemental values of fish habitat and archaeology; BLM-designated Area of Critical Environmental Concern (ACEC);

- Bettles River/Mathews River/Sukakpak, Dillon and Snowden Mountains: the most spectacular mountain landscape along the Dalton Highway, geology, near-pristine (pipeline not pervasive or omnipresent), free-flowing river, wildlife, outstanding opportunities for solitude and primitive recreation (hiking, climbing, hunting), supplemental values (Dall's sheep, rare plants); includes BLM-designated Sukakpak and Snowden ACECs;

- West Fork Atigun River: spectacular landscape along the Dalton Highway on the north side of the Brooks Range, geology, pristine (pipeline not pervasive or omnipresent), free-flowing river, wildlife, outstanding opportunities for solitude and primitive recreation (hiking, packrafting, hunting), supplemental values (Dall sheep); BLM-designated ACEC;

- Campsite Lakes/Sagavanirktok River/Atigun Gorge to the northern limit of BLM-managed lands: pristine kettle lake district uncommon on the North Slope, very scenic, pipeline not pervasive or omnipresent, outstanding opportunities for solitude and primitive recreation (bow- and rifle-hunting, dog mushing, floating and hiking); supplemental values (Dall sheep, important wintering area for Central Arctic Caribou Herd, fish-rearing habitat on Accomplishment and Section Creeks, archaeological sites on Sagavanirktok River). The Campsite Lakes area offers some of the best and only road-accessible hiking on the North Slope that is not inside the Toolik Lake Research Natural Area. The Atigun and Sagavanirktok Rivers together offer the only Class III-IV whitewater, road-accessible river trip on the entire North Slope. While the Atigun River downstream from the Dalton Highway is in the Arctic National Wildlife Refuge, the Sagavanirktok River provides the second leg of the trip and egress back to the highway, and is also likely eligible as a Wild and Scenic River.

2.2. Resource Uses

2.2.1. Facilities

This section addresses BLM-managed administrative sites in the planning area. Campgrounds, waysides, and the Alaska Interagency Visitor Center are discussed in section 2.2.6.1 Recreation and Visitor Services.

Current Location and Level of Use

The BLM manages several administrative sites in the Utility Corridor Subunit. These facilities provide housing for BLM staff manning the visitor center or conducting field work, and volunteers manning the Yukon River Crossing Visitor Contact Station, in addition to storage of equipment and maintenance activities.

Table 2.18. Location and Types of BLM Facilities in the Utility Corridor Subunit

Location	Facility Type and #	Use
Marion Creek Administrative Site	BLM Cabins (4)	Staff housing
	Outhouse (1)	Staff
	Operation Facility/Bath House (1)	Utilities/Staff
	Maintenance Shop (1)	Maintenance Crew
	Solid Waste Transfer Site (1)	Maintenance Crew
	Bear Proof Garbage Receptacle (1)	Staff
Coldfoot	BLM Cabins (3)	Staff housing
	Outhouse (1)	Staff
	Bear Proof Garbage Receptacle (1)	Staff
60-Mile, Dalton Highway	Artesian Well/Dump Station (1)	Staff/Visitors
7-Mile, Yukon Bridge	BLM Cabins (2)	Staff
	Outhouse (1)	Staff
	Bear Proof Garbage Receptacle (1)	Staff
	Maintenance Shop (1)	Maintenance Crew

Forecast or Anticipated Demand

An anticipated increase in recreation, guided and non-guided hunting, mining, surveying, and pipeline activity will result in the need for expanded staff and maintenance facilities in the Utility Corridor Subunit.

Key Areas or Areas of High Potential

An increase in guided and independent travelers to the Yukon Crossing Visitor Contact Station, and Arctic Circle is expected. Staff facilities to support expected use are currently insufficient for increased activities.

2.2.2. Forest and Woodland Products

The planning area overlaps eight ecoregions identified by Gallant et al. (1995), six of which include forested lands. These ecoregions provide a convenient and effective structure to characterize the forests in the planning area.

The Interior Forested Lowlands and Uplands ecoregion contains 60 percent of the unselected BLM-managed lands and 38 percent of all BLM-managed lands in the planning area. This ecoregion is a mosaic of forests dominated by spruce and hardwoods on rolling or rounded hills and dissected plateaus, and characterized by a lack of Pleistocene glaciation, generally shallow soils underlain by discontinuous permafrost, a continental climate, and a very high frequency of lightning fires. Because the permafrost is often near freezing, disturbance of the organic layer can easily result in thawing and associated alterations to soil physical properties and hydrology. Distribution of forest types are primarily determined by topography and the

associated variation in microclimate, soils, hydrology, and ecosystem processes (Chapin, et. al, 2006). Cold, wet north-facing uplands dominated by black spruce are the least productive of any forests in interior Alaska (Ibid).

The Interior Highlands ecoregion contains 23 percent of the unselected BLM-managed lands and 14 percent of all BLM-managed lands in the planning area. Lower elevations in this ecoregion can support open needleleaf forests and woodlands. These woodlands are often dominated by white spruce or codominated by white and black spruce.

Ten percent of the unselected BLM-managed lands and 6 percent of all BLM-managed lands in the planning area fall within the Brooks Range ecoregion. Forest lands occur in valleys and lower hillslopes on the south side of the Brooks Range, extending north to the arctic treeline. Forested lands end at approximately 68 degrees north in the Dalton Highway corridor. Hegg (1974) conducted an inventory and forest characterization in the region. He reported that, of the 741,710 acre inventory unit, 65.6 percent was forested lands. Of those forested lands, he classified 91.2 percent as "noncommercial inoperable," (noncommercial forest land presently carrying a gross volume of less than 800 cubic feet per acre), 1.6 percent as "noncommercial operable," (noncommercial forest land presently carrying a gross volume in excess of 800 cubic feet per acre), and 7.2 percent as "commercial" (forest land producing or capable of producing over 20 cubic feet per acre per year of industrial wood under management and not withdrawn from timber utilization). The commercial lands were composed of 23.6 percent sawtimber, 47.9 percent poletimber, and 28.5 percent seedling/sapling. Gross volume of commercial stands was 92,104.6 thousand board feet, with an annual gross growth of 3,190.7 thousand board feet and annual net mortality of 2,134.9 thousand board feet. All commercial forest lands had a site class of less than 50 cubic feet per acre mean annual increment. He reported that 71.1 percent of annual mortality of growing stock on commercial forest lands was due to stream bank erosion, 14.4 percent due to unknown causes, 10.1 percent to disease, and 4.4 percent to insects.

The Interior Bottomlands ecoregion contains 5 percent of unselected BLM-managed lands and 3 percent of all BLM-managed lands in the planning area. Needleleaf, broadleaf, and mixed forest stands occur on a variety of sites in this ecoregion.

A small portion of the Seward Peninsula ecoregion overlaps the planning area on the western edge. Two percent of the unselected BLM-managed lands and 1 percent of all BLM-managed lands in the planning area fall in this ecoregion. The Alaska Range ecoregion intersects the southeastern corner of the planning area. Less than 0.05 percent of the BLM-managed lands in the planning area fall in this ecoregion. The forests on BLM-managed lands in both these areas consist of sparse black spruce woodlands and peatlands, where both volume and production of woody biomass is negligible.

2.2.2.1. Current Level and Location of Use

Commercial Forest Products: Commercial use of forest products in Interior Alaska is limited by small-diameter logs, high defect rates in hardwoods, access limitations, infrastructure deficiencies, and long distances to significant markets (Wurtz et al. 2006). There has been essentially no demand for commercial timber harvest on BLM-managed lands in the planning area. There are, however, several portable sawmills that have been operated intermittently for specific projects and a more robust mill at Ruby that has not been operational for some time. Most forest products are destined for local projects and not a greater area market at this time.

Biomass: There is increasing interest in the use of biomass throughout Interior Alaska. The village of Tanana is one of the leading communities converting from fossil fuels to biomass and is providing a model for others within the planning area with a consumption of over 500 cords per year, most of which is harvested from the Yukon River as driftwood. As other communities complete feasibility and engineering studies and bring projects through construction to operation, the demand for biomass resources will increase. While most of the readily accessible wood is not on BLM-managed lands, working circles of up to 25 miles radius and 15 miles each side of the major rivers should be considered for biomass resources. Any wildland fires that reach the river system may be considered a good source for biomass for the region for several years to come. Transportation along the river corridor over snow in winter or by barge in summer may move biomass considerable distances at a reasonable cost. Other villages that have approached the Alaska Energy Authority (AEA 2015) or the Tanana Chiefs Conference for assistance with biomass projects include: Kaltag, Nulato, Koyukuk, Galena, Ruby, Hughes, Nenana, Healy, and Minto. Additional communities may consider biomass resources as fossil fuel prices rise and they see more success stories.

In addition to community needs, the pellet mill in Fairbanks may eventually be interested in obtaining biomass for their operation from BLM-managed lands north of the Yukon River crossing.

Non-timber forest products: Classified as Special Forest Products, these include all vegetative materials from mushrooms to seed collection and Christmas trees. Demand for these resources ebbs and flows with markets and their availability. Again, most areas managed by BLM are not adjacent to the roads or rivers except for the Dalton Highway corridor where much of the land was burned early in the twenty-first century through a series of severe fire years. Mushrooms are a common resource of interest in the few years following a wildland fire and may continue to support a market as new fires occur. Commercial operations are required to obtain permits for Special Forest Products. As the burns recover, they may provide opportunities to promote forest thinning through commercial Christmas tree sales. Seed collection for rehabilitation projects is another area where the BLM should consider issuing permits to project proponents for use in revegetation of disturbed areas.

Subsistence use of forest products: Subsistence use of many forest products has occurred throughout the region with little or no oversight since people first migrated to this region. From the earliest settlers to the present time, people have cut “house” logs to build many of their necessary structures. They have milled logs into boards by hand and machine to finish construction and build various articles for local or personal use. Gathering of food is critical for subsistence users and may include berries, mushrooms, seeds and plant parts at various times of year. Firewood is another critical resource for many subsistence users. Historically, no permits have been required for most subsistence or personal uses. However, as population increases and lands are transferred to other land mangers, there is a growing interest in identifying where and to what extent the resources are being used by issuing permits as well as returning a limited income to the government for these resources.

Generally, the BLM has not been able to accurately track forest health on most of the resource area. The remote nature of these lands and the lack of base monitoring information makes it difficult to track any changes in forest health over time. The USDA and Alaska Department of Natural Resources (DNR) Forestry participate in the Alaska Cooperative Agricultural Pest Survey to conduct aerial surveys of selected areas of the state each year and produce an annual report

(FS-R10–FHP, 2013). Upon request, the Cooperative Agricultural Pest Survey will include a limited number of specific sites that the BLM is interested in for their annual survey.

In the past, small pockets of spruce beetle and Ips pine beetle activity have affected limited stands of black and white spruce (*Picea mariana*, *Picea glauca*), which are often fatal to much of the stand. Various defoliation agents have affected all of the hardwood species of trees and shrubs to varying degrees. Some of these have included aspen leaf miner, willow leaf blotch miner, birch aphid, alder dieback, aspen dieback, birch defoliation, willow defoliation, and others. All of the tree species are afflicted to some degree with fungal decay of roots and/or stems, which may not kill the trees immediately, but may affect their quality for specific purposes or their ability to withstand strong wind events.

Animal damage identified to date has been primarily limited to porcupine damage of stems and tops, along with a limited amount of big game impact from marking of territory and rubbing of antlers to remove velvet. None of these are considered a concern for overall forest health. Rodent damage has not been documented, and since there has been virtually no reforestation in this area, it has not been studied on natural regeneration after wildland fire or other disturbance.

Wildland fire is the major catastrophic concern for forest health and often consumes over 1 million acres of boreal forest in a season (Olson et al. 2011). Wildland fires have varying intensity, even within a single event, and for the most part are a result of natural ignition. The patchwork nature of fire provides ample opportunity for natural recovery in many instances. Fire suppression is categorized into four levels of effort (Critical, Full, Modified, Limited) with the highest level of protection being provided to villages and other high value resources. Much of the boreal forest remains in the Limited Suppression category because there is no inventory or current management plans that would assign a higher value to particular areas.

Wind storms can be another major contributor to altering forest health on a landscape scale. Straight line winds in excess of 70 miles per hour do occur at various times and locations throughout the planning area. These winds can flatten considerable areas of forest or just small pockets. Wind felled trees are prone to colonization by various insect pests if they are already present in the area. These infestations may evolve into a forest health problem in the adjacent stands as the insects consume the down wood and look for new material.

Overall, the forests of the Central Yukon planning area are considered to be in relatively good health with generally endemic levels of forest pests affecting the forest health.

2.2.2.2. Forecast or Anticipated Demand

To the extent that the State's "Roads to Resources" program provides improved access, demand for small commercial sales for firewood, biomass, or local building use may increase slightly. However, that will not do anything to resolve other limiting factors (small-diameter logs, high defect rates, infrastructure deficiencies, and long distances to significant markets). The most likely increase in demand is in the biomass market.

Commercial Forest Products: Lack of market demand for solid wood products in the local areas and the difficulty in getting products to markets outside of a village area are not likely to change significantly in the foreseeable future. Local mills will continue to produce materials intermittently for local needs.

Biomass: Biomass has the best opportunity to expand the consumption of forest products and the resource quality is less critical for biomass needs. Currently, the villages of Tanana, Kaltag, Nulato, Koyukuk, Galena, Ruby, Hughes, Nenana, Healy, and Minto have considered or installed biomass systems to meet some portion of their village energy needs. For Alaska, it is estimated that up to 80 percent of the village energy consumption is associated with heating.

There is currently a pellet mill in Fairbanks that has the potential to use biomass material from within 150 miles of the mill. This type of facility may use either dead material from wildland fire or insect damage or green material from entire stands or even non-merchantable materials from forest management projects. There may be proposals for other biomass processing facilities that arise through the expansion of village biomass demands. These new facilities may be constructed to meet a regional demand for biomass along a river or road system.

Non-timber Forest Products: There is no anticipated increase in demand for most non-timber forest products except as noted here. As fires occur in areas where there is access from roads, trails, or rivers, there is often a short-term demand for mushrooms. Much of this activity will be commercial in nature and will be managed through the permitting process on a case-by-case basis. Demand for other forest product materials is likely to be limited in scope and local in nature to meet a specific need for revegetation or site rehabilitation in the immediate area. Major development of mines, pipelines, or other infrastructure may drive demand for seed collection or transplants close to the development.

Subsistence Use of Forest Products: Demand for subsistence use of forest products will continue to be high near all villages within the Central Yukon. No substantial increase in use is anticipated, but capturing the extent of this use through a (self-issuance) permitting process is one goal of the forestry program. Documentation of use areas is desirable for future planning efforts.

Forest Health: The BLM will continue to rely on the cooperative agricultural pest surveys to determine the location, extent, and severity of all insect and disease activities. Currently, there are no imminent threats identified within the planning area. There is very limited access to most of the forested areas. There is a proposed cooperative project to develop a better means for predicting potential areas and severity of infestations based on the annual aerial surveys. Funding for this project has not yet been fully identified.

2.2.2.3. Key Areas or Areas of High Potential

Commercial Forest Products: The most promising areas for commercial products including house logs are stands of white spruce in areas with little to no permafrost. Many of these stands occur in areas where there are abandoned river meanders. The BLM manages very little of this type of land within the planning area, but these are potentially the most productive sites for forest products.

Biomass: Biomass has the potential to use a wide variety of forest and woodland materials. Initially, the existing stands close to villages get drawn upon for biomass resources. In general, a working circle of approximately 25 miles radius around each village and areas within 10 to 15 miles of roads or navigable rivers should be considered the areas available for biomass utilization. Areas with wildland fire damage or insect infestations within the past 10 years are also areas to consider for initial harvest of biomass material. Over time, areas along broad valleys with good stands of hardwood may be managed for rapid growth species to provide biomass resources.

Non-timber Forest Products: Recently burned areas (first 5 years) are considered primary habitat for mushroom harvesting. Sites close to roads and rivers will be preferred. Other non-timber

forest products will be preferred when they are near the site where they will be used. This may include holiday trees, seeds, wild seedlings and others. No areas are considered exempt from providing these resources at the present time.

Subsistence Use of Forest Products: Subsistence use of forest products is concentrated around villages and along roads and rivers. In some instances, these resources also come from traditional use areas along trap lines and around fishing and hunting camps. While all BLM-managed forest land is currently open to this use, there is a need to track use through free use permits. There may be areas where management will be implemented to designate specific sites for some activities to preserve certain resource values.

Forest Health: Historically, forest pests have been endemic throughout his region. Periodic outbreaks have not been extensive in the past, but this may change with changes in climate over time. Areas where the forest vegetation is stressed from overcrowding or drought may be the first to feel the impacts of various vectors. Extensive stands of single species are likely to be most seriously affected by forest pests because there would be continuous host material available in these settings. From the recent forest health surveys (USDA, FS 2006 to 2012), the most common pests have been defoliators of hardwood species, although Ips pine beetle and spruce beetles have also been noted in the area.

2.2.3. Lands and Realty

The primary objective of the Lands and Realty program is to provide the public with use of the land it needs through rightsofway, land use permits, leases, and sales. The secondary objective is to provide support to other programs to protect and enhance the resources. Overlaying these first two objectives is the need to support the Alaska Land Transfer Acceleration process, which involves the survey and conveyance of lands to the State of Alaska, Native corporations, and Native allottees.

Under the Statehood Act, the State of Alaska is entitled to receive 104 million acres of federal land. The Alaska Native Claims Settlement Act (ANCSA) requires the transfer of 45 million acres of public land to Alaska Native corporations. Approximately 4.3 million acres and 0.7 million acres of BLM-managed land in the planning area are State-selected and Native-selected, respectively. The final conveyance priority list for Native selections was submitted to BLM on June 9, 2008, and the priorities for State selections were submitted on December 10, 2008. The State has overselected 25 percent on a statewide basis, and Alaska Native corporations have over-selected as well. Therefore, some of the selected lands will remain in federal ownership over the long term.

The Alaska Native Allotment Act of 1906 (repealed with a savings provision by ANCSA) and the Alaska Native Vietnam Veterans Act of 1998 (P.L. 105276) allow for the transfer of up to 160 acres of nonmineral lands to eligible Alaska Natives if certain requirements were met as of August 31, 1971. These are referred to as Native allotments.

Conveyances to the State of Alaska, Native corporations, and individuals (Native allotments) are ongoing. Unselected public lands in the planning area are currently retained for public use. Any selected lands remaining after various entitlements are fulfilled, will also be retained for public use. However, tenure adjustments, including sale, acquisition, or exchange, may be made to meet management needs such as disposing of isolated parcels. The planning area overlaps portions of the Northwest Arctic Borough, North Slope Borough, Denali Borough, and Fairbanks North

Star Borough. The planning area boundary includes 24 remote villages, 15 of which have tribal entities, and three ANCSA Regional Corporation boundaries (Doyon Ltd., Arctic Slope Regional Corporation, and NANA, Inc.) The needs of local communities will be considered during tenure adjustments and may also be met by lease or sale under the Recreation and Public Purposes Act.

2.2.3.1. Current Level and Location of Use

The planning area encompasses a diverse range of geographical areas, as well as widely varied levels of population and infrastructure development. It includes the city of Fairbanks and Fairbanks North Star Borough in their entirety, the second largest metropolitan area in the state with over 99,000 residents. However, only a small percentage of the planning area's unencumbered BLM-managed lands are within the borough, consisting of mostly scattered, isolated small parcels. Because of proximity to population centers, these parcels see a comparatively high degree of usage for such things as communication sites and utility rights-of-way.

The complete length of the Dalton Highway, 414 miles, is contained within the planning area, providing opportunity for access to BLM-managed lands within the accompanying Utility Corridor. Construction of the highway was necessary for constructing the Trans-Alaska Pipeline System (TAPS), which runs roughly parallel to the highway. Material sites for gravel extraction are abundant along the route, heavily utilized both for maintenance of the pipeline right-of-way and access roads, and by the Alaska Department of Transportation and Public Facilities for maintaining the highway. There are also over 1,200 federal mining claims for locatable minerals in the planning area, many of which are near the Dalton Highway, see section 2.2.4.2 Locatable Minerals.

Originally, the Dalton Highway was closed, intended to serve only as a supply road for the pipeline. It was opened to public travel to Disaster Creek (milepost 211) in 1981, and the entire length was opened to public travel in December 1994. Since then, there has been increased interest in the Dalton Highway as a tourist destination and for sight-seeing, which has caused an increase in permitting for tour busses and other recreational guiding operations. State statute prohibits use of off-road vehicles within 5 miles of the Dalton Highway right-of-way. However, such use can be authorized by permit in conjunction with other permitted activities. There is ever increasing traffic on the highway by the general traveling public, for which services are severely limited along the length of the route. The Utility Corridor Resource Management Plan of 1986 attempted to address this issue through designation of specific "development nodes," where development of privately owned businesses offering travelers such services as fuel sales, dining, and overnight lodging would be encouraged. Four development nodes were specified: Yukon Crossing, Coldfoot, Chandalar, and Happy Valley. The Happy Valley and Coldfoot nodes have since been conveyed to the State of Alaska. Traveler's services are currently available at the Yukon Crossing and Coldfoot locations.

BLM manages lands on both sides of the Dalton Highway from the Yukon River north to milepost 300. At the northern end of this stretch, Toolik Field Station is one of only two leases under the Recreation and Public Purposes Act within the entire planning area. Toolik Field Station lies within the Toolik Lake Research Natural Area (RNA), and is operated by the University of Alaska. Growing interest in climate change has made this a highly sought-after area for research, and the National Science Foundation has put greater focus on both the Toolik Field Station and the Toolik RNA, bringing an increase in research projects to the area.

The vast majority of unencumbered BLM-managed lands within the planning area do not fall within any borough boundary, and are located in rural and remote areas away from developed communities and settlements, without road access. The primary means of access to these lands is by foot, dogsled, boat, offhighway vehicle, snowmobile, or aircraft. These areas often have high scenic and recreational values. Some uses occur throughout the planning area, including cabin leases and permits; free-use firewood permits and timber sales; and hunting, fishing, and other subsistence use of resources.

2.2.3.1.1. Land Use Authorizations

The table below shows numbers of the various types of land use authorizations currently either authorized or pending for the planning area according to BLM data. This table shows over 1,200 federal mining claims, but there are also over 5,000 State of Alaska mining claims authorized within the planning area. Holders of both federal and state mining claims regularly require authorization for access across BLM-managed lands.

Other authorized uses include gravel pits and oil and gas leases and rights-of-way, along with other types of rights-of-way and easements. Short-term low-impact land use permits, recreation permits, and subsistence uses play an important role throughout the planning area.

Table 2.19. Land Use Authorizations in the Central Yukon Planning Area [a]

Type of Authorization	Currently Authorized	Pending	Total
Recorded Mining Claims – Placer (federal only)	735	4	739
Recorded Mining Claims – Lode (federal only)	517	0	517
Mineral Material Sales (gravel pits)	32	3	35
Government Free Use Permit Mineral Materials (gravel pits)	19	3	22
Sec 317 Federal Highways Material Sites (gravel pits)	38	1	39
Rights-of-Way – Roads, Highways and Highway Facilities	62	8	70
Rights-of-Way – R.S. 2477	2	36	38
Rights-of-Way – Telephone & Power Lines and Facilities	37	1	38
Rights-of-Way – Communication Sites	25	7	32
Rights-of-Way – Water Facilities	4	0	4
Rights-of-Way – Pipelines — TAPS	17	2	19
Rights-of-Way – TAPS — Access Roads	129	0	129
Rights-of-Way – Pipelines — Other	3	4	7
Rights-of-Way – Other	68	14	82
ANCSA 17(b) Easements	0	7	7
Section 302 FLPMA Land Use Permits – Low Impact	39	31	70
Recreation Use Permits	23	22	45
NPR-A Oil & Gas Leases	18	1	19
NPR-A Land Use Authorizations	11	0	11
Timber – small timber sales and free use	4	2	6
Airport Leases	4	0	4

Recreation & Public Purposes Act Leases	2	0	2
Section 302 FLPMA Leases	2	0	2
Hot Springs Lease	1	0	1
Reindeer Grazing	1	0	1

[a]Data from 2013, before the Nulato Hills was removed from the planning area

2.2.3.1.2. Withdrawals

A withdrawal withholds an area of federal land from settlement, sale, location, or entry under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of federal land, other than *property* governed by the Federal Property and Administrative Services Act (40 U.S.C. 472), from one department, bureau or agency to another department, bureau or agency.

Withdrawals include federal land set aside and dedicated to a present, governmental use; public land set aside for some other public purpose, e.g., pending a determination of how the land is to be used; an action approved by the Secretary or a law enacted by Congress that closes land to specific uses under the public land laws (usually sale, settlement, location, and entry), or limits use to maintain public values or reserves area for particular public use or program, or that transfers jurisdiction of an area to another federal agency. Withdrawals are usually enacted through a public land order or legislation.

Most of the BLM-managed lands within the planning area are under some type of withdrawal pursuant to ANCSA 17(d)(1), the Wild and Scenic Rivers Act, Trans-Alaska Pipeline Authorization Act, or some other federal law. Some areas are covered by more than one withdrawal. The effect of the withdrawal varies and can only be determined for a specific parcel of land by reading the withdrawal order.

There are other types of withdrawals besides those authorized by ANCSA or other public laws. These include BLM withdrawals for administrative sites and withdrawals by other agencies. All of the withdrawals reserved for or managed by the BLM will be reviewed to determine if they should be retained, relinquished, or whether some other action should be taken. Those withdrawals for the use of other agencies and purposes will be reviewed for status and will continue to be in effect until a change is required or warranted.

Table 2.20. Existing Withdrawals in the Central Yukon Planning Area[a]

Public Land Order (PLO) Number or other Authority	PLO Type or Agency	Description of Withdrawal Purpose
PLO 255	DOD	Military Withdrawal – Fort Greely. Amended by PLOs 1153 & 2418
PLO 399	BLM	Revocation of EO 1324 1/2 withdrawing public lands containing hot springs in Alaska and amending EO 5389 to apply to hot springs in Alaska
PLO 503	BLM	Withdrawal for Administrative Site – Fairbanks District Office
PLO 533	DOD	Withdrawal for Department of the Army cold weather testing site. Amended by PLO 3013
PLO 547	DOD	Military Withdrawal – Clear Station
PLO 577	USAF	Military Withdrawal – Eielson Air Force Base

Public Land Order (PLO) Number or other Authority	PLO Type or Agency	Description of Withdrawal Purpose
PLO 684	USAF	Military Withdrawal – Eielson Air Force Base extension for flood control
PLO 690	DOD	Military Withdrawal – Fort Wainwright. Corrected by PLO 748, revokes PLO 139.
PLO 693	USAF	Military Withdrawal – Murphy Dome
PLO 792		Townsite Withdrawal – Nulato
PLO 818	USAF	Military Withdrawal – Ladd Air Force Base, now part of Fort Wainwright
PLO 843	USAF	Military Withdrawal near Galena (Campion AFS) Amended by PLOs 1713, 4009 and 4723
PLO 854	USAF	Military Withdrawal – Addition to Ladd Air Force Base, now part of Fort Wainwright
PLO 1037	AK Territorial Police	Amends PLO 738. Withdraws land for Alaska Territorial Police Headquarters site – now part of Fort Wainwright
PLO 1205	USAF	Military Withdrawal – Moose Creek Butte
PLO 1405	USAF	Military Withdrawal — Addition to Galena Air Reserve
PLO 1521	USAF	Withdrawal — Moose Creek Dyke Range. Corrected by PLO 1541; amended by PLO 1688
PLO 1588	USAF	Military Withdrawal — Tracts A, B and E near Tanana
PLO 1657	BLM	Withdrawal — Ester Dome Administrative Site
PLO 1760	DOD	Military Withdrawal – Fort Wainwright Addition
PLO 1769	USAF	Military Withdrawal – Bullen Point Short Range Radar Site
PLO 1851	USAF	Military Withdrawal – Oliktok Point Long Range Radar Site. Modified by PLO 6679
PLO 1910	USAF	Military Withdrawal – Indian Mountain
PLO 2209	USDOT / FAA	Withdrawal for Umiat Airport
PLO 2214	FWS	Arctic National Wildlife Refuge
PLO 2909	USDOT / FAA	Withdrawal for FAA VORTAC site adjacent to Bettles Airfield
PLO 2948	DOD	Withdrawal for Department of the Army – Donnelly Flats
PLO 3708	NASA / NOAA	Withdrawal for NASA Facilities site on Gilmore Creek; transferred to NOAA by PLO 6709; partially revoked by PLO 7682; extended by PLO 7710; additionally partially revoked by PLO 7763
PLO 3942	USAF	Withdrawal for Indian Mountain airfield and buffer zone
PLO 3943	BLM	Withdrawal for Protection of Recreational Values – Clear Creek
PLO 5150	BLM	Withdrawal of lands for a Utility and Transportation Corridor
PLO 5164	USAF	Military Withdrawal – Indian Mountain additional
PLO 5169	ANCSA 11(a)(3)	Withdrawal for selections by Village and Regional Corporations
PLO 5173	ANCSA 11(a)(3)	Withdrawal for selections by Village and Regional Corporations
PLO 5179	ANCSA 17(d)(2)(A)	Withdrawal of lands in aid of Legislation concerning Addition to or Creation of Units of the National Park, Forest, Wildlife Refuge, and Wild and Scenic rivers Systems and for Classification
PLO 5180	ANCSA 17(d)(1)	Withdrawal for Classification & for Protection of Public Interest in lands; amended by PLOs 5193, 5242, 5250, 5251, 5254, 5257, 5321, 5391, and 5418.
PLO 5182	BLM	Amended PLO 5150 (outer corridor)
PLO 5184	ANCSA 17(d)(1)	withdrawal for Classification or Reclassification of some areas withdrawn by Sec. 11 of ANCSA
PLO 5186	ANCSA 17(d)(1)	Withdrawal for Classification & Protection of Public Interest in Lands Not Selected by State. Amended by PLO 5254 and 5242
PLO 5187	ANCSA 17(d)(1)	Withdrawal for Classification & Protection Public Interest in lands in military reservations
PLO 5190	ANCSA 17(c)	Modification & Correction of PLO 5150, Utility Corridor
PLO 5193	ANCSA 17(d)(1)	Modification & Correction of PLO 5180

Public Land Order (PLO) Number or other Authority	PLO Type or Agency	Description of Withdrawal Purpose
PLO 5237	DOD	Military Withdrawal — Fort Greely Drop Area Tract F
PLO 5238	DOD	Military Withdrawal — Fort Greely Maneuver Area Tract A
PLO 5242	ANCSA 11(b)(3)	Withdrawal pending Determination of Eligibility of Native Communities — Evansville
PLO 5250	ANCSA 17(d)(1)	Amends PLO 5179 (as amended) to include additional lands
PLO 5251	ANCSA 17(d)(1)	Amends PLOs 5180 and 5179 (as amended) to include additional lands
PLO 5563	BLM	Amend EO 5389 to permit withdrawal of land under Sec 11 of ANCSA
PLO 5657	BLM	Classification of Lands for Selection by State amends existing PLOs
PLO 5696	FWS	Innoko National Wildlife Refuge
PLO 5697	FWS	Kanuti National Wildlife Refuge
PLO 5699	FWS	Koyukuk National Wildlife Refuge
PLO 5700	FWS	Nowitna National Wildlife Refuge
PLO 5701	FWS	Selawik National Wildlife Refuge
PLO 5860	ANCSA 14(h)	Withdrawal – withdraws lands for selection by Arctic Slope Regional Corporation
PLO 5951	ANCSA 17(d)(1)	Modifies and amends PLO 5179, 5250 and others to allow state selection
PLO 6092	BLM	Classification and Open to Entry for State Selection – amends existing PLOs
PLO 6533	BLM	Classification and Open to Entry for State Selection; partial revocation 5150
PLO 6706	USAF	Withdrawal for Indian Mountain Research Site. Extended by PLO 7727
PLO 6727	ANCSA 17(d)(1)	Modify PLO 5150 to classify 25.86 acres in the Wiseman area for sale.
PLO 6951	ANCSA 22(j)(2)	Village Withdrawal – Anaktuvuk Pass
PLO 7032	BLM	Withdrawal of 2,560 acres for Protection of Paleoindian Site – Mesa Site
PLO 7057	BLM	Withdrawal of 5 sites for BLM Administrative use in Coldfoot area
PLO 7231	BLM	Partial revocation of PLO 5860
PLO 7372	BLM	Withdrawal of lands for Lake Todatonten Special Management Area
PLO 7823	BLM	Extends withdrawal authorized by PLO 7032 for an additional 20 years
Public Law (PL) 92–203		Village withdrawals — Alatna; Allakaket; Galena; Hughes; Huslia; Kaltag; Koyukuk; Manley Hot Springs; Minto; Nenana; Nulato; Rampart; Ruby; Tanana; Evansville
PL 94–258		Designation of National Petroleum Reserve – Alaska
PL 96–487		Wild and Scenic Rivers Withdrawal
PL 106–65	DOD	Military Withdrawal — Fort Greely Bombing Range; Fort Greely Air Drop; Fort Greely Maneuver Area; Fort Wainwright Yukon Training Area
Executive Order (EO) 4358	USDOT / AKRR	Withdrawal of Lot 1, Block 49 in Nenana for the Alaska Railroad
EO 4360	USDOT / AKRR	Withdrawal of Lots 7 & 8, Block 53 in Nenana for the Alaska Railroad
EO 4374	USDOT / AKRR	Withdrawal of Lots 23 & 24, Block 2 in Nenana for the Alaska Railroad
EO 5441	USDOT / AKRR	Withdrawal of Lot 1, Block 1 and Lots 23 & 24, Block 12 in Nenana for the Alaska Railroad
EO 7596	DOD	Military Withdrawal – Fort Wainwright
EO 8020	Corps of Engineers	Withdrawal of lands for Chena Flood Control project. Amended by PLOs 1039 and 1075
EO 8847	DOD	Withdrawal for War Dept. – Tanana Flats bombing and gunnery range
Air Navigation Site (ANS) 139	USDOT / FAA	Withdrawal of Air Navigation Site at Tanana

Public Land Order (PLO) Number or other Authority	PLO Type or Agency	Description of Withdrawal Purpose
ANS 153	USDOT / FAA	Air Navigation Site Withdrawal – Manley Hot Springs Field; Nulato Field. Modified by PLO 2517
ANS 161	USDOT / FAA	Withdrawal for FAA VORTAC site adjacent to Tanana Airfield. Partially revoked by PLO 5072
ANS 164	USDOT / FAA	Air Navigation Site Withdrawal – Wiseman Airfield
ANS 267	USDOT / FAA	Air Navigation Site Withdrawal – Nenana Airfield. Expanded by ANS 10
ANS 268	USDOT / FAA	Air Navigation Site Withdrawal – Bettles Airfield. Amended by PLO 2116

[a]Data for this table were generated before the Nulato Hills was removed from the planning area

2.2.3.2. Forecast or Anticipated Demand

Subsistence and recreation, including guided and unguided hunting and fishing, are major uses of the public lands in the planning area. People in the communities within the planning area rely heavily on the public lands for both recreation and subsistence activities; particularly those in the more isolated communities. Demand for use of the public lands is likely to increase as the population within and adjacent to the planning area increases.

Climate research in arctic regions is currently a matter of high international interest, and applications for research activities in the Toolik RNA and the planning area in general can be expected to continue to increase. Communication sites and infrastructure needs are also expected to increase, both within the more populated areas and along the Dalton Highway.

Similarly, gravel extraction from designated material sites is expected to increase with increased use of the public roads and maintenance of the Trans—Alaskan Pipeline System, as well as construction of additional communication infrastructure.

2.2.3.3. Key Areas or Areas of High Potential

As public usage continues to increase along the Dalton Highway, availability of traveler services will become increasingly inadequate, and public safety would be well served by an increase in such services. Designation of additional development nodes would help meet this need.

Isolated parcels of BLM lands, especially within the Fairbanks North Star Borough or near communities, may be suitable for disposal either through sale or exchange. This would assist in future land management by resulting in a more advantageous pattern of land ownership. Sales or exchanges would likely not be considered until the parcels under consideration have been relinquished by selecting entities and conveyance of Native allotments has been completed.

2.2.4. Energy and Minerals

2.2.4.1. Leasable Minerals

Leasable minerals are defined by the Mineral Leasing Act and are either solid or fluid leasable minerals. Solid leasable minerals include coal, oil shale, native asphalt, phosphate, sodium, potash, potassium, and sulfur. Fluid leasable minerals include oil, gas, coalbed natural gas, and geothermal resources. Exploration and production of these minerals on BLM—managed lands may only occur on leases acquired by competitive leasing.

A Leasable Mineral Occurrence and Development Potential Report is being developed for the Central Yukon Planning Area. The report will be available on the Central Yukon RMP website when complete.

2.2.4.2. Locatable Minerals

Locatable minerals are minerals for which the right to explore, develop, and extract mineral resources is established by the staking of mining claims under the General Mining Law of 1872. A Locatable Mineral Occurrence and Development Potential Report is being developed for the Central Yukon Planning Area. This report will discuss mineral occurrence and potential in more specific detail and will be available on the Central Yukon RMP website when complete.

The General Mining Law, as amended, describes locatable minerals as: minerals which include both metallic minerals (gold, silver, lead, copper, zinc, nickel) and nonmetallic minerals (fluorspar, mica, certain limestones and gypsum, tantalum, heavy minerals in placer form, and gemstones). Beginning in 1873, the U.S. Department of the Interior began defining locatable minerals as those recognized as a mineral by the standard experts, that are not subject to disposal under some other law, and that make the land more valuable for mining purposes than for agriculture. Therefore, it is easier to list the minerals that are not locatable because of the complexities listed previously.

Minerals, which are normally locatable on federal lands, found on lands acquired (purchased or received) under the Acquired Lands Act of 1947 by the United States or found on American Indian reservations are subject to lease only (43 CFR 3500 entire sequence).

Types of Federal claims

There are two types of federal mining claims (lode and placer) and two mineral site entries (mill and tunnel).

Lode Claims: Deposits subject to lode claims include classic veins or lodes having well-defined boundaries. They also include other rock in-place bearing valuable minerals and may be broad zones of mineralized rock. Examples include quartz or other veins bearing gold or other metallic minerals and large volume, but low-grade disseminated gold deposits. Descriptions are by metes and bounds surveys beginning at the discovery point on the claim and including a reference to natural objects or permanent monuments. Federal statute limits lode claim size to a maximum of 1,500 feet in length, and a maximum width of 600 feet (300 feet on either side of the vein).

Placer Claims: Placer claims are defined as "...including all forms of deposit, excepting veins of quartz, or other rock in-place." In other words, every deposit not located with a lode claim(s), should be appropriated by a placer claim. Placer claims, where practicable, are located by legal subdivision (aliquot part and complete lots). The maximum size is 20 acres per locator. The maximum size in Alaska is 40 acres.

Mill Sites: A mill site must be located on non-mineral land. Its purpose is to either (1) support a lode or placer mining claim operation or (2) support itself independent of any particular claim. A mill site must include the erection of a mill or reduction works and/or may include other uses in support of a mining operation. The maximum size is 5 acres.

Tunnel Sites: A tunnel site is a subsurface right-of-way under federal land open to mineral entry. It is used for access to lode mining claims or to explore for blind or undiscovered veins, lodes, or ledges not currently claimed or known to exist on the surface. To stake a tunnel site, two stakes are placed up to 3,000 feet apart on the line of the proposed tunnel. Recordation is the same as a lode claim.

An individual may locate lode claims to cover any or all blind (not known to exist) veins or lodes intersected by the tunnel. The maximum distance these lode claims may exist is 1,500 feet on either side of the center line of the tunnel. This, in essence, gives the mining claimant the right to prospect an area 3,000 feet wide and 3,000 feet long. Any mining claim located for a blind lode discovered while driving a tunnel relates back to the date the tunnel site was located.

2.2.4.2.1. Current Level and Location of Use

Areas with locatable mineral deposits are dispersed throughout the Central Yukon Planning Area. From the Dalton Highway corridor to Delta Junction, and west to the Kaltag area, there are numerous federal and State of Alaska (state) mining claims (an estimated 1,500+ federal mining claims (placer and lode) and over 5,200 state mining claims). There are currently no mill sites or tunnel sites within the planning area (Figure 2.3).

Due to the size of the planning area and the dispersed nature of the mining claims, it is difficult to graphically represent the claims on one map. So, the planning area has been broken into several smaller geographic areas as displayed on Figures 2.4 – 2.12 and described beneath each figure. These figures display the areas of most concentrated locatable mineral claims, but by no means encompass all of the mining claims in the planning area. State claims are shown in blue and the federal claims are shown in tan.

Dalton Highway Corridor and the North Slope: This area is geographically defined as the planning area on the north slope of the Brooks Range (Figures 2.4 – 2.8) and the Dalton Highway corridor, beginning at milepost 0.

There are no federal mining claims along the Dalton Highway north of Atigun Pass. However, there are several state claims along the corridor between mileposts 345 and 390 (Figure 2.4). South of that, the heaviest concentration of federal claims is at the Nolan Creek area which is near Wiseman, but the mining claims and operations occur from the Gold Creek area (milepost 210) south to the Prospect Creek area (milepost 135) (Figures 2.5 and 2.6).

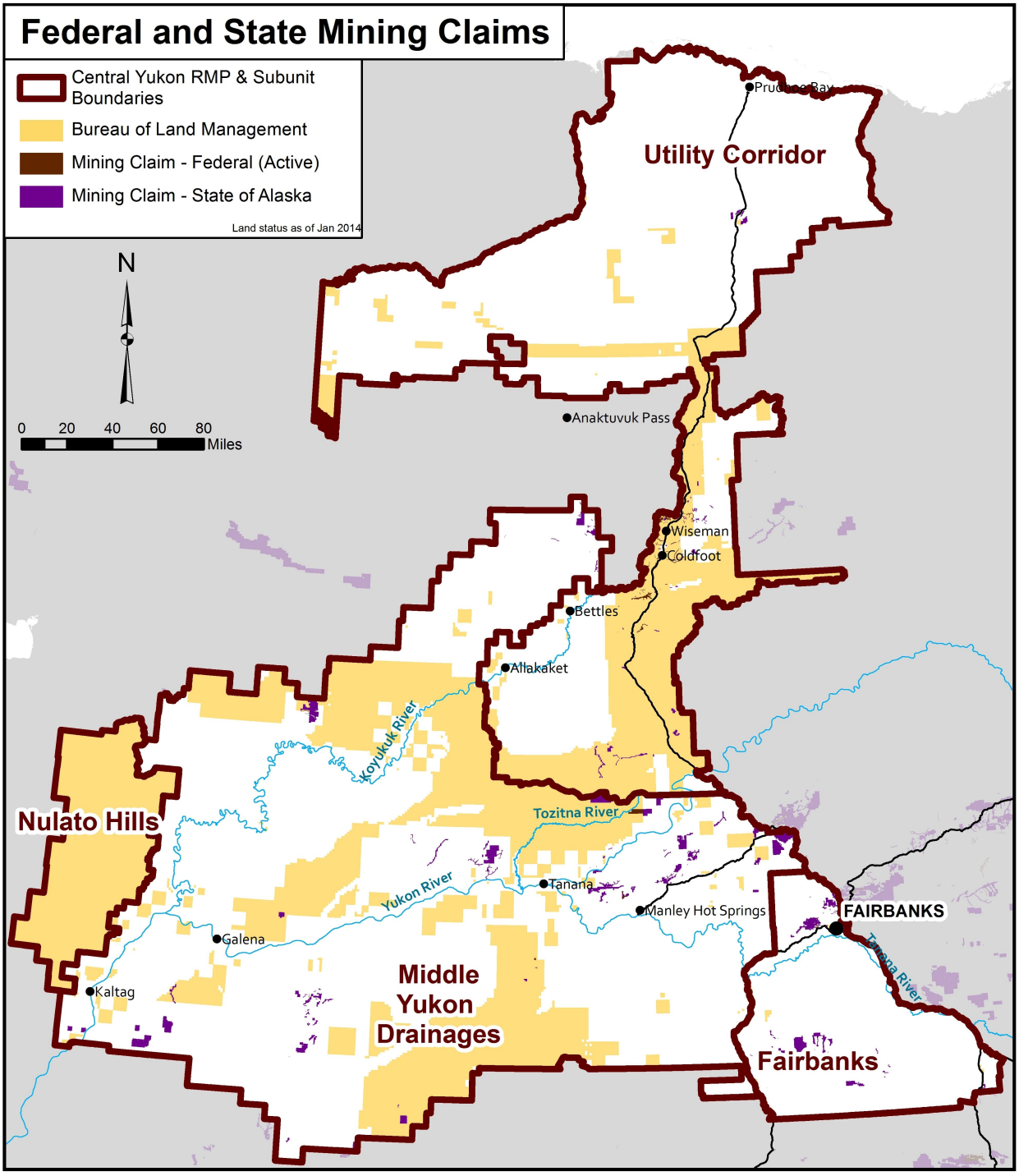


Figure 2.3. Federal and State Mining Claims in the Planning Area

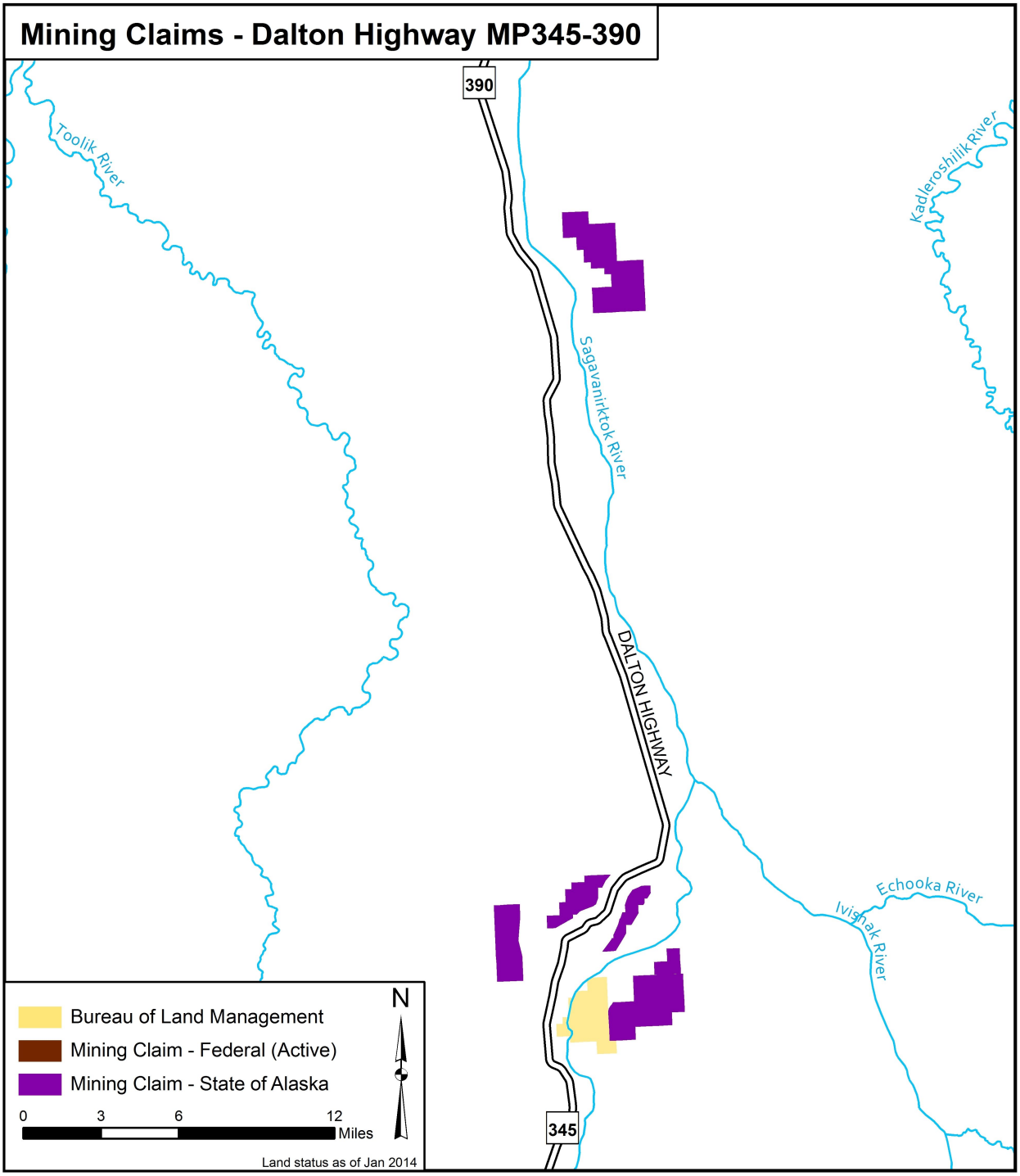


Figure 2.4. Mining Claims along the Dalton Highway: Mileposts 345–390

The state mining claims north of milepost 345 of the Dalton Highway represent the northern most locatable claims in the planning area. However, they are well outside BLM-managed lands.

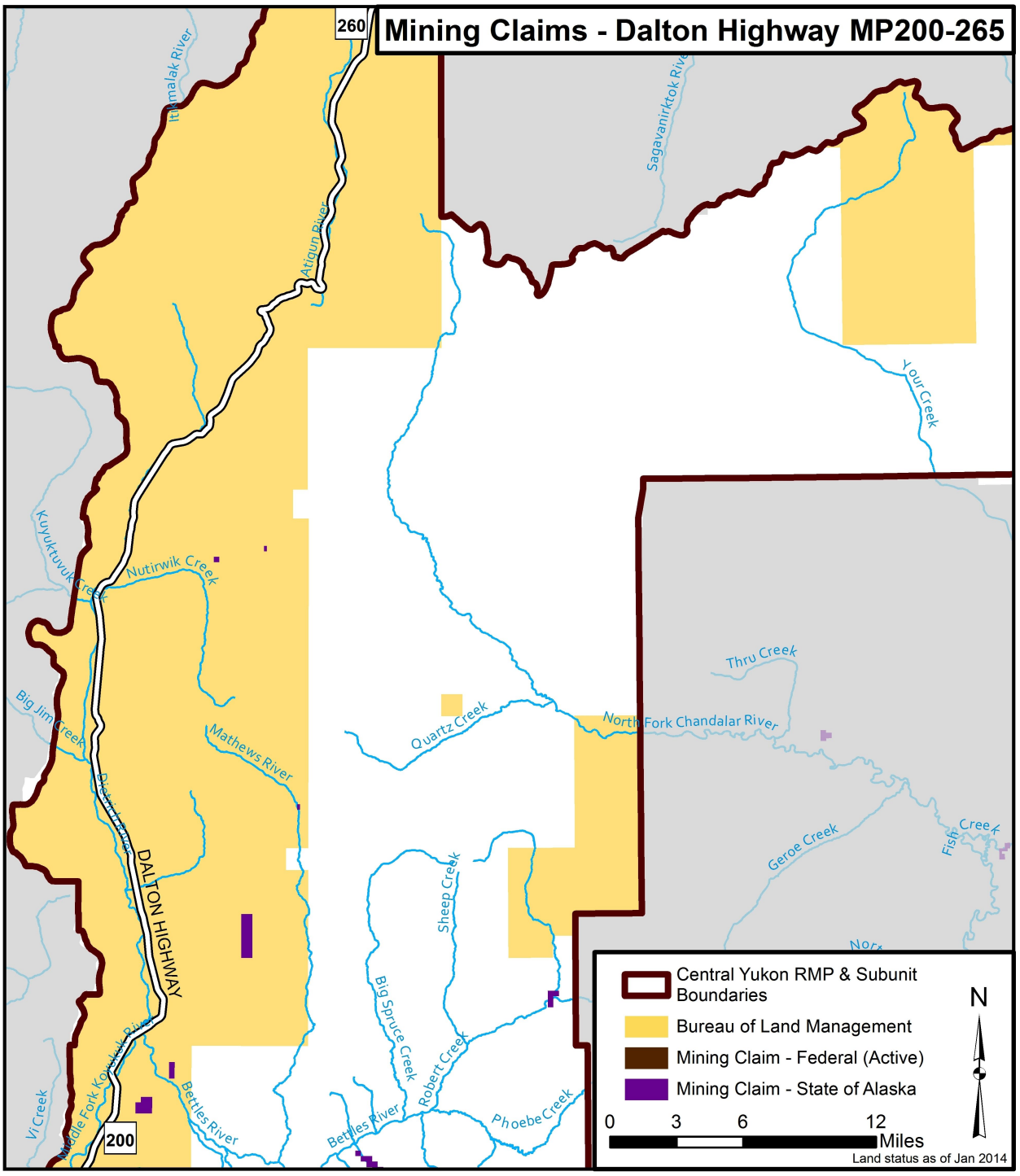


Figure 2.5. Mining Claims along the Dalton Highway: Mileposts 200–265

There are few federal mining claims from milepost 200 to 265.

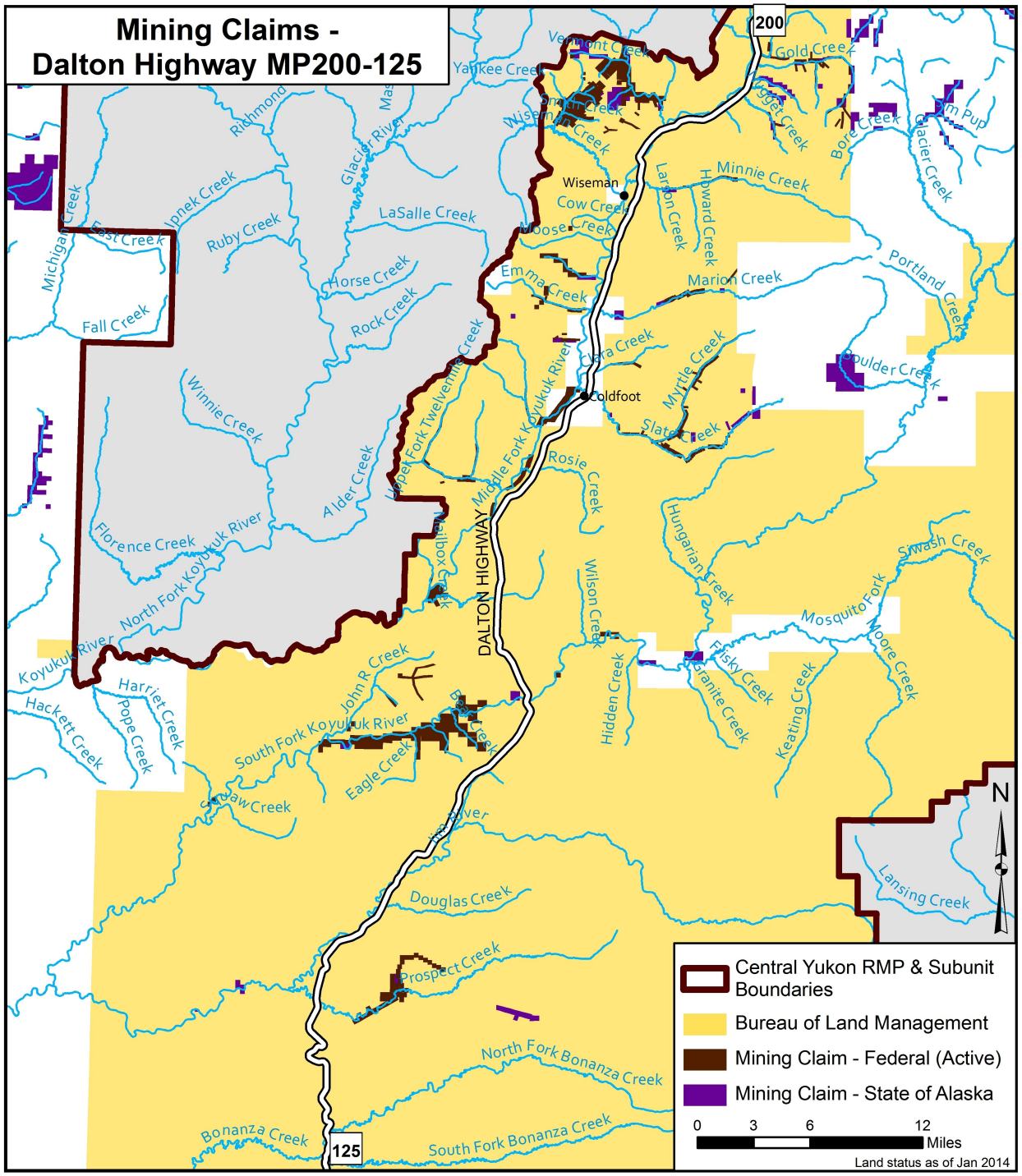


Figure 2.6. Mining Claims along the Dalton Highway: Mileposts 125–200

There are numerous state and federal mining claims from milepost 125 to 200. The majority of the federal claims are concentrated in the Nolan Creek area, which is north-north-west of Wiseman. There is a mix of placer and lode claims in this area.

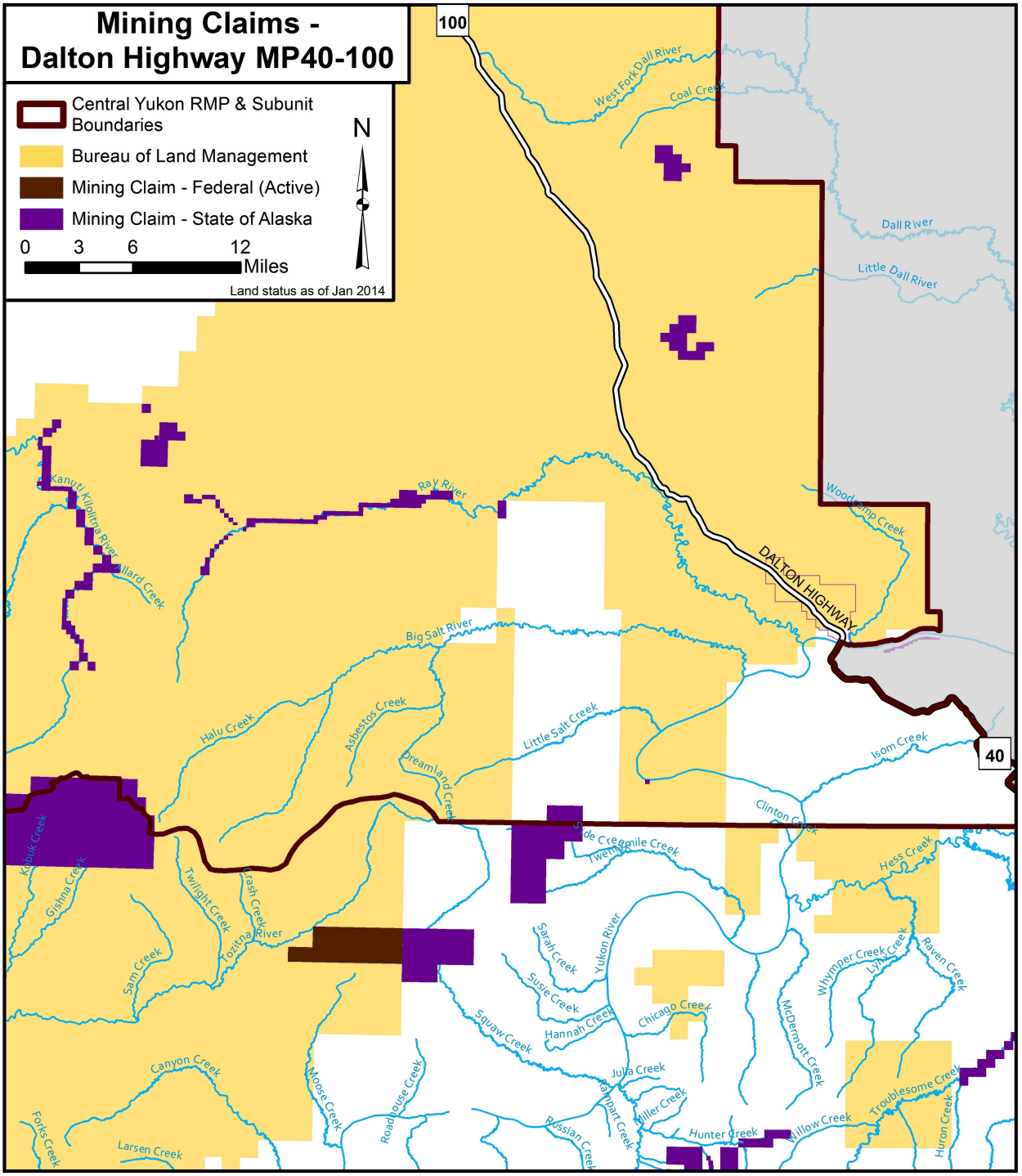


Figure 2.7. Mining Claims along the Dalton Highway: Mileposts 40–100

From milepost 40 to 100, there are no mining claims accessible from the Dalton Highway. However, there are numerous claims, both federal and state west of the highway. The smaller blocks represent placer operations or small exploration operations. The large blocks of claims represent mineral exploration being conducted for copper and rare earth elements (REE).

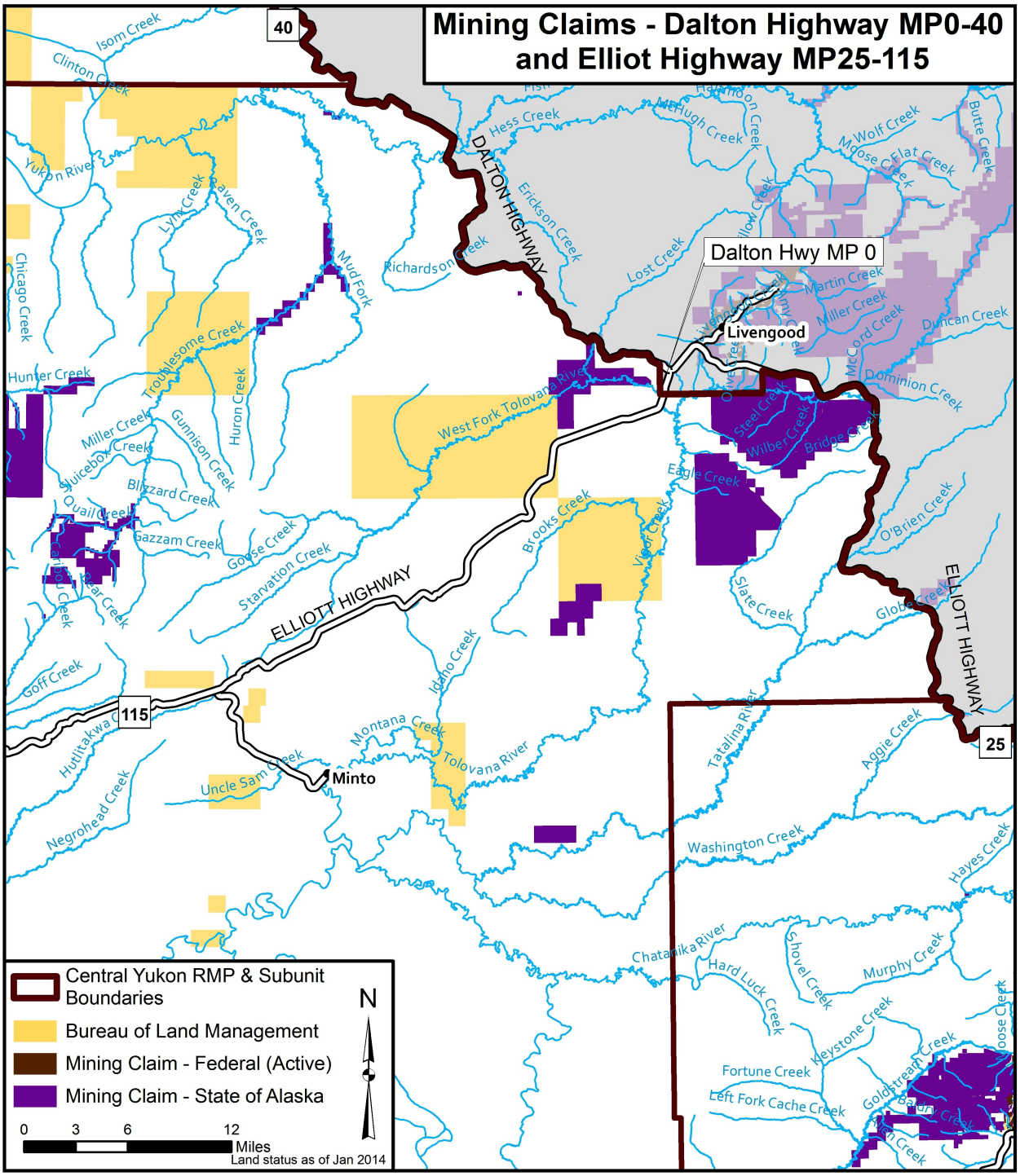


Figure 2.8. Mining Claims along the Dalton (Mileposts 0–40) and Elliott Highways (Mileposts 25–115)

State mining claims within the planning area have a much different dispersal pattern than federal claims. The Dalton Highway corridor is BLM-managed land, with some state in-holdings, so there are very few state claims along it. However, outside the corridor, there are numerous state claims (Figures 2.8, 2.11 – 2.12).

Figure 2.8 shows the claims around Livengood. The claims in this area are mostly state claims. However, there are parcels of BLM—managed land and, consequently, there are also some federal mining claims. The large block of claims north of the highway, around Livengood are outside the planning area and not discussed in this report, as the planning area is south and west of the Elliott Highway.

The BLM-managed lands west of the Dalton Highway corridor are not road-accessible. The mining claims in this area are all state claims (Figures 2.11 – 2.12).

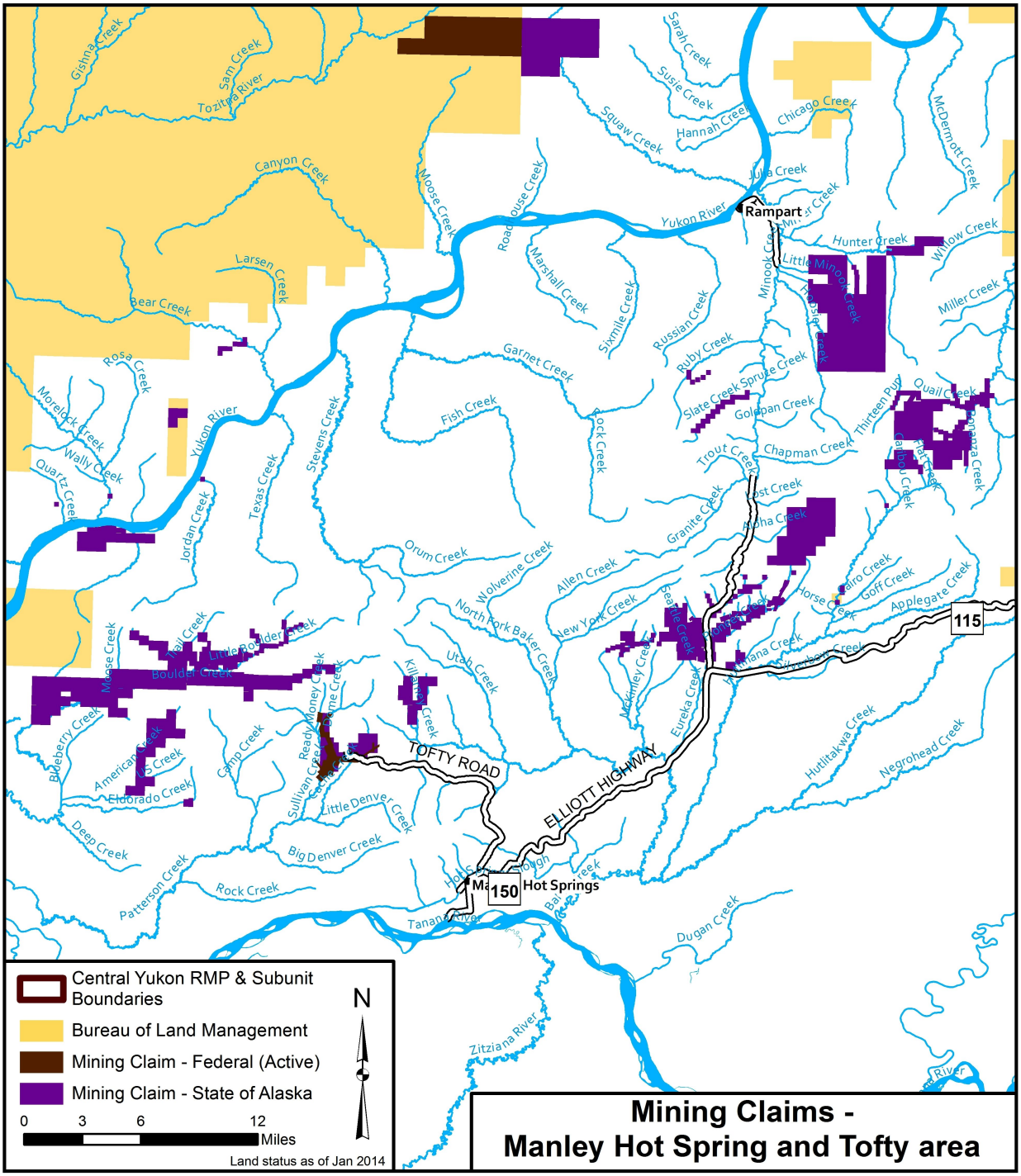


Figure 2.9. Mining Claims in the Manley Hot Springs and Tofty Areas

There are both federal and state mining claims in the Tofty area. The federal claims are on State-selected land and top filed with state mining claims. If the land becomes a priority for State acquisition, then the federal claims will be converted to state claims.

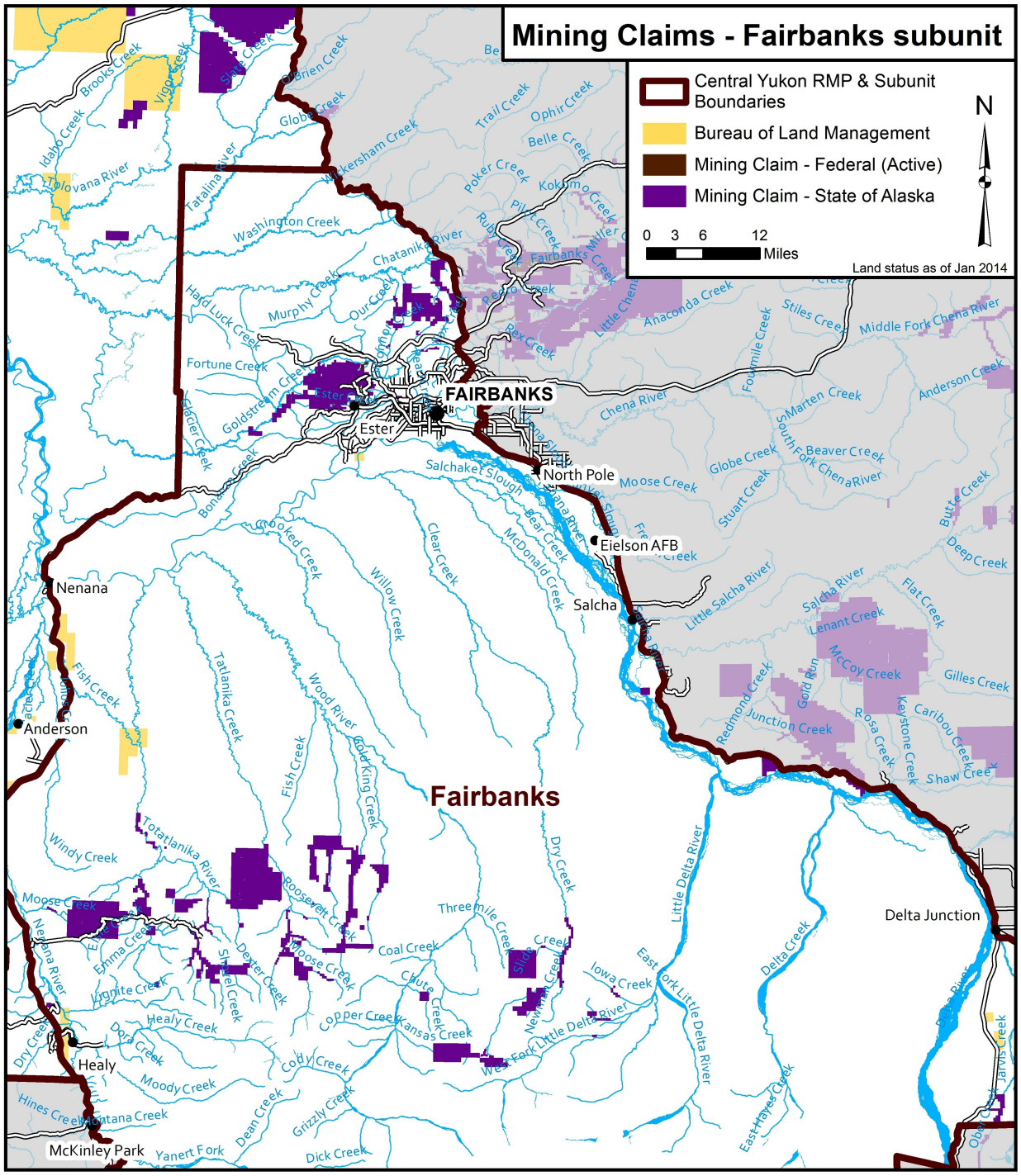


Figure 2.10. Federal and State Claims in the Fairbanks Area

The mining claims around Fairbanks that are within the planning area, are located west of the highway and west of Fairbanks. The claims north and east of the Elliott and Steese highways (in the grey area on the map) are outside of the planning area. The Fairbanks area claims are the easiest to access and the closest to a population center, therefore, there is a lot of activity. The area south of Fairbanks is primarily state land, so all of the mining claims are state claims.

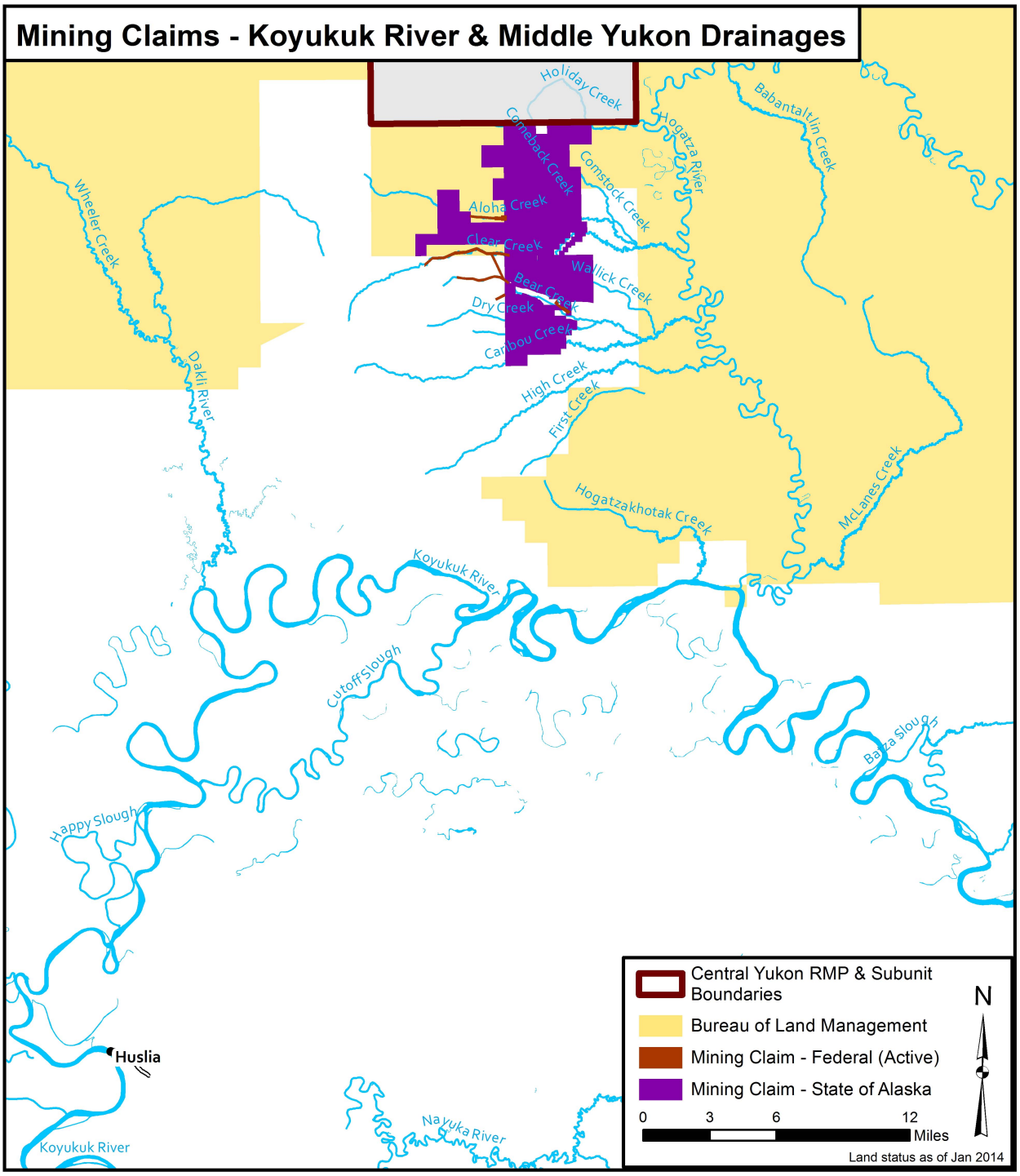


Figure 2.11. Northern Planning Area (Hog River) Mining Claims

The block of claims in Figure 2.11 are in a placer gold mineral area. There are both federal and state claims in this area. The land surrounding this block of claims is State-selected, Native-selected, State-owned and Native corporation-owned.

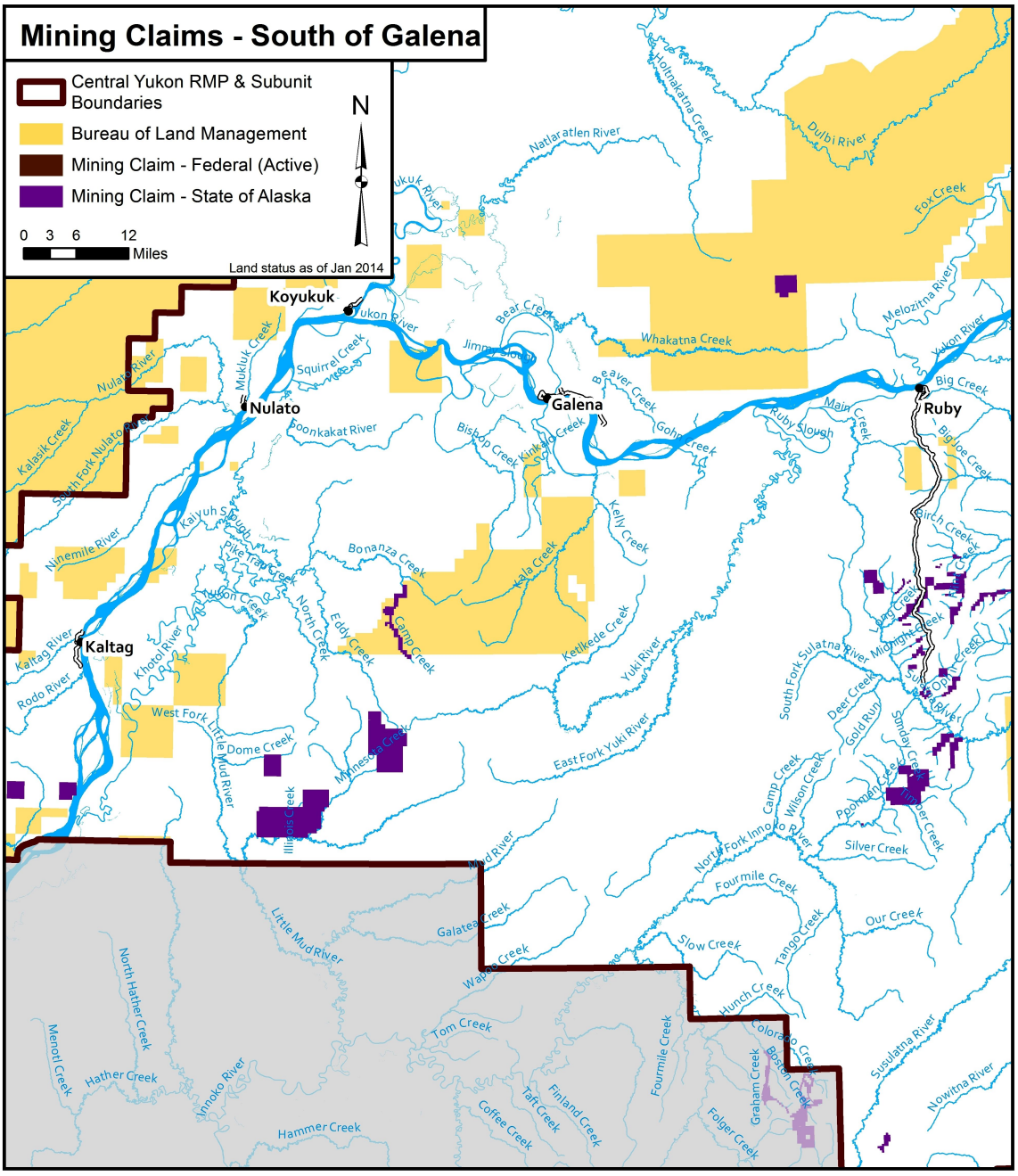


Figure 2.12. Mining Claims South of Galena

There are a collection of state and federal claims in various locations south of Galena and Ruby (Figure 2.12). None are road-accessible so they must be accessed by snowmobile in winter or by aircraft in summer.

2.2.4.2.2. Forecast or Anticipated Demand

The demand for locatable minerals is dependent on: the value of the commodity, the accessibility of the area where that occurrence is located, and the size of the deposits. With gold prices settling

down from a high of almost $2,000 per ounce, other minerals are being looked at as minerals of importance. Currently, copper and rare-earth elements lead the pack for exploration.

Rare Earth Elements: Rare earth elements (REEs) are a group of chemical elements used in radar systems, avionics, satellites, renewable energy systems, and consumer electronic goods. While not particularly rare in the Earth's crust, these elements are not often found in mineable concentrations. China possesses an estimated 48 percent of the world's proven resources of REEs and is the dominant global supplier with nearly 97 percent of the world's production. Recent curtailment of REE exports from China and reliance on the Chinese industry for processing and manufacturing has highlighted the fragility in the global supply-demand chain. Alaska has an important role to play in securing a domestic supply of these strategic minerals (ADNR 2012).

Table 2.21. List of the Rare Earth Elements

Element Name (symbol)	Applications
Scandium (Sc)	X-ray tubes, catalysts for polymerization, in hardened nickel-chromium super alloys, dental porcelain, used as a tracer in studies of oil wells and pipelines.
Yttrium (Y)	De-oxidizer in stainless-steel production, strengthener in magnesium and aluminum alloys, rechargeable batteries, medical uses, and red phosphors for color television, superconductors, various other metallurgical applications, and in cancer fighting drugs.
Lanthanum (La)	De-oxidizer in stainless-steel production, strengthener in magnesium and aluminum alloys, rechargeable batteries, medical uses, and red phosphors for color television, superconductors, and various other metallurgical applications.
Cerium (Ce)	Glass polishing, petroleum-cracking catalysts, radiation shielding, alloys with iron for lighter sparking flints, alloys with aluminum, magnesium and steel for improving heat and strength properties. It has also shown promising future potential in the development of ydrogen fuel cells, a sustainable green energy alternative.
Praseodymium (Pr)	Yellow ceramic pigments, tiles, ceramic capacitors, with neodymium for goggles to shield glass makers against sodium glare, permanent magnets, cryogenic refrigerant.
Neodymium (Nd)	Ceramic capacitors, glazes and colored glass, lasers, high-strength permanent magnets, petroleum-cracking catalysts. Neodymium is one of the most critically important rare earth elements in terms of both existing technologies and emergent sustainable and energy efficient future technologies.
Promethium (Pm)	Small quantities of this element, manufactured in nuclear reactors, are used in the production of nuclear batteries and for a few other specialized applications.
Samarium (Sm)	In highly magnetic alloys for permanent magnets, nuclear-reactor controls and neutron shielding, laser, infrared-absorbing glass, and as a neutron absorber in certain nuclear reactors.
Europium (Eu)	It is currently used, with yttrium, to produce red phosphors that are key to the manufacture of energy efficient (white) compact fluorescent light bulbs, as well as to the function of most computer and television screens.
Gadolinium (Gd)	Rare-earth magnets, high refractive index glass or garnets, lasers, X-ray tubes, computer memories, neutron capture, MRI contrast agent, NMR relaxation agent, magnetostrictive alloys such as Galfenol, steel additive.
Terbium (Tb)	Cathode-ray tubes for X-ray and color-television tubes, magnets, optical computer memories, computer hard-drive components; magnetostrictive alloys. Magnetostrictive materials are broadly defined as materials that undergo a change in shape due to change in the magnetization state of the material.
Dysprosium (Dy)	Rare earth magnets, lasers, magnetostrictive alloys such as Terfenol-D, control rods for nuclear reactors, alloyed with neodymium for permanent magnets, catalysts.
Holmium (Ho)	Lasers, wavelength calibration standards for optical spectrophotometers, magnets.
Erbium (Er)	Infrared lasers, vanadium steel, fiber-optic technology.
Thulium (Tm)	Portable X-ray machines, metal-halide lamps, lasers.

Element Name (symbol)	Applications
Ytterbium (Yb)	Infrared lasers, chemical reducing agent, decoy flares, stainless steel, stress gauges, nuclear medicine.
Lutetium (Lu)	De-oxidizer in stainless-steel production, rechargeable batteries, medical uses, red phosphors for color television, superconductors, used in nuclear technology.

Gold (placer and lode): Placer gold has been a main player throughout Alaskan history. Prior to the purchase of Alaska from Russia, the Russians were exploring for and mining gold. Gold mining has continued through today. The state has produced more than 32 million ounces of gold to date, and that number increases every year. The demand for gold is as high as ever for jewelry, electronics, investments and other industrial uses. Figure 2.13 shows areas of medium to high placer gold potential in the planning area.

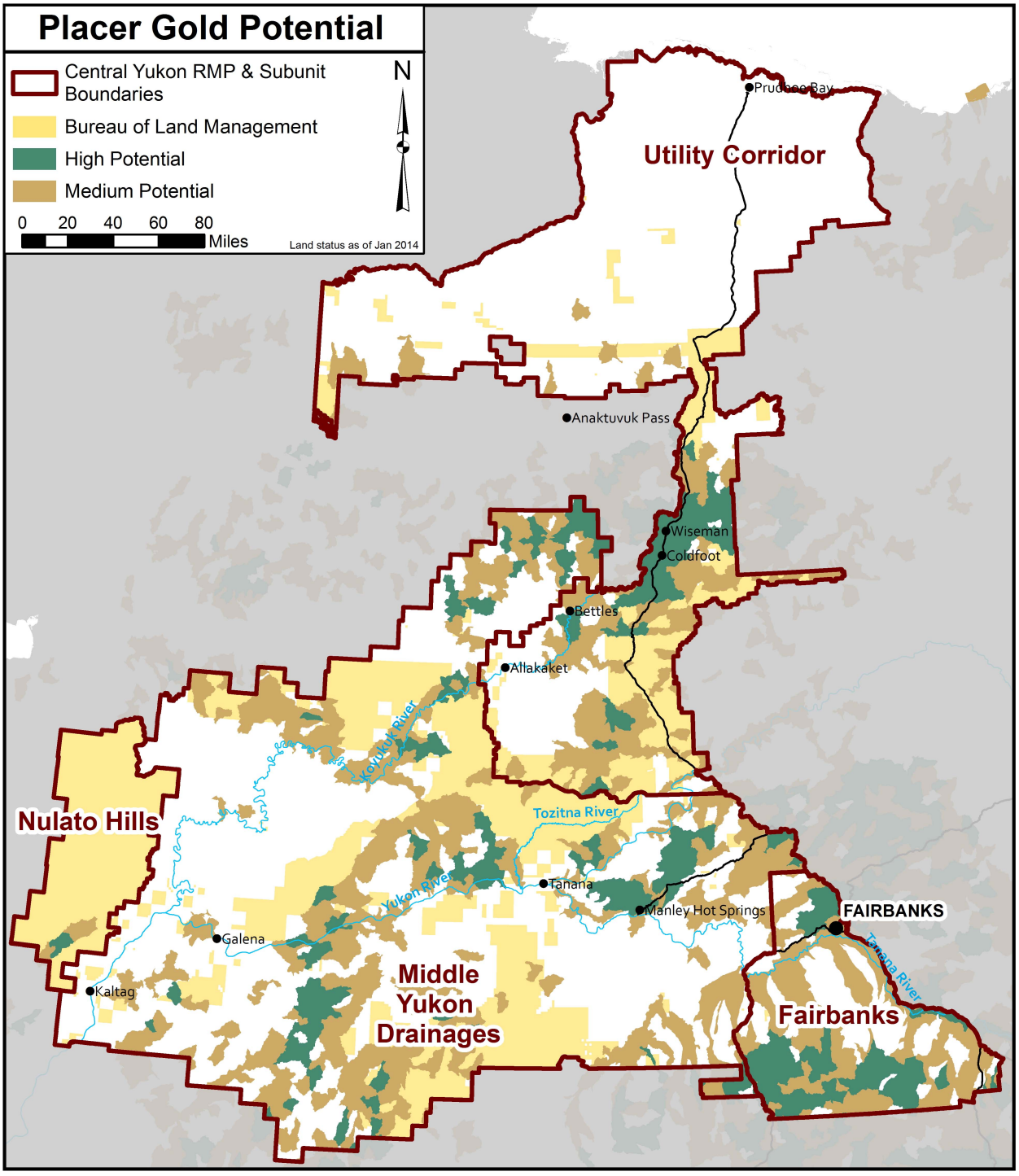


Figure 2.13. Placer Gold Potential in the Planning Area

Other Minerals of Interest: Other minerals of interest include but are not limited to: copper, silver, molybdenum, nickel, and the six platinum group elements (platinum, ruthenium, rhodium, palladium, osmium, and iridium). A large amount of money (more than $330 million in 2012) is spent in Alaska every year to locate or prove mineral deposits. In the planning area several

exploration projects for something other than gold are underway. The figure below shows ares of medium to high potential for platinum group minerals.

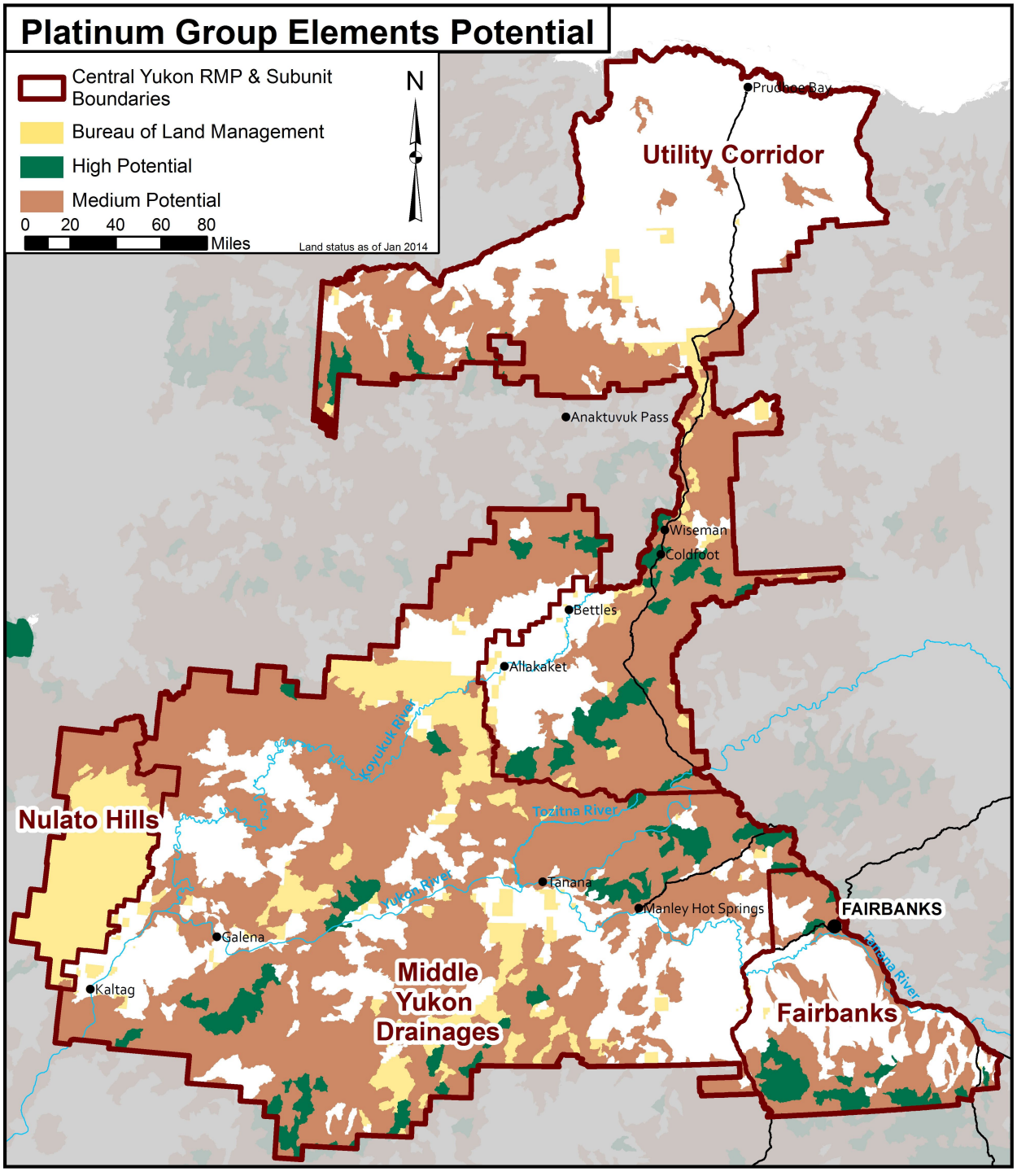


Figure 2.14. Platinum Group Elements Potential in the Planning Area

2.2.4.2.3. Areas of High Potential for Future Use

It is not possible to pin down the areas that might be the next hot-bed of mineral activity in the planning area. Figure 2.15 shows locations where minerals currently are of interest. Any one of these areas might become the next Fort Knox or Red Dog mine, depending on the value of the deposit and the economics of mining that mineral and getting it to market. As the infrastructure of Alaska grows, so will the number of mining operations.

Dalton Highway corridor will continue to be a high-use area for locatable minerals and mining. Although outside of the planning area, the Livengood area has been undergoing heavy exploration for the last several years. A feasibility study report on mining the Livengood area was completed in late 2013 (Kunter et al. 2013). The study recommended that surface mining for gold is feasible at $1,500 per ounce. As gold prices fluctuate, the mine plan may be shelved. If the value of gold increases, it is possible that the development plan will be put into effect.

Currently, exploration for copper, gold, and REEs are of the most interest to industry and governments. In 2011, the governor of Alaska announced a strategy to spur the exploration of REEs and other strategic minerals in Alaska (http://dnr.alaska.gov/commis/priorities/securealaskasfuture_minerals.html). The end goal is to increase mining and processing of those minerals in Alaska.

Alaska has at least 70 occurrences of rare earth elements. The mining area in the north central planning area is listed as a prime area for REEs. The State's strategy is to encourage exploration and development of strategic mineral occurrences throughout Alaska. This strategy will increase exploration on federal lands and, consequently, lead to increased mining activity for other minerals of interest.

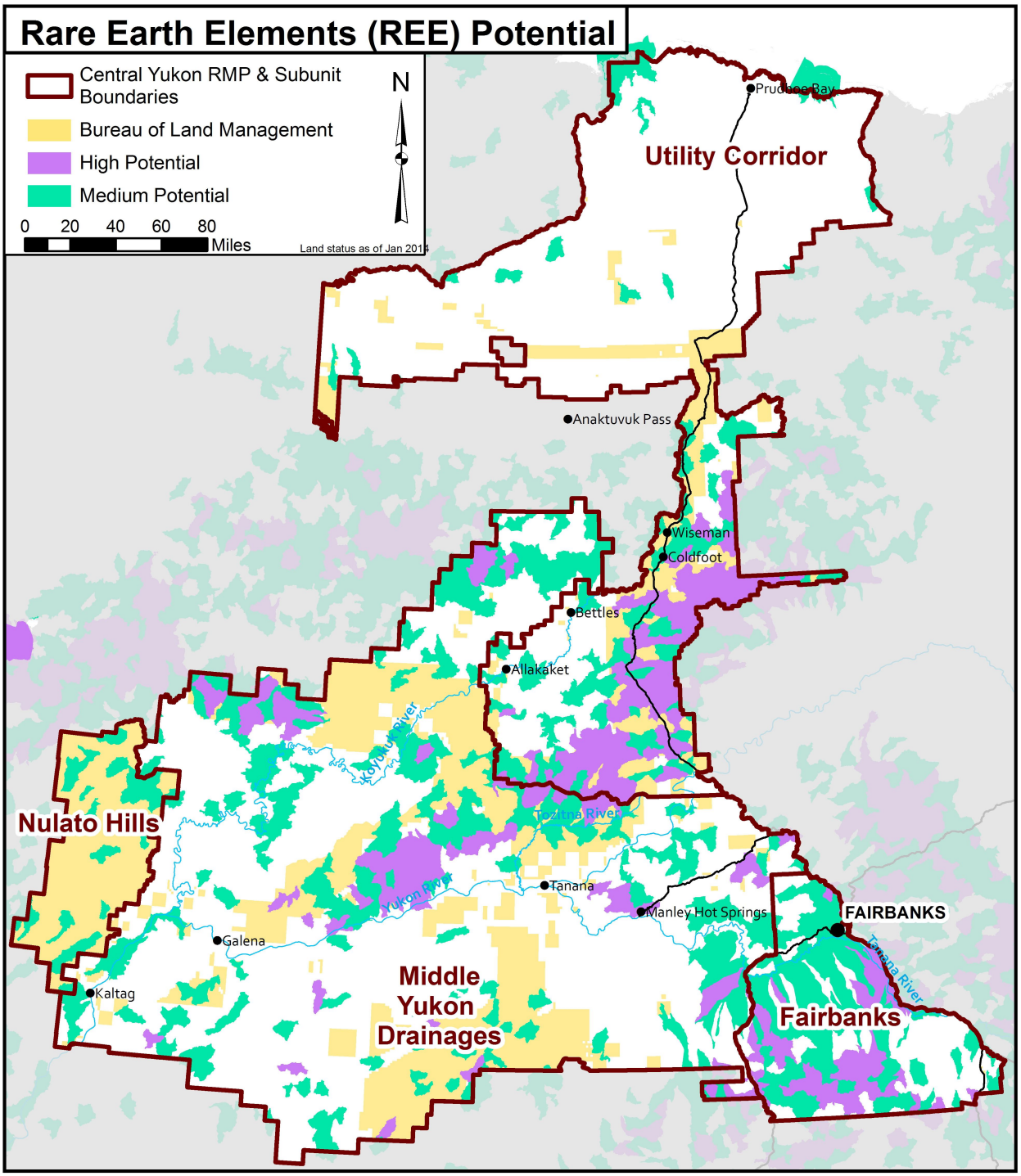


Figure 2.15. Rare Earth Element Potential in the Planning Area

2.2.4.3. Salable Minerals

The Materials Act of 1947 allows the disposal of materials including, but not limited to, sand, stone, gravel, common clay, by sale or free-use permit to governmental agencies and non-profit organizations. In 1955, the Surface Resources Act removed common varieties of sand, gravel,

stone, pumice, pumicite, and cinders from the 1872 mining law and placed them under the 1947 Materials Act. Since these mineral materials are available only by sales contract, they are termed "salable" minerals. Over the years, what is considered common and uncommon variety has been further clarified through various court decisions. Today, salable mineral materials include common varieties of sand, stone, gravel, pumice, pumicite, clay, rock, and petrified wood.

Salable minerals, also called mineral materials, are some of the most basic natural resources, such as sand, gravel, dirt, and rock, used in every day building, and other construction uses. These materials generally are bulky and have low unit price. Their sheer weight makes transportation costs very high. The BLM's policy is to make these materials available to the public and local governmental agencies whenever possible and wherever environmentally acceptable.

Mineral materials are available through a series of competitive and non-competitive sales and by free use permit to governmental agencies and non-profit organizations. Also, a limited amount may be provided free to non-profit groups. Materials obtained free of charge cannot be bartered or sold. The BLM shares a portion of the revenues from the sale of mineral materials with the state where the minerals are produced. In the planning area, the primary user of the mineral material sales is Alyeska Pipeline Service Company (Alyeska) and the primary user of free-use permits is the Alaska Department of Transportation and Public Facilities (ADOT&PF). Small sales for individual use are charged a fair market royalty rate based on a per cubic yard or per ton intended usage.

Villages in the region, due to their locations along rivers or coastlines, have developed local sources for mineral materials for their own use. Outside of these areas, mineral materials have no value unless they are near a project under development or a transportation corridor.

2.2.4.3.1. Current Level and Location of Use

Mineral material use in the planning area is primarily restricted to road-accessible areas. This includes the Dalton and Elliott Highways, and parts of the Steese and the Parks Highways. The highest use of mineral material in the planning area is along the Dalton Highway corridor. ADOT&PF uses mineral materials to maintain and upgrade the highway. Alyeska uses mineral materials to maintain the Trans-Alaskan Pipeline System and the pipeline access roads. Figure 2.16 shows the locations of the ADOT&PF mineral material pits in the planning area.

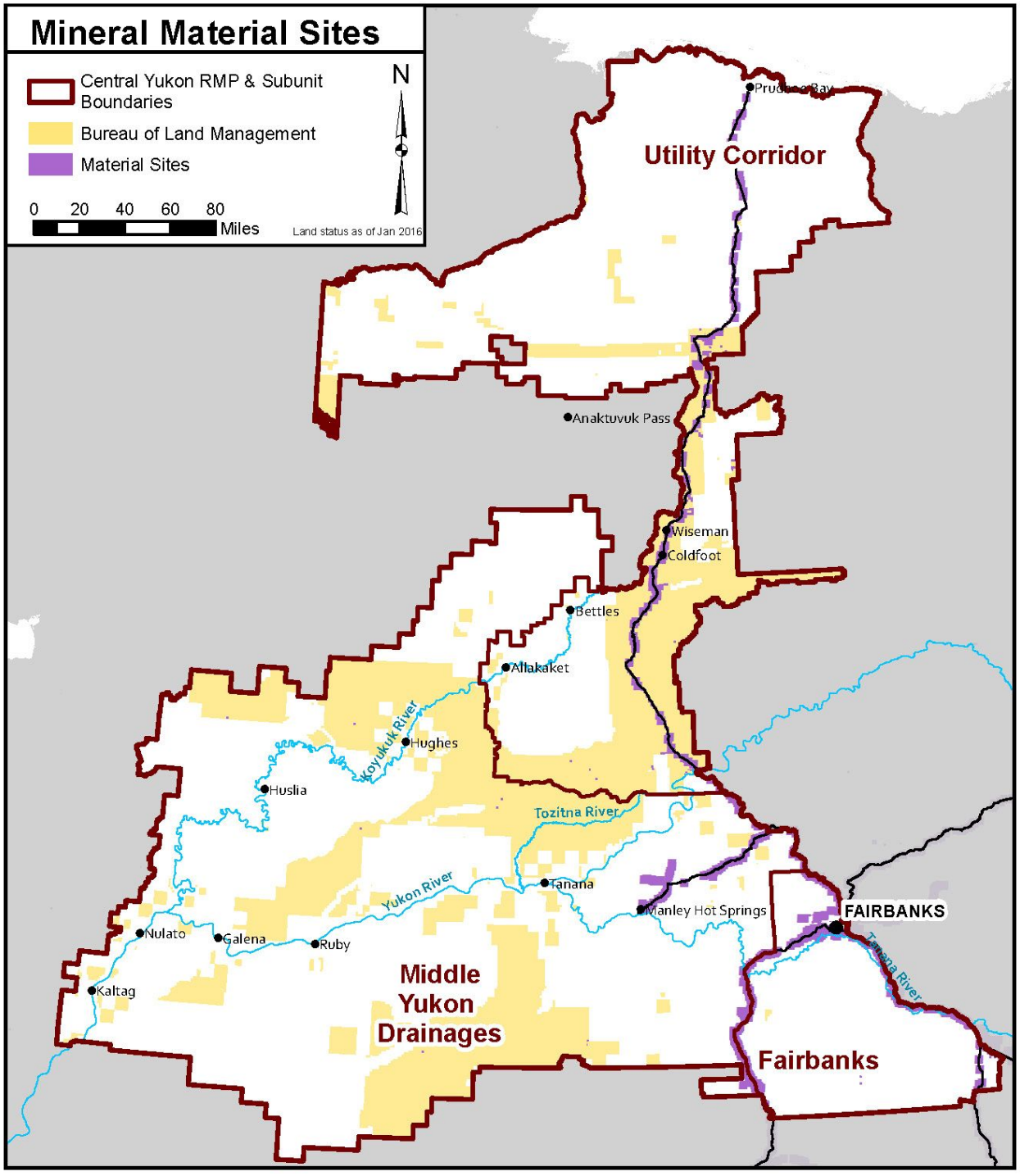


Figure 2.16. Mineral Material Sites in the Planning Area

2.2.4.3.2. Forecast or Anticipated Demand

The forecast for future demand in the planning area, will be essentially the same as it is currently. The exception to this is the possibility of a gas pipeline from Prudoe Bay along the Dalton and Elliott Highways through the planning area, then along either the Parks or the Richardson

Highways to the terminus of the line. If the gas pipeline does get permitted, the mineral material needed will come from existing or new mineral material pits along the route.

2.2.4.3.3. Areas of High Potential for Future Use

Future use for mineral materials in the planning area would be along the gas pipeline corridor, or from any location where the ADOT&PF will build new roads to smaller communities and villages. As the Dalton Highway continues to be used for transporting supplies to the oil fields near Prudhoe Bay, and with increasing tourism travel, mineral materials will be needed to continue maintaining and upgrading the Dalton, Elliott, and Steese Highways.

2.2.5. Renewable Energy

There are no existing renewable energy sites on BLM-managed lands in the planning area. Although solar, wind, and biomass resources occur in the planning area, the development potential of these resources is unknown.

The BLM Land Use Planning Handbook (BLM 2005a) requires that plans address existing and potential development areas for renewable energy projects, including wind, solar, and biomass. In cooperation with the National Renewable Energy Laboratory (NREL), the BLM assessed renewable energy resources on public lands in the western United States (BLM and DOE 2003). The assessment reviewed the potential for concentrated solar power, photovoltaics, wind, biomass, and geothermal on BLM-managed lands in the west. Alaska was not included in this report. Some of the site-screening criteria outlined in this report, however, may be useful in determining potential for renewable energy development in the planning area.

The potential for commercial solar operations in the planning area is very low. One of the criteria outlined in *Assessing the Potential for Renewable Energy on Public Lands* (BLM and DOE 2003) is a solar resource of at least 5 kilowatt hours per square mile per day. This criterion is not met anywhere within the planning area (DOE 2008a and 2008b).

The Alaska Energy Authority, in coordination with the Department of Energy's National Renewable Energy Laboratory and AWS True Power, published a wind resource map for Alaska online at http://www.akenergyauthority.org/programwindmap.html. The map estimates the relative quality of wind resources in Alaska at 50 meters above ground level.

As a renewable resource, wind is classified according to wind power classes, which are based on typical wind speeds. These classes range from Class 1 (the lowest) to Class 7 (the highest). In general, at 50 meters, winds of Class 4 or higher can be useful for generating wind power with large turbines and are considered good resources. Primary criteria for wind development outlined in the *Assessing the Potential for Renewable Energy on Public Lands* (BLM and DOE 2003) included a wind power Class 4 and above for short-term, and Class 3 and above for long-term; and transmission access within 25 miles and road access within 50 miles.

Within the planning area, wind potential is generally poor to fair (classes 1 through 3). Additionally, most of the BLM-managed lands do not meet the criteria of being within 25 miles of transmission lines and within 50 miles of road access.

The biomass program uses organic matter and waste products for producing products such as paper and pulp, value-added commodities, and bio-energy or bio-based

products such as plastics, ethanol, or diesel. Alaska's most important biomass fuels are wood, sawmill wastes, fish byproducts, and municipal waste (AEA 2009, http://www.akenergyauthority.org/programsalternativebiomass.html). Wood from wildland fire scars is a potential source of biomass from BLM-managed lands. For additional discussion on biomass, see section 2.2.2 Forest and Woodland Products.

2.2.6. Recreation and Visitor Services

Utility Corridor Subunit

The Utility Corridor RMP (BLM 1991a) designated five recreation management areas: the Dalton Highway, Nigu Wilderness and Iteriak ACEC, and Oolamnagavik Colville Recreation Management Areas, and the Dalton Highway corridor and Central Arctic Management Area (CAMA) Extensive Recreation Management Areas. In 2002, the BLM conducted an evaluation of the Utility Corridor RMP. This evaluation found that the five recreation management areas established by the RMP were all being managed per decisions in the RMP. However, a significant portion of the CAMA and the Oolamnagavik Colville recreation management areas have been conveyed to the State or Native corporations since approval of the Utility Corridor RMP.

The Dalton Highway Recreation Area Management Plan (BLM 1991b), which at the time of approval, encompassed approximately 1.1 million acres from the Yukon River to north of the Brooks Range, was signed on October 11, 1991. Since that time, the portion of the recreation management area north of Slope Mountain (Milepost 300) has been conveyed to the state. This recreation management plan describes the proposed action as:

(a) identifies on-the-ground action programs to implement recreation use and to manage recreation resources as provided for in the Utility Corridor Resource Management Plan and Record of Decision (RMP/ROD), signed January 11, 1991, (b) provides continuity for the management of recreation use and recreation resources in the Dalton Highway recreation management area, (c) provides data and establishes priorities for the preparing of budget documents including annual work plans and packages for recreation management, recreation construction, recreation maintenance, and recreation acquisition programs, and (d) provides a basis for monitoring accomplishment of recreation program goals and objectives.

The Utility Corridor subunit (Figure C.3) begins at the Yukon River, which is 140 miles north of Fairbanks, and continues through the Utility Corridor and north of the Brooks Range to Milepost 300 of the Dalton Highway. The northern edge of the planning area is approximately 388 miles north of Fairbanks and lies within the southern edge of the arctic environment. At nearly 250 road miles in length, from the Yukon River to the northern boundary of BLM lands in the Utility Corridor, this subunit provides a variety of recreation opportunities for a broad spectrum of users. As a road-accessible recreation area, there are numerous opportunities for solitude and remote experiences difficult to find elsewhere.

Recreation in the planning area is enjoyed by resident and non-resident users representing varied recreational interests. Activities of the user groups include, but are not limited to motor coach sight-seeing tours, back country travel, day trips from Fairbanks, camping, berry picking, photography, fishing, big game hunting, motorcycle tours, river trips, and day hikes.

Visitors to the region include Alaska residents, non-resident U.S. citizens, and travelers from around the world. Tour companies catering to the needs of visitors find opportunities for niche

markets, from the traveling public coming from specific global regions to those with very specific interests. The region provides many urban visitors with a sense of big country and solitude not found in many parts of the world today.

The BLM's Utility Corridor Management Framework Plan (the land use plan that preceded the 1991 Utility Corridor RMP), was completed in September of 1979, and assumed no public road access. The development and infrastructure in support of the Prudhoe Bay oil fields were restricted to commercial access north of the Yukon River, and travel by the general public was prohibited on the Dalton Highway. In 1986, the BLM began a new planning process for recreational use of the region which culminated in a Recreation Area Management Plan – Dalton Highway signed October 1991. This comprehensive plan provided guidance on how, and where and where not to build developed recreation sites (BLM 1991b).

The highway was opened to limited use for tour buses from the Yukon Crossing to Milepost 211 in 1980. The June 1981 opening of the Dalton Highway to the general public to Disaster Creek (Milepost 211) provided the first push of large-scale recreation use deep into the region via ground transportation. Personal correspondence with Dan Wetzel of Nature Alaska Tours provides insight into recreational use by travelers and hunters prior to the road being open to the general public. Mr. Wetzel describes the long drive from Fairbanks to the Yukon River crossing, pulling a horse trailer and gear to the river where they used a ferry system to cross over and move northward with a pack train and horses. In 1994, the highway was opened to the public to Deadhorse, furthering the opportunities for recreational use of the region. Early statistics state that in 1983 an estimated average of 103 vehicles crossed the Yukon River bridge and by the next year that number had increased by nearly 15 percent.

Subsistence fishing and hunting activities are managed by the Federal Subsistence Management Program. This program is discussed in more detail in section 2.4.2 Subsistence. Subsistence use is not covered in this section, but this does not imply that subsistence users do not also recreate on these lands. People using the land for subsistence experience many of the same personal benefits as people do from recreating on public lands. In addition, much of the land described in this section provides for an entry point into vast and remote sections of Alaska that would otherwise be out of reach for most travelers due to time, effort, and cost to reach these areas.

The vast majority of the planning area outside of the Utility Corridor and CAMA is composed of roadless areas where BLM-managed lands meet the criteria for primitive recreation lands. There are villages located along the waterways and populated with primarily Alaska Natives. For generations, these lands have been used by local residents for traditional activities in what is now known as a subsistence lifestyle. Most villages are located along the Koyukuk and Yukon River drainages where waterways and winter trails provide transportation corridors between communities. Access into the region is by commercial carrier to communities and air taxi/transporter to reach remote destinations. Due to the remoteness, rivers in the Nulato Hills in the far western section of the planning area, such as the Tagagwik (Tag), Box, Kateel and Gisasa, are popular with commercial guides. Other areas with commercial hunting activity include the Hogatza (Hog), Pah, Koyukuk, Melozitna, and Tozitna rivers.

2.2.6.1. Recreation and Visitor Services

2.2.6.1.1. Current Level and Location of Use

In response to the growing demand for visitor services, The Arctic Interagency Visitors Center (AIVC) was first established in 1989, in Coldfoot, and staffed by seasonal BLM, NPS, and USFWS personnel and volunteers during the summer season. In 2004, a new visitor's center was opened under the management of BLM with the NPS and USFWS partners staffing the facility. Interpretive programs, displays, backcountry information, and a book store in partnership with Alaska Geographic are all part of the services provided at the AIVC. The primary season of use of BLM-managed and developed sites is Memorial Day weekend through Labor Day weekend; a season of approximately 100 days. During this time period, seasonal volunteer(s) staff the Yukon River Contact Station at milepost 56 from late morning to early evening. In recent years, volunteers have also provided visitor information at the Arctic Circle Wayside at Milepost 115 on an intermittent basis.

Travel to Alaska is costly and requires a planning effort on behalf of the traveler. The February 2013 publication Economic Impact of Alaska's Visitor Industry 2011-12 estimated that the industry generated $3.72 billion in spending during this time frame. Of this amount, 16 percent of visitor spending takes place in the Interior with 1 percent in the Far North.

From May 2011 to April 2012, 1,823,600 out-of-state travelers came to Alaska. An estimated 48 percent of these visitors arrived by cruise ship, 47 percent by air, and 5 percent by highway or ferry. The majority of visitors (85 percent) traveled between May and September.

Of the $1.24 billion of labor income attributed to this industry, 19 percent of the estimated 37,800 tourism jobs were in Interior Alaska. Of the total number of tourism jobs, a mere 1 percent is estimated to have been in the Far North. During the reporting period, Interior Alaska gained 800 jobs or a 13 percent increase over the previous reporting period.

In 2007, the University of Alaska Fairbanks conducted a Dalton Highway Benefits-Based Management Survey with a sample size of 284 respondents (Stegmann et al. 2008). The following table reflects the top five primary activities the respondents participated in.

Table 2.22. Recreation Activities on the Dalton Highway

Primary Activity	Percentage of Respondents Participating
Driving and Sight-seeing	77%
Photography	66%
Watching Wildlife	58%
Walking	49%
Bird Watching	33%

Visitors who travel with commercial tour operators to the Dalton Highway have a limited number of destinations the industry caters to. Of the sample surveyed, the primary destination is the Arctic Circle with 91 percent of respondents identifying this site as an intended destination and 30 percent as their primary destination.

Historical data collected by the BLM and partner agency personnel, at the Yukon River Contact station and the AIVC reflect visitor trends and reliable information about recreation users of the Dalton Highway. Visitor contacts at these locations, as well as at the Arctic Circle Wayside, have enabled the BLM to develop a framework that characterizes the types, origin, destination, and general interest of Dalton Highway travelers. Agency personnel collected the data through direct contact with independent travelers and tour groups, as well as a review of visitor registration books (Table 2.23).

Table 2.23. Visitor Contact Data for the Dalton Highway 2008–2012

Year	AIVC Independent Travelers	AIVC Organized Groups	AIVC Total	Yukon Crossing	Total Visitor Contacts
2008	5,937	3,720	9,657	7,278	16,905
2009	5,807	2,824	8,631	5,017	12,987
2010	5,453	2,858	8,311	9,502	17,119
2011	6,297	3,337	9,634	9,432	17,610
2012	6,249	1,938	8,187	7,473	12,871

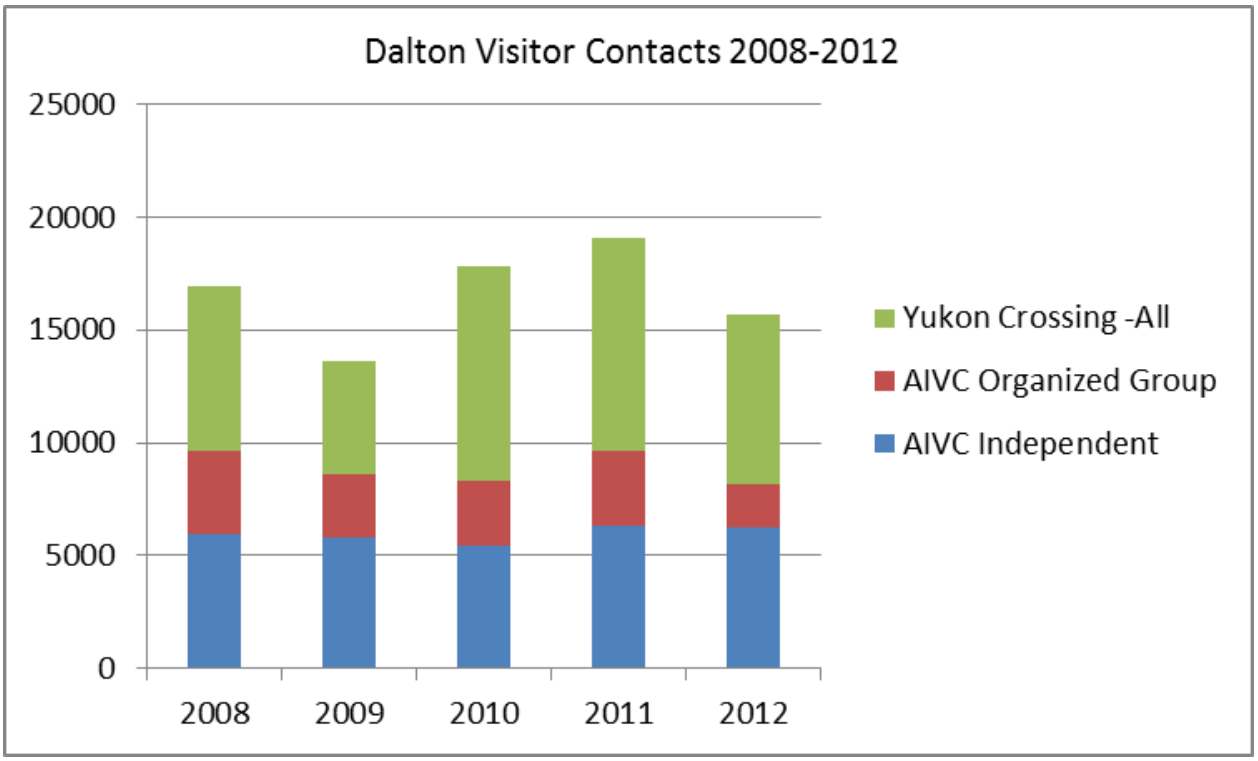


Figure 2.17. Dalton Visitor Contacts 2008–2012

In 2012, the BLM permitted 13 tour operators to operate in the Dalton Highway corridor. Additional organized groups travel through the corridor with destinations into NPS and USFWS managed lands as well as lands managed by the State of Alaska. These operators vary greatly in types of trips they offer and the segment of the market they cater to. Motor touring trip lengths vary from a driving/sight-seeing day trip from Fairbanks to the Arctic Circle to multi-day trips from Fairbanks to Deadhorse. River trips and backcountry pack trips range from a few days to multiple weeks traversing public lands managed by the Department of the Interior and the State of Alaska. Access for more remote trips is conducted with the support of the air transporter/air taxi industry flying from locations such as Fairbanks, Coldfoot, and Bettles.

A typical one-day driving trip from Fairbanks to the Arctic Circle Wayside is advertised at a rate of $185 summer tour and $200 for a winter journey. A drive and fly Arctic Circle tour rate where travelers fly either in or out of Coldfoot is advertised at $369 to $419 per person. A 3-day fly and drive adventure to Deadhorse and return drive on the Dalton Highway is $1,289 for single occupancy. A multi-day cultural/adventure trip can cost around $300 per day for a 10-day trip. One of the larger tour companies advertises a Dalton fly and drive journey inclusive of a professionally guided trip from Fairbanks to Coldfoot/Wiseman, meals and lodging, and a return flight from Coldfoot back to Fairbanks. A segment of the industry that appears to be growing is winter travel to the Arctic Circle with the potential for northern lights viewing.

Permittees pay for use of public lands for private gain by participating in the fee collection program authorized by the Federal Lands Recreation Enhancement Act (REA, December 8, 2004). Currently, there are eight fee sites that support the tour industry. Per direction from the BLM Chief, Division of Recreation and Visitors Service, “fees collected are to be used for recreation related facilities, services, and programs related directly to visitor enjoyment, visitor

access, and health and safety." At present, fees are assessed at $0.50 (50 cents) per person, per visit, per site with a 12-month reporting period ending December 31 each year. In recent years, fees collected from this industry have accounted for over $10,000 per year with 100 percent of these funds going back into the recreation program at the BLM field office level.

Table 2.24. Dalton Highway Waysides and Campgrounds

Location Milepost (MP)	Description	Remarks
MP 56	Yukon River Crossing [a]	Contact Station with summer season staffing, outhouses, boat launch (State facilities), interpretive panels, picnic tables hiking trail with river overlook, BLM realty-permitted hotel/restaurant/work camp/fuel (summer season only)
MP 60	5 mile campground	Artisan spring, rustic campground, picnic tables, fire rings, interpretive panels/kiosk, outhouse, dump station. Restaurant/hotel nearby on private lands (summer season only)
MP 86	Yukon Flats Overlook	USFWS Interpretive panels
MP 98	Finger Mountain [a]	Outhouses, interpretive trail, hiking, 360–degree panoramic scenic views
MP 115	Arctic Circle Wayside [a] and Campground	Arctic Circle sign, picnic tables, fire rings, outhouses, trails, camping
MP 132	Gobblers Knob	Interpretive panels, view of Jack White Mountains, hiking, outhouse
MP 144	Jim River	Interpretive panels, popular pull out for fishing, picnicking, camping
MP 150	Grayling Lake [a]	Interpretive panels, outhouse, boat access, float plane access, wildlife viewing
MP 156	South Fork of the Koyukuk [a]	Interpretive panels, outhouse, fishing, scenic view of mountains
MP 175	Arctic Interagency Visitors Center [a]Coldfoot (summer only)	AIVC, interpretive trails, seasonal interpretive programs, living history exhibits, river access, year-round truck stop with fuel/food/lodging, Coldfoot airport
MP 180	Marion Creek Campground	Summer season only, 27 sites, potable water, volunteer staffed, hiking trails, fee site
MP 189	Wiseman	Interpretive panels, locally lead visitor programs, guest houses, river access
MP 204	Sukakpak Mountain Wayside [a]	Interpretive signs, outhouse, river access
MP 235	Farthest North Spruce Tree [a]	Interpretive panels, outhouses, large parking area
MP 275	Galbraith Lake Campground	Interpretive panels/kiosk, outhouse, rustic campground, picnic tables, fishing, hiking, bear-proof food storage
MP 348	Sag River Overlook (on State land)	Interpretive panels and view of Sag River watershed
MP 355	Last Chance Wayside	Interpretive panels, outhouse, informal camping, views of the Philip Smith Mountains

[a]Dalton Highway Waysides – designated fee sites for Special Recreation Permit Holders

The number 1 destination for commercial and independent travelers on the Dalton Highway is the Arctic Circle Wayside. At latitude 66 degrees 33 minutes north, this site is where the sun doesn't set on the summer solstice or rise at the winter solstice. The site is visited throughout the year with commercial tours available in all 12 months. This developed area is located just north of Milepost 115 and is 59 miles north of the Yukon River, and approximately a 4-hour drive from Fairbanks with favorable road conditions. Day trips with tour companies can last upwards of 12 hours due to stops at popular Dalton waysides as well as photography and game watching opportunities.

Camping is a popular activity with independent travelers and small organized groups inclusive of those holding Special Recreation Permits. Currently, Marion Creek Campground is the only fee site. A notice has been drafted to add the Five Mile, Arctic Circle, and Galbraith Lake Campgrounds to the fee schedule. Fees collected at these sites through the BLM Recreation Enhancement Act directly support recreation infrastructure and maintenance of sites.

Table 2.25. Dalton Highway Campgrounds

Name	Number of Sites	Location	Amenities	Attractions
Five Mile Campground	undeveloped	MP 60, 4 miles north of Yukon River	potable water, dump station, outhouse, picnic tables, fire rings	Yukon River and food service nearby
Arctic Circle Campground	undeveloped	MP 115, on hill above Arctic Circle Wayside	No Water, outhouse, picnic tables, fire rings	Arctic Circle, pipeline, hiking
Marion Creek Campground	27	MP 180, 5 miles north of Coldfoot	potable water, dump station, outhouse, picnic tables, fire rings, host on site	Hiking, fishing, visitors center in Coldfoot
Galbraith Lake Campground	undeveloped	MP 275, 2.5 miles off of highway near airstrip	No potable water (creek nearby), outhouse, trash containers, bear proof food storage	Hiking, fishing, wildlife viewing, access to backcountry, bow hunting, near airstrip

Hunting

As reported in the Economic Impact of Alaska's Visitor Industry 2011-12, non-resident hunters spent $17.8 million on licenses and tags in calendar year 2011. In 2013, the gross revenue from all Hunt/Sport Fish & Game License and Tag was $24.9 million for the state of Alaska. In addition, the industry pumps additional money into the Alaska economy each year through the purchase supplies, equipment, and services associated with hunting and fishing.

Permitted hunting activity in the Utility Corridor Subunit is represented by an average of six guides holding 2930 Special Recreation Permits from 2008 to 2012. These permits are typically issued for a duration of one to five years and are at the discretion of the BLM Authorized Officer. The game pursued is included and it is recognized that a client may hunt more than one species.

No caribou harvest data for Units 24A and 25A are available because residents of these units north of the Yukon River are not required to register for or report harvest of caribou. Figure 2.18 shows hunters who do not reside north of the Yukon River.

Figure 2.18 shows federal and state hunting data. Although many of these hunts do not occur on BLM-managed lands, the users do benefit from the recreation infrastructure of the Dalton Highway corridor. Waysides, campgrounds, the Arctic Interagency Visitors Center, and BLM-published hard copy and electronic information all provide support for resident and non-resident hunters. Access for many hunters is by driving north on the highway where they are moved farther afield by the air taxi/air transporter industry. Popular air travel jumping-off spots from the highway include Grayling Lake, Coldfoot, Galbraith Lake airstrip, and Happy Valley airstrip.

The total number of hunters in the Game Management Units adjacent to the Dalton Highway and on BLM—managed lands is represented in Figure 2.18. Guides can be permitted by both the BLM and the State of Alaska, which allows them to hunt throughout a Guide Use Area (a sub-unit of a Game Management Area) per their permit from each agency.

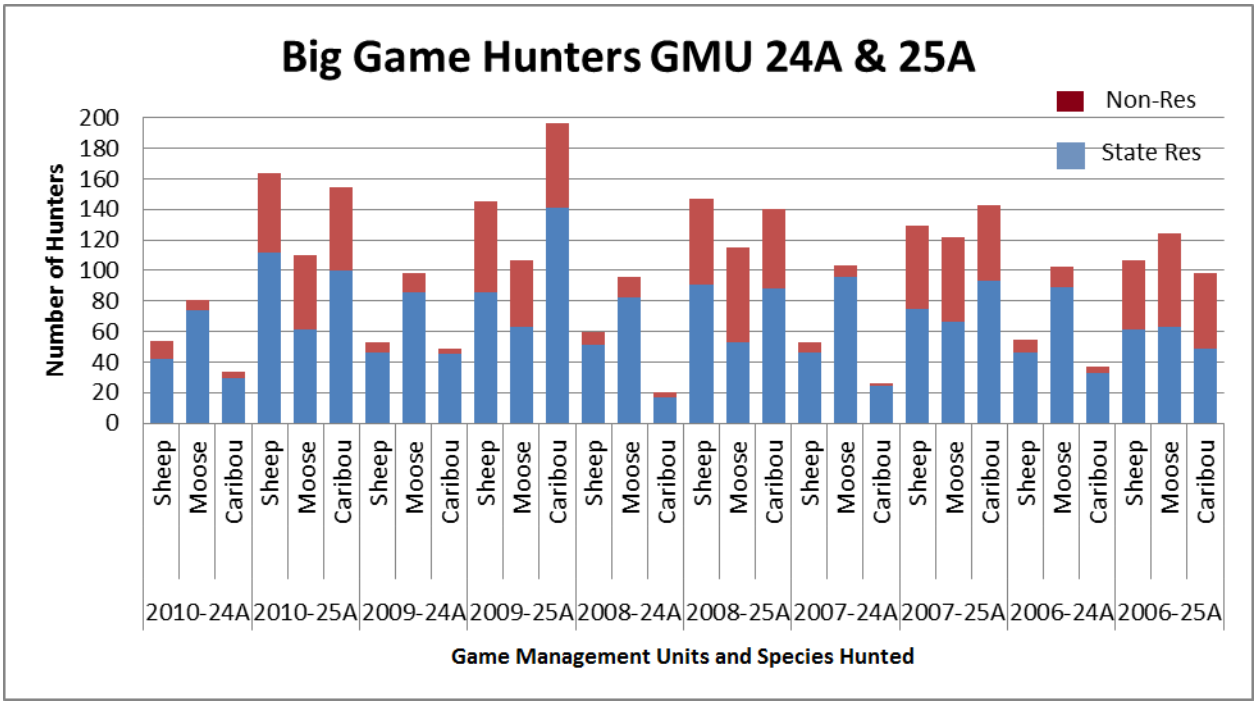


Figure 2.18. Number of Hunters in Units 24A and 25A, Shown by Species Hunted

BLM-managed infrastructure in the Dalton Highway corridor supports hunts on non-BLM lands. For example, between 2001 and 2009, an average of 989 commercially supported hunters flew into the Arctic National Wildlife Refuge. The majority of these hunters drove from Fairbanks and points south to Happy Valley near milepost 334 which is 34 miles north of BLM-managed lands. Getting to Happy Valley to meet an air taxi requires travelling 244 miles of the Dalton Highway with BLM-managed facilities.

2.2.6.1.2. Key Areas or Areas of High Potential

The Dalton Highway corridor and adjacent lands are areas with high potential for continued and expanded recreation use. As road conditions improve and the addition of private sector infrastructure continues, so will increased access to BLM-managed lands. Social media sites depicting the Dalton as the last great American road trip only adds to the interest in the region. The Arctic Circle as a travel destination continues on an upward trend as reflected in data collected in recent surveys by BLM recreation staff.

The remoteness and cost to get to other regions in the planning area limit the potential for growth of recreation use. This same remoteness provides those who do access these lands an opportunity for solitude seldom found elsewhere on public lands.

2.2.6.1.3. Forecast or Anticipated Demand

Many factors influence future demand for recreational use in the planning area. The economic downturn of the early 2000s resulted in decreased visits to BLM—managed lands by general recreationists and those pursuing more specific activities like big game hunting. The general rule of travel from non-Alaska residents is that trips are planned two years or more in advance,

therefore, there is often an echo effect for visitors to Interior Alaska that may not show up for one to two years after an economic event.

The advent of reality TV shows on major cable networks has provided a level of exposure to Alaska not seen before. Anecdotal information collected by visitor services staff suggest that many travelers were inspired to travel to destinations like the Dalton Highway after watching TV programs about the region. Visitor services staff recently collected data showing an incremental increase in independent visitors traveling the Dalton Highway. This can be in part attributed to popular TV shows depicting travel on the highway as well as a plethora of travel blogs, websites, and countless YouTube videos sharing information about adventures in the far north.

As mentioned early in this section, the loss of motor coach travel on the Dalton Highway seems to be long-term in nature. The limited lodging opportunities in support of large tour groups is likely only one factor in the decline of this market traveling the Dalton Highway. There are no emergency response facilities outside of Fairbanks that could respond to an incident with a motor coach. Considering upwards of 60 travelers could be involved in an incident, it is unlikely many travel companies in this market segment are prepared to expose their business to this kind of catastrophic exposure.

The use of the area by commercially guided hunters is anticipated to remain steady if not decrease over the next five years. Conflicts within the commercial hunting community have led to BLM management designating hunt areas within Guide Use Areas, something not done to this level anywhere else within the planning area. Concerns for the subsistence community have also been addressed due to the potential impacts a select number of guides imposed on sheep populations in a specific area. Special Recreation Permits for commercial hunting guide permits, as with all Special Recreation Permits, are at the discretion of the Authorized Officer; if conflicts continue, it is likely there will be a decrease in Special Recreation Permits for commercial guides.

A review of sheep hunting trends in the area north of Wiseman to the Brooks Range shows a steady and continued increase of non-guided Alaska resident hunters. Very few locations in the state provide an opportunity to drive to prime sheep hunting grounds. Hunters can hike in to hunt sheep at their own pace. Many who drive the highway to hunt are also using air taxi services to reach more remote areas. The use of float planes in support of big game is relatively new and is anticipated to provide services to an ever-growing demand for hunts farther off the highway.

Lisa Shon Jodwalis, BLM Park Ranger-Interpretation, noted that while developing information for the Drift Mine display for the Arctic Interagency Visitors Center “Data kept at the Arctic Interagency Visitor Center show that 60 percent of visitors are independent travelers while 40 percent are on guided tours. About 5 percent of visitors are with educational groups such as Scouts, Elderhostel, college field trips, or affiliated with the University of Alaska’s Toolik Field Station, 110 miles to the north ... The more recent surveys show that our visitors are almost all adults in the prime of their lives (ages 20 to 60). Over 75 percent of visitors were primarily interested in sight-seeing, but 25 to 32 percent were also interested in wildlife and bird viewing, hiking, camping, and education/interpretation. Children under age 13 make up only 10 percent of visitors. The 2007 Benefits-Based study also found that over 50 percent of Dalton travelers had some college education and about 35 percent had attended graduate school."

Day trips to the Arctic Circle appear to be increasing and tour companies in Fairbanks advertise daily trips to this destination during the summer peak season. As a whole, the tour industry appears to be increasing their promotion and sales of trips to the Arctic Circle.

Winter travel on the Dalton Highway has not been measured specifically, but the issuing of recent Special Recreation Permits to companies communicating they are conducting winter trips is noted. Additional rest stations and increased access to popular waysides are needed as the travel industry moves more visitors into winter season.

Additional trends include the motorcycle travel segment of the industry. Reports of commercially supported rides, charity rides, and independent rides have all been noted by visitor services staff at the Yukon Crossing, Arctic Circle, and the AIVC. Their interest in Dalton Highway travel may require additional infrastructure at camp grounds to support their mode of transportation.

2.2.6.2. Environmental Education and Interpretation

2.2.6.2.1. Current Level and Location

Environmental education and interpretation represent an important component of the visitor experience on the Dalton Highway corridor. The AIVC provides interpretive talks and walks, trails and exhibits, and interpretive films. Discovery boxes and Junior Ranger programs are available for families traveling with children. Production of an exterior Drift Mining interpretive exhibit located near the AIVC is currently underway. Limited displays, guided hikes, and orientations are delivered by volunteer(s) at the Yukon Crossing Visitor Contact Station. Wayside panels (Table 2.24) offer solitary and social interpretive opportunities. Interpretive programmatic and panel content includes local flora and fauna, culture, history, safety, and stewardship. Due to limited facilities and development restrictions, there are no ranger-led interpretive or environmental education programs offered at the Arctic Circle wayside. There are currently no formal environmental education programs at the AIVC or other BLM sites on the Dalton Highway.

On average, 100 interpretive talks are delivered each season at the AIVC. The loss of large motor coach visitation in 2012 resulted in a marked decrease in evening interpretive program attendance. Continued low attendance at the AIVC could precipitate changes to the current evening program schedule.

Table 2.26. Number of Attendees at Interpretive Programs at AIVC

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013
# of Attendees	2,078	2,365	2,852	2,811	2,068	1,834	2,097	1,079	1,059

Commercial tourism operators and guided education groups provide additional interpretive and educational services for their respective clients in the Dalton Highway region.

2.2.6.2.2. Forecast or Anticipated Demand

Demand for interpretive programs and safety/resource information will coincide with the anticipated increase in visitation cited under section 2.2.6.1 Recreation and Visitor Services. In addition to visitor expectations for quality interpretive experiences, formal and informal interpretive programming delivers important resource stewardship and visitor conduct messages that support resource protection and visitor safety.

Observations by on-site campground hosts show that campers at the Marion Creek Campground can be reluctant to travel 5 miles to the AIVC for evening interpretive programs. In response,

providing facilities and conducting interpretive programs at the campground is an objective in the near future.

Management goals and objectives for interpretive and education services, including expanded partnerships, are outlined in the BLM Alaska Environmental Education/Interpretation/Youth Outreach strategy initiated in 2013. The AIVC Interpretive Plan cites the need for a long-range interpretive plan for the entire region.

2.2.6.2.3. Key Areas or Areas of High Potential

The Yukon Crossing Visitor Contact Station is a 200-square-foot building adjacent to the Yukon River and located at Milepost 56 on the Dalton Highway. Visitation at this site is nearly equal to visitation at the 6,227-square-foot visitor center in Coldfoot. Expanded facilities at Yukon Crossing would provide additional interpretive and educational opportunities for travelers to this site.

The Arctic Circle Wayside at Milepost 115 represents an area of high potential for interpretive and education services. Fifty days of monitoring in 2013, by roving rangers, reflected an average of 107 visitor contacts per day.

2.2.7. Travel Management

Travel and transportation are an integral part of virtually every activity that occurs on BLM-managed public lands: recreation, wildlife management, commodity resource management, subsistence, inter-village travel, access to private inholdings, maintenance of permitted sites (such as communication sites), and management and monitoring of public lands. This section addresses public travel and access.

Comprehensive trails and travel management is the proactive management of public access, natural resources, and regulatory needs to ensure that all aspects of road, primitive road, and trail system planning and management are considered. This includes resource management, road and trail design, maintenance, and recreation and non-recreational uses of the roads and trails. Travel activities in this context incorporate access needs and the effects of all forms of travel, both motorized and non-motorized. Comprehensive trails and travel planning means providing clear specific direction on the proper levels of land and water access for all modes of travel. Travel management objectives serve as the foundation for appropriate travel and access prescriptions.

While many communities in the planning area have access provided by established roads and highways, most of the public lands within the planning area are located in rural and remote areas away from developed communities and settlements. The Parks, Richardson, Elliott and Dalton Highways border or cross through BLM-managed lands in some areas, but the majority of the planning area is not accessible by road. The primary means of access to these public lands is typically a combination of travel by foot, motorboat, off-highway vehicle, snowmobile, and aircraft.

2.2.7.1. Current Level and Location of Use

Dalton Highway

Road access to BLM-managed lands in the Dalton Highway area is primarily from the State maintained Dalton Highway. The highway right-of-way bisects the BLM-managed Utility Corridor, which comprises approximately 2.1 million acres, includes sections of the Trans-Alaska Pipeline System, and is the only road access to the Arctic Ocean in Alaska and the United States. The Utility Corridor begins at the Yukon River and ends in the north near Slope Mountain at milepost 300.

Motorized travel in the Dalton Highway corridor can be divided into several categories — personal vehicles and commercial vehicles traveling the State owned Dalton Highway, and permitted or authorized use. Most numerous are the commercial vehicles that use the Dalton Highway year-round to transport personnel, goods and cargo to the oil drilling operations near the community of Deadhorse on the North Slope. In the summer, recreational travelers arrive to the area by self-contained vehicles such as passenger vehicles, motor homes, and vehicles pulling trailers, and are drawn to the area by its vast array of recreational opportunities including camping, fishing, hiking, photography, wildlife viewing, and the fall big game hunting season. Commercial tour companies use small vans and shuttle bus vehicles to large tour buses to bring passengers from Fairbanks north to travel the Dalton Highway to Coldfoot overnight, and then continue on to Deadhorse, where passengers are flown back to Fairbanks. Recreational and tour bus travelers are typically present from May through mid-September. It is during this time that visitor use is greatest at each of the BLM-managed waysides and campgrounds along the Dalton Highway. Some motorboat use occurs on the rivers within the subunit, especially at Prospect Creek which has a boat put-in.

Alaska Statute sec. 19.40.210 prohibits the use of off-highway vehicles (OHVs) on land within 5 miles of the right-of-way of the Dalton Highway north of the Yukon River, except for persons who hold a mining claim near the highway and who must use land within 5 miles of the right-of-way to gain access to the mining claim. This means that the only legal use of OHVs is by miners. However, miners using these vehicles may not carry game, hunters, or their gear. Access to mining claims and for rights-of-way is authorized through permits. The use of snowmobiles is limited to the residents of Wiseman for subsistence activities, and to snowmobiles traveling from outside the highway corridor and crossing to the opposite side of the corridor, not for snowmobiles use beginning or ending within the corridor.

For those travelers seeking non-motorized forms of transportation, the Dalton Highway corridor provides a variety of scenic settings. There are several BLM-developed trails at waysides, campgrounds, and the Arctic Interagency Visitor Center (AIVC) that offer interpretation displays and hiking opportunities. Long-distance cycling is a popular activity with some cyclists attempting to ride from the Arctic Ocean to the southern tip of South America, although most cyclists are doing shorter trips along the highway. Float boating activities — including river boating, rafting, kayaking, and canoeing — may all be enjoyed on rivers crossing the Dalton Highway Utility Corridor. In the winter, snowshoeing, cross-country skiing, and dog sledding are the primary non-motorized forms of travel.

Central Arctic Management Area

The Central Arctic Management Area (CAMA) WSA is a Wilderness Study Area and a Conservation System Unit under ANILCA; as such, ANILCA provides for the use of snowmobiles (during periods of adequate snow cover, or frozen river conditions), motorboats, airplanes, and non-motorized surface transportation methods within the area. Due to the remoteness of the area, as well as the features of topography, soils, vegetation, and permafrost, there are few defined trails of any kind. Travel is generally conducted by motorized watercraft along rivers during the summer and by snowmobile in the winter. There are no ANCSA section 17(b) easements in this area. Fixed-wing and helicopter access is unrestricted and small fixed-wing aircraft use ridgelines and gravel bars to access backcountry areas. OHV use and foot travel are also unrestricted. There is no known horse or bicycle travel in the area.

Dispersed Use

The majority of the planning area is remote and receives relatively low recreational motorized use. Most of the access and travel needs are from remote village communities for access to subsistence camps and resources, Native allotments, and inter-village travel. Access to public lands from most villages is provided by section 17(b) easements reserved on or across lands conveyed to Native corporations under the ANCSA. To date, approximately 135 ANCSA 17(b) easements have been reserved within the planning area. More will be added as remaining entitlements are conveyed to village corporations and the Doyon Regional Corporation. In some cases, although the easement is reserved on paper, the route may not be passable on the ground.

In the summer, villages are accessed by commercial or chartered airplanes. Barges transport goods and cargo to river-accessible communities. Riverboats are used extensively to travel from the villages to subsistence areas and allotments. OHV use in the form of four-wheelers frequently occurs on Native lands adjacent to the villages. The mining operation at Hogatza Landing is accessed by aircraft and a maintained access road. The Gates of the Arctic National Park administrative offices are in Bettles, which also serves as the primary access point for visitors flying into the park (outside the planning area). Authorized hunting guides use aircraft to access hunting areas.

In the winter, use changes to snowmobiles for travel between villages and for subsistence activities. Winter trails connect villages and provide access to allotments and subsistence areas. The Iditarod National Historic Trail connects several village communities, as well as the frozen Yukon River. Other rivers also serve as a winter trails between villages. The community of Bettles uses a winter snow road as access for visitors that want to view the northern lights and to bring in cargo and supplies via the Dalton Highway.

2.2.7.2. Forecast or Anticipated Demand

Overall, the Dalton Highway will continue to be a destination for recreational travelers and commercial users of the area. Since the Dalton Highway provides the only road access to the North Slope and many unique areas found only in Alaska, it is perceived that the demand for public access and recreational activities will continue to grow in the future. In addition to anticipated increases in road travel, the intensification of non-motorized modes of travel including recreational boating, cycling, and hiking are also predicted. As gas prices fluctuate and the "baby boomer" generation ages, commercial bus tours have become increasingly prominent

forms of recreational travel in the area, as visitors look for more cost-effective and hassle-free way to recreate.

Subsistence use is probably the most prominent activity related to travel management in the area. With advances in recreational vehicle technology, areas near villages and rivers could experience an increased level of land use and activity, particularly in participation related to OHV use and access for subsistence use. However, this increase will most likely be limited due to the features of topography, soils, vegetation, permafrost, lack of any defined trails, lack of road access, and overall remoteness of the area.

In addition to possible increases in OHV use related to subsistence, the State of Alaska is proposing to extend the Elliott Highway from Manley Hot Springs to the Yukon River near Tanana. This will provide road access to mining operations and to the lower Yukon River communities. In addition, the State of Alaska has proposed a road from the Dalton Highway to the Ambler Mining District. The proposed route follows the existing winter road to Bettles and across State and NPS lands to mining operations near the villages of Kobuk, Shungnak, and Ambler, which are located outside the planning area. The primary use will be for mining access and transportation to village communities. If constructed, there is potential to extend the road to Nome and the Seward Peninsula. If the road is open to the public, there will be a dramatic increase in the amount of use of the area and an increased demand for access routes.

2.2.7.3. Key Areas or Areas of High Potential

The Dalton Highway provides the only road access for the typical out-of-state road traveler visiting the planning area. As a result, these developed sites have become destinations for road travelers and tour companies:

- Yukon River Crossing Contact Station
- Arctic Circle Wayside and Campground
- The Arctic Interagency Visitor Center, and the Marion Creek Campground near Coldfoot, Alaska
- Atigun Pass (Continental Divide)
- Galbraith Lake Campground
- Toolik Lake Research Station

The planning area contains numerous Areas of Environmental Concern, Research Natural Areas and the Lake Todatonten Special Management Area. These areas, managed to protect their unique environmental features or habitat. The Toolik Lake Field Station is operated by the University of Alaska under a BLM permit for scientific research of the arctic environment.

The BLM-managed Iditarod National Historic Trail is used to connect several village communities within the planning area, as well as the route for several competitive winter race events. The Nigu River portion of the CAMA WSA has potential to become a designated Wilderness Area if acted on by Congress.

Due to the features of topography, soils, vegetation, permafrost, and remoteness of the area, key features and areas of high potential are minimal. Travel is generally by motorized watercraft along rivers during the summer and by snowmobile travel in the winter. Therefore, waterways and winter trails are conceivably the areas that could be considered to be key or to possess high potential.

The State of Alaska has proposed building a pioneer road from Manley Hot Springs to Tanana, and from the Dalton Highway to Ambler. If constructed, demand for public access to those remote areas would likely increase. Until then, mining and subsistence use will most likely remain the most prominent activities related to travel management in the area.

2.2.8. Utility Corridor

In December 1971, Public Land Order 5150 designated lands from Prudhoe Bay on the north coast of Alaska to Valdez in the south for a Utility Corridor, clearing the way for construction of the Trans-Alaska Pipeline System. The lands so designated were withdrawn from all forms of appropriation under the public land laws except for location of metalliferous minerals under the mining laws (30 U.S.C. 1201 ch. 2). The inner corridor was further closed to all mineral entry. The lands were also withdrawn from leasing under the mineral leasing laws, from selection by the State of Alaska under the Alaska Statehood Act (72 Stat. 339), and from selection by any Native group or village or regional corporation under the Alaska Native Claims Settlement Act.

Since that time, amendments to PLO 5150 have opened much of the originally designated land for selection by the State of Alaska and Native groups qualifying under ANCSA, and the lands have been conveyed. That portion of the Utility Corridor remaining under BLM management (approximately 2.1 million acres) lies on either side of the Dalton Highway, from the Yukon River north to approximately mile 300. The portion of the Inner corridor remaining under BLM management includes about 750,000 acres.

The Utility Corridor is an essential component of the national domestic oil and gas transportation system. It provides a route to transport a significant portion of the nation's petroleum; the present and future importance of access to these resources cannot be overstated.

2.2.8.1. Current Level and Location of Use

Construction of the Trans-Alaska Pipeline System was completed in June 1977. Ancillary to the pipeline are 11 pump stations, 2 of which are within the BLM-managed Utility Corridor described above, as are 129 pipeline access roads. There is also a fuel gas line right-of-way, which originates from Pump Station One and extends as far south as Pump Station Four, serving the fuel needs of those pump stations on the north side of the Brooks Range.

GCI Fiber Communication Company Inc. was granted a right-of-way in 1996 from Pump Station One in the Prudhoe oil fields along the length of the Trans—Alaskan Pipeline System all the way to Valdez, providing communication services to communities along the Utility Corridor as well as pipeline related facilities.

2.2.8.2. Forecast or Anticipated Demand

Trans-Alaskan Pipeline System production peaked in the late 1980s at 2.2 million barrels per day, but has been declining since that time at a rate of 5 to 6 percent per year. Throughput is currently less than one-third of capacity, and continues to decline.

However, as North Slope oil production decreases, there is increasing interest in the natural gas available from the same North Slope oil fields. In April 2010, the State of Alaska enacted legislation authorizing the Alaska Housing Finance Corporation to create a subsidiary corporation named the Alaska Gasline Development Corporation, "for the purpose of planning, constructing,

and financing in-state natural gas pipeline projects or for the purpose of aiding in the planning, construction, and financing of in-state natural gas pipeline projects." The 2010 Act also created the Joint In-State Gasline Development Team within the Alaska Housing Finance Corporation and directed this team to produce a project plan for developing an in-state natural gas pipeline. The resulting project plan, developed with the assistance of the Alaska Gasline Development Corporation is the Alaska Stand Alone Pipeline project, a 737-mile-long, 36-inch-diameter lean gas pipeline intended to run roughly parallel to the Trans-Alaskan Pipeline System along the Dalton Highway corridor, and then continuing south. At current projections, pipeline construction for the Alaska Stand Alone Pipeline is anticipated to begin in 2016.

Besides the Alaska Stand Alone Pipeline project, in the last six years there have also been three applications from the private sector seeking rights-of-way for natural gas pipelines through the Utility Corridor. Considering the high level of product demand; interest from both the State of Alaska and private industry; and exploratory field work currently being performed, it can be projected that construction will likely begin on a gas pipeline within the Utility Corridor in the next several years.

The BLM is currently processing an application to authorize AT&T a right-of-way for installation of a fiber optic transmission line as far north as Coldfoot. Although oil production and throughput in the TAPS line may be waning, demand for the Utility Corridor is not waning or diminishing, but simply shifting focus.

The State of Alaska has top-filed a large portion of the Utility Corridor and is interested in obtaining title to some of these lands. In a letter to Governor Parnell dated June 22, 2012, the Secretary of the Interior indicated that BLM would consider modifications to PLO 5150 through the Central Yukon planning process. If the record of decision for the final RMP recommends modification of PLO 5150 to allow state-selection within portions of the corridor and the Secretary follows up with a modification to the PLO, portions of the corridor could become State land.

2.3. Special Designations

This section addresses special designations including both BLM designations such as Areas of Critical Environmental Concern and congressional designations such as wild and scenic rivers or wilderness study areas.

2.3.1. Areas of Critical Environmental Concern

An Area of Critical Environmental Concern (ACEC) designation highlights an area where special management attention is needed to protect important resources or to protect human life and safety from natural hazards. ACECs must meet the relevance and importance criteria in 43 CFR 1610.7-2(b) and must require special management to: protect the area and prevent irreparable damage to resources or natural systems; or protect life and promote safety in areas where natural hazards exist.

Research Natural Areas (RNAs) are established and maintained for research and education because the land has one or more of the following characteristics: (1) A typical representation of a common plant or animal association; (2) an unusual plant or animal association; (3) a threatened or endangered plant or animal species; (4) a typical representation of common geologic, soil, or water features; or (5) outstanding or unusual geologic, soil, or water features (43 CFR 8223).

Section 202 (c)(3) of FLPMA mandates that the BLM give priority to the designation and protection of ACECs in the development and revision of land use plans. Nominations for ACECs are accepted during the public scoping period. Additionally, the BLM specifically requested ACEC nominations from May 1 through August 29, 2014. This nomination period was announced through a press release, a mailing to the Central Yukon RMP mailing list, and on the Central Yukon RMP webpage. Section 2.3.1.3 Potential Areas of Critical Environmental Concern, lists areas nominated for consideration as ACECs or RNAs by both the public and BLM resource specialists.

2.3.1.1. Existing Areas of Critical Environmental Concern

BLM will review all existing ACECs listed in Table 2.27 during the planning process. The original designation status is unclear for some and others have experienced a change in resource status or lands status since designation. For example, some ACECs have been partially conveyed to either the State or a Native corporation. Several ACECs were designated to protect habitat for the federally listed peregrine falcon, which has since been delisted. Some ACECs may not encompass the values for which they were designated such as crucial spawning habitat. Three ACECs designated in the Utility Corridor RMP: Slope Mountain, Ivishak River, and Sagwon Bluffs, no longer exist because the lands have been conveyed to the State.

The North River ACEC falls within the Bering Sea-Western Interior (BSWI) Planning Area and will be covered by that RMP currently being developed by the Anchorage Field Office. Additionally, the field office boundaries were changed in 2014, and the Nulato Hills Subunit will become part of the BSWI Planning Area. Existing ACECs in this subunit will be reviewed as part of the BSWI planning effort. As will any new nominations or proposed expansions to existing ACECs in the Nulato Hills Subunit.

Table 2.27. Areas of Critical Environmental Concern in the Central Yukon Planning Area

Land Use Plan	ACEC Name	BLM Acres	Values	Comments
Central Yukon	Dulbi-Kaiyuh Mountains Subunit ACEC	54,250	Crucial peregrine falcon habitat	1994 Arctic peregrine falcon delisted. 1999 American peregrine falcon delisted. Portions of ACEC are State-selected.
Central Yukon	Galena Mountain ACEC	19,360	Crucial peregrine falcon habitat; caribou calving grounds	1994 Arctic peregrine falcon delisted. 1999 American peregrine falcon delisted. West section of ACEC is State-selected. Galena Mountain ACEC Management Plan developed in 1986.
Central Yukon	Gisasa River ACEC[a]	278,000	Salmon spawning habitat	Unencumbered BLM lands. No Habitat Management Plan. Index weir for Yukon River salmon management. Scoping comments from refuge staff Koyukuk, keeping this ACEC important for refuge management.
Central Yukon	Hogatza River Tributaries ACEC	5,225	Salmon spawning habitat	1994 Habitat Management Plan. Partially transferred to State and Doyon Ltd. Consider boundary adjustments. Ongoing mining. Instream flow reservation. Proposed 300 foot setback withdrawal but not implemented. Clear Creek chum salmon stock on BLM Watch List.

Land Use Plan	ACEC Name	BLM Acres	Values	Comments
Central Yukon	Indian River ACEC	157,900	Chinook and chum salmon spawning habitat	Mostly unencumbered BLM lands. 1995 Habitat Management Plan developed. Consider boundary adjustments. Downstream mixed ownership. Proposed withdrawal not implemented.
Central Yukon	Inglutalik River (CY) ACEC[a]	71,700[b]	Salmon spawning habitat	Unencumbered BLM lands. ACEC Extends into the Kobuk-Seward Peninsula Planning Area.
Central Yukon	Kateel River ACEC[a]	568,100[b]	Salmon spawning habitat	Unencumbered BLM lands. Proposed 300 foot mineral withdrawal not implemented.
Central Yukon	Nulato Hills (CY) ACEC[a]	40,700[c]	Crucial peregrine falcon habitat	1994 Arctic peregrine falcon delisted. 1999 American peregrine falcon delisted. Mostly unencumbered BLM lands. Has same name as caribou ACEC in the Kobuk-Seward Peninsula Planning Area, but not related.
Central Yukon	Shaktoolik River (CY) ACEC[a]	193,300[b]	Salmon spawning habitat	ACEC extends into the Kobuk-Seward Peninsula Planning Area. Unencumbered BLM lands.
Central Yukon RMP	Sulukna River ACEC	24,600	Salmon and sheefish (inconnu) spawning habitat	One of five known spawning habitats for inconnu in the Yukon River basin. East half is State-selected. Consider boundary adjustment. Proposed 300 foot withdrawal not implemented.
Central Yukon	Tozitna River ACEC	843,000	Salmon spawning habitat	Large parts are State-selected. ACEC Management Plan has been developed. Application for instream flow reservation. State has given filing date. Proposed 300 foot withdrawal not implemented.
Central Yukon	Tozitna Subunit North ACEC	129,000	Crucial caribou calving habitat	All except 8 square miles are State-selected. Tozitna North and South ACEC Management Plan developed in 1988.
Central Yukon	Tozitna Subunit South ACEC	62,600	Crucial caribou calving habitat	Unencumbered BLM lands. Tozitna North and South ACEC Management Plan developed in 1988.
Central Yukon	Ungalik River (CY) ACEC[a]	112,700[b]	Salmon spawning habitat	Unencumbered BLM lands. Extends into the Kobuk-Seward Peninsula Planning Area.
Utility Corridor	Galbraith Lake ACEC	53,900	Cultural, rare or sensitive plants, scenic values, and lambing areas	The entire ACEC is top-filed by the State with high selection priority. PLO 5150 needs to be modified for selection to attach. Current management allows for mineral materials disposal. Gravel pit affects scenic value.
Utility Corridor	Jim River ACEC	202,700	Fishery, recreation, cultural	Large portions of ACEC are State-selected. Current management allows for mineral materials disposal. Consider boundary change.
Utility Corridor	Kanuti Hot Springs ACEC	43	Hot spring system	All State-selected. PLO 399 applies.

Land Use Plan	ACEC Name	BLM Acres	Values	Comments
Utility Corridor	Nigu-Iteriak ACEC	40,200	Geology, cultural resources	PL 104–333 transferred a portion of the Nigu ACEC to Noatak National Preserve. Part of Iteriak ACEC has been tentatively approved for conveyance to State of Alaska. The Mesa Site withdrawal is in Iteriak ACEC.
Utility Corridor	Nugget Creek ACEC	3,300	Dall sheep lambing areas, mineral lick	Partially top-filed by the State. Current management allows for mineral materials disposal.
Utility Corridor	Poss Mountain ACEC	8,700	Dall sheep lambing areas, mineral lick	Unencumbered BLM lands. Consider expanding to include salt lick on Gold Creek.
Utility Corridor	Snowden Mountain ACEC	29,700	Dall sheep lambing areas, mineral lick	Unencumbered BLM lands. Consider expanding to east around Mathews Creek to include additional habitat. Evaluate geology and scenic values.
Utility Corridor	Sukakpak Mountain ACEC	3,500	Scenic, geology	Unencumbered BLM lands. Evaluate rare plant as an additional relevant value.
Utility Corridor	West Fork Atigun River ACEC	9,160	Dall sheep lambing areas, mineral lick	Partially State-selected. Evaluate geology and scenic quality as additional relevant values.

[a]Nulato Hills Subunit

[b]Within the Bering Sea-Western Interior Planning Area

[c]Portion within the Central Yukon Planning Area

2.3.1.2. Existing Research Natural Areas

The planning area contains nine ACECs that are also designated as Research Natural Areas (RNAs). Consistent with current policy, RNAs are designated as a type of ACEC using the ACEC designation process (H-1601-1, Appendix C and BLM Manual 1613).

Table 2.28. Research Natural Areas in the Central Yukon Planning Area

Land Use Plan	RNA Name	Acres	Values	Comments
Central Yukon	Arms Lake RNA	10,590	Sand dune complex and associated vegetation and limnologic characteristics	Unencumbered BLM lands.
Central Yukon	Box River Treeline RNA[a]	13,590	Vegetation complex representing western treeline limit in alaska. Permafrost features.	Unencumbered BLM lands. Tributary to Kateel River.
Central Yukon	Ishtalitna Creek Hot Springs RNA	1,044	Low gradient hot springs system.	Low priority State-selections. PLO 399 applies. Includes part of Ishtalitna Creek to allow for water quality comparisons.
Central Yukon	South Todatonten Summit RNA	655	Open system pingos	Low priority State-selections. Lake Todatonten Special Management Area and the Lake Todatonten Pingos and Summit RNAs geographically close to one another, but do not overlap.
Central Yukon	Spooky Valley RNA	10,100	Geologic, physiographic, vegetation, and scenic	Low priority State-selections. Anecdotal evidence of Alaska Native spiritual values.

Land Use Plan	RNA Name	Acres	Values	Comments
Central Yukon	Redlands Lake RNA	3,829	Remnant lake and sand dune complex	Redlands lake, last remnant of sand dune lake. Unencumbered BLM lands. PLO 5180 applies.
Central Yukon	McQuesten Creek RNA	3,930	Mid-elevation slope and valley ecosystem and vegetation. Low-gradient hot springs system.	Low priority state-selections. Communities from alpine, subalpine and riparian zones of all aspects.
Central Yukon	Lake Todatonten Pingos RNA	658	Open system pingos	Low priority State-selections. The Lake Todatonten Special Management Area and the Lake Todatonten Pingos and Summit RNAs geographically close to one another, but no overlap. Lake Todatonten Pingos RNA borders the Special Management area on the south side for 1/2 mile.
Utility Corridor	Toolik Lake RNA	77,200	Research activities, cultural	High priority State top filings. Modification of PLO 5150 needed for selection to attach. Numerous scoping comments recommended enlarging the RNA (section 2.3.1.3.1)

[a]Nulato Hills Subunit, moved to Bering Sea-Western Interior RMP

2.3.1.3. Potential Areas of Critical Environmental Concern

As part of the land use planning process, the BLM is directed by section 202 of FLPMA and the resource management plan guidance found in 43 CFR 1610.7-2 to identify areas having unique or high value resources that may make them eligible for designation as ACECs.

2.3.1.3.1. Adjustments to Existing ACECs and RNAs

While this report is being prepared, additional analysis of ACECs will be completed. The following sections discuss initial interdisciplinary team ideas on additions to ACECs.

Hogatza River ACEC

In 1986, the record of decision for the Central Yukon RMP designated 42,512 acres or approximately 41 percent of the combined watersheds of Clear Creek and Caribou Creek (tributary to the Hogatza River) as an ACEC. The purpose of the ACEC was to protect the high value summer chum salmon (*Oncorhynchus keta*) spawning habitat within these two drainages.

The BLM completed a habitat management plan for the ACEC in 1994 (Kretsinger et al. 1994), which outlined management objectives for the ACEC. Since the approval of the habitat management plan, many of the State and Native land selections have been conveyed and the original ACEC has been reduced to 5,225 acres. Currently, about 11,000 acres of BLM-managed land in the combined watersheds of Clear and Caribou Creeks is not included in the existing ACEC. In addition, approximately 2,740 acres of BLM-managed lands in the adjoining High Creek watershed and 37,870 acres in the sub-watershed area of the main stem Hogatza River are not in the existing ACEC. These areas all provide important habitat for chum salmon.

From 1995 to 2007, salmon escapement was monitored in Clear Creek. The 12-year average chum salmon escapement for Clear Creek (1995 – 2007, excluding 1998) was 35,418 fish

(Headlee 1996, VanHatten 1997 and 1998; Esse and Kretsinger 2009; BLM unpublished data). Escapement monitoring efforts in Caribou Creek from 2004 to2007 determined the 4-year average chum salmon escapement to be 17,929 fish (BLM unpublished data). An aerial escapement survey of High Creek (July 1996) reported 789 chum salmon. In addition to chum salmon, Clear and Caribou Creeks are known to support both coho (*O. kisutch*), and Chinook (*O. tshawytscha*) salmon.

Because of the high value salmon habitat found within the combined drainages of Clear, Caribou, and High Creeks, it is recommended that the current boundary of the Hogatza ACEC be adjusted to include the remaining BLM-managed lands within the combined watersheds of Clear and Caribou creeks as well as the adjoining BLM-managed land in High Creek and the South Hogatza sub-watershed. The adjusted ACEC boundary would include approximately 62,000 acres.

Sulukna River ACEC

In 1986, the record of decision for the Central Yukon RMP designated 10,240 acres within the Sulukna River drainage as an ACEC to provide protection to the unique inconnu (sheefish; *Stenodus leucichthys*) spawning habitat thought to be present in the lower river (Alt 1974, Alt 1985). In 2003, a cooperative study conducted by the BLM and USFWS documented the timing and distribution of inconnu spawners within the Sulukna River. A majority of the fish were using an area between mile 16 and mile 50 to spawn, which is upstream of the upper-most ACEC boundary (Kretsinger and Brown 2004). A continuation of the 2003 telemetry project was conducted as a collaborative effort by USFWS, BLM, and ADFG. Results from this study (2005 to 2009) further refined the spawning area to between mile 16 and 57 and documented that inconnu spawning within the Nowitna River drainage is limited to the Sulukna River (R. Brown, USFWS, unpublished data).

The Sulukna River is one of five known spawning habitats for inconnu within the Yukon River basin. In 2008 and 2009, the abundance of the spawning population was estimated to be 2,079 and 3,531, respectively (Esse 2011). In addition to inconnu, the Sulukna River provides habitat to a significant number (e.g., hundreds) of coho salmon (D. Esse, BLM pers. comm.) and fall chum salmon; humpback whitefish (*Coregonus pidschian*), and least cisco (*C. sardinella*) are also known to use the river (Kretsinger and Brown 2004).

Administration of the Sulukna River watershed is shared by the USFWS and the BLM. The USFWS manages the lower 1 percent (4,459 acres) of the watershed with the BLM managing the remainder (398,573 acres). Approximately 2.5 percent of the watershed is currently designated as an ACEC and managed by the BLM.

Based on the presence of this rare habitat (only five known inconnu spawning areas within the Yukon River Basin), the BLM recommended that the entire Sulukna River watershed upstream of the Nowitna River National Wildlife Refuge be added to the existing ACEC. The USFWS also proposed that additional acres be added to this existing ACEC. The adjusted ACEC boundary would include approximately 398,600 acres.

Indian River ACEC (tributary to the Koyukuk River)

In 1986, the record of decision for the Central Yukon RMP designated the upper portion of the Indian River watershed as an ACEC to protect Chinook and summer chum salmon spawning habitat. The BLM completed a habitat management plan for the ACEC in 1995, which established

management objectives and outlined initial inventory efforts for the area (Kretsinger and Will 1995).

Following a cursory inventory of the ACEC in 1993, it was determined that a substantial number of summer chum salmon spawned in the Indian River downstream of the lower-most ACEC boundary within T. 6 N., T. 23 E., Kateel River Meridian. Recent aerial escapement surveys conducted in 2011 and 2012 counted 3,979 and 24,833 summer chum in the Indian River. No Chinook salmon were counted in 2011, and only 12 were counted in 2012 (ADFG aerial survey database). The proposed expansion would add approximately 10 additional miles of the Indian River to the existing ACEC. The adjusted ACEC boundary would include approximately 176,500 acres.

Jim River ACEC

In 1986, the record of decision for the Central Yukon RMP designated the 200,000-acre Jim River ACEC based on fishery, cultural, and recreation resources. Management objectives for the fish resources included protecting and/or enhancing Chinook and chum salmon spawning areas, overwintering habitat for resident and anadromous species, and sport fishing.

The BLM manages the entire Jim River watershed with the exception of 1,330 acres at the Jim River mouth, which is within the Kanuti National Wildlife Refuge and on private (Native) land. When designated, the ACEC included the Jim River drainage upstream of that portion of the Utility Corridor designated as the "Inner corridor." While the Inner corridor provided some protection to aquatic resources because it was closed to mineral entry, the lower river (downstream of the western boundary of the Inner corridor) was not afforded additional protection other than discouraging gravel extraction in the floodplain.

Additional research in the Jim River drainage by the ADFG since establishment of the ACEC has documented the lower Jim River as important spawning and overwintering habitat for grayling (Fish 1998). The lower portion of the river is also used by Chinook and chum salmon as spawning habitat (ADFG 2014).

The proximity of the Jim River/Prospect Creek watershed to the Dalton Highway continues to attract economically feasible development opportunities (i.e., roads and mining) that threaten its aquatic habitat and fisheries. Given the high value of the aquatic resources and habitat in the lower Jim River, inclusion of this portion of the watershed into the ACEC is warranted. The adjusted ACEC boundary would include approximately 303,000 acres.

In addition to the expansion proposed by the BLM, the Native Village of Allakaket nominated a Jim River ACEC, which expanded the existing ACEC.

Kateel River ACEC (tributary to the Koyukuk River)

In 1986, the record of decision for the Central Yukon RMP designated the upper portion of the Kateel River watershed as an ACEC to protect Chinook (*O. tshawytscha*) and summer chum salmon (*O. keta*) spawning habitat. When established, this ACEC was 551,297 acres in size. The proposed ACEC included the upper watershed, including the linear river withdrawals, down to the downstream limit of the river withdrawal. Management of the ACEC was to include closure to mineral entry within the streambed and for 300 feet on both sides of the stream from its high water line, but this withdrawal was never implemented.

Additional salmon escapement research has been undertaken in the Kateel River drainage since establishment of the ACEC. The USFWS installed a weir in 2002 (VanHatten 2005). A total of 73 Chinook salmon and 2,853 summer chum were counted. It should be noted that salmon numbers were depressed in the Yukon River drainage in the years surrounding this count. Aerial surveys conducted in 2012 by ADFG counted 122 Chinook and 5,646 summer chum.The lower portion of the river downstream of the current ACEC now has reaches listed in the *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* as chum salmon spawning habitat and Chinook spawning and rearing habitat (ADFG 2014).

The intent of the original ACEC designation was to protect spawning habitat in the Kateel River drainage. Given new data that shows the area downstream of the original ACEC is being used by salmon for spawning, the ACEC should be expanded to include that portion of the river and watershed. The downstream edge of this proposed ACEC expansion would border the Koyukuk National Wildlife Refuge. The adjusted ACEC boundary would include approximately 876,600 acres.

Snowden Mountain ACEC

In 1991, the record of decision for the Utility Corridor RMP designated 29,700 acres as the Snowden Mountain ACEC to protect Dall sheep habitat and mineral lick sites, as well as to protect the unique geologic exposures and associated paleontology. It was established that "crucial habitat and use periods will be monitored" and that the ACEC should be inventoried to "identify any additional crucial sheep habitats." Accordingly, the sheep subpopulation in the Snowden Mountain ACEC and the surrounding vicinity has been monitored and inventoried regularly, particularly from 2000 to 2014.

Surveys of sheep abundance conducted by ADFG have been the primary source of sheep population monitoring for the Central Brooks Range, including the BLM-managed Dalton Highway Corridor Management Area. The two most regularly surveyed Game Management Units (Units 1A and 1B) have been used by ADFG to index the current status of sheep abundance in the Central Brooks Range. The larger Unit 1A encompasses the Snowden Mountain ACEC. Additionally, from 2009 to 2011, collared sheep locations were used to identify highly utilized sheep habitat in relation to ACEC boundaries and survey units.

The current boundary of the Snowden Mountain ACEC does not include the area encompassing the headwaters of Mathews Creek which is frequently used by sheep. While the established Snowden ACEC is situated along the western slope of the Snowden Mountain massif, more sheep activity was found to occur on the northern and eastern slopes of that ridge, east of the existing ACEC boundary. To adequately protect important sheep habitat, the BLM should consider expanding the Snowden ACEC eastward to the boundary of BLM-managed land near Mathews Creek.

Notably, abundance survey results from 2012 to 2014 show reduced lamb production and/or survival for the Snowden Mountain ACEC subpopulation; therefore, there is a high likelihood of reduced abundance in all sheep cohorts in future years. This underscores the importance of protecting sheep habitat to the greatest extent possible.

Poss Mountain ACEC

In 1991, the record of decision for the Utility Corridor RMP designated 8,732 acres as the Poss Mountain ACEC to protect lambing habitat for Dall sheep and known mineral lick sites. The same habitat is used annually by pregnant ewes and mineral licks are essential to sheep health. In 1991, the authors of the record of decision noted that "a growing number of hunters use the Dalton Highway for easy access to hunt Dall sheep; therefore BLM needs to protect this crucial habitat to sustain a viable sheep population…the area should be earmarked for attention since a number of potentially disturbing activities near this habitat (principally mining) may occur with the life of this plan." It was established that "crucial habitat and use periods will be monitored" and that the ACEC should be inventoried to "identify any additional crucial sheep habitats." Program activities outlined in the record of decision specified that an area of 160 acres around a given mineral lick identified within the ACEC would be withdrawn from mineral entry and location under the 1872 mining law.

A collaring study conducted from 2009 to 2011 suggests that the Poss Mountain subpopulation is likely separated by natural and human-made barriers from other subpopulation ranges; the isolated Poss Mountain subpopulation was shown to regularly cross Minnie Creek. This isolated subpopulation relies on a known mineral lick within the perimeter of the current Poss Mountain ACEC as well as a lick located to the north of the ACEC on an embankment of Gold Creek. The Gold Creek lick is located near current human activity. To the west of the lick, a large mineral material site (gravel pit) has been established to support road construction. To the east of the lick, active mining is being conducted. The lick is now sandwiched between the gravel pit and a mining operation just upstream. The current high level of human activity will greatly increase the potential for disturbance of sheep using the lick. Further development of the area will likely compound disturbance to this isolated subpopulation of sheep.

The BLM proposes that the Poss Mountain ACEC be extended to the north to encompass the Gold Creek mineral lick. Furthermore, expansion to the south of the current ACEC to include the Minnie Creek drainage should also be considered because this area is regularly used by this population as well. The adjusted ACEC boundary would include approximately 25,500 acres.

Notably, abundance survey results from 2012 to 2014 suggest reduced lamb production in this region; therefore, there is a high likelihood of reduced abundance in all sheep cohorts in future years. This underscores the importance of protecting sheep habitat to the greatest extent possible.

Toolik Lake Research Natural Area

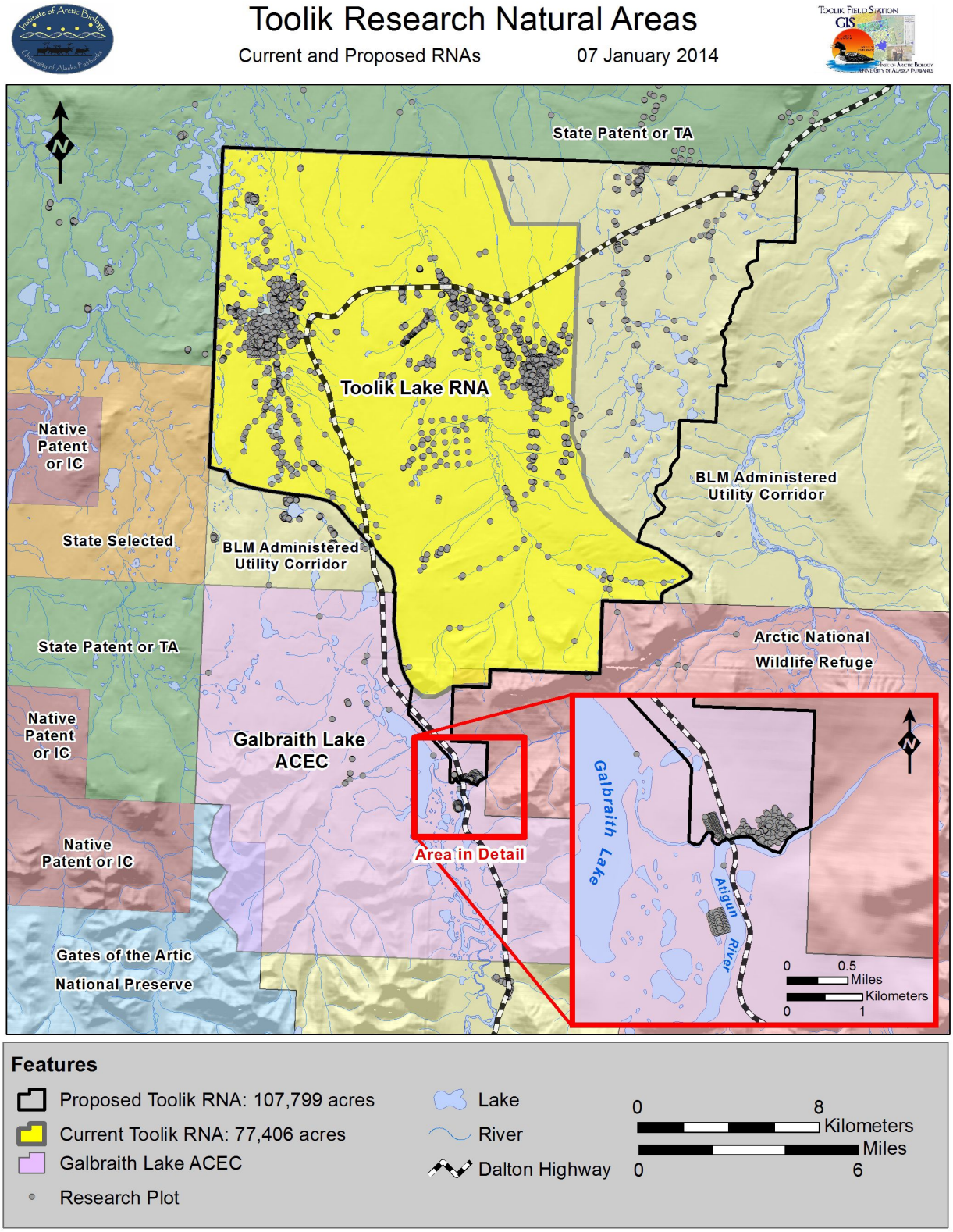
In 1991, the record of decision for the Utility Corridor RMP designated the Toolik Lake Research Natural Area (RNA). The existing RNA is approximately 77,200 acres and is home to the Toolik Field Station managed by the University of Alaska Fairbanks. The Toolik Field Station is one of the premier arctic field stations of the United States, with a history of long-term, continuous research that extends back almost 40 years. Work by scientists at Toolik Field Station begun in 1975 has resulted in much of what is known about the structure and function of the terrestrial and aquatic ecosystems of the arctic foothills and tundra, the effects of climate change in these regions, and feed backs through gas and hydrological fluxes to global climate. In addition, work based out of the field station has resulted in a showcase of discoveries on the adaptations of plants and animals to the Arctic and to population-level changes in distributions and the physiology and phenology of life history traits. Much of the research currently being done near the Toolik Field Station is either explicitly of a long-term nature or could serve as a crucial baseline for

future studies of effects of land use and climate change if the local environment is preserved for research. The area around the field station has been chosen as the arctic site for the National Ecological Observatory Network, an upcoming program of ecological observation that is funded by the National Science Foundation and expected to last for 30 to 50 years.

The Toolik Field Station is a national facility, which is used by many researchers. From 2009 to 2012, in each year between 456 and 533 different scientists, staff, and contractors have worked out of the station, conducting and supporting scientific research in the area around the station. In each year, these scientists come from up to 109 different institutions from around the country, and are working on up to 81 different funded research projects. More than 879 scientific publications have resulted from work based at the station. Research around Toolik Field Station is a major activity, at present and in the future.

Designation of the land around the Toolik Field Station as a RNA has been very important in assuring the integrity of the long-term research originating with scientists working out of the station, and gives scientific research a seat at the table when other land uses are being discussed.

Because of the expansion of long-term research programs beyond the current boundaries of the RNA, the Toolik Field Station Management Team submitted a nomination to expand the current RNA primarily eastward, with a small extension south to the area just north of the Atigun River along the Dalton Highway, as shown in Figure 2.19. There are more than 14,000 scientific research plots in the vicinity of Toolik Field Station, and the proposed expansion of the RNA would pick up most of the current research plots that are on BLM-managed land in the vicinity. The expanded RNA as proposed by the Toolik Field Station Management Team would encompass approximately 107,800 acres.



This map displays the existing Toolik Lake Research Natural Area and changes to the boundary proposed by the Toolik Field Station Management Team

Figure 2.19. Proposed Expansion of the Toolik Lake RNA

Galena Mountain ACEC (boundary adjustment)

The Galena Mountain Caribou Herd inhabits the Koyukuk Flats and Kokrines Hills north of the Yukon River and the village of Galena. In 1986, the record of decision for the Central Yukon RMP designated an ACEC composed of two subunits to protect crucial caribou habitat. The current boundaries for these subunits reflect areas this caribou herd traditionally uses as calving grounds. The herd size is approximately 125 animals and is currently in decline due to low calf survival and recruitment. The BLM recommends that the ACEC boundaries be expanded to include BLM-managed lands within the core range of the Galena Mountain herd. The adjusted ACEC boundary would include approximately 671,000 acres.

The expanded area would meet ACEC relevance criterion for a fish and wildlife resource and ACEC importance criterion because this crucial caribou habitat has qualities that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, and vulnerable to adverse change.

Tozitna North and South Subunits ACECs (boundary adjustment; ACEC name change)

The Ray Mountain Caribou Herd inhabits the Ray Mountains and southern Kanuti Flats between the Yukon and Koyukuk Rivers. In 1986, the record of decision for the Central Yukon RMP designated two ACECs to protect crucial caribou habitat: Tozitna North ACEC and Tozitna South ACEC. These areas were identified as being traditionally used as calving areas by the Ray Mountains herd based on the location data available at the time the plan was written. However, subsequent data acquired through regular radio-tracking efforts by the BLM and ADFG suggest that calving occurs in a much broader area. Expanding the ACEC boundaries to include additional BLM-managed land and both Tozitna North and Tozitna South ACECs would both simplify management of this crucial caribou habitat, and more accurately reflect important calving grounds for the Ray Mountains herd. The adjusted ACEC boundary would include approximately 923,000 acres.

In total, three ACECs were designated in the Ray Mountains in 1986 by the record of decision for the Central Yukon RMP: Tozitna River, Tozitna South, and Tozitna North ACECs. The similarity of these names creates confusion when referencing them. Therefore, it is recommended that the area designated to protect Ray Mountains caribou habitat including the current boundaries for Tozitna North ACEC and Tozitna South ACEC be renamed the Ray Mountains ACEC, to clearly distinguish it from the Tozitna River ACEC.

The Ray Mountains ACEC would meet ACEC relevance criterion for a wildlife resource. It would also meet the ACEC importance criterion as this crucial caribou habitat and caribou herd have qualities that make them fragile, sensitive, rare, irreplaceable, exemplary, unique, and vulnerable to adverse change.

Sukapak Mountains and Dillon Mountain

In 1991, the record of decision for the Utility Corridor RMP designated 3,500 acres as the Sukakpak Mountain ACEC to protect unique geologic structures, folds, and faults; view of the geologic process of mountain building and erosional forces; rare plant species; and one of the more outstanding scenic views along the Dalton Highway corridor.

The ACEC lies entirely within BLM-managed lands. Since approval of the Utility Corridor RMP, Native and state land selections immediately east of Sukakpak Mountain have been conveyed and the State of Alaska has top-filed the Utility Corridor.

The BLM has operated an interagency visitor center in Coldfoot from 1989 to the present and kept visitor statistics. While freight-hauling by truck is still the primary use, the scenery and wildlife along the highway corridor have grown in importance as resources valued by the public. The Dalton Highway corridor is increasingly seen and marketed globally as a unique Alaskan destination. More visitors, using more commercial tour operators, are visiting in the fall, winter, and spring for aurora-viewing and winter scenery. During the 2013-2014 season, the BLM had under permit 12 operators conducting tours along the Dalton Highway, of whom five conducted winter trips as well (K. Egger, pers. comm.).

In the broad Dietrich and Bettles River valleys along the highway, timberline is at an elevation of only about 1,200 feet, and the view from the highway is largely unobstructed by tall trees. Sukakpak Mountain, (elevation 4,459 feet) with its unique shape and distinctive northward-pointing horn, stands apart from the surrounding mountains and draws the eye for miles in either direction. Its western wall is a sheer, vertical face towering 3,060 feet above the highway, slightly less than El Capitan in Yosemite Valley. The clear water of the Bettles River flowing along the northeast flank of the mountain adds to the overall scenic beauty.

The Dalton Highway Scenic Byway Corridor Partnership Plan (Alaska Department of Transportation and Public Facilities 2010) identifies Sukakpak Mountain as "a dominant feature along this stretch of the highway, a massive marble rock rising from the earth." In its Intrinsic Quality Assessment, the Byway Plan identified Sukakpak Mountain for both its scenic and natural qualities, calling it "… one of the most recognized Brooks Range peaks viewable from the byway."

To protect more of this spectacular view for highway travelers, we recommend that the boundary of the Sukakpak Mountain ACEC be adjusted to include all BLM-managed lands extending west to the highway right-of-way in Townships 32 N., R. 10 W., FM and south to a line along the southern border of Sections 25 to 29 (approximately Dalton milepost 200.5 and across peak 2929); and in Townships 33 N., R 9W., and 33 N., R. 10W., FM from the Inner Corridor to far north as the southern border of Section 12, T.33N., R.10W., FM and Sections 8 and 9 T. 33N., R. 9W., FM (approximately Dalton milepost 210).

This adjustment would also protect the scenic view of Dillon Mountain, a massive rugged Skajit Limestone mountain of high scenic quality (A). Dillon Mountain is a spectacular 4,820-foot peak on the opposite side of the Bettles River from Sukakpak Mountain. Together, these two peaks form a breathtaking view, even by Alaska standards.

Extending the boundary to the highway right-of-way will also protect the frost mounds (palsas) that border the highway on the western slope of Sukakpak Mountain. These permafrost features are unusually abundant here. Some are ephemeral, appearing and melting in one or more seasons, and some are more stable and long-lasting. Brown and Krieg (1983) describe the mounds and their vegetation in detail with the calcareous fens between the mounds supporting a rich flora that is distinct from the tops of the mounds or the nearby forest. The frost mound area supports at least one plant species, *Arenaria longipedunculata* or longstem sandwort, identified as rare (Lipkin and Parker 1995) and the ACEC description from the RMP identifies another, *Orthotrichum diminutivum*, a bristle moss. Further research may show that the area between the highway and the base of Sukakpak Mountain is an exemplary example of the frost mound-fen ecosystem.

This boundary adjustment would add approximately 15,000 acres to the ACEC for a total of 18,500 acres. The expanded ACEC would meet ACEC relevance criteria for a significant scenic value and a natural process or system including rare plants or plant communities, or rare geological features, and ACEC importance criteria of more than locally significant qualities and qualities or circumstances that make it exemplary and vulnerable to adverse change.

2.3.1.3.2. Nominated New ACECs

The following areas have been nominated as new ACECs, and they will be evaluated to determine if they meet the criteria for ACEC designation. Additional ACEC nominations from the public are anticipated, thus this document is not inclusive of all nominations.

Nutirwik Creek – High scenic quality (A) along the Nutirwik Creek to the headwaters. Wide floodplains with narrow stream channel, major outcropping of the Skajit Limestone on Table Mountain. Two seasonal high waterfalls at the headwaters.

Klikhtentotzna Creek (tributary to the upper Hogatza River) — for its high-value summer chum salmon spawning habitat. Based on an aerial escapement survey conducted by BLM in 1996, the number of summer chum salmon spawning in Klikhtentotzna Creek is on par with that of Clear and Caribou Creeks (Hogatza River ACEC), two streams recognized as providing high-value spawning habitat to summer chum salmon habitat within the Koyukuk River Basin (Barton 1984; Holder and Senecal-Albrecht 1998).

During the survey of Klikhtentotzna Creek on July 12, 1996, observers documented 11,690 chum salmon. In comparison, a survey of Clear and Caribou Creeks a day later documented 16,620 and 10,470 respectively. The estimated BLM-managed acreage proposed for this ACEC is 107,963. This ACEC could be separate or combined with the existing Hogatza River ACEC (described previously).

Wheeler Creek (tributary to Dakli River) – Aerial escapement data for Wheeler Creek indicate that this stream provides high-value spawning habitat to summer chum salmon. Counts conducted in 1976, 1980, 1983, 1991, and 1995 were 7,564; 5,544; 8120; 7,801; and 15,843 respectively (ADFG aerial survey database). The BLM-managed portion of this proposed ACEC is 143,069 acres (this acreage estimate includes the watershed area within the planning area and upstream from the Koyukuk National Wildlife Refuge).

Teedriinjik (Chandalar) River — The Teedriinjik (Chandalar) River is recognized as providing a significant contribution to the overall Yukon River Basin Chinook salmon stock and is considered to be one of the more productive Chinook salmon streams within the U.S. portion of the Yukon River (Eiler et al. 2006). Based on estimates derived from the distribution of radio-tagged Chinook, Eiler et al. (2006) found the contribution of the Teedriinjik (Chandalar) River to be 4 percent of the overall Yukon River Chinook salmon stock. This is on par with the Chena, Salcha, and Goodpaster Rivers, which are recognized as some of the more productive streams within the U.S. portion of the Yukon River (Eiler et al. 2006). The Teedriinjik (Chandalar) River also provides habitat to the largest population of fall chum salmon in the Yukon River basin, with the number of spawners often accounting for 25 to 30 percent of the Yukon River fall chum salmon run (JTC 2012; Melegari 2012).

The BLM currently manages about 14 miles of the Teedriinjik (Chandalar) River extending from the confluence of the East Fork of the Chandalar, upstream to the mouth of Schilling Creek.

The estimated acreage of the proposed ACEC is 294,723.

Sethkokna River – In the early 2000s, two major multi-year projects were conducted within the Yukon River Basin. One of these projects, the Salmon Production Habitat Survey, was conducted by BLM in cooperation with ADFG and involved systematic trapping (using minnow traps) and aerial surveys of all BLM-managed streams or portions of streams not previously documented in the State's anadromous waters catalog. The other project was the Yukon River salmon radio telemetry project, which was a multi-agency effort initiated in 2000 by the ADFG and the National Marine Fisheries Service (Spencer and Eiler 2004; Eiler et al. 2006). The results of both projects documented Chinook salmon spawning in the Sethkokna River and both projects found that the Sethkokna River is the primary producer of Chinook salmon within the Nowitna River drainage (R. Brown USFWS, pers. comm. and BLM unpublished data). In 2014, the BLM conducted an aerial survey of the Sethkokna River to document the number and location of adult Chinook salmon spawning in the system. Ninety-eight Chinook and forty Chinook redds were observed during the survey. These results, although not representative of the true number of salmon that spawn within the drainage, do indicate that the Sethkokna River is a primary producer of Chinook salmon within the Nowitna River drainage.

The watershed area within the planning area is 303,985 acres of which 98 percent is under BLM management. The area proposed for this ACEC is 298,174 acres.

Accomplishment Creek ACEC (tributary to Sagavanirktok River) – The Accomplishment Creek drainage is unique because it is one of a small number of streams flowing into the Arctic Ocean that provides reliable ground water flow through the winter. The spring areas that exist in Accomplishment Creek and its tributary, Section Creek, are essential to the survival of Dolly Varden, a species sought as a subsistence and sport fishing resource. Conditions at the springs provide spawning habitat and allow eggs to incubate and hatch, and provide an overwintering refuge for all age classes of fish from eggs to adults.

Fisheries work that BLM conducted in the summer of 2012 found juvenile Dolly Varden inhabiting the braided sections of Accomplishment and Section Creeks. Tagging studies have shown that Dolly Varden caught at Kaktovik for subsistence use reside in several North Slope rivers; including streams (i.e., Accomplishment Creek) in the Sagavanirktok River drainage (Craig 1989b). Visitor use of the Dalton Highway corridor is also increasing with improved road conditions. As a result, populations of Dolly Varden will continue to come under increased sport fishing pressure from anglers accessing the Sagavanirktok River drainage via the Dalton Highway corridor.

The BLM-managed portion of this proposed ACEC is 40,956 acres. The upstream (eastern) edge of this watershed area borders the Arctic National Wildlife Refuge.

South Fork Koyukuk River ACEC –The South Fork (S.F.) Koyukuk River provides habitat to a significant number of Chinook salmon and chum salmon. In 1990, the USFWS operated a sonar project to estimate the number of chum salmon. The sonar project was located 1.2 miles downstream from the confluence of the S.F. Koyukuk River and Fish Creek. Chum salmon escapement at the conclusion of the project was estimated at 19, 485 fish (Troyer 1993). A follow-up study conducted by the USFWS in 1996 and 1997 used a resistance board weir located 1.2 miles upstream of the confluence of Fish Creek to count fish. This project estimated chum salmon escapement at 37,450 (1996) and 11,237 fish (1997). The estimate in 1997 was incomplete due to high water (Wiswar 1998). Chinook salmon escapement for 1996 and 1997 was estimated at 1,232 and 1,643 fish, respectively (Wiswar 1997 and 1998). Spawning concentrations are

known to exist near the confluence of the Jim River (Barton 1984), however, the State's *Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes* (ADFG 2014 {webpage}) documents both Chinook spawning and rearing and chum salmon spawning as far upstream as the Mosquito Fork. The watershed area within the planning area is 1,468,491 acres of which 57.1 percent is under BLM management. The area proposed for this ACEC is 673,491 acres (45.9 percent of the watershed) and does not include the Jim River as the Jim River ACEC is addressed separately.

2.3.2. Central Arctic Wilderness Study Area

The planning area includes the Central Arctic Management Area commonly referred to as CAMA. Section 1001 of ANILCA directed the BLM to conduct an interdisciplinary study of natural resources on the federal lands within CAMA. Section 1004(a) directed the Secretary to review the suitability or nonsuitability of these lands for preservation as wilderness. The findings and recommendations of this interdisciplinary study are found in the *ANILCA Section 1001 Report Findings and Recommendations*, which was submitted to Congress in 1988. The ANILCA 1001 report serves as the Wilderness Study report required by the BLM's wilderness study process.

American Rivers and several other conservation organizations filed a lawsuit after the 1991 ROD was issued for the Utility Corridor RMP. This suit included a claim challenging the BLM's interpretation of the wilderness management requirements in sections 1001 and 1004 of ANILCA. In an August 1993 settlement agreement, the BLM agreed to manage lands west of the Killik River in a manner that would protect its wilderness values until Congress acts on the wilderness recommendation. These lands are the CAMA Wilderness Study Area (WSA). The ANILCA 1001 report finds the 41,000-acre Upper Nigu River area suitable for inclusion in the National Wilderness Preservation System, while other lands in the WSA were found nonsuitable.

Originally, CAMA included more than 3 million acres. Section 1001(f) of ANILCA states that "Nothing in this Title [Title X] shall be construed as impeding, delaying, or otherwise affecting the selection and conveyance of land to the State pursuant to the Alaska Statehood Act, or any other Federal law referred to in Section 102(3)(A) of this Act..." Therefore, land conveyance has been ongoing, and much of the CAMA has been conveyed to the State or Native corporations. Within the WSA, approximately 260,060 acres remain under BLM management. The BLM is likely to retain the 41,000-acre Upper Nigu River block, as none of the lands in this parcel are selected.

The CAMA WSA will continue to be managed consistent with BLM Manual 6330 *Management of BLM Wilderness Study Areas* and ANILCA until Congress acts on the wilderness recommendation or releases these lands from consideration for designation. Additionally, the WSA is part of the BLM's National Landscape Conservation System.

2.3.3. Wild and Scenic Rivers

As part of the planning process, the BLM identified all rivers on BLM-managed lands in the planning area that possess free-flowing condition and have at least one "outstandingly remarkable value," and therefore, may have potential for addition to the National Wild and Scenic River System (BLM Manual 6400, BLM 2012a).

Current Condition

All of the waterways in the planning area are free-flowing and many likely have attributes that qualify as outstandingly remarkable values as defined by the Wild and Scenic Rivers Act. These values are defined as scenic, recreational, geologic, wildlife, fish, cultural (prehistoric/historic), botanic/ecologic, and hydrologic/water quality.

Currently, no rivers in the planning area are managed to specifically protect and/or enhance free-flowing condition, water quality, and identified outstandingly remarkable values. There are no congressionally-designated Wild and Scenic Rivers or study rivers in the planning area.

Sec. 604 of ANILCA designated two rivers in the planning area for study, the Melozitna and the Yukon-Ramparts Segment. The NPS completed a study report on the Melozitna in 1982, which found that the river was not qualified because it lacked outstandingly remarkable values. The NPS completed a study report on the Ramparts segment of the Yukon River in 1984 and determined that this segment was not suitable due to lack of support by the affected Native corporations and the State of Alaska.

The BLM has to complete a baseline inventory of eligible rivers and assign a tentative classification (wild, scenic, or recreational). An inventory of rivers in the planning area is underway to determine eligibility for inclusion in the Wild and Scenic River System. Input from agencies, organizations, and individuals who are familiar with the resource is gathered through the scoping process and from cooperating agencies. The complete inventory process and results will be published and made available to the public. Additionally, a summary of the inventory results will be included as an appendix to the Draft RMP/EIS.

Indicator

In general, rivers are eligible if:

- They meet certain minimum thresholds of naturalness, and
- Possess at least one natural and/or cultural feature judged as "outstandingly remarkable" (see below) and which is directly related to the river itself (that is, contributes to the functioning of the river ecosystem, or owes its existence or location to the river).

A river does not need to be boatable or floatable. Rivers with intermittent flows can be considered.

Outstandingly remarkable values include:

- Scenic
- Recreational
- Geologic and/or hydrologic
- Fish and wildlife
- Botanic/ecological
- Cultural (archaeological or historic)
- Other values

The outstandingly remarkable values must be river-related and be unique, rare, or exemplary at a regional or national scale. River-related means that the values:

- Contribute substantially to the functioning of the river ecosystem, or
- Owe their location or existence to the presence of the river.

2.3.4. Backcountry or Scenic Byways

The BLM's Byways Program, established in 1989, is a component of the National Scenic Byways Program. BLM State Directors designate BLM backcountry byways on BLM-managed public lands. There are currently no BLM-designated backcountry byways in the planning area.

BLM's Byways Handbook, 8357-1, 1993, provides specific direction for the BLM's backcountry byways program, including information on byways nomination and designation, planning criteria, and visitor safety. Unlike most scenic byways, which are located on paved highways, backcountry byways focus on the out-of-the-way sights to be found on gravel, dirt, or paved roads. These are routes that may not be suitable for all vehicles. There may be winter trails within the planning area suitable for designation as type IV backcountry byways and managed specifically to accommodate snowmobiles.

The Dalton Highway was designated a State Scenic Byway in 1998. Administered by the Alaska Department of Transportation and Public Facilities, the State Scenic Byways Program recognizes routes that provide access to the state's significant scenic, cultural, and recreational resources. The Dalton Highway Scenic Byway Corridor Partnership Plan was approved in 2010.

2.3.5. Iditarod National Historic Trail

Congress designated the Iditarod National Historic Trail in 1978, in recognition of its significance as a scenic, recreational or historic transportation route. The Iditarod Trail was specifically designated for its historic importance. The BLM was officially delegated administrative oversight.

The Iditarod National Historic Trail retraces a winter Gold Rush trail network connecting Seward in southcentral Alaska to Nome in northwest Alaska via the Iditarod gold mining district. The 938 mile main winter trail between Seward, Iditarod, and Nome was established by users and the Alaska Road Commission on existing native Alaskan trails during the 1900s and 1910s. Branching from the main route are hundreds of miles of paralleling, connecting, and side trails that also played an important role in the historic Gold Rush, and are included as part of the National Historic Trail System.

The Iditarod National Historic Trail was principally a winter trail. Many parts of the trail were passable only in the winter and used frozen rivers. The trail crossed huge expanses of tundra, which were almost completely impassable during summer months when the permafrost thawed. The trail south of Knik was used year-round.

Most of the 30 connecting trails are on the southern and central portions of the trail. The central portion of the trail crosses the Central Yukon Planning Area. Connecting trails in the central part of the Iditarod Trail went as far south as Anvik on the Yukon River and as far north as Koyukuk on the Koyukuk River. The trails connected towns and mining camps to the main route.

The Iditarod Trail passes through the boundaries of different government-managed lands, administrative units, and Native corporation lands. The BLM has determined that 19.1 percent of the Iditarod Trail passes through federal land, 52.4 percent through State land, 28.4 percent through Native land, and 3.5 percent crosses waterbodies (BLM 1997). In 1977, less than 0.5 percent of the trail crossed private land (BOR 1977). The land managers include the Kenai Peninsula Borough, Chugach National Forest, Chugach State Park, Municipality of Anchorage, Matanuska-Susitna Borough, Cook Inlet Region Incorporated, the Iditarod Regional

Educational Attendance Area, the Innoko National Wildlife Refuge, the BLM (Anchorage Field Office), the Yukon-Koyukuk Regional Educational Attendance Area, Doyon Limited Regional Corporation, the Bering Straits Regional Educational Attendance Area, and the Bering Straits Native Corporation.

It is estimated that between 400 and 500 miles of the Iditarod National Historic Trail System lies within the currently proposed Central Yukon Planning Area. At the section-level view of generalized land status, only 1.5 miles of the trail lies on BLM-managed land; this portion of the Ruby-Kaltag Connecting Trail (NUL-00066) crosses a small block of State-selected land located approximately 6 miles northeast of the village of Koyukuk. A detailed analysis of land status may identify additional small parcels of BLM-managed land crossed by segments of the Iditarod Trail within the planning area.

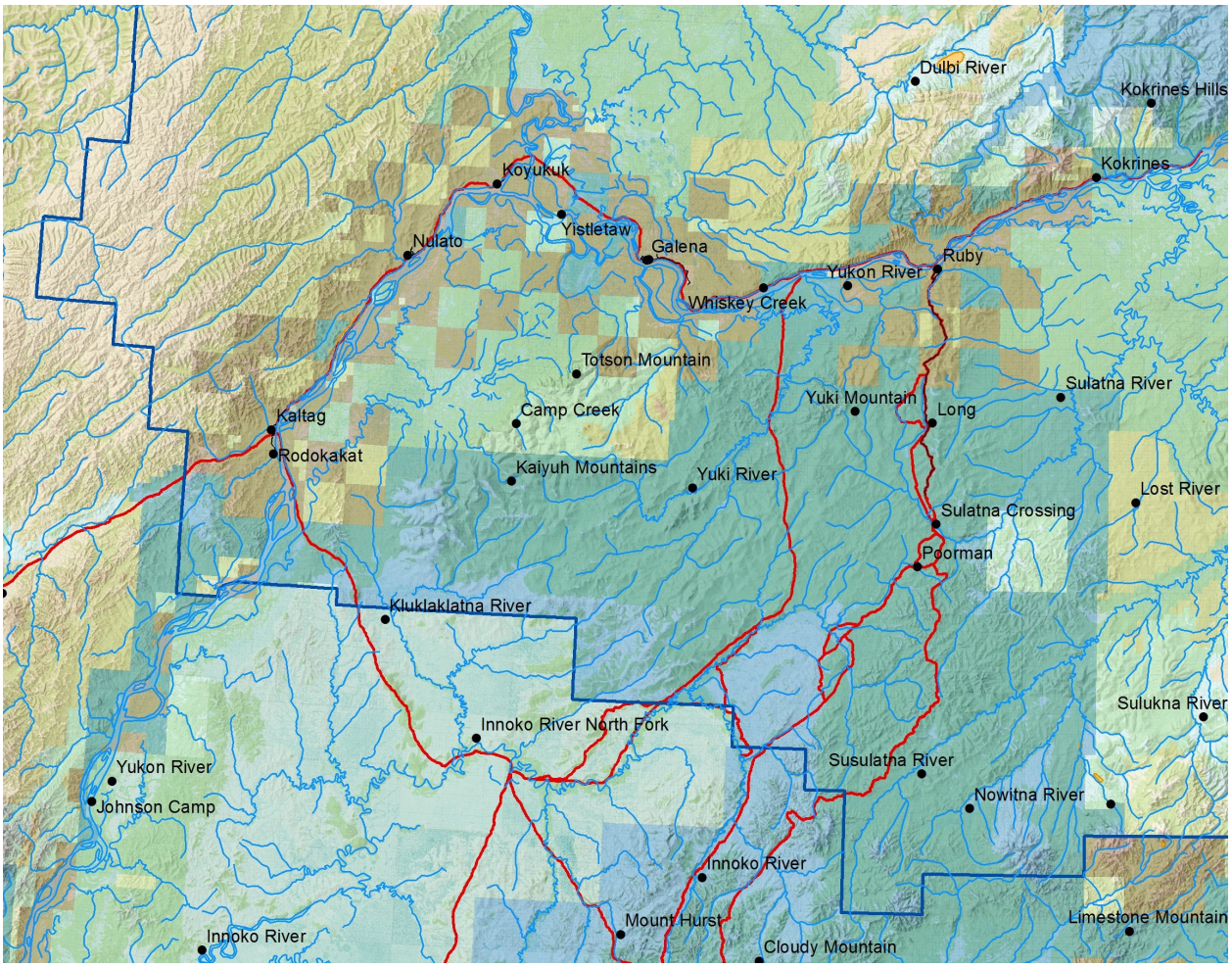


Figure 2.20. Iditarod Trail System within the Central Yukon Planning Area.

2.4. Social and Economic

2.4.1. 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 2005a). 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 socio-economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

In addition to determining if its proposed actions will 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 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 will work with local community groups/associations, governments, and tribal leaders to determine if land disposition and/or acquisition policies affect real estate values and real income of minority and low-income communities, and tribes.

2.4.1.1. 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 Fairbanks Field Office will initiate government-to-government consultation with federally recognized tribes in the planning area. Such consultation will be in compliance with the Department of Interior's Alaska Policy on Government-to-Government Relations with Alaska Native Tribes, dated January 18, 2001. 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

2.4.1.2. 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 United States, a total of 14.3 percent of the population lives below the poverty level; the comparable estimate for the State of Alaska is lower, at 9.6 percent (http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF).

For the Central Yukon RMP, any community having a poverty rate greater than 9.6 percent in terms of the number of individuals below the poverty rate will be considered a low-income community. As a result, 18 of the 30 communities within the planning area or that could be affected by the plan are considered low-income (Table 2.31).

2.4.1.3. 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: (1) a minority population exceeds 50 percent of the population of the affected area; or (2) 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. [2]

As shown in Table 2.29, 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, we took a closer look to see if the proportion would increase when also considering people who reported being more than one race. However, the proportion increased only 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), only 9 of the 30 communities are **not** considered to be environmental justice communities: Wiseman, Coldfoot, Bettles, Anderson, North Pole, Big Delta, Delta Junction, Healy, and Fairbanks. All of the other

[2]The meaningfully greater analysis is generally used to make sure that no areas of minority populations are omitted if the 50 percent threshold does not identify any environmental justice populations.

communities are subject to environmental justice considerations because of their minority status and/or their poverty status.

Table 2.29. Minority 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]7 percent part Alaska Native

2.4.2. Subsistence

Subsistence is an integral part of life in Alaska. The term subsistence uses refers to the customary and traditional uses by rural 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 non-edible byproducts of fish and wildlife resources taken for family or personal consumption; for barter, or sharing for personal or family consumption; and for customary trade. ANILCA was signed into law by President Carter on December 2, 1980, and established conservation and allocation mandates for subsistence uses of fish and wildlife and other renewable resources by rural residents on federal public lands in Alaska. Subsistence, as used in this document, refers primarily to the federal program as set forth under Title VIII of

ANILCA (Subsistence Management and Use). The State of Alaska similarly defines subsistence as the customary and traditional uses of wild resources for food, clothing, fuel, construction, art, sharing and trade. However, under the State constitution, all residents of Alaska are considered eligible subsistence users. This document does not encompass discussion of subsistence under the State's definition.

The State of Alaska maintained responsibility for enacting and implementing Title VIII from 1980 to 1990. The Secretaries of Interior and Agriculture assumed management responsibilities for the mandates of Title VIII in 1990 after the Alaska Supreme Court ruled that it was in violation of the state's constitution (specifically the rural preference provisions). The case became known as *McDowell* v. *Alaska*, 785 P.2d 1, 10 (Alaska 1989). As a result, responsibility for management of wildlife, and fisheries in nonnavigable waters, on federally managed land in Alaska including National Conservation Units and federal public lands, was assumed by the Secretaries. The 1995 *Katie John* v. *United States* (95 C.D.O.S. 9660) decision on extension of federal subsistence management to include jurisdiction over navigable waters within and adjacent to National Conservation Units was implemented in 2001. The provisions under Title VIII of ANILCA provide for a continuation of the opportunity for subsistence uses by rural resident of Alaska. Section 810 (Subsistence and Land Use Decisions) requires that the head of the federal agency that has primary jurisdiction over public lands must evaluate the effects on subsistence for any withdrawal, reservation, lease permitted use, occupancy, or disposition of those public lands. If any of the above-listed actions are determined to significantly restrict subsistence uses, ANILCA section 810 requires the agency to minimize adverse impacts upon subsistence uses and resources and comply with a number of procedural requirements to proceed with the proposed action.

ANILCA further provides that the taking on public lands of fish and wildlife for non-wasteful subsistence uses shall be accorded priority over taking on such lands for other purposes. When necessary to restrict taking to assure the continued viability of a fish or wildlife population or the continuation of subsistence uses of such populations, section 804 outlines criteria that implement a subsistence priority through limitations on uses evaluated through the following criteria: (1) customary and direct dependence upon the population as the mainstay of livelihood; (2) local residency; and (3) the availability of alternative resources. This is often defined as a customary and traditional use determination, which can be applied when a need to restrict take is determined. The Federal Subsistence Board has determined that there is customary and traditional use of specific resources in some areas and only those communities or areas with a positive determination can participate in harvesting those resources for subsistence uses. In many areas, a customary and traditional use determination for specific resources has not been made, and therefore, all rural residents are eligible to participate in subsistence activities.

Each federal land management agency has a responsibility for providing the opportunity for rural residents engaged in a subsistence way of life to do so. Utilization of public lands in Alaska is to cause the least adverse impact possible on rural residents who depend upon subsistence uses of the land's resources (section 802). To carry out the responsibility for subsistence management, the Secretaries of the Interior and Agriculture established the Federal Subsistence Program, which is housed within Fish and Wildlife Service (Alaska Regional office). The Federal Subsistence Board, ten Regional Advisory Councils and interagency staff specialists comprise the program. The Federal Subsistence Board consists of the State or Regional Directors of the BLM, USFWS, NPS, Forest Service, Bureau of Indian Affairs, and a Chair from the user public representing the Secretary of Interior. The Federal Subsistence Board oversees the Federal Subsistence Management Program and sets bag limits, seasons, methods and means and other regulatory decisions after considering recommendations from the Regional Advisory Councils, biologists,

anthropologists, and land managers. The Regional Advisory Council region that overlaps with the planning area is the Western Interior and is referred to as the Western Interior Regional Advisory Council.

Section 811 ensures reasonable access by rural residents to subsistence resources on federal public lands. The appropriate use of snowmobiles, motorboats, and other means of surface transportation "traditionally employed for such purposes by local residents, subject to reasonable regulations" is allowed on federal lands, including lands within the DHCMA, where non-subsistence use of motorized vehicles is prohibited.

ANILCA does not define the meaning of rural resident. Rural means any community or area of Alaska determined by the Federal Subsistence Board as meeting the criteria of rural. Federal subsistence regulations, which apply only on Federal public lands, define a resident as a person who has their primary, permanent residence for the previous 12 months within Alaska. Factors demonstrating residence include voter registration, tax documents, and driver's license. A seasonal resident does not qualify. These definitions are codified in 50 CFR Part 100 and 36 CFR Part 242 and summarized in the annual Subsistence Management Regulations booklets. Federal lands, as defined by ANILCA, are "lands the title to which is in the United Sates after the date of enactment of this Act." Public lands are any lands situated in Alaska that are consistent with the definition for federal lands, but do not include valid land selections of the State of Alaska or selections made under the ANCSA.

Within the borders of the planning area, the Fairbanks North Star Borough was determined to be a predominately nonrural area and residents do not qualify as subsistence users. Residents of all other areas and communities are designated as federally qualified subsistence users. Twenty-six recognized villages are within or immediately adjacent to the planning area and qualify as rural: Nuiqsut, Umiat, Anaktuvuk Pass, Wiseman, Coldfoot, Bettles, Evansville, Alatna, Allakaket, Hughes, Huslia, Kaltag, Nulato, Koyukuk, Galena, Ruby, Poorman, Tanana, Lake Minchumina, Manley Hot Springs, Rampart, Minto, Livengood, Nenana, Anderson, and Healy.

Part or all of the following Game Management Units (Units) are within the planning area: Units 26, 25, 24, 22, 21, 20, and 19. Most BLM-managed lands within the planning area are in Units 26B, 24, 21, and 20. Each Unit has multiple species and multiple populations with varying population dynamics. Additionally, varying degrees of commercial, sport, and subsistence use occurs within the planning area and inter- and intra-community competition for limited subsistence resources is often an issue. See the Wildlife, Fisheries and Vegetation sections of this report for descriptions of wildlife, fish, and vegetation in the planning area.

2.4.2.1. Indicators

BLM policy directs the agency to incorporate its Alaska Land Health Standards and Guidelines in land use plans and land management decisions and use the standards and guidelines to develop specific objectives and outcome indicators in the plans (IM-AK-2004-023). There are five standards by which the diversity and ecological health of BLM-managed land is measured, including a locally important species standard.

The document provides indicators that help evaluate whether the standard is being met. The indicators include physical and biological elements that describe a healthy ecosystem.. Success indicators are relative for any given landscape, but are based upon an ability to provide the essential habitat elements for plant and animal species, populations, and communities. The BLM

uses these indicators to monitor resource trends toward or away from the standard. Traditional knowledge of an area can also provide information on historic and current trends.

The goal for the locally important species standard is to ensure that habitats support healthy, productive, and diverse populations and communities of native plants and animals, including those used for subsistence. Species of local importance is defined as species of significant importance to Native American populations (e.g., medicinal and subsistence plant and animals).

The desired condition (objective) for this standard is that habitat elements essential for those species, populations, and communities are present and available to the extent they are consistent with the potential/capability of the landscape. Indicators of successfully meeting the standard include: species composition, distribution, productivity and population trends, population stability and resilience, habitat distribution, connectivity and structure, and fire history.

IM-AK-2004-023 provides guidelines for achieving objectives and fulfilling the fundamental physical and biological attributes that define land health. These guidelines offer guidance for managing public lands that will help meet current and anticipated climatic and biological conditions while considering cultural and local economic needs. For example, management practices will consider protection and conservation of plant and animal populations of significance; fish and wildlife will be maintained and protected; and the habitat needs of fish and wildlife resources necessary to maintain or enhance such populations will be provided.

Implementing guidelines that maintain ecosystem health satisfies the requirements of ANILCA Title VIII: to provide continued opportunity for rural residents to engage in a subsistence way of life; and to utilize public lands in Alaska in ways that will cause the least adverse impact possible on rural residents who depend on subsistence uses of resources on public lands.

2.4.2.2. Current Condition

Several important subsistence resources are found within 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. BLM-managed lands occur in large tracts in Units 24, 21, and 20.

Current subsistence harvest levels of wildlife, fish and other resources in the planning area are sustainable. Although it is difficult to measure, based on discussions at Western Interior Resource Advisory Council and other meetings, subsistence needs by rural residents in the planning area are not being met, particularly for salmon, moose, and sheep. The DHCMA is accessible by non-subsistence bow hunters from the Dalton Highway. Lands outside the DHCMA are accessed from the road as well. Harvest pressure on the most accessible areas can be very high from subsistence users and other hunters. Currently, the BLM, the Federal Subsistence Board, and rural residents in the planning area, in partnership with other federal agencies and ADFG, provide for harvest quotas of some subsistence resources at threshold levels, which are determined jointly and based on past use by rural residents. Threshold levels are those at which the Federal subsistence user is able to harvest the minimum resources to reasonably subsist.

2.4.2.3. Trends

Harvest pressure by subsistence users in the planning area has remained consistent, with some fluctuations over the 34 years since ANILCA was passed. Census data indicate that most

populations in the rural areas have not changed significantly, and changes are not great enough to substantially affect pressure on subsistence resources. Census records for rural areas range from 1 year of data (Chicken and Livengood) to 12 years of data (Fort Yukon). The average number of census data points for rural areas is 6 years.

Subsistence users target the same resources as other user groups, including nonrural residents. Fairbanks and the Fairbanks North Star Borough have grown steadily since population census for the area began. Since 1950, Fairbanks has increased by 556 percent (5,771 to 32,070 in 2012) and the Fairbanks North Star Borough by 517 percent (19,409 to 100,343). Many nonrural residents in the Fairbanks North Star Borough and other parts of the state harvest fish, wildlife, and other resources in the same areas as do subsistence users. Trends in abundance and distribution of subsistence resources have been variable. This is discussed in more detail in the Key Features section below and in section 2.1.8 Wildlife.

Dall sheep are an important subsistence resource in the Central Brooks Range (Units 24A and 26B), specifically for the communities of Wiseman and Coldfoot. These sheep populations are accessible from the Dalton Highway by non-subsistence bow hunters within the DHCMA and rifle hunters outside the DHCMA. Road-accessible sheep populations in the state are rare, making this area popular for sheep hunting because access is relatively inexpensive. Hunting guides also use this area for commercial guiding of non-resident sheep hunters. This activity has resulted in user conflict in recent years as non-subsistence hunting activity in the area has increased. Rural residents have expressed frustration over low hunter success rates for sheep in the DHCMA, and cite guided hunting activity and non-subsistence hunting as causes for difficultly procuring sheep as subsistence users. User conflict will continue to be a problem if non-subsistence sheep hunting increases.

2.4.2.4. Forecast

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. In this section, possible changes in resource availability and use are considered given the current resource management situation. Stochastic events such as severe winters and climate shifts, and changes in demand for allowable land uses such as increased gold mining activities spurred by favorable gold prices can affect resource distribution and availability.

The price of fuel affects the level of participation in subsistence activities, as gas prices influence how far rural residents can afford to travel to harvest resources, but also increases the cost of bringing groceries and other resources to remote communities. Rural residents may concentrate harvest pressure in local areas to reduce fuel usage while continuing to offset the cost of importing groceries to the communities, especially those not connected by road. Fuel prices can be several dollars per gallon higher in rural areas than in Fairbanks and along major highways.. If construction of a road from the Dalton Highway to Ambler is completed, the communities of Bettles, Evansville, and potentially Alatna and Allakaket would become connected to the road system. This could potentially reduce the price of fuel and cost of supplies in these communities, and increase the ability to harvest resources farther from these communities. If construction of the road to Ambler goes forward, it has the potential to open up areas on the south side of the Brooks Range to non-subsistence consumptive use and access, including two Conservation System Units within and immediately adjacent to the planning area: Gates of the Arctic National Park and Kanuti National Wildlife Refuge. These areas are traditionally used by rural residents of the villages of Bettles, Evansville, Allakaket, and Alatna. Game populations relied upon by

subsistence users, particularly moose and caribou, could be adversely affected by increased use. There is concern that the road to Ambler would alter the migration of the Western Arctic Caribou Herd (WACH). The planning area is at the outer range of the WACH winter range. The herd uses the area sporadically, but residents of the area depend heavily on caribou as a subsistence resource. If the road changes the migration, these residents could be impacted. The construction of the road to Ambler and associated increase in fuel and facilities needs could also result in a population increase in Bettles. 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.

2.4.2.5. Key Features

Eleven caribou herds range within the planning area at least seasonally. Of these herds, the Western Arctic, Teshekpuk, and Central Arctic are important subsistence resources for communities in the planning area, and frequently use BLM-managed lands. There are a number of federal (subsistence) and state moose hunts in the planning area. A detailed discussion of caribou and moose is included in section 2.1.8 Wildlife.

Numerous streams and rivers support fish populations that provide important subsistence resources for communities both in and near the planning area. A detailed discussion of fish and aquatic resources is found in section 2.1.7 of this document.

2.4.3. Social and Economic Conditions

The preceding section described subsistence lifestyles in planning area communities and the opportunities associated with BLM-managed and other lands. In the planning area, as elsewhere in rural Alaska, subsistence use is an integral part of both social and economic conditions and typically the aspect of communities most closely tied to BLM-managed lands.

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. However, the majority of the planning area does not fall within any of these boundaries, so a description of social and economic conditions at the borough/census area level could be misleading. Lumping the communities together for description would also be misleading, because the data would be dominated by the population in the Fairbanks area. Instead, we will describe social and economic conditions in the 30 communities that are located in the planning area or that could be affected by the new RMP. Of these communities, 14 are unincorporated, 11 are second class cities, two are first class cities (Galena and Tanana), and 3 are home rule cities (Fairbanks, Nenana, and North Pole).[3] In addition to the communities, boroughs, tribes, and village and regional corporations, the Tanana Chiefs Conference provides a variety of social services to 18 of the communities (and to 24 other communities in its service region of about 235,000 square miles).

2.4.3.1. Population

As reported in the 2010 Census, about 42,000 people live in the 30 communities, with the vast majority (36,000) living in the Fairbanks area (Table 2.30). The population of the other 27 communities ranges from 10 (Coldfoot) to just over 1,000 (Healy). Between 1990 and 2012, the

[3]For definitions of the city types and Alaska's municipal government structure, see: http://commerce.alaska.gov/dnn/dcra/LocalGovernmentOnline/MunicipalGovernment/MunicipalGovernmentStructureinAlaska.aspx

population decreased in 18 of the communities. Several of the communities were once much larger in the past due to mining or other opportunities, and several, including Hughes, Huslia, Alatna, Allakaket, Galena, and Minto, were relocated in the past due to flooding.

Except for the greater Fairbanks area, two small communities on the Dalton Highway, and Bettles, the communities are predominantly Alaska Native, with 13 having a population in 2010 that was 90 percent or more Alaska Native (Table 2.30). These data are for people who reported in the Census that they were one race, which in most cases was the vast majority of the population.

Table 2.30. Population Characteristics of Central Yukon Planning Area Communities

City/Village	Census Area	Population 1990[a]	Population 2000[a]	Population 2010 [a]	Percent Alaska Native	Percent of people 25 and over high school graduate	Percent of people 25 and over with Bachelor degree or higher
Wiseman	Yukon-Koyukuk	33	21	14	0 (7% part Alaska Native)	na	na
Coldfoot	Yukon-Koyukuk	0	13	10	10	na	na
Bettles	Yukon-Koyukuk	36	43	14	14	na	na
Evansville	Yukon-Koyukuk	33	28	14	53	na	na
Rampart	Yukon-Koyukuk	68	45	24	96	na	na
Alatna	Yukon-Koyukuk	31	35	37	97	na	na
Allakaket	Yukon-Koyukuk	170	97	105	95	66	0
Stevens Village	Yukon-Koyukuk	102	87	78	85	54	0
Hughes	Yukon-Koyukuk	54	78	77	96	86	0
Huslia	Yukon-Koyukuk	207	293	275	92	78	2.3
Ruby	Yukon-Koyukuk	170	188	166	89	76	10
Galena	Yukon-Koyukuk	833	675	470	64	86	20
Tanana	Yukon-Koyukuk	345	308	246	87	84	20
Koyukuk	Yukon-Koyukuk	126	101	96	97	74	3
Nulato	Yukon-Koyukuk	359	326	264	94	81	11
Kaltag	Yukon-Koyukuk	240	230	190	92	87	12
Manley Hot Springs	Yukon-Koyukuk	96	82	79	13	84	27
Minto	Yukon-Koyukuk	218	258	210	90	72	5
Nenana	Yukon-Koyukuk	398	402	378	38	84	4
Ester	Fairbanks North Star Borough (FNSB)	147	1,680	2,422	7	93	37
Fairbanks	FNSB	30,843	30,224	31,535	10	90	20
North Pole	FNSB	1,456	1,570	2,117	3	89	19
Lake Minchumina	Yukon-Koyukuk	32	32	13	15	78	22
Anderson	Denali Borough	628	367	246	3	95	10
McKinley Park	Denali Borough	171	142	185	0	91	53
Healy	Denali Borough	487	1,000	1,021	2	84	21

City/Village	Census Area	Population 1990[a]	Population 2000[a]	Population 2010 [a]	Percent Alaska Native	Percent of people 25 and over high school graduate	Percent of people 25 and over with Bachelor degree or higher
Big Delta	Southeast Fairbanks Census Area	400	749	591	2	89	25
Delta Junction	Southeast Fairbanks Census Area	652	840	958	3	95	26
Anaktuvuk Pass	North Slope Borough	259	282	324	83	79	9
Venetie	Yukon-Koyukuk	182	202	166	92	47	5.5
Total Population		**38,776**	**40,398**	**42,325**			
Average		**1,293**	**1,347**	**1,411**	**52**	**81**	**15**

[a]Community and Regional Affairs, Alaska Department of Commerce, Community and Economic Development at http://www.commerce.state.ak.us/cra/DCRAExternal/Community

Table 2.31. Income and Poverty Characteristics of Central Yukon Planning Area Communities

City/Village	Population 2010	Per Capita Income ($) [a]	Median Household Income ($)[a]	Percent Households with Public Assistance Income [a]	Percent Persons in Poverty
Kaltag	190	14,103	23,000	60	25
Wiseman	14	na	na	na	0
Coldfoot	10	na	na	na	0
Bettles	14	45,050	94,583	na	0
Evansville	15	47,473	29,688	na	0
Rampart	24	27,200	73,750	na	0
Alatna	37	na	na	na	0
Allakaket	105	11,702	17,917	100	46
Stevens Village	78	13,320	20,000	83	51
Hughes	77	16,159	40,000	29	16
Huslia	275	10,820	29,167	74	38
Ruby	166	12,659	23,594	47	29
Galena	470	27,004	58,125	22	11
Tanana	246	21,133	45,179	51	13
Koyukuk	96	14,108	19,583	45	54
Nulato	264	15,803	29,861	61	25
Manley Hot Springs	89	25,682	31,750	41	40
Minto	210	12,383	30,179	96	20
Anderson	246	46,734	68,750	9	2
Nenana	378	27,815	59,583	43	20
Ester	2,422	33,668	80,102	9	18
Fairbanks	31,535	27,646	54,572	19	12
North Pole	2,117	32,128	71,250	11	6
Big Delta	591	20,708	47,500	9	7
Delta Junction	958	37,282	86,193	13	7
Healy	1,021	41,427	97,778	7	8
McKinley Park	185	27,765	46,528	0	22
Anaktuvuk Pass	324	18,936	47,143	50	7
Venetie	166	12,037	25,000	67	32
Lake Minchumina	13	na	na	0	13
Average		**$24,644**	**$48,107**	**39**	**17.4**

[a]Economic Profile System data from 2010 U.S. Census available at http://headwaterseconomics.org/tools/eps-hdt

In 19 of the 24 communities for which educational attainment data are available, 75 percent or more of the population over age 25 had a high school degree, and the rate was over 70 percent in two of the others (Table 2.30). In 7 communities, 20 percent or more of the population had a bachelor's degree or higher, with McKinley Park having the highest proportion (53 percent) and Ester the second highest (37 percent).

The number of housing units is generally related to population size, and the percentage of units that are vacant is generally low (Table 2.32). Some housing units are vacant because they are

only seasonally occupied. The proportion of houses with complete plumbing facilities (hot and cold piped water, a bathtub or shower, and a flush toilet) ranges from 0 in Rampart, Alatna, and Stevens Village to about 95 percent or more in Fairbanks, Evansville, Anderson, Big Delta, Delta Junction, and Healy. These compare to the Alaska average of about 88 percent and the national average of 97 percent.

As reported by the Department of Community and Regional Affairs, municipal facilities and utilities vary widely, with the larger communities providing more facilities; this information was not reported for the unincorporated communities (Table 2.32). Only six of the communities do not currently have schools; these were among the smallest in population size.

Kids Count Alaska, part of a nationwide program that collects information on childrens' well-being, found that in 2012, Alaska had among the highest rate (of all states) on five indicators: child and teen death rates, the proportion of children with no parent working full- time, year-round, percentage of teens not in school and not working, and teen birth rate. On other indicators, the State was among the average or highest on five other indicators, including percentage of children in single-parent families, percentage of teens not in school and not graduates, and percentage of babies with low birth weight (http://kidscount.alaska.edu/wp-content/uploads/2012/10/2012-KidsCountAlaska.pdf). Regional analysis found that many of the measures of child well-being were lower in rural areas of Alaska than in urban areas.

Table 2.32. Housing, Municipal Facilities, and Schools in Central Yukon Planning Area Communities

City/Village	Type	Number Housing Units[a]	Number housing units vacant [a]	% occupied housing units with plumbing [b]	Municipal Facilities and Utilities [a]	Schools, number of students [a]
Wiseman	Unincorporated	25	20	na[c]	Connected to Alaska road system via Dalton. A state-owned 2,000 foot by 30 foot gravel airstrip is available, but not consistently maintained	Closed in 2002
Coldfoot	Unincorporated	11	5	na	na	none
Bettles	2nd class city	25	16	na	Volunteer Fire Department, Fire Hall, Roads, Ice Roads, Parks & Recreation, Fuel Tank Farm	Closed in 2002
Evansville	Unincorporated	25	12	95	na	Closed in 2002-2003
Rampart	Unincorporated	43	10	0	na	Closed in 1999
Alatna	Unincorporated	14	12	0	na	none
Allakaket	2nd class city	58	14	100	Watering Point, Landfill, Health Clinic, Counseling Center, Fuel Sales, U.S. Post Office, Roads	P-12, 36 students
Stevens Village	Unincorporated	52	26	0	na	P-12, 2
Hughes	2nd class city	40	9	46	Watering Point, Washeteria, Electric, Refuse Collection, Landfill, Health Clinic, Fuel Sales, Airport (State Contract), U.S. Post Office (Federal Contract), General Store, Roads, Community Hall, Bingo	K-12, 2
Huslia	2nd class city	105	14	85	Piped Water & Sewer, Honeybucket Haul, Washeteria, Electric, Airport maintenance (State contract), Landfill, Health Clinic, Volunteer Fire, Fuel Sales, Head Start, City Hall/Public Safety Office, Tribal Office, Community Hall, Roads, Harbor/Dock, Bingo. State-funded Public Safety Officer.	P-12, 84
Ruby	2nd class city	108	46	43	Watering Point, Washeteria, Electric, Landfill, Health Clinic, Volunteer Fire/Rescue/Ambulance, Public Safety Facility, Fire Hall, Community Hall, Teen Center, Library, Roads, Public Campground, Airport Maintenance (State Contract), Roads, Community Freezer, Sawmill, Suicide Prevention	P-12,37

City/Village	Type	Number Housing Units[a]	Number housing units vacant [a]	% occupied housing units with plumbing [b]	Municipal Facilities and Utilities [a]	Schools, number of students [a]
Galena	1st class city	264	74	82	Piped Water, Water Delivery, Sewage Tank Haul, Electric Utility, Refuse Collection, Landfill, Public Showers, Health Center, Dental Clinic, Behavioral Health, Police Department, Volunteer Fire Department, EMS & Ambulance, Schools Pre-K - 12, Daycare, Galena Interior Learning Academy Boarding School, Yukon-Koyukuk Learning Center, Public Library, Community Hall, Roads, Parks & Recreation, Swimming Pool	4 Schools and 4,113 students (includes Interior Distance Education of Alaska with 3,811 students)
Tanana	1st class city	136	36	48	Landfill, Airport Maintenance (state contract), River Dock, Police, Volunteer Fire/EMS/Ambulance, Fire Station, City School, Gravel Sales, Roads, Maintenance & Streetlights, Equipment Rental and Sales, Teacher Housing, Beverage Control/Liqour Sales, Incarceration Facility, Public Safety Housing, City Shop/Mechanical Work, Construction/Rehabilitation, New Road Construction, Biomass Installation, Process Fire Wood, Office Rental, ANP, Local Financial Contributions.	K-12,40
Koyukuk	2nd class city	54	12	8	Water & Sewer Haul System, Washeteria, Electric, Landfill, Health Clinic, Suicide Prevention, Volunteer Fire/EMS, Library, Fuel Sales, Lodging, Parks & Recreation	P-10,15
Nulato	2nd class city	134	42	na	Piped Water, Watering Point, School Water, Piped Sewer, Washeteria, Electric, Landfill, Health Clinic, Public Safety Building, Fuel Sales, Roads, Maintenance Shop, City Office, Community Hall, Activity Center, Adult Recreation Center, Head Start Building, Gravel Sales, Equipment Rental, Package Storage, State-funded Public Safety Officer	P-12,44
Kaltag	2nd class city	87	17	65	Piped Water & Sewer, Washeteria, Electric, Landfill, Health Clinic, Volunteer Fire, Fire Hall, Community Hall, Roads, Boat Haul, Sawmill, Gravel Sales, Equipment Rental	P-12,24
Manley Hot Springs	Unincorporated	116	75	33	na	K-12,13
Minto	Unincorporated	94	29	81	na	P-13,43

City/Village	Type	Number Housing Units[a]	Number housing units vacant [a]	% occupied housing units with plumbing [b]	Municipal Facilities and Utilities [a]	Schools, number of students [a]
Anderson	2nd class city	145	55	96	Sewage Lagoon, Volunteer Fire/EMS, Ambulance, Health Clinic, Riverside Park, Parks & Recreation, Gravel Sales, Building Rental, Dept. of Motor Vehicles, Fish & Game Licenses	K-12,16
Nenana	Home rule city	215	44	89	Piped Water & Sewer, Clinic, Mental Health, Dock/Boat Ramp, Airport, Police, Volunteer Fire/EMS, Library, Roads, Schools, Civic Center, Visitor Center, Senior Center, City Building, Parks	2 Schools, 974 students (includes CyberLynx Correspondence Program with 766 students)
Ester	Unincorporated	1,229	160	68	na	na
Fairbanks	Home rule city	13,056	1,522	99	Refuse Collection, Police, Fire Department, Snow Removal/Street Maintenance, City Cemetery	24 Schools, 10,633 students (two school districts: FSNB School District and Yukon-Koyukuk School District
North Pole	Home rule city	916	88	99	Piped Water & Sewer, Police, Fire & Ambulance, Fire Stations, Municipal Buildings, Bingo, Building Permits	6 Schools, 3,044 students
Big Delta	Unincorporated	305	99	95	na	na
Delta Junction		517	140	94	Landfill, Airstrip, Public Works Building, Fire Station, Volunteer Fire & Ambulance, Library, Community Center/Senior Lounge, Park, Cemetery, Skating Rinks	5 Schools, 558 students
McKinley Park	Unincorporated	422	313	92	na	na
Healy	Unincorporated	711	277	96	na	2 Schools, 840 students
Anaktuvuk Pass	2nd class city	118	19	84	Bingo/Pull Tabs and Recreation	P-12, 102
Venetie	Unincorporated	85	24	3	na	P-12, 51

City/Village	Type	Number Housing Units[a]	Number housing units vacant [a]	% occupied housing units with plumbing [b]	Municipal Facilities and Utilities [a]	Schools, number of students [a]
Lake Minchumina	Unincorporated	36	30	20	na	na
Average				**62.35**		

[a]Community and Regional Affairs, Alaska Department of Commerce, Community and Economic Development at http://www.commerce.state.ak.us/cra/DCRAExternal/Community

[b]American Community Survey 2007-2011, as reported online by Research and Analysis, Alaska Department of Labor and Workforce Development at http://live.laborstats.alaska.gov/cen/acsarea.cfm

[c]Data not available

Alaska has one of the highest per capita alcohol consumption rates in the Nation and the prevalence of alcohol dependence and alcohol abuse, at 14 percent, is twice the national average (http://dhss.alaska.gov/dbh/Pages/Prevention/programs/substanceabuse/default.aspx). The use of alcohol and other drugs among high-school aged students also is high, although comparable to national statistics, and the rates of drinking behaviors have decreased since 1995. Several communities have taken advantage of the local option laws allowing communities to regulate alcoholic beverages: Allakaket and Anaktuvuk Pass have banned sale, importation, and possession; Stevens Village and Minto have banned sale and importation; and Hughes and Huslia have banned sale (http://commerce.alaska.gov/dnn/abc/Resources/DryDampCommunities.aspx).

2.4.3.2. Economic Conditions

As described in the Subsistence section 2.4.2, the economy in much of rural Alaska is a mixed subsistence-cash economy, and this is true of many planning area communities. However, the Joint Board of Fisheries and Game has designated the area immediately around Fairbanks as a nonsubsistence area; this includes the planning area communities of Fairbanks, Ester, North Pole, Healy, McKinley Park, Big Delta, and Delta Junction.

Cost of living in much of the planning area is higher than averages for other places in Alaska and much higher than for the United States as a whole. A key factor that has socioeconomic effects throughout the planning area is high fuel costs, which are especially high in the communities off the road system. Higher fuel prices ripple through rural village lifestyles many ways, including increasing the cost of store-bought foods through transportation and storage costs. Subsistence activity is more expensive because of higher fuel costs for snowmobiles, four wheelers, and motorboats, while high food prices increase the need for subsistence as a food source. The increased reliance on subsistence as a source of food, coupled with greatly increased costs of getting to the fish, moose, or caribou, and a poor commercial fishing season, are problems in many villages.

Although average Alaska heating fuel and gasoline prices are slightly lower than their peak in the summer of 2008, the statewide average cost of heating fuel has increased 65 percent and the statewide average cost of gasoline has increased 59 percent since 2005. During July, 2013, current retail prices for heating fuel #1 and gasoline were collected from 100 select communities across Alaska (http://www.commerce.alaska.gov/dnn/dcra/ResearchAnalysis/FuelPriceSurvey.aspx). The communities were selected from throughout the eight Department of Commerce Community and Regional Affairs (DCRA) Alaska regions (Northern, Gulf Coast, Interior, Northwest, Southwest, Western, South Central, and Southeast).

Retail price of a gallon of heating oil #1 in surveyed planning communities averages $5.26, ranging from a low of $1.55 in Anaktuvuk Pass (one of the communities in which heating fuel price is subsidized by the North Slope Borough) to a high of $9.00 in Hughes (Table 2.33). Retail price of a gallon of gasoline varies across the communities, ranging from $3.65 in Fairbanks to $9.65 in Anaktuvuk Pass, where gasoline prices are not subsidized.

The communities rely primarily on diesel for power. The residential electrical rate ranges from $0.13 per kilowatt hour in Hughes and Anaktuvuk Pass to $0.61 per kilowatt hour in Stevens Village (Table 2.33). These effective residential rates are much lower than they would be without the Alaska Energy Authority's Power Cost Equalization (PCE) program, which provides economic assistance to customers in rural areas of Alaska to compensate for the high kilowatt-hour charges for electricity. Rates in 2012 for Anchorage were about $0.11 per kilowatt hour.

As found throughout the state, Alaska Village Electric Cooperative, one of the utilities serving several planning area communities, recovers heat at nearly all of its power plants, and provides heat to schools and other buildings and facilities at many locations. In Galena, for example, the city buildings, school, swimming pool, and health clinic space are heated by cogeneration. Several of the utilities serving planning area communities also utilize wind turbines to supplement diesel.

2.4.3.2.1. Income and Employment

As is common in rural Alaska, many of the communities rely on local government as a major source of jobs; the percent of workers employed by local government ranged from 7 to 9 percent in Fairbanks, Alatna, and McKinley Park to 71 to 72 percent in Tanana and Allakaket, with an average of 38 percent across all communities (Table 2.34 Employment by Sector). The percentage of workers employed by local government was above 40 percent in 14 communities.

A very small proportion of workers in the communities were employed in Natural Resources and Mining except in Healy, where the Usibelli coal mine operates year-round and employs about 130 workers. The proportions of employment in Construction and Manufacturing, Leisure and Hospitality, and State Government were generally low; a high proportion of employment in McKinley Park is in Leisure and Hospitality (47 percent), as would be expected for a national park gateway community. Larger communities and those on a major road system such as Fairbanks, Ester, North Pole, McKinley Park, Big Delta, and Delta Junction have relatively high proportions of employment in the Trade, Transportation and Utilities sector, as does Ruby. Big Delta, Delta Junction, and Anderson (where a major employer is Clear Air Force Station) have the highest proportion of employment in the Professional and Business Services, Financial, and Information sectors. The percentage employed in Educational and Health Services also varies widely, but is highest in Fairbanks, Hughes, Huslia, and Koyukuk.

The role of commercial fishing as an industry and employer is generally low compared to some Alaska communities, and none of the communities is a participant in the Community Development Quota program, but several communities (Nulato, Nenana, Kaltag, Galena, and Tanana) have a fair number of residents with commercial fishing permits compared to the population size (Table 2.30). Another characteristic of the planning area is the seasonality and part-time nature of many work activities; the average (by community) of employed residents who worked 50 to 52 weeks per year was 42 percent in the planning area compared to 55 percent of workers nationally (Table 2.33, EPS 2013 using American Community Survey data from 2007-2011).[4]

Table 2.33 shows the number of people employed in each community, plus the number of people who filed for unemployment insurance. The ratio of these two numbers, which serves as another measure of work seasonality as well as work patterns, averaged 0.32 across all planning area communities, ranging from 0.13 in Ester (and comparable rates in two very small communities) to 0.63 in Venetie and 0.54 in McKinley Park, and even higher in one very small community.

Per capita income varies from $10,820 in Huslia to $45,000 to $48,000 in Bettles, Evansville, and Anderson (Table 2.31). Another measure of income is median household income, the number at which half of the household incomes fall above and half fall below. Median household income varies from $17,917 in Allakaket to $97,778 in Healy. The percent of persons living in poverty in

[4]The average for planning area communities is the average by community — i.e., it does not reflect the different numbers of those employed in each community, so the rate for Hughes counts the same as the rate for Fairbanks.

the communities ranged from less than 10 percent in 12 communities to 20 percent or greater in 12 other communities.

In addition to earned income, many households receive one or more forms of public assistance (the largest of which often comes from the Supplemental Nutrition Assistance Program). The proportion of households receiving public assistance in the 30 communities ranged from 0 to 100 percent, with residents of Allakaket, Stevens Village, Minto, Venetie, and Huslia receiving the highest amounts, and residents of Healy, Anderson, Ester, Big Delta, Lake Minchumina, and McKinley Park receiving the least (Table 2.33).

Table 2.33. Cost of Living and Employment Conditions in Central Yukon Communities

City/Village	Power type/ residential rate per kWh after Power Cost Equalization (PCE) ($)[a]	2013 retail price/gallon, heating oil #1 ($) [b]	2013 retail price/gallon gasoline ($) [b]	Number of residents employed [c]	Unemployment insurance claimants [c]	Ratio # employed: # unemployment insurance claimants	% who worked 50-52 weeks/year [d]
Kaltag	Diesel, $0.22	5.74	6	99	31	0.31	12
Wiseman	na	na	na	8	6	0.75	na
Coldfoot	na	na	na	18	2	0.11	na
Bettles	Diesel, $0.26	na	na	15	2	0.13	81
Evansville	Diesel, $0.26	na	na	na	na	na	59
Rampart	na	na	na	8	3	0.37	100
Alatna	Diesel, $0.26	7	7	10	5	0.5	100
Allakaket	Diesel, $0.26	na	na	111	31	0.28	12
Stevens Village	Diesel, $0.61	na	na	34	15	0.44	9
Hughes	Diesel, $0.13	9	8.25	60	18	0.3	45
Huslia	Diesel, $0.22	7	7	127	52	0.41	17
Ruby	Diesel, $0.44	5.92	6.35	93	31	0.33	24
Galena	Diesel, $0.31	6.03	6.8	252	43	0.17	49
Tanana	Diesel, $0.31	5.5	6	136	46	0.34	17
Koyukuk	Diesel, $0.55	na	na	53	14	0.26	17
Nulato	Diesel, $0.22	5.25	6.25	150	40	0.27	34
Manley Hot Springs	Diesel, $0.16	na	na	57	27	0.47	20
Minto	Diesel, $0.22	5	4.95	108	45	0.42	20
Anderson	na	4.18	4.18	91	14	0.15	71
Nenana	na	4.18	4.18	236	70	0.3	31
Ester	na	na	na	1,098	141	0.13	52
Fairbanks	Coal, diesel, $0.22[e]	4.12	3.65	10,236	1,980	0.19	58
North Pole	Diesel, $0.22	na	na	807	127	0.16	61
Big Delta	na	na	na	167	35	0.21	43
Delta Junction	Wind turbine, intertie, $0.22[e]	4.19	4.09	486	112	0.23	53
Healy	Diesel, $0.22 [e]	4.4	3.9	476	123	0.26	61
McKinley Park	na	na	na	100	54	0.54	31
Anaktuvuk Pass	Diesel, $0.13	1.55	9.65	152	39	0.26	27
Venetie	Diesel, $0.28	na	na	121	76	0.63	12

City/Village	Power type/ residential rate per kWh after Power Cost Equalization (PCE) ($)[a]	2013 retail price/gallon, heating oil #1 ($) [b]	2013 retail price/gallon gasoline ($) [b]	Number of residents employed [c]	Unemployment insurance claimants [c]	Ratio # employed: # unemployment insurance claimants	% who worked 50-52 weeks/year [d]
Lake Minchumina	na	na	na	na	na	na	60
Average		**5.27**	**5.88**			**0.32**	**42**

[a]Community and Regional Affairs, Alaska Department of Commerce, Community and Economic Development
[b]Alaska Fuel Price Report, July 2013
[c]Alaska Department of Labor and Workforce Development 2012
[d]Economic Profile System Data 2012 U.S. Census
[e]not PCE eligible

Table 2.34. Employment by Sector, Central Yukon Communities

City/Village	% Employed Natural Resources and Mining [a]	% Employed Construction and Manufacturing [a]	% Employed Trade, Transportation and Utilities [a]	% Employed Professional and Business Services, Financial, Information [a]	% Employed Educational and Health Services [a]	% Employed Leisure and Hospitality [a]	% Employed State Government [a]	% Employed Local Government [a]	Commercial Fishing Permits, Crew Licenses 2010 (#)[b]
Kaltag	3	5	12	1	11	1	na	66	9,12
Wiseman	59	25	0	12.5	0	12.5	0	0	1,0
Coldfoot	6	6	6	0	0	67	17	0	0,0
Bettles	0	0	13	33	7	20	0	27	0,0
Evansville	na	na	na	na	na	na	na	na	0,0
Rampart	12	12	12	12	12	12	0	25	1,0
Alatna	0	0	0	1	0	0	0	9	0,0
Allakaket	1	3	7	2	9	2	2	71	0,0
Stevens Village	0	26	0	9	3	15	0	47	3,0
Hughes	0	7	8	0	15	2	0	67	1,0
Huslia	6	2	3	2.4	16	3	0	67	0,0
Ruby	6.5	14	19	1	5	5	0	46	8,2
Galena	3	10	9	6	9	2	7	55	12,0
Tanana	4	1	11	4	4	3	1	72	12,0
Koyukuk	4	4	4	0	15	6	2	64	0,0
Nulato	3	9	3	1	13	3	0	67	8,2
Manley Hot Springs	2	14	12	7	10	0	7	47	8,0
Minto	3	9	7	2	8	10	3	57	0,0
Anderson	3	4	13	29	3	5	3	35	0,0
Nenana	2	7	14	10	12	18	2	33	19,1
Ester	3	9	17	11	11	10	24	13	0,2
Fairbanks	4	8	23	15	15	15	9	8	109,75
North Pole	3	10	24	15	12	13	8	11	16,15
Big Delta	5	9	23	27	10	6	7	10	0,0
Delta Junction	5	13	18	28	10	6	4	13	23,15
Healy	25	8	15	6	4	20	5	17	2,2
McKinley Park	5	6	17	7	9	47	2	7	0,0

City/Village	% Employed Natural Resources and Mining [a]	% Employed Construction and Manufacturing [a]	% Employed Trade, Transportation and Utilities [a]	% Employed Professional and Business Services, Financial, Information [a]	% Employed Educational and Health Services [a]	% Employed Leisure and Hospitality [a]	% Employed State Government [a]	% Employed Local Government [a]	Commercial Fishing Permits, Crew Licenses 2010 (#)[b]
Anaktuvuk Pass	1	5	5	21	2	1	0	66	0,0
Venetie	8	8	2	1	7	2	1	62	0,0
Lake Minchumina	na	na	na	na	na	na	na	na	0,0
Average	**6.3**	**8.4**	**10.6**	**9.4**	**8.3**	**11.0**	**3.9**	**37.9**	

[a]Alaska Local and Regional Information Database 2012

[b]Alaska Commercial Fisheries Entry Commission Database 2012

2.4.3.2.2. Non-market Values

The BLM's Instruction Memorandum (IM) No. 2013-131 describes when and how to consider non-market environmental values when preparing National Environmental Policy Act (NEPA) analyses for BLM resource management planning and other decision-making. The IM directs BLM managers to use estimates of non-market environmental values in NEPA analysis supporting planning and other decision-making where relevant and feasible, and to include at least a qualitative description of the most relevant non-market values for the affected environment and the impacts of alternatives in NEPA analyses.

Non-market environmental values reflect the benefits individuals attribute to experiences of the environment, uses (both active and passive) of natural resources, or the existence of particular ecological conditions, including the full range of ecosystems goods and services) that do not involve market transactions, and therefore, lack prices. The goal is to provide economic analysis for resource management that considers all relevant values, not merely those that are easy to quantify; using non-market values provides a more complete picture of the consequences of a proposed activity than market data alone would allow.

Economists have developed a number of quantitative techniques for estimating dollar values of non-market uses, goods and services. IM 2013-131 encourages such quantitative analysis of non-market values when one or more of three conditions is present: a proposed action is likely to have a significant direct or indirect effect and the quality or magnitude of the effect can be clarified through the analysis of non-market values; if the alternatives to be considered present a strong contrast between extractive and non-extractive uses of land and resources; or if the magnitude of the proposed change is large. In these cases, the analysis typically requires comparison of non-market costs or benefits to market costs and/or benefits, so the goal is to transfer costs and benefits into the same language and terms (dollars) to allow decision-makers and society to better compare alternative outcomes.

For example, dollar values for non-market resources and opportunities have been estimated in a variety of Alaska settings: losses in subsistence harvest resulting from the Exxon Valdez oil spill (Duffield 1997) and passive use losses resulting from the same oil spill (Carson et al. 2003), sport fishing for king salmon on the Kenai River (Carson et al. 1990), wild salmon ecosystems in Bristol Bay (Duffield et al. 2007), Alaska moose (Northern Economics 2006), and wildlife-related trips by Alaska residents and visitors (McCollum and Miller 1994).

When these conditions or criteria are not present, the non-market values can be described qualitatively. That is the case with the Central Yukon RMP; it is unlikely that alternatives will incorporate significant or substantial trade-offs between market and non-market resources or uses of BLM-managed lands. The subsistence sections of this AMS chapter, along with the other resource sections of the AMS, describe the ecosystem goods and services present in qualitative terms (and sometimes quantitative terms, although not in dollars).

2.4.3.3. Sociocultural Systems

Koyukon Athabascans

The kinship relations between Alaska Natives in Middle Yukon villages are often place-based, with some families from different villages having a common ancestry in these other places; this has influenced both trade and travel between these villages. Second, this also means that there is a

tremendous wealth of environmental knowledge about areas far outside current villages, which has significance to resource management and ecological monitoring. Third, this means that an individual's sense of "home" and "belonging" and even "responsibility" is often tied to places outside the current village location, where their ancestors walked daily (Watson and Huntington 2014; Watson and Huntington 2008).

Being the westernmost group of Athabaskan tribes in North America, Koyukon occupy what has traditionally been a borderland region between that of Interior Athabaskan and coastal Inupiat peoples. Historically, there have been both tensions and intense trading relationships at this "Athabascan-Eskimo interface" (Clark 1970; see also Morlan 2000; Huntington and Elliott 2002), with records showing shifting territorial boundaries over time, especially along the northern Koyukon area. Indeed, the village of Alatna is predominantly Inupiat or Nunamiut, composed of families descended from those that had moved inland during the 1930s to trade with Koyukon (Watson and Huntington 2014; Englehard et al. 1993; Clark 1970). Englehard et al. (1993) note that extensive rituals and intermarriage have maintained largely peaceful relations to the present day between Inupiat and Koyukon cultural groups residing in Alatna and Allakaket, just across the river from each other. There are also extensive trail systems for winter travel between Koyukon and Inupiat communities throughout the western border of the area, which served as important customary trade routes between coastal and Interior Alaskan communities (Watson and Huntington 2014).

Oral history also indicates tensions and intermarriage when Russian explorers and military traveled and settled the Middle Yukon in the 1700s to 1867. Given that the Russian fort was located near present-day Nulato, both the southern Koyukon dialect and family names in those southern villages reflect their Russian influence (Watson and Stickman forthcoming). Although first documented by U.S. explorer Dall (1870) as the "Nulato Massacre," oral history recounts that this episode of inter-tribal warfare was a response to the Russian migration, with people from the northern Koyukuk retaliating against those who they claimed brought disease into the country (Watson and Huntington 2014).

With the sale of "Russian America" to the United States in 1867, more people from the United States and Northern Europe migrated to the Middle Yukon to obtain riches or establish a home. Much of this migration was drawn westward by the gold mining and trapping economies, each of which experienced periods of boom and bust throughout the twentieth century. The military boom during World War II included the transformation of one fish camp on the Yukon into the community of Galena, developed into an air base for the lend-lease program. Today Galena serves as a regional hub for the Middle Yukon; many of its families come from different villages across the region and current residents, including a large non-Native population, participate in a variety of cash-based jobs, as well as a subsistence way of life. By the 1970s, the mineral and trapping economy was joined by a rich salmon egg fishery, which attracted some Asian migration to communities along the Yukon (Watson and Stickman forthcoming). These connections to the global capitalist economy were crucial in producing certain changes in the sociocultural system, especially in developing the mixed cash-subsistence economy. However, these global connections, affected by larger-scale market changes, often did not endure, such as the collapse of the European and American fur market in the 1990s.

This brief introduction to the history of human migration and occupation of the Middle Yukon area only begins to narrate the extensive transformations experienced by this sociocultural system. Yet changes wrought by the colonial era and the eventual emergence of the mixed

cash-subsistence economy have not affected a number of values and practices that endure in this society—including many of those affecting land use decisions.

2.4.3.3.1. Occupational and Interest Groups

Since the purchase of Russian America, numerous institutions have evolved to take on roles of governance, and they remain sites of civic participation for residents of the Middle Yukon for the governing of land and resources. In many cases, tribes argued for their inclusion in structures of governance, such as within the migratory bird management regime run by the U.S. Fish and Wildlife Service. It was not until 2000, that the Alaska Migratory Bird Co-Management Council was created to make a place at the management table for Native participation in bird management and to manage a legal harvest for Alaska Natives (Watson 2014). But, the most significant institutional changes for the Middle Yukon occurred with the passage of ANCSA (1972) and ANILCA (1980), which finalized a process of land selection for the different parties interested in Alaskan land ownership, and created a corporate structure for Alaska Native development. In the Middle Yukon, the major corporate landowner is Doyon Ltd. Corporation, but there are other smaller village corporations that pay out dividends to their shareholders. While these corporate structures aimed to create a source of necessary cash income for rural subsistence users, tensions remain over resource use between these corporate interests and those of more rural, village subsistence users. Tanana Chiefs Conference is the regional nonprofit entity also created in the land claims process that represents these Middle Yukon tribes in terms of building tribal capacity and advocating for subsistence rights and Native land management on a state and federal level. However, Tanana Chiefs Conference is not a legal decision-maker for lands in the Middle Yukon.

Since the Indian Reorganization Act created recognition of Alaskan tribal governments in 1936, communities in the Middle Yukon have developed local governmental structures to relate to outside entities and to administer community-level needs. In these Indian Reorganization Act governments, tribal councils are elected, along with First and Second Chiefs or Presidents, to make decisions for the tribes. Most small Alaska Native communities, although federally recognized as villages under the Indian Reorganization Act and/or ANCSA, are also incorporated as second-class cities (in order to be recognized by the State of Alaska as a municipal entity) and therefore, also have city government and staff, with elected mayors, to oversee issues such as infrastructure needs and policing.

Besides institutions such as Alaska Migratory Bird Co-Management Council, residents of the Middle Yukon participate in many other wildlife and land management entities. For example, ungulates on federal lands are managed in this area by the Western Interior Regional Advisory Council, while there are state-level advisory groups that make management decisions on private and tribal land. This “dual management” structure reflects that the Alaska State Constitution, which defines a “subsistence user” as any rural Alaska resident, is out of alignment with ANILCA (1980), which assures subsistence rights to all Alaska Natives (Watson 2007).

The proliferation of these governing institutions comes with a cost to rural communities in the Middle Yukon: it is challenging to participate from a rural area (especially considering the costs of travel, including the time away from subsistence labor), and many tribes and individuals lack the financial and institutional capacity to participate as effectively as they would like in these institutions. The administrative capacity to engage other institutions varies greatly from tribe to tribe; currently the tribe of Nulato is the only tribe in the region with a direct fiscal relationship to the Bureau of Indian Affairs, while all other tribes work through the Tanana Chiefs Conference

to administer programs and funds for self-governance. Rural participation in institutions of governance, therefore, remains a challenge throughout the region (Watson 2007).

2.4.3.3.2. Management and Land Use of the Local Environment

There are three ways that land use decisions are made by Alaska Native communities in the Middle Yukon: (1) through legal governance and corporate structures and other institutions that have emerged in the twentieth century to manage wildlife and lands; (2) through cultural systems that guide ethical and community-level decision-making; and (3) through individual daily practices of subsistence within the region.

Despite the numerous changes to the institutional context, studies have consistently shown that many Koyukon cultural beliefs and associated subsistence practices remain prevalent land management tools in the region. Anthropologist Richard Nelson worked in the area beginning in the late 1970s and documented extensively what he called "making prayers to the raven": a deep respect for the human and non-human community (Nelson 1986). Writing in the era of the early environmental movement, Nelson examined whether hunting and gathering societies were also conservationists, and articulated a Koyukon worldview where their sense of respect amounted to an ethics of the environment (Nelson 1986; Nelson et al. 1982). Ethnographic work conducted over thirty years later (Watson et al. 2014; Watson and Huntington 2014 and 2008) affirms that the Koyukon sense of "respect" involves feeling responsible for the land and its non-human inhabitants, and rural tribes show a continued commitment to subsistence as a way of life.

In this spiritual worldview and way of knowing, land and animals are not understood as a species separate from the human self (Huntington and Watson 2012; Watson and Huntington 2008). That is, a hunter "becomes" the animal that is sought—they share a common identity and set of practices, even just for a few moments, which allow a hunter to best locate a potential encounter with that animal. Hunters *think as* that animal to examine places where the animal might bed down, or seek shelter, and thereby, have intimate behavioral knowledge of those species and the ecology within which they live (Watson et al. 2014). This way of knowing is very different from that of western sciences like wildlife biology, which presumes an "objective" way of understanding animals—reflected through techniques like aerial surveying (Watson 2014). This difference in cultural beliefs is significant, because Alaska Native societies not only understand a kinship with these other species, but they are often opportunistic in their harvest, and recount how if a hunter shows respect, an animal will "give himself to you." It would be disrespectful not to accept the gift being presented to the hunter, because this spiritual worldview informs a practice of opportunism. Other actions of resource management that are influenced by a Koyukon worldview include active predator management, especially of wolf and bear, and frequent potlatch ceremonies, which serve to distribute subsistence resources more widely across the region. By contrast, Western wildlife management aims to police a separation between hunter and prey, via regulatory windows and bag limits. These different ways of knowing, and their resultant management actions, have often been the source of tensions between tribes and regulatory agencies (Watson and Huntington 2008; Watson 2007).

While subsistence hunting and fishing are largely opportunistic activities, this does not mean that Alaska Natives in the region will simply decimate all edible species. For example, Koyukon notions of "respect" also include taboos about when and how to interact with their non-human kin—such as limits on how many beaver to harvest from a single lodge—actions which often reflect sophisticated understandings of population ecology (Huntington and Watson 2012; Watson 2007). In another example of the impact of worldview and values on resource management, the

emergent international governance structure called the "Inter-Tribal Fish Commission" promoted and secured a moratorium on the subsistence Chinook salmon fishery in 2014, in efforts to conserve the run in the Yukon River drainage (Watson and Stickman, forthcoming).

Such efforts represent a strong belief in being stewards of the ecosystem. Village residents have developed a discourse of "local" and "non-local" hunters, which is a reflection of their belief that human communities in rural areas are part of the ecosystem. Rural Alaska Native communities have been documented to be an ongoing and adaptive part of the boreal ecosystem (Chapin et al. 2010), while hunters coming from Fairbanks or other urban area may have less local and traditional knowledge of the area; urban hunters are certainly not on the landscape at multiple times of year to take care of the ecosystem in ways documented by village residents. This tension often emerges in land management contexts, especially regarding "non-local" moose hunters and associated guiding activity (Watson et al. 2014).

Subsistence and Cash Economies

Most land use decisions by local residents take place on an individual scale, in the daily lives of the person and family who are subsisting off the land. In the Middle Yukon area, the mixed cash-subsistence economy has a seasonal rhythm that is in currently in flux due to climate change (Watson et al. 2014; Chapin et al. 2010). In general, subsistence resources (fish, game, firewood and other flora) are gathered year-round, with many foods being gathered summer to fall to make it through the winter. Summer had traditionally been a time to harvest from a variety of salmon and non-salmon fisheries, and by fall, families would fill their caches with berries. With the recent entrance of a moose population in the Middle Yukon area in the 1930s, fall and sometimes winter subsistence activities would focus on moose hunting, as well as a bear harvest. Winter would be the time to trap for small furbearers, for both the subsistence and cash markets' demand for thick pelts. In more mountainous areas, such as the foothills of the Brooks Range and the Nulato Hills, caribou were once more available to harvest, and resident communities near the Brooks Range continue to harvest Dall Sheep (Watson et al. 2014; Watson 2007). Winter moose hunting opportunities are often limited because of travel/weather conditions or because of low moose populations, so the springtime geese and duck hunting season has traditionally been important for a family's food security (Watson 2014).

Prior to contact with the West, Alaska Natives in the Middle Yukon area would experience periods of starvation; if, for example, a warm spring was followed by a cold snap, migratory birds might bypass the re-frozen lakes, while the quality of the re-frozen snow would make hunting small game too noisy for much success (Nelson et al. 1987). Such experiences have at once instilled the value of opportunism for subsistence hunters and gatherers, in addition to a desire to adapt to new technologies to make their subsistence more efficient.

Although families no longer live as scattered groups across the landscape, modern equipment like motorboats and snowmobiles allow residents to travel the distance of their traditional hunting grounds. Residents of Alatna and Allakaket are more dependent on moose for their food security and have expanded their traditional range southward in response to changing resource availability (Watson et al. 2014).

Another reason that subsistence users seek new and efficient technologies is because the time it takes to complete subsistence activities to provide for the household has often conflicted with the time required to labor in the capitalist economy. Sometimes, as in trapping, the subsistence lifestyle meshes well with the cash economy; likewise, the cash earned from firefighting both

in and out of state often comes at a crucial time for purchasing gas and equipment for fall subsistence. Nevertheless, making choices at the household scale about whether to participate in the subsistence or cash economy in a particular season is not easy because both the environment and global market are in flux (Kofinas et al. 2010; McNeeley and Shultzki 2011).

2.4.3.3.3. Socially Significant Places

Koyukon Athabaskan Cultural Landscape

According to the *Guide to Cultural Landscapes Reports*, cultural landscapes are "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or that exhibit other cultural or aesthetic values" (Page et al. 1998:12). Characteristics of an Alaska Native group's cultural landscape include areas of historical extended use, aboriginal trade routes, traditional use sites, and an area of current intensive subsistence use.

An enduring tensions between the subsistence and cash economies revolves around the continued need—and perhaps growing need—for large and connected land areas reserved for subsistence. This need is seen not only because of development activities that either displace (caribou) or decrease (Chinook) crucial subsistence resources, but also because of the changing ecosystem (Euskirchen et al. 2009). For example, in a recent study mapping subsistence, Watson and Huntington (2014) found that the food security of communities of Alatna and Allakaket was made more vulnerable because of both development activities and climate change. While the communities practiced a shift from salmon to non-salmon species (Andersen et al. 2012, 2004) in response to decreases in king salmon and caribou, they also increased their dependence on moose. But, the traditional ecological knowledge in the area indicated that the changing hydrology brought about by climate change is making moose more vulnerable to predators and not providing the lake habitat necessary for a healthy population. The resulting subsistence use maps produced by this project showed growth in the area where they historically practiced subsistence, compared with baseline studies completed by the Alaska Department of Fish and Game and other agencies (Watson and Huntington 2014; see also Holen et al. 2012; Marcotte and Haynes 1985).

Such subsistence patterns also underscore how land ownership maps do not reflect the ways that the people feel they take care of the land, and how the land takes care of their communities. Some work documents the extensive landscape of Native place names (YRDFA 2009) that show not only the historic use of the area, but also the continued relationship that families and individuals residing in the Middle Yukon have with places and organisms that share their home.

Chapter 3. Current Management Direction and Management Opportunities

3.1. Relevant Plans and Amendments

Three land use plans cover the planning area. Additionally, some lands are not covered under existing plans. Some of the existing plans have been amended. Several of the ACECs are covered by ACEC or habitat management plans.

Table 3.1. List of Relevant Plans and Amendments

Document Title	Year	Other relevant information
Utility Corridor RMP and Record of Decision	1991	Lawsuit filed on record of decision. Wild Rivers lawsuit settlement agreement (8/30/1993) requires the BLM to: review rivers in the Utility Corridor Planning Area for eligibility and suitability for inclusion in the National Wild and Scenic Rivers System; and manage lands in the Central Arctic Management Area west of the Killik River in a manner that will protect its wilderness values until Congress acts on the wilderness recommendation.
Central Yukon RMP and Record of Decision	1986	Decisions to revoke existing ANCSA Section 17(d)(1) withdrawals or to approve new withdrawals have not been implemented.
Southwest Management Framework Plan	1986	This plan covers only a small area on the southern edge of the Central Yukon Planning Area.
BLM Alaska Land Use Plan Amendment for Wildland Fire and Fuels Management	2005	Amended all BLM land use plans statewide for fire management.
Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States	2008	Amended the Central Yukon RMP to: Identify public lands that are administratively and legally closed or open to leasing and under what conditions; provide a comprehensive list of stipulations and best management practices; and provide a reasonably foreseeable development scenario for geothermal development on federal lands. Lands withdrawn under the authority of Section 17(d)(1) of ANCSA are identified as closed to leasing unless the Secretary revokes these withdrawals.
Galena Mountain ACEC Management Plan	1986	Objectives: improve caribou habitat; protect crucial calving areas from alteration and disturbance by human activities.
Tozitna North and South ACEC Management Plan	1988	Objectives: improve caribou habitat; protect crucial calving areas from alteration and disturbance by human activities.
Indian River ACEC Aquatic Habitat Management Plan	1995	Objectives are to maintain: the capability of the aquatic habitat to sustain annual production of 3.1 million chum salmon eggs and 117,000 Chinook salmon eggs; natural substrate, stream type, and geometry on all streams; minimum stream discharge needed for natural stream channel and habitat composition; stream bank stability, riparian cover, and woody debris; and water quality.
Hogatza ACEC Aquatic Habitat Management Plan	1994	Objectives are the same as Indian River ACEC above except for production and escapement goals. These are to maintain capability of habitat to: sustain annual production of 5 million chum salmon fry; support a minimum annual escapement of 8,000 chum salmon in Clear Creek and 9,000 chum in Caribou Creek.

Document Title	Year	Other relevant information
Dalton Management Area Integrated Invasive Plant Strategic Plan	2013	The purpose is to prevent the introduction of new invasive species and control the further spread of invasive plants within the Dalton Highway corridor. The goal is to protect fish habitat, wildlife habitat, and other resource values in the area. The specific objective is to apply control methods on up to 350 acres (including up to 300 acres treated with herbicides) of the known 350 acres of invasive plant infested land in the management area over the course of five years.
BLM Alaska Invasive Species Management	2010	This document establishes BLM Alaska policy concerning the coordination and management of invasive species actions on public lands within the State. This includes other resource management activities of the BLM, other organizations and individuals and their actions on public lands. Based primarily on the BLM Manual 9015 - Integrated Weed Management, this document is in furtherance of BLM responsibilities mandated by the legislation identified below in Authority and the BLM manual sections and other guidance, listed under the Reference section below. The primary goal is to protect the environment with effective prevention, management and treatment strategies of invasive species that cross-cut most functional areas.
Partners Against Weeds, An Action Plan for the Bureau of Land Management	1996	This is a strategy to prevent and control the spread of noxious weeds on BLM lands through cooperation with all partners. It is divided into two sections — Introduction and Actions. The Introduction describes the background of BLM's cooperative weed management program, the impact of weeds on ecosystem health, the Integrated Weed Management approach, the use of the fire /weed model, the origin of weeds in the United States, the legal direction for weed management, the recognition of the importance of cooperation and partnerships, BLM's budget, and weed program opportunities. The second section lists seven goals and associated actions necessary for implementing an improved weed management program.
Recreation Area Management Plan for the Dalton Highway Recreation Management Area	1991	Objective: Manage the recreation management area to provide a variety of developed and semi-primitive motorized recreation opportunities. Maintain the physical setting to protect scenic resources in a predominantly natural setting, consistent with development and maintenance of the Utility Corridor.

3.2. Management Decisions

The following sections list management decisions in place under the existing plans. These decisions form the basis for the No Action Alternative.

The tables below also address the adequacy of current management direction and options for change.

3.2.1. Cooperative Planning

Table 3.2. Current Management and Options for Change for Cooperative Planning

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 1:** A cooperative planning agreement should be established with the State of Alaska and other appropriate parties through the Alaska Land Use Council. The proposed planning agreement would be in accordance with provisions contained in Sec. 1201 of ANILCA and would allow for public participation. The zone covered by this agreement would correspond to the Dalton Highway Recreation Management Area. This area includes those lands which, due to existing access, are most likely to be impacted by public use. The proposed study recognizes that the State of Alaska and BLM share management responsibilities and that management objectives and priorities may at times be in conflict or inconsistent. The proposed plan would determine how the state and BLM, working together, could best provide for the public's needs while also protecting natural resources and the subsistence lifestyle of nearby communities.	The Alaska Land Use Council was terminated before any formal cooperative planning agreements were developed. The BLM has collaborated at several levels with the State and other parties to resolve management issues along the Dalton Highway, including participation in the Dalton Highway Users Group and, serving as a member of the Governor's Dalton Highway Advisory and Planning Board.	There are issues where coordination and collaboration are advantageous for both agencies and for the public.	This decision is not really needed at the land use plan level. Memoranda of Understanding between the State and BLM can be developed at any time under existing authorities. The BLM will continue to collaborate with the State on Dalton Highway management issues through various user groups and advisory boards.

3.2.2. Soil, Water, and Air Resources

Decisions in existing plans focus on maintaining water and air quality in cooperation with other agencies, reducing soil erosion, and reserving federal instream water rights.

Table 3.3. Current Management and Options for Change to Soil, Water, and Air Resources

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 47:** Require mitigation for all activities which may result in accelerated soil erosion or in water or air pollution. Vegetative cover diversity and condition would be maintained. Off-road vehicles would be restricted to soils with low erosion hazard or to winter use with snow cover adequate to prevent disturbance of the vegetative cover. The BLM will adhere to water quality standards established by the Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation.	Ongoing. Addressed at project level in NEPA documents. We are not currently maintaining vegetation cover and density on various land authorizations (e.g., mines, road, trails). OHVs are not restricted to soils with low erosion potential. Damage from OHV use conflicts with legal requirements under EO 11989 – OHV use on Public Lands. Water quality requirements are not being met on all streams (e.g., mined streams) – primarily due to non-point source pollution.	Partially. When permitting activities, BLM must adhere to federal and state air and water quality laws. While the current management decision is responsive to current issues, mitigation to date has been ineffective in regard to soil and water resource degradation.	Currently, the BLM is attempting to address mitigation at the project level through NEPA. There is opportunity to address at the planning level by limiting or excluding soil and vegetation disturbance activities and OHV use in some areas.
Utility Corridor RMP/ ROD	**Proposed Action 48:** Floodplains and wetlands would be managed in accordance with Executive Order (EO) 11988 Floodplain Management and EO 11990 Protection of Wetlands to assure continued hydrological functions.	Attempting to address in NEPA. Not meeting all requirements of EO 11988 or EO 11990. For example, notice level mining operations do not follow the minimization, restoration, or protection standards because NEPA is not required on this type of activity.	Partially. The BLM must adhere to EO 11988 and EO 11990. These orders were given to avoid adverse impacts associated with the occupancy and modification of floodplains and the destruction or modification of wetlands. While the current management decision is responsive to current issues, mitigation to date has been ineffective in regard to floodplain and wetland degradation.	Currently, BLM uses NEPA to address these EOs at the project level. Address at the planning level by limiting or excluding surface disturbance activities within wetlands and floodplains in some areas. Add stipulations to the RMP that ensure the EOs, criteria for the occupancy and modification of wetlands and floodplains are being met. Develop more cooperative projects with the Corps of Engineers for wetland mitigation monitoring.

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 49:** Designate Kanuti Hot Springs as an ACEC. Investigation of the area indicated the range extension of several plant species. Do not allow leases within the immediate area of the springs or "thawbulb" (an area roughly corresponding to a meadow which surrounds the hot water pools). Conduct additional inventory to define the area needed under ACEC protection more accurately, and to aid in the design of lease stipulations intended to protect this resource. If changes in the ACEC boundary or use restrictions result from such an inventory, address in a plan amendment (also see proposed action 23).	Ongoing. Designated ACEC. Some limited inventory for plants. No leases have been authorized. Subject to PLO 399.	Partially. Due to unique vegetative communities, ACEC designation remains appropriate, but additional inventory has been limited and no recommendations on the suitability of the existing boundary have been made.	Currently, no leases are allowed within the immediate area of the "thawbulb." The area closed to leasing could be expanded to encompass the entire ACEC to preserve the unique vegetation and hydrologic processes of the Kanuti Hot Springs. Consider revisions to the boundary of the ACEC based on more current inventory.
Central Yukon RMP/ ROD	**Goal #4, Objective 8:** Cooperate with other federal agencies in construction and maintenance of water gauging stations and snow courses. Cooperate with state and other federal agencies in obtaining water quality and quantity inventory data.	Ongoing snow surveys Lake Todatonten and Tozinta River in cooperation with National Resource Conservation Service.	Yes. With limited funding and mixed management of lands within the planning area coordination for monitoring of water resources is necessary.	Deploy automated Snotel site at Lake Todatonten. Install automated seasonal stream gage at Tozitna River and Lake Todatonten.
Central Yukon RMP/ ROD	**Goal #4, Objective 9:** Inventory water needs and secure Federal Reserved Water Rights where needed.	Ongoing. BLM has received provisional priority dates for instream flow reservations on the Tozitna, Jim, Kanuti, and South Fork Koyukuk rivers and Clear and Caribou creeks (Hogatza River tributaries). BLM is currently collecting data on Prospect Creek.	Yes. Federal instream flow reservations are intended to preserve the flows necessary to protect fish and wildlife habitat, fish migration and propagation; and to maintain and improve recreational and subsistence opportunities.	File for water reservations on important streams within the planning area. Expand current effort to other high priority streams such as, but not limited to, the Sulukna, Gisasa, Kateel, Indian, Sethkokna, and Ray Rivers; also Klikhtentotzna, Accomplishment, and Section Creeks.

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for Change
Central Yukon RMP/ ROD	**Soil, Water, and Air (pg. 13):** Cooperate with State and other agencies in monitoring air quality to verify compliance with lease or permit requirements.	Ongoing cooperation on an as needed basis in the Utility Corridor subunit; some fire related mitigation for wildfire smoke; and Fairbanks North Star Borough in winter non-attainment.	Yes. With limited funding and mixed management of lands within the planning area coordination for monitoring of air resources is necessary.	Consider deploying air quality meters at selected locations along the Dalton Highway, winter and summer to document current conditions. Other agencies may have instrumentation deployed, for example at Bettles, nonetheless specific air quality data for the Dalton Highway corridor is needed.
South-west MFP	**Watershed 1–1:** Maintain water quality of watersheds on BLM-managed lands in compliance with Alaska Water Quality Standards.	Not meeting standards in streams that are being mined – primarily a non-point source pollution issue in some parts of the planning area.	Partially. When permitting activities BLM must adhere to federal and state laws in relation to water quality. While the current management decision is responsive to current issues, mitigation to date has been ineffective in regard to non-point source pollution.	Address in the RMP that standards are not being met in some streams that are being mined, primarily as non-point source pollution. Develop appropriate mitigation or best management practices.
South-west MFP	**Watershed 2–1:** Perfect legal water rights to the water resource on public lands in support of BLM programs, and in compliance with the Alaska Water Use Act. Protect existing water rights of the U.S. File for water rights to protect fisheries resources in the Unalakleet, Anvik, Tuluksak Rivers, and others as needed.	Not applicable to Central Yukon Planning Area. These rivers are in Bering Sea Western Interior Planning Area.	See Central Yukon Goal # 4, Objective 9 above.	See Central Yukon Goal # 4, Objective 9 above.
South-west MFP	**Watershed 3–1:** Consider protection of wetlands when planning or permitting activities on BLM-managed lands. Consider protection of floodplains regardless of ownership wherever affected by BLM actions.	Same as Proposed Action 48 above. The Army Corps of Engineers is lead on jurisdictional wetlands, but since BLM definition includes both jurisdictional and non-jurisdictional wetlands, we must meet the BLMs policy for maintaining proper functioning condition,	Partially. See Proposed Action 48 above.	See Proposed Action 48 above.

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for Change
		the EOs, FLPMA requirements for protection of resources (sec. 102, clause 8), and cooperator responsibilities under the State's non-point source pollution control strategy (req. by sect 319 CWA).		

3.2.3. Vegetative Communities

The current RMPs do not meet the planning guidance for vegetative communities. There is only one general decision for vegetative communities in the Utility Corridor RMP and none in the Central Yukon RMP (CYRMP).

Table 3.4. Current Management and Options for Change Vegetative Communities

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 47:** Vegetative cover diversity and condition would be maintained.	Addressed on a project-specific basis. Generally, vegetative communities are in natural state and disturbance is limited.	No. Does not meet planning guidance.	Develop desired conditions for vegetative communities in the planning area. Consider necessary restrictions on use to protect vegetative communities.

The following table compiles all decisions pertinent to riparian-wetland communities. The requirements of EO 11990 (Floodplain Management) and EO 11988 (Protection of Wetlands) were not adequately considered during development of the existing RMPs. Implementation of these EOs at the project level has not been effective in meeting the protection and restoration requirements they lay out for floodplains and wetlands. Requirements for these EOs will influence many decisions in the revised RMP.

Table 3.5. Adequacy of current management direction and options for change for Riparian-Wetland Communities

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for change
Utility Corridor RMP/ ROD	**Proposed Action 48:** Floodplains and wetlands would be managed in accordance with EO 11990 (Floodplain Management) and EO 11988 (Protection of Wetlands).	Attempting to address at project level through the NEPA process. The process required by EOs being partially implemented: EO requirements are not addressed in CYRMP.	Although the current management decision is responsive to the issues, the implementation of the EOs at the project level not has not been effective in meeting the protection and restoration requirements of the EOs; Efforts to protect wetlands and avoid disturbance to floodplains not documented; alternatives to allowing development in floodplain and riparian-wetlands not documented; restoration actions not successful in many instances.	Address the preservation and restoration requirements of EOs through alternative development, land-use allocations, and development of standard operating procedures; consider maintaining existing withdrawals or establishing new withdrawals from mining in some areas to protect floodplains and riparian-wetlands; Where applicable, incorporate riparian-wetland and floodplain functions into the purposes for which ACECs were established; limit land use within ACECs to activities that are compatible with the purpose of the ACEC. Where floodplain and riparian-wetland disturbance cannot be avoided, use compensatory mitigation to mitigate loss.
Utility Corridor RMP/ ROD	**Proposed Action 47:** Require mitigation for all activities which may result in accelerated soil erosion or in water or air pollution. Maintain vegetative cover diversity and condition. Restrict off-road vehicles to soils with low erosion hazard or to winter use with adequate snow cover. Adhere to water quality standards established by the EPA and the Alaska Department	Attempting to address at project level through the NEPA process. Vegetative cover and diversity not being maintained on site-specific locations where activity is occurring. Off-road vehicles not restricted to soils with low erosion hazard or to winter use with adequate snow cover to provide protection.	Partially. Although the current management decision is responsive to current issues, mitigation to date has been ineffective in regard to protection of riparian-wetland communities.	Adjust land use allocations to address the EO requirement to protect riparian-wetland habitat; enforce existing decision to restrict OHVs to soils with low erosion potential or periods of snow cover; designate OHV trails and harden trails to support anticipated loads. Where disturbance to riparian-wetlands cannot be avoided,

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for change
	of Environmental Conservation.			develop standard operating procedures for restoration; and use compensatory mitigation to mitigate loss.
Utility Corridor RMP/ ROD	**Proposed Action 49:** Designate Kanuti Hot Springs as an ACEC. Do not allow leases within the immediate area of the springs or "thawbulb" (an area roughly corresponding to a meadow which surrounds the hot water pools). Conduct additional inventory to more accurately define the area needed under ACEC protection, and to aid in the design of lease stipulations intended to protect this resource.	Ongoing. Designated ACEC. Some limited inventory for plants, but the boundary has not been adjusted. No leases have been authorized. Subject to PLO 399.	Partially. Due to unique vegetative communities, ACEC designation remains appropriate. Management of the ACEC and boundaries may need to be revisited.	Additional inventory should consider extent of riparian-wetland habitat associated with the hot spring, consider any needed boundary changes to the ACEC, and proactively address requirements of EOs 11990 and 11988.
Central Yukon RMP/ ROD	**Goal 4, Objective 9:** Inventory water needs and secure Federal Reserved Water Rights where needed.	Ongoing. Several of the applications for instream flow reservations have considered riparian-wetland function as part of the basis for the request.	Partially. Securing instream flow reservations is responsive to current issues. Should include riparian-wetland function as a component of future applications.	Revise the decision to include riparain-wetland function as a component of future instream flow reservations.
South-west MFP	**Watershed 1–1:** Maintain water quality of watersheds on BLM-managed lands in compliance with Alaska Water Quality Standards.	Within the Central Yukon Planning Area water quality is not being maintained in many streams that have been altered by placer mining. A majority of the problem is associated with non-point source pollution.	Partially. While the management decision is responsive to current issues, mitigation to date has been ineffective in regard to non-point source pollution.	Proper riparian-wetland function plays a key role in maintaining water quality. Protection of riparian-wetlands and floodplains should be incorporated into all plan alternatives and land-use allocations as a means of ensuring water quality standards will be met.
South-west MFP	**Watershed 2–1:** Perfect legal water rights to the water resources on public lands to support BLM programs.	See CYRMP Goal 4, Objective 9 (above)	See CYRMP Goal 4, Objective 9 (above)	See CYRMP Goal 4, Objective 9 (above)

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for change
South-west MFP	**Watershed 3–1:** Consider protection of wetlands when planning or permitting activities on BLM-managed lands and protection of floodplains, regardless of ownership.	Ongoing. Consideration is given to the protection of wetlands when planning or permitting activities, however, the effectiveness of this consideration has been marginal at best.	Partially. While the current management decision is responsive to issues, mitigation to date has been ineffective in regard to floodplain and wetlands degradation.	See Utility Corridor RMP Proposed Action 48 (above)
Utility Corridor RMP/ ROD	**Proposed Action 37:** Withdraw portions of the Jim River, Kanuti River, and Prospect Creek floodplains from mineral location.	In support of fisheries habitat, portions of the riparian-wetlands within floodplains of the Jim, and Kanuti Rivers and Prospect Creek were to be withdrawn from mineral entry. This withdrawal was never completed.	Yes. The recommendation to withdraw these floodplains from mineral entry is responsive to current issues.	Recommend new withdrawals to protect riparian-wetlands in these areas and others as needed.
Central Yukon RMP/ ROD	**Wildlife Aquatic Prescription 3:** Withdraw selected crucial spawning habitat from mineral location and FLPMA sales and leases. Including a 300 foot withdrawal on both sides of the North Fork Unalakleet, Kateel, Gisasa, Tozitna, and Indian Rivers, and Clear and Caribou Creeks (tributary to the Hogatza River).	The proposed 300 foot mining withdrawals were never finalized by PLO. Closure to FLPMA sales and leases is a planning decision and was approved with the signing of the ROD. Mineral withdrawals will protect floodplain and riparian-wetlands on the identified streams. The North Fork of the Unalakleet is not in the planning area.	Partially. The decision to close these rivers within the Central Yukon Planning Area to FLPMA sales and leases is responsive to current issues. The decision to implement a mining withdrawal on these rivers is responsive to current issues, but the size of the withdrawal could be revisited and additional rivers could be considered.	Recommend new withdrawals to mining on important streams within the planning area as appropriate. Identify which lands in the planning area would be available for FLPMA sale and lease. In areas where these activities are not appropriate, consider closures.
Central Yukon RMP/ ROD	**Wildlife Aquatic Prescription 9:** Establish watershed ACECs for the streams identified above and also the Sulukna River.	These ACECs are established, but may need boundary revisions.	Partially. One key factor in protecting spawning habitat is recognizing the role that floodplain and riparian-wetland function plays in maintenance of aquatic habitat.	When reviewing the ACEC designations, consider floodplain and riparian-wetland function as a potential relevant and important value in these ACECs. Develop appropriate management in the ACECs to protect floodplain and wetland values.

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for change
Central Yukon RMP/ ROD	**Wildlife Aquatic Prescription:** Establish a 300 foot no surface occupancy zone for a portion of the Nulato River which contains crucial salmon spawning habitat.	The plan establishes a 300 foot no surface occupancy zone; this no surface occupancy zone would not preclude mining, but would apply to mineral leasing.	Partially. The no surface occupancy setback zone would protect floodplain and riparian-wetlands from some types of activities, but would not preclude mining.	Along with no-surface occupancy setbacks, recommend mineral withdrawals to provide complete protection to aquatic habitat and the floodplain and riparian-wetland functions that support this habitat.
Central Yukon RMP/ ROD	All withdrawals are subject to valid existing rights. Mining operations within designated ACECs will require plan approval.	Withdrawals are subject to valid existing rights and ACECs require approved mine plans per the regulations.	Yes, but is not really needed as a planning decision because these issues are dealt with through the 3809 regulations.	None
South-west MFP	**Wildlife Habitat 5–1 and 5–2:** Prepare a Habitat Management Plan (HMP) to include furbearer and non-game species management in planning blocks. The floodplain forests of the Unalakleet River are first priority.	These HMPs were never completed.	No. Unalakleet is outside of the planning area. No known issues related to furbearers and non-game species that require plans.	Consider which areas would benefit from HMPs and recommend the appropriate plans in the RMP. Consider basing activity plans on watersheds.
South-west MFP	Designate the Unalakleet River ACEC to provide special management consideration of fisheries resources.	The upper Unalakleet was designated as an ACEC based on fishery values. This ACEC is not within the Central Yukon Planning Area.	Address this issue in the BSWI RMP.	Address this issue in the BSWI RMP.
Central Yukon RMP/ ROD Utility Corridor RMP/ROD	Multiple decisions related to the protection of peregrine falcon habitat, including designation of ACECs and protection of associated riparian-wetland habitat.	ACECs were established as a means to protect the threatened and endangered peregrine falcon. No longer listed, the value of the ACECs and associated riparian-wetland habitat remains important for maintenance of healthy populations.	Partially.	Continue the ACECs previously established for the peregrine falcon and incorporate riparian-wetland function into the purposes for which the ACECs are established.
All Plans	Plan-level decisions related to the management of visual resources (multiple decisions all plans)	Visual resource management classes have been established for the Utility Corridor. Visual resources in remaining areas are considered during NEPA.	Partially. Not all plans have VRM classes assigned. One service provided by proper functioning riparian-wetlands and floodplains is the maintenance of aesthetic character of an area.	Include as appropriate, the protection of riparian-wetlands and floodplains when developing management prescriptions for the maintenance of visual resources.

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for change
All Plans	Multiple actions or decisions regarding management and harvest of forest products.	There are multiple planning decisions in all plans regarding timber harvest.	Partially. Timber harvest has the potential to adversely impact riparian-wetland and floodplain function through the removal of large wood (timber). No specific consideration was given to the protection of riparian-wetland and function in decisions related to timber harvest.	Consider how timber harvest would be conducted while maintaining natural recruitment rates of large wood into local stream and floodplain environments. Develop standard operating procedures.
Central Yukon RMP/ ROD Utility Corridor RMP/ROD	Multiple actions or decisions in respect to mineral leasing. Both RMPs proposed opening lands to mineral leasing.	In some areas ANCSA withdrawals that were to be lifted were not; and in other areas withdrawals that were proposed for the protection of competing resources were not implemented. PLO 6098 opened some lands south of the Nowitna National Wildlife Refuge in 1981. Most of the planning area remains closed to mineral leasing.	Partially. All mineral leasing decisions should be revisited based on current issues and land status. Some proposed closures to leasing may remain valid.	As a means of protecting riparian-wetland and floodplain areas, meeting the requirements of EOs 11990 and 11988, and providing protection to other identified resource values — consider closing riparian-wetland and floodplain areas to mineral leasing. Also see "Opportunities" for mineral location below.
Central Yukon RMP/ ROD Utility Corridor RMP/ROD	Multiple actions or decisions in respect to mineral location. Both RMPs identify decisions to open certain lands to mineral location and close certain lands to mineral location.	In some areas ANCSA withdrawals that were to be lifted were not; and in other areas withdrawals that were proposed for the protection of competing resources were not implemented. Much of the planning area is open to the location of metalliferous minerals. PLO 6098 opened some lands south of the Nowitna National Wildlife Refuge in 1981.	Partially. Where lands were not opened to mineral location, the requirements to protect riparian-wetlands and floodplains have been met by default. If these lands are opened to mineral location in the future, then the plan must identify how the requirements of EO 11990 would be met. In addition, the plan must demonstrate how other resources that are dependant on riparian-wetland function would be protected (FLPMA 102(8), and how non-point source water quality issues (CWA requirements) would be addressed.	Consider using some of the new land use planning concepts to address minimizing disturbance to riparian-wetlands and floodplains (req. by EOs) while also ensuring that keystone functions and processes that support other resources are maintained. For example Brost and Beier — Use of land facets to design linkages for climate change (2012).

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for change
Central Yukon RMP/ ROD Utility Corridor RMP/ROD	Actions or decisions in respect to salable minerals.	Decisions specifically address protecting certain areas such as crucial wildlife habitat or floodplains along portions of Prospect Creek or Jim River.	No. No specific mention is made of reviewing mineral material permits and sales for their compliance with EOs 11990 or 11988 or maintenance of riparian-wetland and floodplain function and its role in the protection and maintenance of other resources.	See "Opportunities" for mineral location above.
Utility Corridor RMP/ ROD	**Proposed Action 24:** The draft RMP/EIS recommended designation of a transportation corridor from the Dalton Highway to the Ambler Mining District.	The transportation corridor was not designated, but a right-of-way was issued to the city of Bettles for winter road.	No. Compliance with EOs 11990 and 11988 not addressed.	Address requirements of EOs through planning process. Evaluate effects of transportation routes on ability to establish landscape scale linkages (Brost and Beier 2012).
Central Yukon RMP/ ROD Utility Corridor RMP/ROD	Multiple actions related to transportation routes and use (UC RMP actions 25, 26, 27, 30, 31; CYRMP: Goal 2, obj. 1, Access p. 10 and 11)	Transportation plans have not been completed.	No. No consideration of requirements of EOs 11990 and 11988 into transportation planning.	Same as Action 24 above.

3.2.4. Nonnative Invasive Species

This section discusses opportunities to change or improve management of invasive plants through prevention, control, inventory, monitoring, partnerships, public involvement, education and awareness in the planning area. There are no decisions for nonnative invasive species in the Utility Corridor RMP or the Central Yukon RMP; however, the Dalton Highway Integrated Invasive Plant Management Strategic Plan was approved in November 2013.

Prevention and Control

The establishment of voluntary or mandatory prevention standards and a protocol for reporting detections will be a critical component of sustainable invasive plant management for the future. Common methods of invasive plant introduction that may be addressed through prevention include: contaminated seed, feed grain, straw, or mulch for reclamation projects; movement of unclean vehicles, equipment or machinery from weed-contaminated areas; animals (domestic and wildlife) that may have viable weed seed present in their digestive tract or attached to their hair or wool; wind or waterways dispersing seed; hunters, hikers, fishers, pilots moving invasive plant parts with viable seed; gardeners planting invasive plants as ornamentals; land owners scattering contaminated wild bird seed or allowing invasive plants to produce seed along waterways and roadways; and maintenance practices using gravel, road fill, or top soil contaminated with seed or vegetative reproductive plant parts.

The following prevention and control efforts have been identified as management opportunities as part of this analysis:

1. develop and make publicly available early detection and rapid response materials to reduce the need for larger, more expensive future control efforts;

2. continue surveys to detect new invasive plants and monitor existing infestations that might be expanding;

3. ensure that seed, feed grains, straw or mulch is free of weed reproductive plant parts;

4. declare the area north of Coldfoot a weed-free zone to prevent northward spread, and monitor the area regularly for early detection of nonnative invasive plant species;

5. declare weed free zones within 500 feet of bridges and river crossings and monitor these areas regularly for early detection of nonnative invasive plant species;

6. target non-permitted activities through public outreach by using education on best management practices;

7. develop best management practices for road construction material sites, sand and gravel pits, mulch, and other material source sites (i.e., use certified weed-free materials);

8. require as a stipulation in all permits that operators clean all equipment before entering and leaving project sites when operating in areas infested with weeds;

9. train and educate maintenance staff and truck operators to recognize weeds and report locations of infestations to the local weed specialist;

10. time disturbing activities to precede seed set and ensure weed propagules are not moved to uncontaminated sites; and

11. treat weeds in road decommissioning and reclamation projects and revegetate with certified weed-free seed to speed recovery and mitigate soil erosion.

Ongoing inventory and monitoring will prioritize infestations that have already been detected in fire-disturbed sites and populations of highly aggressive species located near a forest clearing, a burned site, or a waterway, giving precedence to those sites with high propagule pressure. The following management opportunities have been identified for future inventory and monitoring: (1) conduct surveys of gravel pits, particularly those slated for closure, and make management recommendations on a case-by-case basis; (2) prioritize monitoring sites and establish a point infestation protocol; (3) develop a monitoring plan for post-treatment surveys of effectiveness.

Partnerships and Public Involvement

At the current level of infestation along the Dalton Highway corridor, strong efforts dedicated to prevention, early detection, and rapid response are necessary.

These specific public participation activities have been identified as management opportunities:

1. encourage the use of best management practicess for road and vehicle maintenance (i.e., ADOT&PF and Alyeska);

2. encourage control of invasive plants on adjacent private property such as commercial visitor services and in rural communities;
3. develop informative displays and brochures for the Arctic Interagency Visitor Center;
4. provide tour companies educational materials about introduction and spread of invasive plants;
5. work with the ADFG to provide information to educate hunters and anglers;
6. arrange for community service hours to support invasive plant control projects; and
7. foster the establishment of cooperative agreements with stakeholders.

Education and Awareness

Increased awareness of nonnative invasive plants and the associated economic and ecological problems will help with public understanding of the importance of a comprehensive and sustainable long-term invasive plant management strategy.

Continued and expanded outreach and education management opportunities include:

1. target outreach to increase local and tribal awareness of the potential threats of invasive plants to subsistence resources;
2. place educational materials at trailheads and other entry points to natural areas;
3. encourage stock users to tie and/or hold stock in a way that minimizes vulnerability resulting from soil disturbance and loss of native vegetation;
4. develop displays and outreach programs for the general public with an emphasis on: damage to wildlife habitat, crop, and forage production; health problems associated with weeds, including skin irritations and allergies; and, impacts on scenic and recreational values;
5. educate BLM staff on invasive plant identification and reporting;
6. educate land use permit holders on weed identification and reporting;
7. target non-permitted activities through public outreach by using education on best management practices; and
8. inspire public awareness about the costs and benefits associated with certain treatments.

Table 3.6. Current Management and Options for Change, Nonnative Invasive Plant Species

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Dalton Highway Integrated Invasive Plant Management Strategic Plan	Establishment of voluntary or mandatory prevention standards	Currently being implemented.	Yes	(1) Ensure that seed, feed grains, straw or mulch is free of weed reproductive plant parts; (2) include as a stipulation in all permits that operators clean equipment before entering and leaving project sites; (3) time disturbing activities to precede seed set and ensure weed propagules are not moved to uncontaminated sites; and (4) encourage stock users to tie and/or hold stock in a way that minimizes vulnerability resulting from soil

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
				disturbance and loss of native vegetation
Dalton Highway Integrated Invasive Plant Management Strategic Plan	Develop strong efforts dedicated to early detection, and rapid response involving partnerships and the public	Currently being implemented.	Yes	Include a protocol for reporting detections and conduct trainings
Dalton Highway Integrated Invasive Plant Management Strategic Plan	Expand outreach and education to increase awareness	Currently being implemented.	Yes	(1) Increase awareness of potential threats to subsistence resources; (2) place educational materials at trailheads and other entry points to natural areas; (3) create displays and programs for the general public with an emphasis on the risks, costs and benefits associated with weeds such as habitat loss, human health, and impacts on scenic/recreational values; (4) educate BLM staff on identification and reporting; (5) educate land use permit holders on identification and reporting
Dalton Highway Integrated Invasive Plant Management Strategic Plan	Continue formal surveys to detect new invasive plants, monitor existing infestations	Currently being implemented.	Yes	(1) Conduct surveys of gravel pits, particularly those slated for closure, and make management recommendations on a case-by-case basis; (2) prioritize monitoring sites and establish a point infestation protocol; (3) develop a monitoring plan for post treatment surveys of effectiveness
Dalton Highway Integrated Invasive Plant Management Strategic Plan	Establish weed-free zones	Currently being implemented.	Yes	Prevent northward spread and areas within 500 feet of road-river interface to prevent downstream spread
Dalton Highway Integrated Invasive Plant Management Strategic Plan	Treat weeds in road decommissioning and reclamation projects	Currently being implemented.	Yes	Re-vegetate with certified weed-free seed to speed recovery and mitigate soil erosion
Dalton Highway Integrated Invasive Plant Management Strategic Plan	Develop best management practices (BMPs)	Currently being implemented.	Yes	(1) Educate the public on BMPs targeting non-permitted activities; (2) develop BMPs for road construction and material source sites; and (3) train and educate maintenance staff and truck operators to recognize and report weeds
Dalton Highway Integrated Invasive Plant Management Strategic Plan	Develop partnerships with other affected land owners, users, and managers	Currently being implemented.	Yes	(1) Encourage control of weeds on adjacent properties; (2) provide educational materials about introduction and spread to commercial service operators; (3)

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
				work with the state agencies to provide information to educate hunters and anglers; (4) arrange community service projects to control weeds; and (5) foster the establishment of cooperative agreements with stakeholders

3.2.5. Fish and Wildlife

Table 3.7. Current Management and Options for Change, Fish and Wildlife

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 34:** Implement a systematic monitoring program to assess impacts of human uses on fisheries resources. Initial inventories will establish comparable baseline data that can be used to develop an aquatic habitat management plan if significant fisheries habitat improvements or protections are required in the future.	Ongoing. Toolik and Alyeska also do some monitoring.	Partially. Baseline inventories are ongoing though not complete. Areas of highest impact are being inventoried first. Information collected is being used to formulate mitigation measures for permitted actions. Anthropogenic disturbances to resources will continue to increase (i.e., access, oil and gas, locatable) stretching capability of staff and funding to complete inventories needed for management decisions.	Future permitted actions may need to require applicants to provide baseline data. Internal workload analysis may be needed to direct funding and staffing.
Utility Corridor RMP/ ROD	**Proposed Action 35:** With the assistance of the ADFG, and the U.S. Fish and Wildlife Service, transplant sufficient numbers of muskoxen to support a viable population on BLM-managed lands near Pingaluligit Mountain in the Oolamnagavik Block.	This decision has not been implemented. Most if not all of these lands have been conveyed to the State of Alaska.	No. ADFG not in favor of this and most of these lands are no longer under BLM management.	Coordinate with the State of Alaska to determine if the State is planning any wildlife transplants or introductions within the planning area.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 36:** Develop a habitat management plan (HMP) for the Colville River area, a nationally important area for raptors, including the peregrine falcon. The HMP would focus management of peregrine falcons in accordance with the *Peregrine Falcon Recovery Plan- Alaska Population* (USFWS 1982) and other raptor species concentrated in the area. Other species emphasized will include important big game species and fisheries. Management options and stipulations would be developed before the area is classified for competitive or noncompetitive mineral leasing.	A Colville River Special Area Management Plan was developed in 2008. This plan includes a raptor monitoring program. The area is open to leasing within the NPR-A. Most of the lands in the area have been conveyed to the State or Native corporations.	No. Peregrine falcons are no longer federally listed. Most of these lands are no longer BLM-managed.	N/A
Utility Corridor RMP/ ROD	**Proposed Action 37:** Restrictions on mineral entry and location would be placed on areas of high wildlife (terrestrial and aquatic) resource values, including withdrawal of eight mineral licks (160 acres each), portions of the floodplains of the Jim and Kanuti Rivers and Prospect Creek, and the southern portion of the proposed Nigu-Iteriak ACEC from mineral location (Proposed Action 2). Except for the Nigu-Iteriak ACEC, which would be closed to mineral leasing, the above areas are open to leasing only with no surface occupancy stipulations (Proposed Action 4). In addition, the Jim River and Ivishak River ACECs would be designated for protection of fisheries habitat, and six ACECs would be designated for the protection of crucial Dall sheep habitat. Six mineral licks are within ACECs (Proposed Action 52). The other identified mineral licks are shown on Map 2.9. Also, see the "Mineral Resource Development" section of Chapter 2, the foldout maps, and Appendix N of the Proposed RMP.	No new withdrawals have been done. Jim River is an ACEC. Ivashak is now State land. PLO 5180 still in effect. This PLO withdraws lands from all forms of appropriation under the public land laws, including State selections under the Alaska Statehood Act, and "from location and entry under the mining laws (except locations for metalliferous minerals), 30 U.S.C. Ch. 2." In some areas PLO 5180 has been amended to allow for State selection.	Not for aquatic species. Withdrawal of the Jim, Prospect, and Kanuti floodplains to mineral entry and location to protect resource values was not completed. Floodplains were delineated. Closure was not implemented. Partially responsive for Dall sheep. BLM has more data on mineral licks. Proposed mining withdrawals were not implemented.	Consider the need for new withdrawals in the RMP for both fisheries and Dall sheep and take action to implement them once the RMP is approved.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 38:** Habitat improvement for moose and other species would occur through implementation of the Alaska Interagency Fire Management Plans. Prescribed burns may be used to reestablish or improve habitat.	Fire management plan was implemented. No prescribed burns have been done.	Partially. Habitat may not be the limiting factor for all moose populations. Prescribed fire is not the only tool for habitat improvement.	Consider the need for prescribed fire in the planning area. Consider revisions to fire management options. Fire management options can be revised outside the planning process.
Central Yukon RMP/ ROD	**Wildlife Resources, Terrestrial:** Based on wildlife concerns (wintering areas of the Western Arctic Caribou herd), all lands within the Tagagawik/Buckland watershed (Nulato Subunit) and Purcell Mountains (Hughes Subunit) are closed to FLPMA sales/leases.	No withdrawal has been done to close to FLPMA sales/leases. No known demand for sales/leases.	No. Closing these areas to sales and leases will not address current issues. Issues are potential future roads and changes to caribou migration and wintering patterns, and changes due to climate change.	Revisit this decision. Consider management options for caribou habitat that will address current issues.
Central Yukon RMP/ ROD	**Wildlife Resources, Terrestrial:** Crucial caribou habitats within the Tozitna and Dulbi subunits have been designated as ACECs. Mineral exploration and development is allowed in all ACECs. An approved Plan of Operations is required before any ground-disturbing activity (other than those defined under 43 CFR 3809 as casual use) can occur.	See section 3.2.20 ACECs	No. This decision is unclear. Mining plans of operations are required per regulation in ACECs regardless of location.	Revisit the boundaries and proposed management for these ACECs to provide protection for crucial caribou habitat.
Central Yukon RMP/ ROD	**Wildlife Resources, Terrestrial:** Monitoring programs will be continued in cooperation with ADFG.	Ongoing.	Yes.	Increase/decrease monitoring and/or support of monitoring.
Central Yukon RMP/ ROD	**Wildlife Resources, Aquatic:** Selected crucial spawning habitat will be withdrawn from mineral location and FLPMA sales and leases. These withdrawals extend 300 feet back along each side of the streams mean high-water line to also include the stream bed of waterways unless known to be navigable. These withdrawals include portions of the North Fork Unalakleet River, Kateel River, Gisasa River, Tozitna River, Indian River, and Clear, Bear, and Caribou Creeks (Hogatza River tributaries).	Not implemented. Withdrawal orders were drafted, but not implemented. PLO 6098 opened some lands south of Nowitna National Wildlife Refuge to mining and mineral leasing. North Fork Unalakleet, Kateel, and Gisasa Rivers are in the BSWI Planning Area.	No. Withdrawals to protect habitat are not in effect. Permit mitigation measures are being used to minimize adverse effects. Some of the rivers covered by this decision are no longer in the Central Yukon Planning Area.	Consider recommending new withdrawals in the RMP and take action to implement them once the RMP is approved.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ ROD	**Wildlife Resources, Aquatic:** Stream monitoring programs initiated in cooperation with ADFG will be continued.	Done in the past. Changing priorities and funding constraints preclude current cooperative efforts.	Partially. Given declining budgets and staff, agencies should continue to coordinate monitoring efforts when possible.	Future cooperation will be issue driven.
Central Yukon RMP/ ROD	**Wildlife Resources, Aquatic:** Watershed ACECs have been established for all portions of the watershed lying above the lower limit of identified river withdrawals. These ACEC designations include all lands within the river withdrawal area. In addition, an ACEC designation has been placed on that portion of the Sulukna River (Kuskokwim Subunit) lying within the Fairbanks District. This designation was made to protect identified sheefish spawning habitat within this drainage.	See section 3.2.20 ACECs. Management plans have been written for Hogatza, Indian, Tozitna, and Norton Sound drainage ACEC's.	Partially. Some ACECs are not located properly to protect resources of concern.	Review all ACECs and consider any needed revisions to boundaries. If needed, modify boundary through RMP. ACEC management plans could be developed as part of the RMP, removing the need for future ACEC management plans.
Central Yukon RMP/ ROD	**Wildlife Resources, Aquatic:** A 300-foot "no surface occupancy" (NSO) setback zone has been identified for a portion of the Nulato River which contains crucial salmon spawning habitat. This zone will extend 300 feet back along each side of Nulato River segment mean high-water line. If this segment is determined to be non-navigable, the 300 foot NSO zone will extend back along both sides of the river center line. Note: see Management Prescriptions p. 37 CY Plan ROD.	The 300 foot NSO zone is established for leasable minerals per the RMP, but no mineral leasing has occurred. These lands continue to be withdrawn from mineral leasing via ANCSA withdrawals.	Yes. A 300 foot NSO would protect aquatic resources in the event of mineral leasing.	Reevaluate the need for an NSO zone along rivers in the planning area to protect fish and aquatic species and water quality.
Central Yukon RMP/ ROD	**Wildlife Resources, Aquatic:** All withdrawals are subject to valid existing rights including properly recorded unpatented mining claims. Areas designated as ACECs are open to mineral location and mineral leasing. Lands withdrawn from mineral location are open to non-ground-disturbing mineral leasing, such as oil and gas. Mining operations within designated ACECs will require an approved plan of operations prior to starting any ground-disturbing activities	Much of this decision restates regulation. ANCSA withdrawals are still in place. No new withdrawals recommended by the CY RMP have been implemented. Not all ACECs have watershed management plans.	Partially. ACECs require an approved plan of operation per regulation. Most ACECs remain closed to mineral leasing by ANCSA 17(d)(1) withdrawals. New mining withdrawals to protect habitat are not in effect. ACEC management plans can be done through the RMP, removing the	Revisit ACEC designations, consider new ACECs. Revisit proposed mining withdrawals and existing ANCSA 17(d)(1) withdrawals to determine where withdrawals should be modified or revoked and where recommendations for new

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	other than those described as casual use by 43 CFR 3809. Plan approval will require compliance with both the general guidelines established in this plan and the specific watershed ACEC Management Plan.		need for future activity level planning.	withdrawals are appropriate.
Southwest MFP	**Wildlife Habitat 2–1:** Prepare habitat management plans (HMPs) to include caribou ranges in the Sleetmute, Minchumina, and Lime Village planning blocks to determine what management actions can be taken to improve, maintain, or protect wintering areas, migration routes, and calving areas.	These lands are not in the planning area or are no longer BLM-managed.	No. These lands are not in the planning area or are no longer BLM-managed.	N/A
Southwest MFP	**Wildlife Habitat 5–1 and 5–2:** Prepare an HMP to include furbearer management in the planning blocks. The floodplain forests of the Unalakleet River are first priority. Strong consideration should be given to non-game wildlife species in all HMPs.	Unalakleet is not in planning area.	No. Not applicable to current Central Yukon Planning Area. HMPs are activity-level plans and can be addressed outside the RMP and, if appropriate, would consider non-game species.	N/A
Southwest MFP	**Fisheries Habitat 1–3:** Designate the Unalakleet River drainage as an ACEC to provide special management consideration for the fisheries resource.	Unalakleet River is an ACEC.	No. The Unalakleet ACEC is not in the Central Yukon Planning area.	N/A

3.2.6. Special Status Species

Table 3.8. Current Management and Opportunities for Change, Special Status Species

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 39:** Management practices for peregrine falcon, a threatened species in CAMA and an endangered species in the southern half of the planning area, would include (1) implementation of monitoring activities to obtain information to enhance population recovery, (2) implementation of the protection measures recommended by the *Peregrine Falcon Recovery*	Measures to implement the *Peregrine Falcon Recovery Plan* were implemented and the peregrine has been delisted. Sagwon Bluffs ACEC is State land. The BLM monitors raptors in	No. Peregrine falcons are no longer listed and land ownership in the area has changed. Colville River Special Area Plan addresses this issue.	Evaluate appropriate level of protection for peregrine falcon habitat. Consider standard operating procedures to protect raptor nesting habitats

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	Plan- Alaska Population (U.S. Fish and Wildlife Service 1982), (3) enhancement of populations to a point of recovery that allows peregrine falcons to be removed from threatened and endangered species lists, and (4) proposed designation of Sagwon Bluffs ACEC for the protection of peregrine falcons.	the Colville River Special Area.		throughout the planning area.
Utility Corridor RMP/ROD	**Proposed Action 40:** No federally listed or proposed threatened or endangered (TE) plant species are known to occur in the planning area. BLM policy requires that plants designated as "sensitive" be accorded the full protection of the Endangered Species Act (ESA). The sensitive plant *Montia bostockii* is present in the Toolik Lake ACEC, and *Erigeron muirii* is present in the Sagwon Bluffs ACEC (Proposed Action 52). The ESA requires protection of TE habitat from actions that would modify or destroy them. All actions that might affect these plants or their habitats would be examined through the environmental assessment process. Stipulations to assure their protection would be included in permits and leases.	Sagwon Bluffs ACEC is State land. The BLM follows current policy for sensitive species (Manual 6840, 2001): "ensure that actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species and do not contribute to the need to list any special status species, either under provisions of the ESA or other provisions of this policy." *Montia bostockii* is a BLM sensitive species.	No. BLM follows law and policy for special status species. Numerous changes have occurred since 1986.	Evaluate appropriate level of protection for *Montia bostockii* and other BLM Alaska sensitive species.
Utility Corridor RMP/ROD	**Proposed Action 49:** Species management plans for *Montia bostockii* in the Toolik Lake ACEC and *Erigeron muirii* in the Sagwon Bluffs ACEC would be initiated. Additional plans would be written and implemented if these species are found in other areas, or if other threatened, endangered, or sensitive plants are located (also see proposed action 40).	Sagwon Bluffs ACEC is State land. Inventories were done. No species management plans were written. *Montia bostockii* is a sensitive species. *Erigeron muirii* occurs in more areas than just Sagwon.	Partially. BLM Alaska Sensitive Species list has changed since the Utility Corridor RMP was written. Management plans for other species or areas may be appropriate.	Evaluate the appropriate level of protection for these species and other species that have been added to the BLM Alaska Sensitive Species List (BLM 2010).

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Threatened and Endangered Species:** Crucial habitat areas for peregrine falcon are separated into three categories. The first category (36,480 acres) deals with those lands which have been identified for withdrawal from all forms of appropriation and further classified for exchange. These lands (located southeast of Kaltag) are withdrawn for five years. Those lands not exchanged or being considered for exchange at the end of the five-year period will be designated as ACECs.	No mining withdrawals have been implemented. No exchanges have been done. Peregrine falcon was delisted in 1991. No additional ACECs have been designated. Land status has changed.	No. BLM follows law and policy for special status species. Numerous changes have occurred since 1986.	Evaluate appropriate level of protection for peregrine falcon habitat. Consider standard operating procedures to protect raptor nesting habitats throughout the planning area.
Central Yukon RMP/ROD	**Threatened and Endangered Species:** Category two lands (20,480 acres) are lands not identified for exchange. These lands are withdrawn from metalliferous mineral location. All discretionary actions, including actions associated with oil and gas leasing, would be reviewed for consistency with both the ESA and guidelines established by the *Peregrine Falcon Recovery Plan*.	Same as above.	Same as above.	Same as above.
Central Yukon RMP/ROD	**Threatened and Endangered Species:** Category three lands (54,000 acres) are those identified as ACECs. These lands are open to mineral entry and location, and mineral leasing. The ACEC management plan will require that all actions within the ACEC be consistent with existing protective guidelines established by the *Peregrine Falcon Recovery Plan*. An approved plan of operations will be required for all ground-disturbing activities associated with mineral exploration/development (casual use as defined under 43 CFR 3809 is excepted).	Same as above. No ACEC plans have been developed. 43 CFR 3809 requires a mining plan of operations in ACECs.	Same as above.	Same as above.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Threatened and Endangered Species:** Any ground-disturbing activities associated with existing federal mining claims on lands withdrawn for threatened and endangered species will require an approved plan of operations before activities are initiated.	Existing 17(d)(1) and other withdrawals would trigger the need for a mining plan in areas currently under withdrawal from locatable mineral entry. These areas are limited.	No. Not responsive to current issues, no candidate or listed species in planning area, restates regulations.	No opportunity for change in planning effort, addressed in 3809 regulations.
Central Yukon RMP/ROD	**Threatened and Endangered Species:** Peregrine falcon monitoring programs will be continued in cooperation with the U.S. Fish and Wildlife Service.	Monitored for 5 years after delisting. Included in general raptor surveys as they occur.	N/A	N/A — currently more than 5 years post-delisting.

3.2.7. Wildland Fire Ecology and Management

Table 3.9. Current Management and Opportunities for Change, Wildland Fire Ecology and Management

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 50 and Appendix N:** Fire will be managed according to the standards and procedures outlined in the Alaska Interagency Fire Management Plan. Areas of critical, full, modified, and limited suppression are defined. A major focus of fire suppression in the Utility Corridor would be the protection of the facilities needed for the transport of energy minerals.	Replaced by BLM Alaska Land Use Plan Amendment for Wildland Fire and Fuels Management (BLM 2005b)	Yes. Required under current Fire Management Plan.	No changes recommended
Central Yukon RMP/ROD	**Fire Management (pg. 13):** The Central Yukon Planning Area is included under three approved interagency fire management plans. Actions dealing with implementation and modification of approved fire plans will be implemented in accordance with guidelines contained in the plans. Plan review and monitoring evaluations are conducted on an annual basis. Modifications of existing protection boundary lines will be coordinated with affected land owner(s) and Alaska Fire Service.	Replaced by BLM Alaska Land Use Plan Amendment for Wildland Fire and Fuels Management (BLM 2005b)	Yes. Required under current Fire Management Plan.	No changes recommended

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Amendment for Wildland Fire and Fuels Management	Cooperate and collaborate with other federal, state, and Native land managers, and with other suppression organizations to address issues and concerns related to wildland fire management in Alaska and to implement operational decisions. Implement the most current fire management plan.	Ongoing	Yes. Required under current Fire Management Plan.	No changes recommended
Amendment for Wildland Fire and Fuels Management	Apply four wildland fire management suppression options: Critical, Full, Modified, and Limited. Management options are ecologically and fiscally sound, operationally feasible, and sufficiently flexible to respond to changes in fire conditions, land use patterns, resource information, new technologies, and new scientific findings. These options may be adjusted periodically. The designation of a management option pre-selects strategies to accomplish established land use and resource objectives.	Ongoing	Yes. Required under current Fire Management Plan.	No changes recommended
Amendment for Wildland Fire and Fuels Management	Actions will be taken to protect specific sites that have been identified for special fire management protection. Site-specific actions may be taken to protect structures, cultural and paleontological sites, small areas of high resource value, and threatened and endangered species habitat to give suppression agencies more specific guidance for small sites.	Ongoing	Yes. Required under current Fire Management Plan.	No changes recommended
Amendment for Wildland Fire and Fuels Management	Fuels management activities assist in achieving the objectives stated for wildland fire management options. Prescribed burning, mechanical and manual treatments may also be used. Projects may be implemented in support of scientific research and in cooperation with BLM cooperators and partners.	Ongoing	Yes. Required under current Fire Management Plan.	No changes recommended
Amendment for Wildland Fire and Fuels Management	Fuels treatments are prioritized to: 1. Reduce the risk to human life and inhabited property. Highest priority for fuel treatments would be those communities surrounded by hazardous fuels. 2. Reduce the risk and cost of wildland fire suppression in areas of hazardous fuels buildup. 3. Achieve other resource objectives such as habitat needs. 4. Achieve desired future condition of Fire Regime Condition Class 1.	Ongoing	Yes. Required under current Fire Management Plan.	No changes recommended

3.2.8. Cultural and Paleontological Resources

Table 3.10. Current Management and Opportunities for Change, Cultural and Paleontological Resources

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 51:** Cultural resources would continue to be inventoried and evaluated as part of project or activity planning. Such evaluation would consider the significance of the proposed project and the sensitivity of cultural resources in the affected area. Stipulations would be attached as appropriate to assure compatibility of projects with management objectives for cultural resources.	Ongoing through NEPA process and "Section 106" [54 USC 306108] review process.	Yes	No changes recommended
Utility Corridor RMP/ROD	**Proposed Action 51:** In addition, the southern portion of the Nigu-Iteriak ACEC would be closed to ground-disturbing activities, in large part because of the cultural resources in the area.	Ongoing. Subject to interim management guidelines because of WSA designation. Part of the ACEC transferred to NPS. Known cultural resources within the ACEC are found on lands managed by the NPS.	Yes. Limitations on ground-disturbing activities are appropriate because of the status of the area as a WSA.	Expand rationale for limiting ground-disturbing activities to other resources besides cultural.
Utility Corridor RMP/ROD	**Proposed Action 51:** The proposed Galbraith Lake and Ivishak River ACECs contain cultural resources eligible for inclusion on the National Register of Historic Places.	Ivashak ACEC has been conveyed to the State of Alaska. No sites have been nominated for the register; this is not something BLM normally does.	No. Nomination to the register is not a planning decision.	The Galbraith Lake ACEC is far larger than necessary for the enhanced protection of cultural resources. The ACEC could be diminished in size if only considering cultural resources.
Central Yukon RMP/ROD	**Goal #2, Objective 6:** Protect cultural resources in accordance with the requirements of 36 CFR 800. Avoid adverse impacts to significant cultural and paleontological sites.	Ongoing. 36 CFR 800 requires that the BLM "accounts" for impacts to sites determined eligible for inclusion on National Register of Historic Places — not "avoid impacts."	Yes	No changes recommended
Central Yukon RMP/ROD	**Goal #1, Objective 13:** Manage cultural and paleontological resources for a balance of current and future scientific use, socio-cultural use, and public interpretation.	Ongoing.	Yes	Consider designating sites in the RMP for future use per the BLM Planning Handbook.

Decision Source	Current Management Decision	Status	Is Decision Responsive to current Issues?	Options for Change
Central Yukon RMP/ROD	**Cultural and Paleontological Resources:** Management of cultural and paleontological resources with other land use proposals would avoid or mitigate impacts, where possible and warranted. Consumptive uses of archaeological and historical sites would be allowed for scientific use and interpretation.	Ongoing. 36 CFR 800 directs agency decisions to "avoid, minimize, and mitigate" adverse affects to cultural resources. NEPA process allows for protection of a wider variety of cultural resources.	Yes	No changes recommended
Central Yukon RMP/ROD	**Goal #4, Objective 6:** Maintain and expand the inventory of cultural and paleontological resources to enable the BLM to respond with compliance requirements for ground-disturbing activities.	Section 110 inventory is funded only through annual 1050 Program flexible funds. Sustained Section 110 inventory work is vulnerable to swings in annual 1050 Program fund levels.	Yes, but funding is outside the RMP process.	Consider need for inventory to support implementation of RMP decisions. Pursue funding outside the planning process.
Southwest MFP	**Minerals 3–1:** Identify known paleontological resources and others discovered through other resource development in order to protect significant sites.	Ongoing through NEPA process and "Section 106" [54 USC 306108] review process.	Yes	Recommend "Section 106" [54 USC 306108] introductory training for all field office staff involved in project permitting.
Southwest MFP	**Cultural Resources 1–1:** Assure that potential ground-disturbing projects planned or authorized by the BLM are examined in order to protect significant cultural resources. Cultural clearances could be performed either by a BLM-archeologist or contracted, by the permittee, to professional archeologists recognized by the BLM.	Ongoing through NEPA process and "Section 106" [54 USC 306108] review process.	Yes, required by law.	No changes recommended

3.2.9. Visual Resources

The overall goal of the Visual Resources Management (VRM) program is to minimize impacts on visual resources. Scenic quality is maintained using the VRM Objectives assigned in land use plans or other policy documents. All of the subunits in the existing Central Yukon RMP have scenic quality rate ratings, but do not have VRM classifications assigned, i.e., VRM Class I –IV. The Utility Corridor RMP, however, has both VRM and scenic quality classifications.

Table 3.11. Current Management and Opportunities for Change, Visual Resources

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 32:** PLO 5150 withdraws the Utility Corridor and dedicates it to long-term utility and transportation needs; utility and energy transportation functions supersede other considerations. Management must allow for activities which could require major modification of the existing landscape. Therefore, Inner corridor lands would be managed as visual resource management (VRM) Class IV. To the extent feasible, minimize the visual impacts of authorized activities, especially in Class A scenery areas. Special attention would be given to the protection of visual resources within Galbraith Lake and Sukakpak Mountain ACECs.	Ongoing. Impacts to visual resources are minimized during the NEPA process.	Partially. The Dalton Highway has become an important tourist destination for Alaska and maintenance of visual quality is very important. There may be other areas with high scenic values besides Galbraith Lake and Sukakpak Mountain ACECs.	Options for change are limited within the Inner corridor because of the overriding designation of the area as a Utility Corridor. Review and update the visual resource inventory. Determine most appropriate VRM classes, based on current issues and proposed alternatives in the Draft RMP.
Utility Corridor RMP/ROD	**Table 2.3:** Dalton Corridor Extensive Recreation Management Area – VRM Class III	Ongoing. Impacts mitigated through NEPA process.	Possibly not. This area is within the viewshed of the Dalton Highway, an important tourist destination and some areas may warrant a more protective class.	Review and update the visual resource inventory. Determine most appropriate visual resource management classes, based on current issues and proposed alternatives in the Draft RMP.
Utility Corridor RMP/ROD	**Table 2.3:** Oolamnagavik-Colville Recreation Management Area – VRM Class III	Ongoing. Impacts mitigated through NEPA process. The majority of these areas have been conveyed to the State or Native corporations.	Most of the area is no longer BLM-managed lands. Class III may be appropriate on the remaining BLM-managed lands.	
Utility Corridor RMP/ROD	**Table 2.3:** Central Arctic Management Area – VRM Class IV		Most of the area is no longer BLM-managed lands. VRM classes on remaining lands should be commensurate with activities likely to occur on adjacent lands.	
Utility Corridor RMP/ROD	**Table 2.3:** Nigu — Suitable for Wilderness – VRM Class I	Ongoing. Impacts mitigated through NEPA process.	Yes. This is a wilderness study area.	
Utility Corridor RMP/ROD	**Table 2.3:** Iteriak ACEC – VRM Class III		Class III may be appropriate on the remaining BLM-managed lands.	

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Goal #1, Objective 10:** Manage lands in conformance with visual quality standards in order to maintain scenic values. Mitigate visual impacts where surface disturbances occur.	Ongoing. Impacts mitigated through NEPA process. Visual resource classes have not been assigned.	Yes, but resource management classes need to be assigned.	Conduct a visual resource inventory for the Central Yukon Planning Area. Determine most appropriate visual resource management classes, based on current issues and proposed alternatives in the Draft RMP.
Central Yukon RMP/ROD	**Visual Resources (pg.12):** Areas of outstanding scenic value in the Ray Mountains would be managed where possible to retain the existing character of the landscape. Other areas would be managed to lessen impacts from other activities. Potential impacts would be evaluated, and mitigative measures implemented on a case-by-case basis through the environmental analysis process.	VRM identified for special consideration in this area. Ray Mountains treated differently. Much of this area is State-selected.	Partially. Through this planning process, other areas besides the Ray Mountains may be identified as having high scenic value and it may be appropriate to retain the existing character of the landscape in these other areas as well.	
Central Yukon RMP/ROD	**Visual Resources (pg.12):** The viewshed of the Unalakleet National Wild River, outside the designated corridor, would be managed with an awareness of the important scenic values associated with the river.	Most of the viewshed is outside the planning area. Impacts mitigated through NEPA process.	Yes. If there are important viewsheds for the WSR corridor within the Central Yukon Planning area, a higher VRM class may be warranted.	Determine if viewshed for Unalalkeet WSR exists within the planning area. If so consider this when setting VRM classes.
Southwest MFP	**Visual Resources 1–1:** Define the seen areas of the Unalakleet River and manage those sections outside of the Wild River Corridor as VRM Class II. Management will particularly address potential tributary crossings for transportation, rights-of-ways, and utilities outside the Wild River Corridor.	All but 2,000 acres of the river corridor isis in the Bering Sea-Western Interior planning area. Corridor is managed as VRM Class II. Impacts mitigated through NEPA process.	VRM Class II is appropriate for designated wild and scenic rivers, but most of the corridor is not within the Central Yukon Planning Area.	Conduct a visual resource inventory for the Central Yukon Planning Area. Determine most appropriate visual resource management classes, based on current issues and proposed alternatives in the Draft RMP.
Southwest MFP	**Visual Resources 2–1:** Evaluate all proposed management activities by using the visual resource management contrast rating system and encourage those projects that are compatible or designed to be compatible with the character of the natural landscape.	Ongoing through the NEPA process.	Yes.	

3.2.10. Forestry and Woodland Products

Table 3.12. Current Management and Opportunities for Change, Forestry and Woodland Products

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 44:** The proposed RMP would allow commercial harvest of timber resources in the Utility Corridor for salvage purposes, such as after clearing operations along rights-of-way, or of fire-killed timber	Ongoing, no requests made to date	Yes. Some limitations on salvage may be appropriate on a case-by-case basis.	Revisit this decision based on revised visual resource inventory, ACECs, and current issues.
Utility Corridor RMP/ ROD	**Proposed Action 45:** The proposed RMP would permit use of timber resources, such as firewood and house logs, on a case-by-case basis. Should future monitoring indicate any intensive use areas (i.e., where demand may be exceeding supply), a forestry management activity plan would be initiated.	Ongoing, a few firewood permits and subsistence permits issues to date.	Unknown. Location and quantity of subsistence harvest is not documented. Subsistence harvest policy has changed.	Increase information about subsistence harvest activities. Educate subsistence users about changes in policy.
Utility Corridor RMP/ ROD	See also Proposed Action 43 under Subsistence			
Central Yukon RMP/ ROD	**Goal #1, Objective 8:** Maximize opportunities for the harvest of forest products where feasible and practical.	Ongoing, allowed	Yes, little or no demand for forest products. User hopes for biomass harvest, but BLM least accessible biomass on the landscape.	Revisit this decision based on current issues.
Central Yukon RMP/ ROD	**Forestry Resources (pg. 11):** All forest lands are 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 will be permitted on these withdrawals.	Ongoing, never implemented due to low demand. RNAs were never withdrawn. Subsistence studies were never done.	Yes, responsive to current issues to the extent that they exist. Subsistence harvest policies have changed from previous planning effort. No demand for commercial harvest.	Increase information about subsistence harvest activities. Educate subsistence users about changes in policy.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ ROD	**Forestry Resources (pg. 11):** Data on forest lands will be accumulated and maintained until identified needs require a more intensive forest inventory.	Ongoing, little done to date.	No. Little known about forest productivity, health, and phenological shifts.	Partner with US Forest Service for inventory of forest product status. Planning Handbook requires establishment of 'desired cut levels' but without demand and/or inventory can't be accomplished.
South-west MFP	**Forestry 1–1:** Provide for the use of forestry products throughout the planning area with priority in areas open for settlement entry.	Ongoing, little done to date. Settlement laws have expired.	Yes, responsive to current issues. Although little or no demand in the part of the area covered by this MFP.	Increased information about the use of forest products.

3.2.11. Livestock Grazing

There are no current livestock grazing permits in the revised planning area. Both the Utility Corridor and Central Yukon RMPs prohibit livestock grazing, other than that associated with recreational purposes such as pack horses. The Southwest MFP allows for grazing, but has minimal overlap with the Central Yukon Planning Area. There may be interest in reindeer grazing at the community level. The RMP provides an opportunity to consider and analyze potential impacts of reindeer grazing.

Table 3.13. Current Management and Opportunities for Change, Livestock Grazing

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 46:** Under current management, grazing permits are not allowed. The proposed RMP would continue this policy. Any horse grazing north of the Yukon River is currently associated with pack trips for recreational purposes. These activities	Ongoing, never requested. Could be authorized for recreation permits. Special rules dictate that livestock corralled only in BLM corrals prior to	Yes. There is no demand for traditional livestock grazing permits and the area is not suitable for such use. Grazing associated with pack trips can be accommodated	Revisit special rules regarding livestock (pack animal) use in the Dalton Highway Recreation Management Area.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	can be accommodated under a temporary use permit.	entry, but corrals were never built.	under temporary use permits.	
Central Yukon RMP/ROD	**Goal #3, Objective 3:** Prohibit domestic livestock grazing due to identified wildlife conflicts and the lack of suitable grazing lands within the planning area.	Ongoing, no known permit requests	Yes. Same as above. Possible interest in reindeer grazing.	Evaluate allowing reindeer grazing under the Alaska Reindeer Grazing Act.
Southwest MFP	**Range Management 1–1:** Allow seasonal grazing for domestic livestock on a local level where public demand warrants, and where determined compatible with other resources.	Ongoing, no known permit requests	Possibly for reindeer. Lands are not suitable for cattle or sheep and disease transmission is a concern.	
Southwest MFP	**Range Management 1–2:** Allow seasonal grazing for reindeer or muskoxen on a level to protect other resources. Exclude Unalakleet and Avik Rivers and their significant tributaries from grazing leases.	Ongoing. Unalakleet and Anvik Rivers are outside of the current planning area.	Possibly for reindeer. Muskoxen are wildlife, not domestic livestock.	

3.2.12. Minerals

3.2.12.1. Leasable Minerals

Table 3.14. Current Management and Opportunities for Change, Leasable Minerals

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 4:** All lands, except for split-estate (the subsurface estate has been conveyed to ASRC) and the southern portion of proposed Nigu-Iteriak ACEC (the proposed Nigu wilderness area), would be open to the exploration and development of leasable minerals. No surface occupancy stipulations would apply to the Inner corridor, eight identified mineral licks, Ivishak River and Kanuti Hot Springs ACECs, and streams closed to mineral location, i.e., floodplains of the Jim River and Prospect Creek downstream from the eastern boundary of the Inner corridor, and the Kanuti River downstream of the western boundary of the Inner corridor. Seasonal closures may also be applied to areas crucial to	ANCSA withdrawals prohibit leasing. These withdrawals were not modified to open 5.8 million acres to leasing as recommended in the Utility Corridor RMP. No surface mineral access since no known demand for use. Most lands with high oil and gas potential have been conveyed to the State or Native corporations. Ivishak and Sagwon Bluffs ACECs no longer	No. These withdrawals date from the early 1970s. Withdrawals need to be reviewed and a determination made to maintain, modify, or revoke. If lands are opened to the mineral leasing laws, then no surface occupancy stipulations and seasonal restrictions should be considered.	Review all existing withdrawals. Consider opening some lands to the mineral leasing laws through modification of existing withdrawals. On lands recommended open to mineral leasing, develop the appropriate leasing stipulations to protect sensitive resources.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	species covered by the ESA, e.g., the Sagwon Bluffs ACEC. Currently, there are no lands open to mineral leasing within the planning area. Under the proposed RMP, approximately 5.8 million acres would be open to leasing.	exist because these lands were conveyed.		
Utility Corridor RMP/ROD	**Proposed Action 5:** The coal screening process, including the application of unsuitability criteria, has not been conducted for this proposed RMP. This does not imply that coal exploration, leasing, and development are incompatible with this proposed plan. If an application for a coal lease is received sometime in the future, an appropriate land use and environmental analysis, including the coal screening process, will be conducted to determine whether or not the applied-for coal areas are acceptable for development and for leasing consideration. The plan would be amended as necessary.	Would be considered in plan amendment if application received; no interest to date.	Yes. There has been no interest from industry. There is no need to conduct the coal screening process at this time.	Defer decisions on coal in the RMP until there is an application or interest from industry. At that time, conduct the coal screening process and amend the RMP as appropriate.
Central Yukon RMP/ROD	**Goal #1, Objective 2:** As required by Section 1008 of ANILCA, provide opportunities for mineral leasing and development.	ANCSA withdrawals prohibit leasing.	No. These withdrawals date from the early 1970s. Withdrawals need to be reviewed and a determination made to maintain, modify, or revoke. If lands are opened to the mineral leasing laws, no surface occupancy stipulations and seasonal restrictions should be considered.	Review all existing withdrawals. Consider opening some lands to the mineral leasing laws through modification of existing withdrawals. On lands recommended open to mineral leasing, develop the appropriate leasing stipulations to protect sensitive resources.
Central Yukon RMP/ROD	**Leasable Minerals:** Approximately 8,768,334 acres of land will be open to mineral leasing (including oil and gas leasing). An additional 1,349,673 acres within the Seward 1008 Buckland Basin and Purcell Mountains management units will be opened to mineral leasing under this plan (10,118,007 acres total).	ANCSA withdrawals prohibit leasing. These withdrawals were not modified to open 10 million acres to leasing as recommended in the Central Yukon RMP.		

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Leasable Minerals:** The following areas (706,450 acres) will be closed to all mineral leasing. ● Unalakleet WSR withdrawal (28,249 acres) ● Eight RNAs (43,010 acres) ● Subsistence withdrawal study areas (174,144 acres) ● Withdrawal/exchange lands (461,047 acres)	ANCSA withdrawals prohibit leasing. These were not lifted as recommended in the Central Yukon RMP. New proposed Central Yukon withdrawals were never implemented.	Possibly. There may be values on these lands that warrant closing them to mineral leasing. There may be additional areas not on this list where closures are also warranted.	Review all existing withdrawals to determine which lands should remain closed to the mineral leasing laws. Consider no surface occupancy or seasonal stipulations to protect sensitive resources as alternative to closure if appropriate.
Central Yukon RMP/ROD	**Leasable Minerals:** Mineral leases within areas having an identified subsistence interest, but not designated as withdrawn from mineral leasing [Rodo River, Kateel River, South Fork Huslia River, Tagagawik River, Ray River and the three tributaries of Squaw Creek (northwest of Rampart)] will be subject to a 300-foot "no surface occupancy" setback zone along either side of the water course (measured from the mean high-water line or center line of non-navigable water courses).	Although a 300 foot no surface occupancy setback has been identified, ANCSA withdrawals prohibit leasing. These withdrawals were not lifted as recommended in the Central Yukon RMP. Additionally, lands with high mineral potential have mostly been conveyed.	Yes. A no surface occupancy set back from rivers is a valid protective measure. However, the sites where such a set back is desired need to be revisited based on current land status and management issues. Also, the width of the setback should be reviewed.	Review all existing withdrawals to determine which lands should be opened or closed to the mineral leasing laws. In areas recommended to be opened, consider no surface occupancy setbacks from the rivers, particularly those with anadromous fish spawning habitats. Consider closure to mineral leasing as well as no surface occupancy.
Central Yukon RMP/ROD	**Leasable Minerals:** Mineral leases within areas withdrawn for anadromous fish spawning habitat will have a "no surface occupancy" setback zone which corresponds with the outer withdrawal limits. Designated portions of the Nulato River having important anadranous fish spawning habitat will have a "no surface occupancy" setback zone which runs along both sides of the river and is measured 300 feet back from the mean high water line.			

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Southwest MFP	**Minerals 1–1:** BLM-managed lands open to oil and gas leasing under section 1008 of ANILCA with the following exclusions: Unalakleet River drainage, raptor nesting areas along the Kuskokwim River, and peregrine falcon active or historic nesting areas.	ANCSA withdrawals prohibit leasing. These withdrawals were not lifted as recommended in the Southwest MFP.	Possibly. Closure to mineral leasing to protect resources is a valid decision. Some of the areas listed are not within the Central Yukon Planning Area.	Same as above.
Southwest MFP	**Minerals 1–2:** Provide opportunities for leasing or permitting of coal reserves for local use.	ANCSA withdrawals never lifted; no interest in coal leasing to date.	No. There has been no interest from industry. There is no need to conduct the coal screening process at this time.	Defer decisions on coal in the RMP until there is an application or interest from industry.
Southwest MFP	**Minerals 1–3:** Identify opportunities for leasing of geothermal resources on BLM-managed lands.	ANCSA withdrawals never lifted; No geothermal interest. Little overlap with Central Yukon Planning Area.	Possibly. If there are geothermal resources with development potential within the Central Yukon Planning Area.	Review existing withdrawals and geothermal potential. Consider opening some lands to the mineral leasing laws. On lands recommended open to geothermal leasing, develop appropriate leasing stipulations to protect sensitive resources.

3.2.12.2. Locatable Minerals

Most of the planning area is covered by Secretarial level withdrawals issued through public land orders (PLOs) in the early 1970s. These are referred to as ANCSA 17(d)(1) withdrawals. Some of these withdrawals close lands to all mineral location and entry, others allow for entry and location for metalliferous minerals only. See sections 2.2.3.1.2 and 2.2.4.2 of this document for more details.

Table 3.15. Current Management and Opportunities for Change, Locatable Minerals

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 2:** Approximately 1.7 million acres of public land are open to locatable mineral development. Under this proposed RMP, approximately 4.7 million acres would be open to mineral location. The following areas would remain closed: the Inner corridor, 160 acres surrounding the Kanuti Hot Springs under PLO 399 (August 20, 1947), and the southern portion of the proposed Nigu-Iteriak ACEC (recommended Nigu wilderness area). In addition, the floodplains of the Jim River and Prospect Creek downstream from the eastern boundary of the Inner corridor (which is the limit of salmon spawning habitat), 8 identified mineral licks (160 acres each), and the floodplain of the Kanuti River downstream from the western boundary of the Inner corridor, or any wilderness area designated by Congress would be closed to mineral location [Action 33 (wilderness), Action 37 (wildlife), and Action 52 (ACECs)]. All closures are discretionary, except for the recommended Nigu wilderness area, the Kanuti Hot Springs withdrawal, or any area that Congress may designate as wilderness.	The decision to open large portions of the planning area to mineral location has not been implemented. PLO 6098 opened some lands south of Nowitna National Wildlife Refuge to mining and mineral leasing. The decision to close specific areas to mineral location through new withdrawals has not been implemented.	Partially. These withdrawals date from the early 1970s. Withdrawals need to be reviewed and a determination made to maintain, modify, or revoke. It may be appropriate to retain withdrawals in some areas, but the location of areas proposed for withdrawal need to be reviewed based on current land status and issues.	Review all existing withdrawals to determine which lands should be opened or closed to the mining laws. Based on this review, recommend partial revocation of existing withdrawals and new withdrawals to the Secretary of the Interior. For new withdrawals, follow the process outlined in Section 1326 of ANILCA.
Central Yukon RMP/ROD	**Goal #1, Objective 1:** Consistent with Departmental policy, provide opportunities for mineral exploration location, development, and extraction under the 1872 mining law as amended.	Some areas are open to metalliferous mineral location and entry. Other areas are withdrawn by existing PLOs.	Yes. Opportunities should be provided on some lands.	Review all existing withdrawals to determine which lands should be opened or closed to the mining laws. Based on this review, recommend partial revocation of existing withdrawals and new withdrawals to the Secretary of the Interior.
Central Yukon RMP/ROD	**Locatable Minerals:** An additional 73,865 acres of land located within the Purcell Mountains Soil Map Unit of the Seward 1008 study will be open to mineral location.	For the most part, withdrawals have not been revoked. Part of this unit is open to metalliferous	Unknown. Need to determine current land status and resources of concern.	

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
		location and entry.		
Central Yukon RMP/ROD	**Locatable Minerals:** The following areas (1,207,762 acres) will be closed to mineral location, subject to valid existing rights. Mining on valid existing claims located within fish spawning habitat withdrawals, RNAs, and withdrawals for threatened and endangered species will require a plan of operations. ● Spawning habitat of selected anadromous streams (15,776 acres) including portions of the North Fork Unalakleet River, Kateel River, Gisasa River, Tozitna River, Indian River, and Clear, Bear and Caribou Creeks (Hogatza River Tributary streams); ● Crucial peregrine falcon habitat (20,480 acres) ● Kaltag and Nulato River watersheds (460,000 acres) ● Eight RNAs (43,010 acres) ● Subsistence withdrawal study areas (179,200 acres) ● Withdrawal/exchange lands (461,047 acres) ● Unalakleet WSR withdrawal (28,249 acres)	No new withdrawals have been implemented. Some of the subject lands may be closed by existing withdrawals. Other lands are currently open to metalliferous mineral entry and location. Land status may have changed.	Partially. These withdrawals date from the early 1970s. Withdrawals need to be reviewed and a determination made to maintain, modify, or revoke. It may be appropriate to retain withdrawals in some areas, but the location of areas proposed for withdrawal need to be reviewed based on current land status and issues. There may be additional areas not currently listed where withdrawal is appropriate.	Review all existing withdrawals to determine which lands should be opened or closed to the mining laws. Based on this review, recommend partial revocation of existing withdrawals and new withdrawals to the Secretary of the Interior.

3.2.12.3. Salable

Table 3.16. Current Management and Opportunities for Change, Salable Minerals

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 3:** Consistent with the transportation of energy minerals as the primary purpose of the Utility Corridor, mineral material (gravel) permits and sales would be allowed throughout the planning area with safeguards for specific areas. Extraction of gravel from already disturbed sites would be encouraged. Any new site would be approved if judged not in conflict with crucial wildlife habitat, other important resource values, recreation opportunities,	Ongoing. Permit-based approval rather than economically feasible analysis-based approval.	Partially. Proliferation of gravel pits along the highway is of concern.	Develop a needs assessment for gravel on the Dalton Highway in cooperation with ADOT and Alyeska. Zone areas on the Dalton Highway as closed to new material sites. Develop appropriate stipulations for

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	or the purposes of the proposed ACECs. Of special concern are portions of the streambeds and floodplains of Prospect Creek, the Jim River, and the Ivishak River in proximity to the highway. Because of additional resource values (e.g., recreational fishing, salmon spawning) along these streams in the entire Utility Corridor, extraction of mineral materials through permit or sale would only be approved in the floodplains if it were demonstrated that no other economically feasible sites were available.			areas open to mineral materials.
Utility Corridor RMP/ROD	**Proposed Action 3:** Closed to mineral material extraction would be the Nigu-Iteriak ACEC and whatever area is designated wilderness by Congress, Kanuti Hot Springs and Sukakpak Mountain ACECs, and the eight identified mineral licks. 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 Sagwon Bluffs and Toolik Lake ACECs.	Ongoing. Sagwon Bluffs was conveyed to the State of Alaska.	Partially. Areas recommended closed need to be reviewed based on current issues and land status. New ACECs may be proposed through the planning process.	Review and revise areas recommended closed based on current issues and land status. Develop appropriate stipulations for areas open to mineral materials.
Central Yukon RMP/ROD	**Goal #1, Objective 3:** Provide opportunities for mineral material sales where environmentally feasible.	Ongoing. Impacts minimized through NEPA process. Low demand in Middle Yukon Drainages Subunit.	Yes. There is likely to be a need for mineral materials in the future.	Same as above. Assess needs for gravel for the State's Roads to Resources program.

3.2.13. Renewable Energy

There are no specific decisions for renewable energy in either the Utility Corridor or Central Yukon RMPs. There is increasing interest in renewable energy and it is BLM policy to address renewable energy in land use plans. Infrastructure capable of supporting large renewable energy projects in the planning area is very limited. The RMP provides an opportunity to address this resource.

3.2.14. Recreation

The Utility Corridor RMP (BLM 1991a) designated five recreation management areas: the Dalton Highway, Nigu Wilderness and Iteriak ACEC, and Oolamnagavik Colville Recreation Management Areas, and the Dalton Corridor and CAMA Extensive Recreation Management Areas. In 2002, the BLM conducted an evaluation and found that the five recreation management areas were all being managed per decisions in the RMP. However, a significant portion of the

CAMA and the Oolamnagavik Colville recreation management areas have been conveyed. See section 2.2.6 of this document.

Table 3.17. Current Management and Opportunities for Change for Recreation

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 28:** Designate the following recreation management areas (RMAs). See Table 2.3 of the Proposed RMP.	The following areas were designated. However, land status has changed.	See below.	See below.
Utility Corridor RMP/ROD	**Proposed Action 28:** Dalton Highway RMA: This area generally corresponds to the inner Utility Corridor and includes those lands within the Corridor adjacent to existing roadways. The primary recreational uses include road-related sightseeing, overnight lodging and developed camping, interpretative services, and fishing. The primary Recreation Opportunity Spectrum (ROS) classes for this area would be Roaded Modified and Roaded Natural. A Rural classification will apply to areas surrounding nodes (see Appendix G Proposed RMP for description of these classes). Recreation facility development, information signs, interpretive facilities, and the presence of seasonal staff will involve intensive management presence in this area.	Ongoing. A recreation area management plan is being implemented. The part of the RMA north of Atigun Pass has been conveyed to the State.	Yes. The Dalton Highway has a high visitation rate and is a popular destination for recreationists. The BLM has invested significant dollars into developing recreational opportunities including: an Interagency Visitor Center, waysides, and campgrounds.	Revisit this recreation management area designation and management objectives for the area, in light of current policies, visitor use patterns, and changes in land status. Establish recreation and visitor services objectives, allowable uses and supporting management decisions for the RMA.
Utility Corridor RMP/ROD	**Proposed Action 28:** To protect the on-going and future research work near Toolik Lake, a campground would not be established on the shores of the lake. No recreation use cabins will be constructed on or near Toolik Lake. An interpretive site at Galbraith Lake or at the junction of Dalton Highway and the access road to the Toolik Lake research facilities would describe the purpose and importance of the research activities in the area. Though recreation facility development is being considered north of 68° N latitude (see Table 2.3), no overnight campground facilities	Camping is currently prohibited in the Toolik Lake RNA.	Partially. Limitations on camping are appropriate in the current RNA. If the RNA is expanded through this planning process, limited camping in some areas may be appropriate.	Revisit this decision, in light of current issues, visitor use patterns, and changes in special designations. Establish recreation and visitor services objectives, allowable uses and supporting management decisions for the RMA and ACECs/RNAs.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	would be constructed unless the State makes the decision to allow general public travel north of this line. Guides and outfitters would be allowed use of the Galbraith Lake area, but no ground-disturbing activities or development (e.g., fuel storage or equipment storage facilities) would be allowed.			
Utility Corridor RMP/ROD	**Proposed Action 28:** Dalton Corridor Extensive RMA: The Outer Utility Corridor, the Venetie block, and several tracts of land (125,000 acres) near or adjacent to the corridor. Primary recreational uses would include hunting, fishing, backpacking, and snowmobiling. The area generally falls under Primitive-Traditional ROS classification. There would be no new recreational facility development in this area.	Ongoing.	No. BLM policy for recreation and visitor services has changed since approval of the RMP. Issues in the area may have changed.	Revisit the decision to make this area an extensive recreation management area in light of pending land conveyance, current issues, and guidance in BLM Handbook-8320-1.
Utility Corridor RMP/ROD	**Proposed Action 28:** Oolamnagavik-Colville Extensive RMA: Primitive and semi-primitive recreation experiences would be emphasized. Land acquisitions are proposed in order to provide coherent natural boundaries to this block of land to ease management. The primary uses of this area would be hunting; fishing, backpacking, and river floating. No development of recreational facilities.	Most if not all of this area has been conveyed to the State of Alaska. The area remaining under BLM management is within the CAMA WSA. No land acquisition has occurred.	No. Land status has changed. BLM no longer manages much of this area. There are no major recreation issues in this area driving designation as a RMA.	Revisit the decision to make these areas extensive recreation management areas in light of pending land conveyance, current issues, and guidance in BLM Handbook 8320–1
Utility Corridor RMP/ROD	**Proposed Action 28:** CAMA Extensive RMA: Emphasize primitive and semi-primitive recreation experiences. The primary recreational uses would be hunting, fishing, and backpacking. No recreational facility development.	Much of this area has been conveyed to the State or Native corporations.	No. Land status has changed. BLM no longer manages much of this area. There are no major recreation issues in this area driving designation as a RMA.	
Utility Corridor RMP/ROD	**Proposed Action 28:** Nigu Wilderness and Iteriak ACEC RMA: The primary recreational uses of these areas would include kayaking, rafting, backpacking, and fishing.	Ongoing. Land status has changed with conveyance to State and Native corporations.	Possibly not. There are no major recreation issues in this area driving designation as a RMA.	

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 29:** Complete Recreation Area Management Plan for each of these RMAs to aid in the implementation of recreation facility development. Highest priority would be given to the Dalton Highway RMA.	A recreation area management plan has been completed for the Dalton Highway RMA.	Yes for the Dalton Highway RMA. Possibly not for the other RMAs.	Revisit decisions to designate RMAs. Designation of RMAs would drive the need for management plans.
Central Yukon RMP/ROD	**Goal #4, Objective 7:** Monitor recreation uses to determine the need for providing future access and facilities.	Ongoing to the extent funding available. Focused on recreation permits.	Yes	Consider need for designated RMAs.
Central Yukon RMP/ROD	**Recreation Resources (pg. 12):** The primary objective for management of recreation resources will be to allow opportunities that presently exist, and support or encourage opportunities for improving access. This will require continued close coordination with other programs to assure that recreational opportunities are expanded, not limited, by on-going proposals.	Ongoing.	Possibly. Land status and issues have changed since approval of the RMP.	Consider the need for designated RMAs.
Central Yukon RMP/ROD	**Recreation Resources (pg. 12):** Hot Springs: All undeveloped hot springs will be studied for their suitability for remote public-use cabins with winter access trails.	This has not been done. Attempted to visit hot springs in 2015, but due to weather was not accomplished.	Possibly. Hot springs should be evaluated and managed for most suitable uses.	Evaluate management of hot springs in light of current issues, spring specific values, visitor use patterns, and changes in special designations.

3.2.15. Transportation and Access

See section 2.2.7 for more background information.

Table 3.18. Current Management and Opportunities for Change, Transportation and Access

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 24:** To facilitate issuance of rights-of-way from the Ambler Mining District to the Dalton Highway in accordance with the provisions of Sec. 201(4)(b-e) of ANILCA, the draft RMP recommended designation of a transportation corridor near Prospect/Pump Station 5 (Map 2.1). Because the State of Alaska	The transportation corridor was not designated, but a right-of-way was issued to the city of Bettles for winter road access. Land conveyance has resulted in changes	Yes. The State has proposed constructing an all-weather road to the Ambler mining district that would follow the current Bettles right-of-way across	Reconsider establishing a transportation corridor and/or analyze impacts for the proposed year-round road.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	expressed a strong interest in obtaining these lands to develop access to State and Native lands to the west of the Utility Corridor, the area identified in the draft RMP as the "Ambler Mining District Transportation Corridor" will be opened to State selection under this proposed RMP (see proposed action 6).	in land ownership patterns.	BLM-managed lands.	
Utility Corridor RMP/ ROD	**Proposed Action 25:** Facilitate State access to State lands to the east of Coldfoot, an "access corridor" from the Coldfoot node to the east would be opened to state selection (see proposed action 6).	A right-of-way was issued to the State of Alaska for the Slate Creek Trail.	No. The State was issued a right-of-way for the historical route.	N/A No longer an issue.
Utility Corridor RMP/ ROD	**Proposed Action 26:** Elsewhere, allow appropriate access to State/private lands from the Utility Corridor, although no specific routes are defined. Appropriate locations for rights-of-way from the Dalton Highway should be determined through cooperative planning. Specific definitions of rights-of-way would await the filing of rights-of-way applications by the State of Alaska.	Ongoing. Determined on a case-by-case basis.	Yes. The State of Alaska currently restricts motorized travel off of the Dalton Highway.	Work with State and other land management agencies to determine what type and where access is appropriate.
Utility Corridor RMP/ ROD	**Proposed Action 27:** The proposed RMP encourages the BLM to join with the National Park Service, the U.S. Fish and Wildlife Service and the State of Alaska to evaluate current and projected OHV use in the corridor and possible routes of access to State land and to the boundaries of conservation units adjacent to the Corridor. This OHV evaluation proposal is also mentioned under "Recreation Resources" below and is an issue appropriate for consideration through proposed cooperative planning (see proposed action I).	An evaluation of current and projected OHV use was not done.	Yes. Travel management planning is required by BLM policy.	Complete a Travel Management Plan and establish supplemental rules to implement.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ ROD	**Proposed Action 30:** The planning area is designated as "limited" to OHV use. At present, State law prohibits ORVs within 5 miles of the Dalton Highway right-of-way except when being used in conjunction with mineral development (Alaska Statute 19.40.210). Federal recreation program regulations prohibit operation of an OHV in violation of state laws and regulations which relate to OHV use, standards, registration, operation and inspection [43 CFR 8341.1(d)]. Consequently, no noncommercial casual (recreational) or commercial recreational OHV use (e.g., use by guides and outfitters) can be authorized or permitted by BLM within 5 miles of the Dalton Highway right-of-way. Therefore, recommendations under this proposed RMP relating to allowable recreational uses of OHVs will not apply within 5 miles either side of the Dalton Highway; nor will OHV access points identified in this plan be developed at this time. The recreational OHV policy stated in this proposed RMP will be held in abeyance until such time as (1) the State and BLM reach an acceptable agreement on suitable OHV use in the restricted area, (2) State law changes, or (3) federal regulations change. Nigu WSA and Iteriak ACEC are limited type 4. The reminder of the planning area is limited type 2.	State statute prohibits OHV use within 5 miles of the Dalton Highway right-of-way except when used in conjunction with mineral development.	Yes. State law is still in effect.	Work with State to identify potential routes through the Utility Corridor. Revisit OHV designations outside of the Utility Corridor.
Utility Corridor RMP/ ROD	**Proposed Action 31:** The plan proposes an off-road vehicle use evaluation for Corridor lands to be conducted by the BLM in cooperation with the State of Alaska, U.S. Fish and Wildlife Service, and National Park Service. This evaluation should be an element of the cooperative planning effort discussed under proposed action 1, and would address current OHV uses in the Corridor and recreational access to lands (both federal and state) adjacent to the Corridor.	An evaluation of OHV use was not done due to the State motorized restrictions within the corridor.	Yes. Until the State restriction on motorized off-highway travel is changed, this may not be a priority task.	Work with State to identify appropriate OHV use within the Utility Corridor.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	At a minimum, results of this evaluation should determine the extent of OHV use in the Corridor and specify the need, if any, to reclassify lands to prohibit or allow (with or without restrictions) their use in specific areas. Reclassification of lands for OHV use after the use evaluation, if necessary, will be through a plan amendment.			
Central Yukon RMP/ ROD	**Goal #2, Objective 1:** Require permits for off-road vehicles in excess of l,500 pounds using federal lands.	Ongoing. Determined on a case-by-case basis.	Yes. Limiting vehicle weight reduces impacts to resources.	Consider changing vehicle weight limits to match the State's vehicle curb weight limit.
Central Yukon RMP/ ROD	**Access (pg. 10):** Access to or across public lands will be considered on a case-by-case basis. Under this RMP, the use of vehicles of greater than 1,500 pounds gross vehicle weight (GVW) will be allowed by authorization only. Vehicle use may be authorized under a mining plan of operations (43 CFR 3809), with a permit (43 CFR 2800 or 43 CFR 2920), or by other appropriate means. Approval would be subject to conditions which minimize the impact to other land uses and/or prevent unnecessary damage to the environment.	Ongoing. Determined on a case-by-case basis.	Generally yes. Some slight changes may be warranted.	Review OHV limitations based on new issues and new technology. Consider changing vehicle weight limits to curb weight.
Central Yukon RMP/ ROD	**Access (pg. 10):** Normally, use of vehicles greater than 1,500 pounds GVW will be limited to winter months with adequate snow cover and would be limited to existing trails where practical. Under certain circumstances, the AO may authorize summer moves. These circumstances include, but may not be limited to the following when: 1. A winter move is impracticable. 2. A summer move would not result in undue or unnecessary impacts. 3. An existing trail would be used and the proposed limits would not damage the trail to the extent that it becomes unusable by other users (recreation vehicles).	Ongoing. Determined on a case-by-case basis.	Yes, but technology has changed and new information is available.	Review stipulations for winter overland moves based on current issues, new technology, and any new research on impacts of such moves. Consider changing vehicle weight limits to curb weight.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	4. Specialized equipment such as low-ground-pressure vehicles would be used to minimize impacts.			
Central Yukon RMP/ ROD	**Access (pg. 11):** Management of l7(b) easements will be in accordance with current management policy.	ANCSA section 17(b) easements are administered in accordance with current management policy.	Yes. Continue with current management practices.	No changes recommended.
Central Yukon RMP/ ROD	**Access (pg. 11):** Any proposed access into or through the Unalakleet Wild River Corridor as identified in the approved river management plan is subject to Title XI of ANILCA.	Not located within the current planning area boundary.	N/A	N/A
Central Yukon RMP/ ROD	**Goal #4, Objective 5:** Process R.S. 2477 right-of-way claims.	There is currently no MOU in place. R.S. 2477 claims must be settled through the courts.	No. R.S. 2477 claims must be settled through the courts. This is outside the scope of the RMP.	N/A. Outside scope of RMP.
Central Yukon RMP/ ROD	**Access (pg. 11):** R.S. 2477 right-of-way assertions will be processed in accordance with the existing Memorandum Of Understanding (MOU).			
Central Yukon RMP/ ROD	**Access (pg. 11):** Based on future needs, a transportation plan may be prepared for all or part of the lands within the planning area.	A transportation plan was not done.	Yes. BLM policy is to develop Travel Management Plans for all BLM-managed lands.	Develop Travel Management Plan(s) tiered from the RMP decisions.
Southwest MFP	**Recreation 2–1:** Designate BLM-managed lands in the Minchumina block as restricted to winter OHV use only.	Not located within the current planning area boundary.	N/A	N/A

3.2.16. Utility Corridors and Communications

In December 1971, PLO 5150 designated the Utility Corridor to allow construction of the Trans-Alaska Pipeline System. Portions of the corridor have been conveyed to the State of Alaska. Approximately 2.1 million acres of the Utility Corridor remains under BLM management. See section 2.2.8 of this document. Other rights-of-way, such as for fiber optic lines have or may be approved within the corridor. The Utility Corridor RMP designated development nodes along the corridor.

Table 3.19. Current Management and Options for Change Utility Corridors and Communications

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 17:** Designate four development nodes: Yukon Crossing, Coldfoot, Chandalar, and Happy Valley (Maps 2.3-2.6). Coldfoot and Happy Valley, included in areas opened to State selection, would be managed as nodes until such time as the lands were conveyed. The areas around Prospect and Pump Station 3, designated as nodes in the previous land use plan, would no longer be designated or managed as nodes while the lands are under federal management. Governmental units and energy transportation facilities would be allowed to locate outside the nodes if the needs or purposes of the facility were better met outside the node. Commercial activities not directly related to road traffic (e.g., horse corral or grazing areas) would be considered for permit approval in areas outside the nodes. Such activities would be screened from the Dalton Highway, where appropriate, by vegetation and distance.	Coldfoot and Happy Valley development nodes conveyed to State. BLM administrative sites were withdrawn as planned at Coldfoot, but not Happy Valley. Yukon Crossing and Chandalar nodes remain, with no significant changes. No commercial development has occurred outside of the designated nodes.	This decision has been implemented for Coldfoot and Happy Valley nodes. Partially. Development nodes are needed, but locations and sizes of nodes could be reconsidered. The State is interested in obtaining ownership of more of the corridor, which may include some of the development nodes.	Consider the need for any new development nodes, the need to revise boundaries of existing nodes, the removal of nodes, or changes to management within nodes. Consider modification of PLO 5150 to allow conveyance of parts of the corridor to the State.
	Proposed Action 17: Continue the policy of allowing the location of State road maintenance camps at the Yukon Crossing (7-Mile), Coldfoot, Chandalar Shelf, and Slope Mountain. The lands occupied by the Alaska Department of Transportation and Public Facilities Jim River maintenance camp would be opened to State selection.	Coldfoot and Happy Valley development nodes conveyed to State. Yukon Crossing and Chandalar nodes remain, with no significant changes.	Yes	None
	Proposed Action 17: No homesite development would be offered at any nodes.	Ongoing.	Yes	None

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 17:** Yukon Crossing node (7,050 acres): In the long term, if growth at the Yukon Crossing area warrants, the existing airstrip should be closed and a new airstrip constructed along the northeast/southwest trending ridge in Sec. 1, T. 12 N., R. 11 W., Sec. 6, T. 12 N., R. 10 W.; and Secs. 31 and 32, T. 13 N., R. 10 W. Fairbanks Meridian. The state has applied for an airport lease on this site.	No new airstrip developed at this node, and no current application from the State for such. Existing 5 Mile Airport authorization expired in December 2014. AKDOT&PF has requested the area, not as an airport, but as an extension to the road right-of-way for storage and miscellaneous uses.	No. The State does not appear to be interested in a new airstrip at this location. However, they are interested in using the site in other ways.	Re-visit the Yukon Crossing node to determine if any changes to the boundary or management are needed.
Utility Corridor RMP/ROD	**Proposed Action 17:** Coldfoot node (7,000 acres): If demand for facility expansion should occur that cannot be accommodated in secs. 15 and 16 along the Dalton Highway and above the Slate Creek floodplain, consideration would be given to permitting actions north of Slate Creek in sec. 10. The floodplain boundary of Clara Creek would require mapping before an area in sec. 10 could be identified. If lands within this node are conveyed to the State, five sites totaling approximately 20 acres would be retained by the BLM for use by federal agencies to facilitate their management responsibilities within the area.	This node has been tentatively approved for conveyance to the State. The BLM retained five sites for administrative purposes, totaling 100 acres, via PLO 7057.	No. The conveyance portion of this decision has been completed. More research is needed to determine if use of lands north of Slate Creek are needed.	Consider the need for any new development nodes, the need to revise boundaries of existing nodes, the removal of nodes, or changes to management within nodes.
Utility Corridor RMP/ROD	**Proposed Action 17:** Chandalar Shelf Node (1,700 acres): Currently located within this node boundaries are a BLM administration site, a State-held airport lease, and a State highway maintenance camp. No commercial activities are located within the node, but interest has been expressed in developing a service facility and lodge. The BLM could accommodate anticipated road-related uses in this node along with the current government and energy transport activities.	No BLM administration site found on MTP, otherwise no change. No recent interest in commercial activities.	Partially. No recent interest in commercial facilities, but State facilities within the node.	Consider the need for any new development nodes, the need to revise boundaries of existing nodes, the removal of nodes, or changes to management within nodes.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 17:** Happy Valley Node (1,600 acres): The boundary of this node encompasses the areas permitted to several guides/outfitters and the governmental units clustered along the airstrip. If the lands within this node are conveyed to the State, a site (or sites) would be retained by the BLM as necessary or appropriate to fulfill its management function within the area.	Conveyance to the State tentatively approved. No sites were retained by BLM as originally anticipated.	No. This node is no longer BLM-managed land.	N/A
Utility Corridor RMP/ROD	**Proposed Action 18:** Modify the boundary of the Inner corridor to conform better to current and future needs for energy transportation. The Inner corridor was designated before the final alignments of the current highway and pipelines were determined to minimize conflicts with new mining claims. Now that these alignments are in place the boundary of the Inner corridor should be modified. Appendix N provides a precise description of proposed changes in this boundary. PLO 5150 would be modified to conform with these proposed changes.	The Inner corridor boundary has not been modified.	Potentially. Some public comments noted that the corridor is wider than necessary. Alternatively, a gas pipeline could be authorized within the corridor.	Consider if modification of the Inner corridor boundary is appropriate. Re-visit the proposed boundary changes in Appendix N of the Proposed RMP.

3.2.17. Land Tenure

Many of the land tenure decisions in the Utility Corridor RMP have been implemented. One remaining issue in the planning area is isolated small tracts of BLM-managed lands that are no longer manageable and should be considered for disposal through either sale or exchange. Additionally, the State of Alaska has requested modification of existing withdrawals to allow conveyance of lands within the Utility Corridor to the State. See section 2.2.3 of this document.

Table 3.20. Current Management and Opportunities for Change, Land Tenure

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 6:** Open approximately 0.7 million acres of land within the Corridor to State selection. These lands are located in four different areas or units: (1) Corridor lands south of the Yukon River, originally described in the preferred alternative of the draft RMP (25,000 acres); (2) Prospect Unit (55,000 acres)	(1) Corridor lands south of the Yukon River were opened for State selection and were subsequently selected and conveyed. (2) The Utility Corridor RMP Record of Decision determined not to open	(1) This action has been completed (2) The local public tend to be opposed to the transfer, therefore, the decision is responsive to their concerns.	(2) Revisit the decision to retain the Utility Corridor in federal ownership or to allow State selection.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	which corresponds closely to the "Ambler Mining District Transportation Corridor" defined in the draft RMP as well as lands occupied by the nearby State of Alaska highway maintenance camp and state maintained public airstrip (Map 2.1); (3) Coldfoot Unit, which includes the node described in the draft RMP as well as a transportation corridor to the east (26,000 acres; Map 2.2); and (4) Sagavanirktok Unit, described in the supplement to the draft RMP (Appendix J) as Corridor lands north of Toolik Lake (600,000 acres).	lands in the Prospect area to State selection. (3) The Utility Corridor RMP Record of Decision determined that the Coldfoot node should be opened to State selection, but the transportation corridor to the east would be omitted, and the total acreage reserved for administrative use would be increased from 20 acres to 100 acres. (4) The Sagavanirktok Unit lands were opened for State selection and were subsequently selected and conveyed.	However, the State and other interests have requested the transfer and therefore, this decision is not responsive to their concerns. (3) The Coldfoot development node has been conveyed and adequate acreage has been reserved for BLM's administrative purposes. (4) This action has been completed.	
Utility Corridor RMP/ROD	**Proposed Action 7 as modified by the Utility Corridor Record of Decision:** A portion of the Coldfoot Unit, identified in the RMP as the "Coldfoot Development Node" (see map 2.4, Proposed RMP, page 2-17) would be made available for State selection. The remainder of the Coldfoot Unit would not be available for State selection. Should access be required to State-owned lands east of the Coldfoot node, the BLM will entertain an application for a right-of-way for access to these lands. The Prospect Unit would be retained by BLM.	Lands within the Coldfoot Unit were selected and conveyed, except for five sites (totaling 100 acres) were retained, per the The Utility Corridor RMP Record of Decision. The Happy Valley node was selected and conveyed, without retaining any portion for an administrative site. The Prospect Unit was not opened for selection, nor conveyed.	(see Proposed Action 6)	This RMP will revisit the decision to retain the Utility Corridor in federal ownership and consider recommending modification of PLO 5150 to allow State selection.
Utility Corridor RMP/ROD	**Proposed Action 8:** The draft RMP identified lands for possible sale within the Coldfoot and Yukon Crossing nodes. As a result of public comments, under the proposed plan these lands would not be made available for sale. Sale of lands within 5 miles of the Dalton Highway is currently prohibited under State law.	The lands within the Coldfoot node have been transferred to the State. The lands within the Yukon Crossing node have been retained but are top-filed for State selection.	There are divergent opinions on this issue. Land sales have not been identified as an issue during the current scoping period.	Consider State selection as a first priority and direct sale as a second priority.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 9:** Amend PLO 5150, as amended by PLO 5182, to allow State selection in the remainder of the Gas Arctic east-west energy transportation corridor adjacent to the Arctic Wildlife Refuge. This area is approximately 30,000 acres in size and involves land in T. 1 S., R. 24 and 25 E., Umiat Meridian.	These lands have been conveyed to the State of Alaska.	N/A	N/A
Utility Corridor RMP/ROD	**Proposed Action 10:** Disposal of small tracts of public land would be encouraged just west of the upper reaches of the Middle Fork Chandalar River through exchange with or selection by the State of Alaska.	These lands have not been conveyed or selected, status remains unchanged.	Yes. Isolated small tracts of BLM-managed lands are difficult to manage.	Revisit the decision for disposal of these lands through State selection, exchange with the State or private entities, or direct sale.
Utility Corridor RMP/ROD	**Proposed Action 11:** To consolidate federal land ownership, the relinquishment of State selections on four isolated tracts of land (15,000 acres) located south of the Brooks Range between the Utility Corridor and adjacent Conservation System Units would be requested. Also, should the State choose not to select the "Sagavanirktok Unit," relinquishment of an isolated tract of land (12,000 acres) north of the Brooks Range located between the Utility Corridor and the Arctic National Wildlife Refuge would be requested.	Unknown. More information is needed on the location of these lands. The Sagavanirktok Unit was selected and conveyed.	Unknown.	Revisit this decision based upon other proposed decisions in the draft RMP.
Utility Corridor RMP/ROD	**Proposed Action 12:** Encourage exchanges with appropriate land owners to provide for federal ownership of a corridor surrounding the Killik River. This corridor would be a multiple-use management area focusing on protection of 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 land ownership.	Land acquisitions along the Killik River have not been pursued. Most, if not all, of these lands have been conveyed to Native corporations.	Unknown	Reevaluate this decision. The BLM could consider either pursuing conservation easements or land exchanges if a corridor is desired.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 13:** Encourage the acquisition of the approximately 274,000 acres of subsurface estates from the Arctic Slope Regional Corporation (ASRC) or the disposal of the corresponding 274,000 acres of surface estates to ASRC to end the "split-estate" conditions in CAMA and to increase land consolidation.	Split estate conditions on 274,000 acres in CAMA are unknown. Most of CAMA has been conveyed.	No. These lands have been conveyed.	Research land status and determine if split-estate is still an issue on any lands.
Utility Corridor RMP/ROD	**Proposed Action 14:** Resolve unauthorized occupancies in Wiseman by selling lots to the owners of cabins. PLO 6727 modified PLO 5150 and classified the lands for sale. The affected lands have been determined suitable for disposal, and BLM is expecting to sell surveyed lots in Wiseman to the cabin owners in accordance with the FLPMA and the existing land use plan (i.e., the MFP).	This action was accomplished as stated.	This is no longer an issue.	N/A
Utility Corridor RMP/ROD	**Proposed Action 15:** Make lands available for disposal to qualified applicants under the R&PP Act to accommodate future public purpose needs in Wiseman, Coldfoot, and Yukon Crossing/7-Mile area.	No disposals have been made under the R&PP Act.	There may be interest for R&PP leases in the future for these areas.	Evaluate potential interest and needs for R&PP leases and disposals.
Utility Corridor RMP/ROD	**Proposed Action 16:** The draft RMP recommended transfer of approximately 48,000 acres of BLM-managed lands within the Arctic National Wildlife Refuge (ANWR) to the U.S. Fish and Wildlife Service. These lands were withdrawn by Public Land Order 6607 and were remnants of a gas pipeline corridor no longer receiving active consideration.	Congress made these lands part of ANWR on August 18, 1988 (P.L. 100-395).	This is no longer an issue.	N/A
Central Yukon RMP/ROD	**Goal #1, Objective 4:** Provide continued public settlement opportunities in the Minchumina Settlement block up until expiration of the Alaska settlement laws on October 21, 1986.	Settlement laws have expired. Minchumina Settlement block is not in the planning area.	This is no longer an issue.	N/A
Central Yukon RMP/ROD	**Realty Actions, Settlement:** The existing Minchumina settlement area will remain open to FLPMA lease and sale proposals.	11 patents were issued 1988 – 2005 for Homesites and Trade and Manufacturing sites	This is no longer an issue.	N/A

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Southwest MFP	**Lands 2–1:** Consider for settlement entry public lands excluding those with mineral interest, legal exclusions, crucial habitat, and environmentally sensitive areas. Priority blocks for review of settlement potential are: Minchumina, Lime Village, Goodnews, Anvik River, Sleetmute.	Settlement laws have expired. None of these blocks are in the planning area.	No longer an issue	N/A
Central Yukon RMP/ROD	**Goal #1, Objective 6:** Provide opportunities for FLPMA leases and sales on federal lands where environmentally feasible and where compatible with management objectives.	Ongoing	Yes	Evaluate potential interest and needs for FLPMA leases and sales.
Central Yukon RMP/ROD	**Goal #1, Objective 7:** Identify federal lands for exchange when in the national interest to provide manageable land patterns and lower administrative costs.	This has not been implemented. Criteria and priority areas for exchange have not been established.	Yes. Isolated small tracts of BLM-managed lands are difficult to manage.	Establish criteria and priority areas for exchange.
Central Yukon RMP/ROD	**Realty Actions, Exchange:** Lands within the original ANCSA village withdrawal boundary which were not selected by village or regional corporations will be made available for exchange. These lands are located in the vicinity of Kaltag, Nulato, Allakaket/Alatna and Hughes. The existing withdrawal or its equivalent will be retained for 5 years. Exchange negotiations for these lands could be conducted with the State of Alaska, the village or regional corporations, and the U.S. Fish and Wildlife Service.	Land tenure in the area of Kaltag and Nulato is virtually unchanged, no exchanges have occurred. In the area of Hughes northeast toward Allakaket and Alatna some exchange has taken place, but land tenure pattern could be further consolidated for efficiency.	Yes. Land exchange is responsive to the issue of consolidating land ownership and improving ease of management. A checkerboard land status still exists around many communities.	Establish criteria and priority areas for exchange.
Central Yukon RMP/ROD	**Realty Actions, Exchange:** Three tracts identified as sensitive to management of adjacent lands in the Koyukuk and Kanuti National Wildlife refuges are to remain withdrawn and be classified as available for exchange. Through withdrawal, these lands will be maintained in an unencumbered state, thus simplifying future exchanges. The BLM would consider offered lands which: ● Consolidate BLM-managed lands, ● Contain identified mineral values, or	Unknown. More information is needed to determine which specific tracts of land this decision refers to.	Potentially. The USFWS is concerned about activities on lands adjacent to refuges and indicated in their scoping comments that some lands should be considered for addition to refuges.	Establish criteria and priority areas for exchange. Consider minor adjustments to conservation system units as allowed under section 3103(b) of ANILCA.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	• Contain other resource values comparable to those transferred through exchange. If there is no interest in exchange during the 5 year withdrawal period, these tracts will be managed for multiple use under plan prescriptions that are in place on contiguous BLM-managed lands. Note: These lands are not available for consolidating inholdings, ANILCA boundary adjustments, or for parks or wildlife refuges.			
Central Yukon RMP/ROD	**Realty Actions, Exchange:** The single township in the Yanert drainage (Nenana subunit) will not be available for exchange. This township is adjacent to a large tract of BLM-managed land in the Anchorage District.	Unknown. Not clear which parcel this is. Parcel in question may have been conveyed to the State or be outside of the Central Yukon Planning Area.	Possibly. If this parcel is still under BLM management and is adjacent to large block of BLM lands, then this decision would still be appropriate.	Revisit which lands should be made available for exchange based on current land status and manageability.

3.2.18. Land Use Authorization

Table 3.21. Current Management and Opportunities for Change, Land Use Authorization

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 19:** Consider FLPMA leases on federal lands where environmentally feasible and compatible with management objectives. Previously disturbed sites would be considered prior to allowing uses on undisturbed sites, giving first priority to locations within development nodes. Where the proposed uses or site requirements would not be compatible within a development node, leases would be considered outside of a node.	Ongoing. Development nodes have been under utilized, there has been no need for or interest in authorizations in areas outside of the development nodes.	Yes	Consider the need for any new development nodes, the need to revise boundaries of existing nodes, the removal of nodes, or changes to management within nodes.
Utility Corridor RMP/ROD	**Proposed Action 20:** Allow for leases with restrictions within the Kanuti Hot Springs ACEC. However, no lease would be allowed within the immediate area or "thawbulb"	No leases have been issued or applied for within the Kanuti Hot Springs ACEC. Unknown if the	Possibly not. Leases that would result in development of the hot springs area is of concern; particularly when the relevant	Revisit the decision to allow for leases within Kanuti Hot Springs ACEC. Review ACEC boundaries to more

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	of the springs (an area roughly corresponding to the meadow which surrounds the hot water pools). Undeveloped hot springs on federal land are few in number, and little is known about the resource value of this particular hot spring. Additional inventory work is recommended to define more accurately the area needed under ACEC protection and to aid in the design of lease stipulations intended to protect this resource. If changes in the ACEC boundary or use restrictions result from this inventory work, they would be addressed in a plan amendment (also see proposed action 51).	recommended inventory was preformed.	and important value for the ACEC is the hot springs.	accurately define the area needed and develop standard operating procedures to protect ACEC values.
Utility Corridor RMP/ROD	**Proposed Action 21:** 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. Consider previously disturbed sites prior to allowing uses on undisturbed sites.	Ongoing, notably at Toolik, Coldfoot, and Marion Creek where there are existing administrative sites.	Yes. There is a need for these types of facilities and use of previously disturbed sites is desirable.	No changes recommended.
Utility Corridor RMP/ROD	**Proposed Action 22:** Make lands available within the Utility Corridor where needed to accommodate public solid waste disposal sites operated by appropriate governmental agencies or private operators. The environmental feasibility of site location and methods of disposal would be a primary consideration. Consider previously disturbed sites prior to allowing uses in new areas.	Lands within the Utility Corridor have not been made available for solid waste disposal sites.	No. BLM will not authorize landfills on federal lands, due to the potential for release of hazardous materials to the environment and long-term monitoring requirements.	This decision is no longer valid.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 23:** Until Congress acts on BLM's wilderness recommendations, planning area lands north of 68° N latitude (CAMA) must be managed to protect their wilderness values in accordance with BLM's "Interim Management Policy and Guidelines for Lands Under Wilderness Review." Only those lands within the Dalton Highway "viewshed," determined nonwilderness in character (BLM 1980), would be available for utility and transportation systems. Other impacting activities outside the Dalton Highway viewshed would also be prohibited until Congress acts on the wilderness recommendation.	No action by Congress. Wild Rivers lawsuit settlement agreement (8/30/1993) requires the BLM to manage lands in the CAMA west of the Killik River in a manner that will protect its wilderness values until Congress acts on the wilderness recommendation.	Yes	None
Central Yukon RMP/ROD	**Realty Actions, FLPMA Sales and Leases**: All lands within the planning area will be open to FLPMA leases and sales except lands within: ● The Tagagawik/Buckland watershed ● Purcell Mountains Soil Map Unit (Hughes Subunit) ● Eight RNAs ● Identified 300-foot "no surface occupancy" setback zones ● Subsistence study areas ● Withdrawn crucial wildlife habitat ● The Unalakleet WSR Corridor ● Lands withdrawn for possible exchange	There has been no interest in FLPMA leases in the area. Some of the referenced areas, such as the Unalakleet WSR corridor, are not within the Central Yukon Planning Area.	Possibly. FLPMA sales and leases are not appropriate in some of the listed areas such as RNAs, but may be appropriate in other areas.	Revisit areas where FLPMA leases and sales would not be allowed.
Central Yukon RMP/ROD	**Goal #1, Objective 14:** Continue leases on hot springs which presently have authorized development.	Ongoing, see below	Possibly, see below	See below
Central Yukon RMP/ROD	**Goal #2, Objective 5:** Prohibit leasing of undeveloped hot springs in order to allow for noncommercial, public use of these resources.	Ongoing, see below	Possibly, see below	See below

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	Leases on undeveloped hot springs will not be issued within the Central Yukon Planning Area. Renewal or reassignment of existing leases would be allowed. Public shelter cabins could be constructed in the vicinity of hot springs which are not presently developed.	Tolovana Hot Springs, originally authorized in 1968, is the only existing hot springs lease. No new leases have been issued for hot springs. No public shelter cabins have been constructed.	Not necessarily. There are interested parties that would like to propose leasing some of the hot springs. There is interest in public shelter cabins in some areas. There are a limited number of undeveloped hot springs remaining in Interior Alaska.	Consider an alternative that would allow leasing of hot springs. Consider an alternative that would prohibit leasing of hot springs.
Southwest MFP	**Lands 1–2:** Allow rights-of-way grants throughout the planning area on a case-by-case basis.	Ongoing	Yes. There is a public need for rights-of-way.	Rights-of-way can be addressed on a case-by-case basis and conditions placed to prevent unnecessary or undue degradation.
Southwest MFP	**Lands 1–3:** Make public lands available for the development of electronic communications facilities sites.	Ongoing	Yes. There is a public need for communication sites.	Consider identification of priority areas for communication site location. Require collocation of facilities to reduce the number of sites needed.
Southwest MFP	**Lands 2–2:** Assure that the existence and erection of temporary or permanent structures and shelters to be used in conjunction with hunting, trapping, and fishing are consistent with resource management principles.	Unauthorized structures exist, but possibly not within the Central Yukon Planning Area.	No. Section 1316 of ANILCA allows for temporary structures, but policy is needed.	2920 regulations could be used for permitting, but subsistence use cabins have not been addressed in policy.

3.2.19. Withdrawals

As discussed in section 2.2.3.1 of this document, virtually all of the BLM-managed lands in the planning area are under some type of withdrawal. All of the withdrawals that are reserved for or managed by the BLM will be reviewed to determine if they should be retained, relinquished, or modified. Those withdrawals for the use of other agencies and purposes will be reviewed for status and will continue to be in effect until a change is required or warranted.

The State of Alaska has specifically requested that the BLM consider modification of PLO 5150 to allow conveyance of lands within the Utility Corridor to the State. Additionally, the State supports revocation of ANCSA 17(d)(1) withdrawals to open lands to mineral entry and mineral leasing. Other interested publics have indicated interest in retaining many of these withdrawals, including PLO 5150.

Table 3.22. Current Management and Opportunities for Change, Withdrawals

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	See Land Tenure section 3.2.17			
Central Yukon RMP	**Table 1-1 (pg. 14):** Recommends 1,207,762 acres of withdrawals.	No new withdrawals have been issued.	Not necessarily. There have been changes in land status and resources since 1986.	Review all recommended withdrawals. Make new recommendations based on current issues.
Southwest MFP	**Minerals 2–1:** Review those areas that are presently closed to the various mining laws and the Mineral Leasing Act of 1920 for potential opening under these laws. First priority area for review is the Minchumina planning block.	No existing withdrawals have been revoked or modified.	Yes. All existing withdrawals should be reviewed. The Minchmina Block is not in the planning area.	Review all recommended withdrawal revocations. Make new recommendations based on current issues.

3.2.20. Areas of Critical of Environmental Concern

See section 2.3.1 for descriptions of existing ACECs and Research Natural Areas (RNAs). Additionally, see *Scoping Report for the Central Yukon RMP* and *Central Yukon Resource Management Plan Areas of Critical Environmental Concern: Report on the Application of the Relevance and Importance Criteria*, both available online at www.blm.gov/ak/cyrmp.

Table 3.23. Current Management and Opportunities for Change, ACECs and RNAs

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 52; Table 2.4:** Designate 13 ACECs. Toolik Lake ACEC would also be classified as an Research Natural Area to protect ongoing and future research.	These ACECs were designated. Toolik Lake is an RNA.	Partially. There may be other areas that qualify as ACECs. Some of the current ACECs may no longer be appropriate.	Consider nominations for new ACECs, revisions to boundaries of existing ACECs, and nominations to remove ACECs.
Utility Corridor RMP/ROD	**Proposed Action 52:** Management Common to All Utility Corridor ACECs: Prepare a base map of appropriate scale; prepare an ACEC management plan; conduct monitoring; conduct some level of cultural resource inventory; plans of operation are required.	Plans of operation are required per 43 CFR 3809. ACEC management plans have not been completed. GIS coverage of existing ACECs and RNAs is available.	Partially. Regulations require mining plan of operations within ACECs. This is not a planning decision.	ACEC management can be included in the RMP, removing the need for step-down ACEC management plans.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor Proposed RMP**Proposed Action 52:**	**Galbraith Lake ACEC** (56,000 acres): Protect habitats crucial to threatened, endangered, candidate, or sensitive plant and animal species; withdrawn from mineral entry as part of Inner corridor; no surface occupancy for leasable minerals; Require plans of operation with protective stipulations and mitigation measures to all surface-disturbing activities to avoid restricting sheep movement, unduly disturbing sheep habitat, or affecting any other protected resource; All BLM-authorized camps and support facilities located within the confines of the ACEC, including cabins and tent frames, shall be temporary and must be removed after their purpose has been accomplished; Aircraft associated with all BLM-authorized land use activities shall be required to fly a minimum of 2,000 feet above ground level (AGL) from May 1 to August 31, unless doing so would endanger human life or be an unsafe flying practice; All recreational facilities will be consistent with the Dalton Highway Recreation Area Management Plan (RAMP), and will minimize disturbance to protected resources within the ACEC; Allow the development of public campground facilities; Establish cooperative agreements for cultural resource research and excavation; Allow use by guides and outfitters, but no ground-disturbing activities in association with guides and outfitters.	Ongoing. Plans of operations are required per 43 CFR 3809. No mineral leasing has occurred. Galbraith Lake campground exists, but development is minimal.	Yes. It is known that notable plant and animal species occupy this area. Protection of sheep lambing areas is crucial considering recent population fluctuations.	Current ACEC boundary is likely inclusive of representative sensitive habitat for plants and animals. Current boundary includes relevant cultural sites.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD **Proposed Action 52:**	**Ivishak River ACEC** (3,800 acres): Approve new mineral sites only if no other economically feasible sites are available; allow temporary and casual use permits; Protect habitats considered crucial to threatened, endangered, candidate, or sensitive plant and animal species; Protect fisheries habitats and populations, including char spawning, overwintering, and nursery/rearing habitat; Protect crucial raptor habitats, especially peregrine falcon; Plans of operation with protective stipulations and mitigation measures will be applied to all ground-disturbing activities to avoid unduly disturbing aquatic, riparian, and threatened, endangered, or candidate species, including plants. Nonsurface occupancy stipulations apply to oil and gas leasing activity; Establish cooperative agreements for cultural resource research and excavation.	These lands have been conveyed to the State of Alaska. This ACEC no longer exists	No. Lands are no longer managed by BLM.	N/A
Utility Corridor RMP/ROD **Proposed Action 52:**	**Jim River ACEC** (200,000 acres): Protect fisheries habitats and populations, including salmon spawning, overwintering, and nursery/rearing habitat; Require plans of operation with protective stipulations and apply mitigation measures to all surface-disturbing activities to avoid unduly affecting aquatic and riparian habitat or threatened, endangered, or candidate species (including plants and peregrine falcons), or affecting any other protected resource; Seasonal use and surface occupancy restrictions, including oil and gas leasing, may be identified once inventory and monitoring studies have been conducted; All BLM-authorized camps and support facilities located within the confines of the ACEC, including cabins and tent frames,	Ongoing. Mining Plans of Operation required by regulation. Peregrine falcon no longer a listed species.	Partially. Current ACEC boundary excludes important fish habitat. Substantial numbers of fish (i.e., salmon, grayling) use habitat downstream of boundary.	Adjust current boundary of the ACEC to include the river downstream of the current boundary. See section 2.3.1.3 of this document for more details. Withdraw the entire watershed from mineral location, mineral material sales, and leasing.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	shall be temporary and must be removed after their purpose has been accomplished; Protect habitat crucial to threatened and endangered species, especially peregrine falcons; Approve new mineral material sites within the floodplain only if no other economically feasible sites are available.			
Utility Corridor RMP/ROD **Proposed Action 52:**	**Kanuti Hot Springs ACEC** (40 acres): Restrict leasing and development to actions which would not directly affect the hot springs, any identified crucial wildlife habitat, and rare, endangered or listed plant species; The ACEC and surrounding lands (total of approximately 160 acres) closed to mineral entry under PLO 399 of August 20, 1947, which withdrew from entry and all forms of appropriation all hot springs in Alaska; No surface occupancy stipulations apply for mineral leasing within the ACEC; Maintain water quality of spring area and adhere to EPA and State water quality standards; All ground-disturbing activities having any effect on the resources within the ACEC will require plans of operation and appropriate mitigation to eliminate or minimize any adverse impacts; Close to gravel extraction.	No leases have been authorized and no development has occurred.	Yes. Due to unique vegetative communities, the Kanuti Hot Springs was designated an ACEC under the Utility Corridor RMP.	Currently, no leases are allowed within the immediate area of the "thawbulb." This area could be expanded to encompass the entire ACEC to preserve the unique vegetation and hydrologic processes of the Kanuti Hot Springs.
Utility Corridor RMP/ROD **Proposed Action 52:**	**Nigu-Iteriak ACEC** (64,000 acres): The upper Nigu section has been recommended to Congress for wilderness designation in the *Central Arctic Management Area Wilderness Recommendations and Final EIS* (USDOI, BLM; 1988b) and the *Alaska National Interest Lands Conservation Act Section 1001 Report* (USDOI, BLM; 1988b). Until Congress either designates or releases these areas from consideration, both areas will be managed to protect their wilderness values in accordance with interim wilderness management policy	39,682 acres of BLM-managed lands remain in this ACEC. Lands within a portion of the Nigu section have been transferred to the Noatak National Preserve by PL 104-333. Lands within a portion of the Iteriak section have been transferred to the State of Alaska.	Possibly. Needs additional review.	Review the ACEC to determine if any changes to the boundary or management are needed.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	and guidelines; Regardless of congressional action, the upper Nigu section would remain closed to mineral location, mineral materials extraction, and mineral leasing; the Iteriak section would be opened to mineral development (entry and leasing), but closed to mineral materials extraction; Require plans of operation for any mining activities in the northern section; Only OHV use for subsistence purposes would be allowed.			
Utility Corridor RMP/ROD **Proposed Action 52:**	**Nugget Creek ACEC** (3,300 acres), **West Fork Atigun ACEC** (8,500 acres), and **Poss Mountain ACEC** (8,000 acres): Mineral lick sites (160 acre parcels), would be closed to mineral entry and location, to surface occupancy by BLM-authorized land activities, and to mineral materials extraction. Nonsurface occupancy stipulations would apply to mineral leasing; Only allow mineral materials extraction with stipulations to prevent disturbance of Dall sheep habitat or access; Plans of operation with protective stipulations and mitigation measures would be applied to all ground-disturbing activities to avoid restricting sheep movement, unduly disturbing sheep habitat, or affecting any other protected resource; All BLM-authorized camps and support facilities located within the confines of the ACEC, including cabins and tent frames, shall be temporary and must be removed after their purpose has been accomplished; Aircraft associated with all BLM-authorized land use activities shall be required to fly a minimum of 2,000 feet above ground level (AGL) from May 1 to August 31, unless doing so would endanger human life or be an unsafe flying practice.	This action has been implemented as described.	Partially. The currently implemented action for Poss Mountain ACEC includes some, but not all of important habitat for sheep inhabiting this area. Extension of the ACEC area will be recommended.	Review the current boundary of all three ACECs. Consider adjusting the Poss Mountain ACEC to include mineral lick on Gold Creek. See section 2.3.1.3 of this document for more details.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD **Proposed Action 52:**	**Sagwon Bluffs ACEC** (42,200 acres): Protect habitats crucial to species considered threatened, endangered, candidate or sensitive by U. S. Fish and Wildlife Service or the State of Alaska; All BLM-authorized land use activities shall follow the protective measures for peregrine falcons identified in the *Peregrine Falcon Recovery Plan* (September 1982); Nonsurface occupancy stipulations would be applied to plant habitat *(Erigeron muirii)* locations; Plans of operation with protective stipulations and mitigation measures will be applied to all ground-disturbing activities to avoid unduly disturbing peregrine falcons and their habitats, or affecting any other protected resource; Establish cooperative agreements for cultural resource research and excavation.	Only 2,560 acres of BLM-managed lands remain in this ACEC. The remainder has been conveyed to the State. The remaining BLM lands are under Airport Lease. For all practical purposes, this ACEC no longer exists. Peregrine falcon is no longer a listed species.	No. The ACEC no longer exists and peregrine falcon is no longer listed.	Consider standard operating procedures to protect raptor nesting habitats throughout the planning area. Evaluate the appropriate level of protection for *Erigeron muirii* and other species that have been added to the BLM Alaska Sensitive Species List (BLM 2010) where they occur on BLM-managed lands.
Utility Corridor RMP/ROD **Proposed Action 52: Appendix K**	**Slope Mountain ACEC** (5,100 acres): Mineral licks (160 acre parcels), would be closed to mineral entry and location, to surface occupancy by BLM-authorized land activities, and to mineral materials extraction. No surface occupancy stipulations would apply to mineral leasing; Only allow mineral materials extraction with stipulations to prevent disturbance of Dall sheep habitat or access; Plans of operation with protective stipulations and mitigation measures would be applied to all ground-disturbing activities to avoid restricting sheep movement, unduly disturbing sheep habitat, or affecting any other protected resource; All BLM-authorized camps and support facilities located within the confines of the ACEC, including cabins and tent frames, shall be temporary and must be removed after their purpose has been accomplished;	These lands have been conveyed to the State, ACEC designation no longer applies.	N/A	N/A

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	Aircraft associated with all BLM-authorized land use activities shall 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; Protective measures for peregrine falcons will be those measures identified in the *Peregrine Falcon Recovery Plan* (September 1982).			
Utility Corridor RMP/ROD **Proposed Action 52:**	**Snowden Mountain ACEC** (28,000 acres): Mineral lick sites (160 acre parcels), would be closed to mineral entry and location, to surface occupancy by BLM-authorized land activities, and to mineral materials extraction. No surface occupancy stipulations would apply to mineral leasing; Only allow mineral materials extraction with stipulations to prevent disturbance of Dall's sheep habitat or access; Plans of operation with protective stipulations and mitigation measures would be applied to all ground-disturbing activities to avoid restricting sheep movement, unduly disturbing sheep habitat, or affecting any other protected resource; All BLM-authorized camps and support facilities located within the confines of the ACEC, including cabins and tent frames, shall be temporary and must be removed after their purpose has been accomplished; Aircraft associated with all BLM-authorized land use activities shall 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; All recreational facilities would be consistent with the Dalton Highway Recreation Activity Management Plan (RAMP), and will minimize disturbance to	This action has been implemented as described.	Partially. Protection of sheep habitat areas is crucial considering recent population fluctuations. Snowden Mountain ACEC and adjacent habitat to the east is an area of high sheep density relative to other portions of the Dalton Highway Corridor Management Area.	Consider extension of the Snowden ACEC, along the eastern edge of the ACEC to the eastern extent of BLM-managed lands. See section 2.3.1.3 of this document for more details.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	protected resources within the ACEC.			
Utility Corridor RMP/ROD **Proposed Action 52:**	**Sukakpak Mountain ACEC** (3,500 acres): Mineral materials extraction would not be allowed on the slopes of Sukakpak Mountain; Mineral location will not be allowed in the ACEC. (This area is located within the Inner corridor.); No surface occupancy stipulations would be applied to mineral leasing in the ACEC; All recreational facilities would be consistent with the Dalton Highway Recreation Activity Management Plan (RAMP); Recreational opportunities of the area will be emphasized by trail development.	This action has been implemented as described.	Partially. The scenery along the highway has grown in importance as a resource valued by the public. The Dalton Highway is increasingly seen and marketed globally as a unique Alaskan destination. Sukakpak Mountain is a highly visible and photographed landmark.	To protect more of this spectacular view for highway travelers, consider expanding the Sukakpak ACEC to protect more of the viewshed, including that of Dillon Mountain on the opposite side of the Bettles River from Sukakpak.
Utility Corridor RMP/ROD **Proposed Action 52:**	**Toolik Lake ACEC/RNA** (82,000 acres): Protect habitats crucial to species considered threatened, endangered, candidate or sensitive by U.S. Fish and Wildlife Service or the State of Alaska; All authorized actions would be reviewed to avoid conflict with ongoing research projects in the area; Mineral location will not be allowed in this ACEC. (The area is located within the Inner corridor.); Nonsurface occupancy stipulations would be applied to mineral leasing. (The area is located within the Inner corridor.) No surface occupancy stipulations would be applied to plant habitat (*Montia bostockii)* locations; No recreational camping would be permitted. No public use campgrounds would be developed at Toolik Lake; OHV access for research activities would be allowed through permit; Guiding operations would not be authorized at Toolik Lake; The sale of mineral materials would be confined to already disturbed sites. New sites would be considered only if no other economically feasible alternatives are available; No	These management restrictions have been implemented as described. A management plan and programmatic EA were prepared. A rare plant inventory was done in 2002, but no species management activity plan was prepared for *Montia bostockii* .	Partially. Rare plant habitat is present and a management activity plan for *Montia bostockii* should be prepared. Yellow-billed loon inhabit the area encompassed by this ACEC. The species is a BLM Alaska sensitive species. USFWS issued a finding (FR Vol. 79, No. 190, Wednesday, October 1, 2014) that a decision to list the yellow-billed loon as threatened or endangered is not warranted at this time. The loon was removed from the candidate list.	Protections should be placed in the ACEC which would limit the disturbance of nesting and brooding yellow-billed loons consistent with BLM policy for management of sensitive species.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	lands within the RNA would be made available for disposal (State selection, exchange, or sale); Prepare a detailed management activity plan for the Toolik Lake Research Natural Area Plan, including the Galbraith Lake ACEC; Prepare a species management activity plan for the sensitive plant species, *Montia bostockii*.			
Central Yukon RMP/ROD	**RNAs (pg. 12), Cultural Resources (pg. 40, #4), Appendix H DRMP/EIS:** Eight RNAs (43,000 acres total) are designated in the Nulato, Tozitna, Kuskokwim, and Hughes subunits. Designated RNAs are Box River Treeline, Redlands Lake, Arms Lake, Ishtalitna Creek Hot Springs, McQuesten Creek, Spooky Valley, Lake Todatonten Pingos and South Todatonten Summit. Closed to commercial timber harvest (p. 11 of ROD). Closed to mineral leasing. Recommended withdrawn from mineral location and entry.	All eight RNAs have been designated. Recommended withdrawals have not been implemented. RNAs are closed to mineral leasing.	Further RNA specific review is needed to determine this.	Review all existing RNAs to determine if any changes to boundaries or management are needed.
Central Yukon RMP/ROD	**RNAs (pg. 12):** The eight RNAs would be proposed for inclusion into the Ecological Reserve System. These RNAs would be closed to FLPMA leases and sales, mineral entry and mineral leasing. There would be no restriction on hunting and fishing by the public or subsistence activities within the RNAs. Access through RNAs for vehicles over 1,500 pounds GVW would be allowed by permit. An approved plan of operations would be required for any ground-disturbing activity on existing mining claims within RNAs.	No new withdrawals have been implemented. Other management prescriptions for RNAs are ongoing. Unknown if RNAs were proposed for inclusion in the Ecological Reserve System or if this program still exists. More research is needed.	Partially. No withdrawals from mining have been implemented.	Revisit management prescriptions for RNAs based on current issues and technology.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Wildlife, Terrestrial (pg. 6), Table 1–2 (pg. 15):** Crucial caribou habitats in the Tozitna and Dulbi subunits are designated as ACECs: 1. Galena Mountain ACEC (24,800 acres) 2. Tozitna North ACEC (127,000 acres) 3. Tozitna South ACEC (5,134 acres)	These ACECs were designated.	Partially. Crucial habitat and actual calving range may be only partially represented within current ACEC boundaries and/or may have shifted over time and currently be offset from what was previously established.	Review current and historic caribou locations, and specifically, calving locations to determine correct location for ACECs and/or ascertain whether boundary expansions are justified.
Central Yukon RMP/ROD	**Wildlife Resources, Aquatic (pg. 6), Table 1–2 (Pg. 15):** Designated fishery ACECs: **Nulato Subunit** 1. Inglutalik River ACEC 2. North River ACEC 3. Shaktoolik River 4. Kateel River ACEC 5. Gisasa River ACEC 6. Ungalik River ACEC 7. Unalakleet River ACEC **Kuskokwim Subunit** 1. Sulukna River ACEC **Tozitna Subunit** 1. Tozitna River ACEC **Hughes Subunit** 1. Indian River ACEC 2. Hogatza River Tributaries ACEC	These ACECs were designated. North River and Unalakleet ACECs are not in the planning area. These two ACECs will be addressed by the BSWI RMP.	Partially. Conveyance of lands has changed land ownership patterns, affecting the land base of some ACECs. Monitoring of the Sulukna River has shown that most of the sheefish are spawning upstream of the ACEC. Monitoring of the Hogatza and Indian River ACECs has shown that some important salmon habitats in these rivers are outside of the ACEC boundaries.	Review all existing ACECs to determine if changes are needed to boundaries or management prescriptions based on current issues and land status, and additional data collected since approval of the 1986 RMP.
Central Yukon RMP/ROD	**Inglutalik River ACEC (71,700 acres):** Recommended open to mineral location and mineral leasing. Mining plans of operation required. Additional requirements will be identified in the ACEC management plan.	This ACEC is in the BSWI Planning Area.	No. The ACEC is no longer in the planning area.	N/A
Central Yukon RMP/ROD	**Shaktoolik River (193,300 acres):**	This ACEC is in the BSWI Planning Area.	No. The ACEC is no longer in the planning area.	N/A

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Kateel River ACEC (568,000 acres):** Recommended withdrawal of crucial spawning habitat from mineral location and FLPMA sales and leases. This withdrawal would extend 300 feet from each side of the stream mean high-water line and also include the stream bed of non-navigable reaches.	Most of this ACEC is in the BSWI Planning Area. No ACEC management plan has been done. Selected crucial spawning habitat was not withdrawn from mineral location and FLPMA sales and leases.	Partially. Chinook spawning and rearing habitat and chum spawning habitat exists in the lower river reach that is outside the current ACEC boundary. Most of this ACEC is no longer in the planning area.	N/A
Central Yukon RMP/ROD	**Gisasa River ACEC (278,000 acres):** Recommended withdrawal of crucial spawning habitat from mineral location and FLPMA sales and leases. This withdrawal would extend 300 feet from each side of the stream mean high-water line and also include the stream bed of non-navigable reaches.	This ACEC is in the BSWI Planning Area. No ACEC management plan has been done. Selected crucial spawning habitat was not withdrawn from mineral location and FLPMA sales and leases.	No. The ACEC is no longer in the planning area.	N/A
Central Yukon RMP/ROD	**Ungalik River ACEC (112,700 acres)**	This ACEC is in the BSWI Planning Area.	No. The ACEC is no longer in the planning area.	N/A
Central Yukon RMP/ROD	**Unalakleet River (278,400 acres):** Recommended withdrawal of crucial spawning habitat from mineral location and FLPMA sales and leases. This withdrawal would extend 300 feet from each side of the stream mean high-water line and also include the stream bed of non-navigable reaches.	This ACEC is in the BSWI Planning Area.	No. The ACEC is no longer in the planning area.	N/A
Central Yukon RMP/ROD	**Sulukna River ACEC (24,600 acres):** Complete ACEC management plan.	This ACEC is designated, but does not encompass all crucial spawning habitat. Proposed management for the ACEC is unclear in the ROD.	Partially. Inconnu (sheefish) spawning documented in the Sulukna River upstream of the ACEC. One of only five known spawning areas in the state.	Adjust current boundary of the ACEC to include the entire Sulukna River watershed upstream of the Nowitna River National Wildlife Refuge. See section 2.3.1 for more details.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Tozitna River ACEC (786,700 acres):** Recommended withdrawal of crucial spawning habitat from mineral location and FLPMA sales and leases. This withdrawal would extend 300 feet from each side of the stream mean high-water line and to also include the stream bed of non-navigable reaches.	This ACEC is designated, but crucial spawning habitat was not withdrawn from mineral location and FLPMA sales and leases.	Partially. Recommended withdrawals were not implemented.	Implement withdrawals from mineral entry and location. Include all active stream channels in the watershed. Withdraw the entire watershed from mineral location, mineral material sales and leasing.
Central Yukon RMP/ROD	**Indian River ACEC (158,000 acres):** Recommended withdrawal of crucial spawning habitat from mineral location and FLPMA sales and leases. This withdrawal would extend 300 feet from each side of the stream mean high-water line and to also include the stream bed of non-navigable reaches.	This ACEC is designated, but crucial spawning habitat was not withdrawn from mineral location and FLPMA sales and leases.	Partially. Current ACEC boundary excludes important salmon habitat. Substantial number spawn downstream of boundary.	Adjust current boundary of the ACEC to include approximately 10 additional miles of the Indian River. Seesection 2.3.1 of this document for more details.
Central Yukon RMP/ROD	**Hogatza River Tributaries ACEC (5,225 acres):** Includes portions of Clear, Caribou, and Bear Creeks. Recommended withdrawal of crucial spawning habitat from mineral location and FLPMA sales and leases. This withdrawal would extend 300 feet from each side of the stream mean high-water line and to also include the stream bed of non-navigable reaches.	This ACEC is designated, but crucial spawning habitat was not withdrawn from mineral location and FLPMA sales and leases. Original ACEC was approximately 155,000 acres. Due to land conveyance, the remaining ACEC is only 5,225 acres.	Partially. Current ACEC boundary excludes high-value salmon habitat (chum, coho, and Chinook).	Adjust current boundary of the ACEC to include remaining BLM lands within the combined watersheds of Clear and Caribou Creeks, as well as the adjoining BLM lands in High Creek and the South Hogatza sub-watershed. See section 2.3.1 of this document for more details.
Central Yukon RMP/ROD	**Dulbi River Threatened and Endangered ACEC (54,200 acres):** Also commonly referred to as the Dulbi-Kaiyuh ACEC. Complete ACEC management plan.	This ACEC is designated. No ACEC management plan was developed. This ACEC was designated to protect peregrine falcons which were delisted in 1991.	Possibly not. More review is needed.	Review ACEC to determine if it still meets designation criteria. Review land status to make sure sufficient lands remain in BLM management to protect relevant and important values. Make a determination on retaining, modifying, or eliminating the ACEC.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Galena Mountain ACEC (19,400 acres):** Recommended open to mineral leasing and location. Monitor in cooperation with ADFG.	This ACEC is designated. No ACEC management plan was developed.	Possibly not. The ACEC does not encompass all crucial caribou habitat.	Review ACEC to determine if it still meets designation criteria. Review land status to make sure sufficient lands remain in BLM management to protect relevant and important values. Make a determination on retaining, modifying, or eliminating the ACEC.
Central Yukon RMP/ROD	**ACECs (pg. 12):** All ACECs in the Central Yukon Planning Area require that ground-disturbing activities associated with mineral exploration and development be conducted under an approved plan of operations. Casual uses as defined under 43 CFR 3809 are exempt from this requirement. Additional requirements will be identified in the appropriate ACEC management plans.	Aquatic ACEC management plans completed for Tozitna River Watershed, Hogatza River tributaries; and Indian River.	Yes. 43 CFR 3809 requires a mining plan of operations in ACECs.	Implement new 3809 regulations. Review ACECs to determine if a withdrawal is appropriate.
Central Yukon RMP/ROD	**Threatened and Endangered Wildlife, (pg. 7):** The ACEC management plan for threatened and endangered species ACECs will require that all actions within the ACEC be consistent with existing protective guidelines established by the Peregrine Falcon Recovery Plan.	Management was consistent with peregrine falcon recovery plan; no ACEC management plans were ever developed; peregrine falcons were delisted in 1991.	No. Peregrine falcon is no longer a federally listed species.	Make a determination on retaining, modifying, or eliminating peregrine falcon ACECs. If retained, determine appropriate management and the need for ACEC management plan.

The BLM nominated the following areas for consideration as ACECs. Additional nominations may be forthcoming from the public and cooperating agencies. All nominated ACECs will be evaluated as part of the Draft RMP/EIS. See section 2.3.1.3 of this document for more specific information on these proposals.

Table 3.24. Potential New ACECs for Fisheries

Potential ACEC	Is Decision Responsive to Current Issues?	Options for Change
Klikhtentotzna Creek (tributary to the upper Hogatza River)	Yes. High-value chum salmon spawning habitat.	Evaluate watershed for ACEC designation. If it meets the criteria, consider adding these lands to Hogatza ACEC.
Wheeler Creek (tributary to Dakli River)	Yes. High-value chum salmon spawning habitat.	Evaluate watershed upstream of Koyukuk National Wildlife Refuge for ACEC designation.
Teedriinjik (Chandalar) River	Yes. Provides a significant contribution to the overall Yukon River Basin Chinook salmon stock and is one of the more productive Chinook salmon streams within the U.S. portion of the Yukon River. Provides habitat for up to 25 – 30 percent of the Yukon River fall chum salmon run.	Evaluate the BLM-managed portion of the Teedriinjik (Chandalar) River for ACEC designation, extending from the confluence of the East Fork of the Chandalar, upstream to the mouth of Schilling Creek
Sethkokna River	Yes. Chinook salmon spawning habitat. Primary producer of Chinook salmon in the Nowitna River drainage.	Evaluate the BLM-managed portion of the Sethkokna River for ACEC designation.
South Fork Koyukuk River	Yes. Provides high-value habitat for both Chum and Chinook salmon.	Evaluate watershed upstream of Kanuti National Wildlife Refuge for ACEC designation.
Accomplishment Creek	Yes. Unique springs habitat used year-round by Dolly Varden.	Evaluate Accomplishment and Section Creek watersheds on BLM-managed land for ACEC designation..

3.2.21. National Trails

The Iditarod National Historic Trail runs through the planning area. Little if any of the designated trail is located on BLM-managed lands. See section 2.3.5.

Table 3.25. Current Management and Management Opportunities for Iditarod National Historic Trail

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Central Yukon RMP/ROD	**Objective #12 (pg. 2), Recreation (pg. 12):** Manage the Iditarod National Historic Trail in cooperation with the BLM, Anchorage Field Office as outlined in the Trail Management Plan	This decision is ongoing. Most if not all of the trail in the planning area is not on BLM-managed lands.	Yes. The Anchorage Field Office manages the majority of the trail and takes the lead in issuing permits.	No changes are recommended.

3.2.22. Wild and Scenic Rivers

There are no designated wild and scenic rivers in the planning area. See section 2.3.3.

Table 3.26. Current Management and Options for Change, Wild and Scenic Rivers

Status	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	The RMP has no decisions for Wild and Scenic Rivers (WSR). Wild Rivers lawsuit settlement agreement (8/30/1993) requires BLM to do a WSR review.	The required WSR review has not been completed.	Yes. BLM policy requires looking at WSR eligibility and suitability.	Conduct WSR inventory, and make eligibility and suitability determinations.
Central Yukon RMP/ROD	**Recreation Resources (pg. 12):** The Unalakleet WSR is managed per the River Management Plan administered by the Anchorage Field Office. Use authorizations are coordinated with the Central Yukon Field Office. The viewshed of the river, outside of the designated corridor would be managed with an awareness of the important scenic values associated with the river.	The Unalakleet WSR corridor is in the Anchorage Field Office and will be covered by the BSWI RMP.	No. Other rivers in the planning area have not been evaluated for eligibility or suitability.	Conduct WSR inventory, and make eligibility and suitability determinations for rivers in planning area.

3.2.23. Wilderness Study Areas

The Central Arctic Management Area (CAMA) Wilderness Study Area (WSA) is located in the planning area. See section 2.3.2 for more details.

Table 3.27. Current Management and Options for Change, Central Arctic WSA

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 33:** The upper Nigu River area (approximately 41,000 acres) is recommended for wilderness designation (Map 2.8). This recommendation was submitted to the President and Congress through the *ANILCA Section 1001 Report Findings and Recommendations* (USDOI, BLM; 1988b) on December 14, 1988.	Waiting for action from Congress.	Yes. BLM Manual 6330 Management of Wilderness Study Areas and ANILCA dictate how the lands will be managed until Congress acts on the wilderness recommendation or releases these lands from consideration for designation.	None
American Rivers et al. v. Lujan et al. 7/30/91	Central Arctic Management Area: Lands in the CAMA WSA will continue to be managed consistent with the *Interim Management Policy and Guidelines for Lands under Wilderness Review* and ANILCA until Congress acts on the wilderness recommendation or releases these lands from consideration for designation.	Ongoing. Much of the WSA has been conveyed. About 260,000 acres remain under BLM management, but some of these lands are selected and may be conveyed.	Yes. CAMA is a WSA and must be managed as such.	None
Utility Corridor	**Proposed Action 28** (pg. 2–26): In the CAMA extensive recreation management	Ongoing	Yes. Currently rafting, wildlife, and	Recreation decisions

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
RMP/ ROD	area, primitive and semi-primitive recreation experiences would be emphasized. The primary recreational uses would be hunting, fishing, and backpacking. No recreational facility development would take place.		landscape viewing are ongoing summer activities in the area.	must be consistent with WSA management.

3.2.24. Social and Economic

3.2.24.1. Subsistence

See section 2.4.2 for background information.

Table 3.28. Current Management and Options for Change, Subsistence

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Section 810 Policy	Procedural requirements mandated by section 810 of the Alaska National Interest Lands Act (ANILCA) are followed for all authorized actions. All actions are evaluated on a case-by-case basis.	Ongoing per BLM Alaska policy.	Yes. Statewide policy. Not really a land use planning decision.	None. This is policy, not an RMP-level decision.
Utility Corridor RMP/ROD	**Proposed Action 41:** The proposed RMP would withdraw lands from mineral entry and location to protect subsistence resource values. The Kanuti and Jim Rivers and the Prospect Creek withdrawals from mineral location and mineral materials extraction, if possible, serve to protect salmon spawning areas (see the Mineral Resources Section). Protection of these spawning areas would aid in protecting fishery resources used by downstream rural subsistence-based communities. Additional subsistence resource protection is provided through the withdrawal of known mineral lick (i.e., natural salt lick) sites from mineral location and by the establishment of ACECs around sheep lambing areas.	Recommended new withdrawals were not completed. ACECs for sheep habitat are established.	Partially, needs further review since more information available now for sheep habitat. Salmon spawning habitat is downstream of current ACEC, needs reevaluation.	Potential expansion of Jim River ACEC for salmon spawning habitat, additional and/or expand current ACECs for sheep habitat and mineral licks.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor RMP/ROD	**Proposed Action 42:** The proposed OHV use evaluation and study would fully consider the effects on subsistence resources resulting from any changes in land classification for off-road vehicle use. BLM will work closely with the State of Alaska and other federal agencies during the OHV evaluation period to appropriately design stipulations for the protection of subsistence resources.	Not implemented	Study was never conducted, State law closes the DHCMA to OHV use but makes exceptions to OHV use for access to (1) oil/gas exploration and (2) valid mining claims.	OHV use evaluation targeting mining-related use of OHVs and consequent impacts on subsistence resources.
Utility Corridor RMP/ROD	**Proposed Action 43:** Local use of forest products for subsistence purposes would be allowed on a free-of-charge basis if demand does not exceed supply. In those areas where the supply of forest products is limited, a fee may be charged.	Ongoing	Unknown, location and quantity of subsistence harvest is not known and because subsistence harvest policy has changed since last planning effort.	Increase information about subsistence use of forest products. Educate subsistence users about policy changes to forest product utilization.
Central Yukon RMP/ROD	**Goal #1, Objective 9:** Provide for protection of subsistence uses and needs as required by section 810 of ANILCA.	Ongoing	Yes. Statewide policy. Not really a land use planning decision.	None
Central Yukon RMP/ROD	**Goal #4, Objective 11:** Inventory and monitor subsistence uses and needs in accordance with sec. 810 of ANILCA, and in cooperation with ADFG and rural communities.	Ongoing	Yes	Increase BLM participation and support of ADFG Community Subsistence Harvest Surveys.
Central Yukon RMP/ROD	**Subsistence Resources:** Three categories of withdrawals designed to protect subsistence resource values are proposed. These withdrawals will retain existing closures or close lands to all activities until scheduled subsistence studies or other identified actions are complete. These withdrawals are described as follows: See below.	see below, next 3 rows	see below, next 3 rows	see below, next 3 rows
Central Yukon RMP/ROD	**Subsistence Resources:** River Study Areas: A linear withdrawal of 300 feet on either side of the stream's mean high-water line to also include the stream bed of waterways not known to be navigable. Lands within river study areas will be withdrawn from all forms of appropriation including mineral leasing for a 3 year period. This withdrawal category applies to the lower Kateel River, a segment of the South Fork Huslia River, and the Rodo River. During this withdrawal period, subsistence studies will be conducted	Withdrawals were not established and studies were not conducted. Lower Rodo River is on State and Native corporation lands. Upper segments are BLM-managed. Kateel River is in the BSWI	Unknown, but some of these lands are no longer managed by the BLM or are outside the planning area.	Investigate current need for study and withdrawal. Consider other options for protecting subsistence use areas besides withdrawals.

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	by BLM in cooperation with ADFG or by a BLM contact, funding permitting in either case. On completion of the studies, recommendations will be made concerning retention, modification, or repeal of the withdrawal.	Planning Area. South Fork Huslia River is on USFWS lands or outside the planning area.		
Central Yukon RMP/ROD	**Subsistence Resources:** Subsistence Study Areas/Retention Lands: There are three tracts of land in this category. One tract is located approximately 13 miles south-southwest of Galena and the other two are located 18 and 25 miles northeast of Galena, respectively. Lands in this category will be withdrawn from all forms of appropriation for a 3 year period. The study and withdrawal requirements of this category are the same as those for River Study Areas listed above.	Withdrawals were not established and studies were not conducted. Other than 160 acre Native allotment, these lands remain under BLM management.	Unknown. More research is needed. Establishing a 3 year withdrawal period is not feasible, given ANILCA requirements for Congressional approval of withdrawals over 5,000 acres.	Investigate current need for study and withdrawal.
Central Yukon RMP/ROD	**Subsistence Resources:** Withdrawal/Exchange Lands: These are lands located within the ANCSA original village withdrawal boundaries, which were not selected. Lands in this category are located in the vicinity of Allakaket/Alatna, Hughes, Nulato and Kaltag. A subsistence study will be completed on these lands during the 5 year withdrawal period. The findings of these studies will be considered when the withdrawals are reviewed after the 5 year exchange period.	Withdrawals were not established and studies were not conducted.	Short-term withdrawals from mining are not really feasible.	Investigate current need for study and withdrawal. Look at other options besides withdrawals. Determine which lands are suitable for exchange in the RMP.
Central Yukon RMP/ROD	**Subsistence Resources:** The BLM will continue to exchange and coordinate the collection of subsistence data with ADFG Subsistence Division.	Ongoing	Yes	Increase cooperative projects in conjunction with ADFG. Increase participation/ support of ADFG Community Subsistence Harvest Surveys.
Central Yukon RMP/ROD	**Subsistence Resources:** Based on identified subsistence usage, designated portions of the following streams will have 300 foot wide (each side) "no surface occupancy" setback zones. These zones will extend from the center line of the river or stream. The affected river areas are the Tagagawik River (Nulato subunit), the Ray River, and three short tributaries of Squaw Creek (Tozitna Unit). Lands within these zones will be closed to FLPMA sales or leases, and surface	Although a 300 foot no surface occupancy setback has been identified, ANCSA withdrawals prohibit leasing. Withdrawals were not lifted. Additionally, lands with high mineral potential	Yes. A no surface occupancy setback from rivers is a valid protective measure. However, the sites where such a setback is desired need to be revisited based on current land status and management issues. Also,	Review all existing withdrawals to determine which lands should be opened or closed to mineral leasing laws. In areas recommended to be opened, consider no surface occupancy setbacks from

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	occupancy in conjunction with mineral leasing activities. The zones will be open to mineral location (no presently known potential).	have mostly been conveyed.	the width of the setback should be reviewed.	rivers, particularly those with anadromous fish spawning habitats.
Central Yukon RMP/ROD	**Subsistence Resources:** The Kaltag and Nulato River watersheds have been closed to mineral entry and location since village residents use these watersheds as their principal source of potable water.	No new withdrawals have been implemented.	The referenced rivers are either outside the planning area or are on Native corporation lands.	Ensure that potable water protection adequately meets public health needs for all communities.

3.2.24.2. Public Safety

Table 3.29. Current Management and Options for Change, Hazardous Materials

Decision Source	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Utility Corridor ROD	See section 3.2.25 Administrative Stipulations.	Ongoing	Partially	Review and if needed, revise administrative stipulations. Develop standard operating procedures for planning area.
Central Yukon RMP/ROD	**Objective 12 (pg. 4):** Inventory and provide management for hazardous waste sites.	Ongoing	Yes	

3.2.25. Administrative Stipulations

The following list of standard stipulations apply within the Utility Corridor Planning Area. Application of these stipulations is recommended for protecting the resource values as outlined in the Utility Corridor Proposed RMP/Final EIS. The source for all of these stipulations is Appendix L of the Utility Corridor RMP/ROD (BLM 1991a).

Appendix L stipulations are narrow in scope and do not cover all current and foreseeable future authorizations. Some stipulations are too specific for land use planning-level decisions. Others reference a BLM organization that no longer exists due to office reorganization over the past 24 years. Some stipulations merely reiterate regulations. Similar stipulations do not exist for the Middle Yukon Drainages Subunit.

As part of this planning effort, the BLM will review and revise all administrative stipulations in light of current issues, current policy, new information, climate change, and revised planning area boundaries. Many of the stipulations are responsive to current issues, but they should be applied to a broader range of activities than just seismic exploration. In some cases, summer and winter stipulations are repetitive and should be applied year-round. Stipulations should be consistent to the extent possible with adjacent planning areas such as the National Petroleum Reserve-Alaska (NPR-A), the Eastern Interior RMP, and the Kobuk-Seward Peninsula RMP.

Summer Stipulations

The stipulations listed below are applied as appropriate on authorized activities that will occur during the summer. The intent behind the stipulations is generally being implemented. All the following stipulations will be reviewed, revised, or dropped as appropriate during this planning process. Only those identified as potentially needing change are listed in Table 3.30.

1. The Bureau of Land Management (BLM), Arctic District Manager, or his delegate, is the Authorized Officer (AO).

2. A letter of non-objection will be required from the State of Alaska and/or the appropriate Native corporations before entry onto any state or Native-selected land.

3. The Permittee must notify the BLM immediately of any changes or modifications in plans covering field operations.

4. The Permittee will conduct an environmental briefing of all employees, contractors, and subcontractors, including pilots, which will cover these stipulations. A copy of these stipulations shall be posted in a conspicuous place in the crew quarters.

5. No historic site, archeological site, or paleontological resource shall be disturbed in any manner, nor shall any item be removed. Any site discovered during the course of field operations will be reported promptly to the AO and in the completion report (Stipulation #14).

6. All operations must not impede rural residents from pursuing their traditional subsistence activities (ANILCA, PL 96-487).

7. The Permittee will be financially responsible for any fire caused by field operations that gets out of control.

8. Harassment of peregrine falcons (50 CFR 17.3) and eagles (50 CFR 22.3) is not permitted. Activities will be restricted, as described in the table below. If peregrine falcons are encountered in cliff areas during permitted activities, leave the area and follow the restrictions. Any site discovered during the course of field operations will be reported promptly to the AO and in the completion report (Stipulation #14). If the field party needs to revisit an area with a potential nest site, contact the BLM for more information.

9. No feeding, chasing or buzzing by aircraft of any wildlife.

10. The Permittee shall protect all survey monuments, witness corners, and reference monuments against destruction, obliteration, or damage. Any damaged, destroyed, or obliterated monuments and corners shall be reestablished to the original exact location at the Permittee's expense. A record of the reestablishment shall be submitted to the AO.

11. The Permittee shall hold the United States harmless against and from all demands, claims, or liabilities of any nature arising directly or indirectly from any operation on the land.

12. The following data will be submitted to the BLM, Alaska State Office:

    a. A location map of all field sampling sites at a scale of 1:250,000 or larger.

    b. Quality legible copies of all original observations and recordings, including descriptions of rock and hydrocarbon samples taken, keyed to the location map required in (a).

c. Results of all analyses conducted on rock and hydrocarbon samples, including, but not limited to, geochemical techniques, reservoir and source rock property determinations, and paleontologic and palynologic information.

Items (a) and (b) are due within 30 days after the last day of permitted use. Item (c) is due within 30 days of completion of analyses or within one year of completion of the permitted activity, whichever comes first. All data clearly marked as proprietary or confidential will be kept confidential according to the standards and conditions set forth in BLM Manual 1273. All third party requests for access to such data will be referred to the Permittee. There will be no publication of or public access to the data or derived interpretations or conclusions without the express written consent of the Permittee.

13. The BLM reserves the right to impose closure of any area to operators in periods when fire danger or other dangers to natural resources are severe.

14. Upon program completion or within 30 days of cessation of operations, a final summary report shall be submitted to the BLM including:
    a. A description of all work performed.
    b. Charts, maps, or plats depicting the areas and blocks in which the exploration was conducted and specifically identifying the lines of geophysical traverses.
    c. The dates actual exploration was conducted.
    d. A statement that all terms and conditions have been complied with, or that corrective measures shall be taken to rehabilitate the lands or other resources.

15. All fuel containers must be marked with the operator's name, date purchased, and contents. No fuel storage or refueling of equipment shall be allowed within the flood plain of a river or lake.

16. All refuse, fuel, food tins, human wastes, and debris must be recovered from the public lands to approved collection sites. Garbage and human wastes may not be buried.

17. The foregoing provisions do not relieve the contractor or his subcontractor of any responsibilities or provisions required by any applicable laws or regulations.

Table 3.30. Stipulations for Summer Authorized Actions Needing Change, Utility Corridor RMP

Stipulation #	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
Summer 4	The Permittee will conduct an environmental briefing of all employees, contractors, and subcontractors, including pilots, on the stipulations. A copy of stipulations shall be posted in a conspicuous place in the crew quarters.	Possibly not being followed.	Yes, but needs some revision.	In addition to briefing, Permittee must provide all subcontractors and pilot a copy of the BLM permit and all stipulations.
Summer 8	Harassment of peregrine falcons (50 CFR 17.3) and eagles (50 CFR 22.3) is not permitted. Following restrictions apply :	Ongoing. Peregrine falcons are no longer a listed species.	Possibly not. Nest sites of other species besides falcons and eagles may require protection.	Identify priority raptor species. Revisit permit stipulations for activities near raptor nests. Consider consistency

Stipulation #	Current Management Decision	Status	Is Decision Responsive to Current Issues?	Options for Change
	1. Maintain a minimum aircraft altitude of 1,500 feet above nest level from April 15 to August 31. 2. All ground-level activity is prohibited from April 15 through August 31. 3. Prohibit activities with high noise levels within 2 miles of nest sites from April 15 through August 31.		There may be new information to support changes to these stipulations.	with adjacent planning areas such as NPR-A, Eastern Interior, and Kobuk-Seward Pensinsula.
Summer 15	All fuel containers must be marked with the operator's name, date purchased and contents. No fuel storage or refueling of equipment shall be allowed within the floodplain of a river or lake.	Ongoing. Refueling within floodplains problematic.	Yes, but need to allow for site-specific project requirements and further details.	Revise to account for the fact that sometimes it is necessary to store fuel and refuel within a floodplain. Revise to address ADEC regulations. Allow for burning of combustibles under favorable conditions. Build in AO discretion to modify on case-by-case basis.
Summer 16	All refuse, fuel, food tins, human wastes, and debris must be recovered from the public lands to approved collection sites. Garbage and human wastes may not be buried.			

Winter – Seismic Stipulations

The stipulations listed below apply to any operation under a Notice of Intent or permit for geophysical exploration in the Utility Corridor Planning Area. No seismic exploration has occurred in the planning area. Much of the planning area is closed to mineral leasing by ANCSA 17(d)(1) withdrawals. Additionally, most of the land on the north slope has been conveyed to the State or Native corporations. Thus, geophysical exploration would be unlikely. Some of these stipulations, however, have general applicability to other activities besides seismic exploration. Some stipulations restate laws or regulations and others are too detailed for a land use planning document. Similar stipulations do not exist for the Middle Yukon Drainages Subunit. All the following stipulations will be reviewed, revised, or dropped as appropriate during this planning process.

General Winter – Seismic

1. The BLM Arctic District Manager or delegate is Authorized Officer (AO) for this permitted activity.

2. Communication shall be addressed to: Arctic District Manager, 1150 University Ave, Fairbanks, Alaska, 99709

3. The AO or designated field representative may issue temporary suspension orders for any activity if operations are in non-compliance with permit stipulations.

4. Requests to resume suspended activities shall be made directly to the AO when noncompliance has been corrected.

5. In matters of disagreement between the AO and the Permittee, appeals may be made directly to the BLM State Director.

6. This permit is not valid for seismic exploration until the AO receives detailed descriptions and plats of proposed shot lines (scale at least 1:250,000) and principal contacts, including field representatives, are identified by both parties.

7. The U.S. Government reserves access to all geophysical data, processed geophysical information, reprocessed geophysical information, and interpreted geophysical information collected by the Permittee pursuant to this permit. The BLM Division of Minerals, Chief Branch of Mineral Assessment, shall act on the government's behalf.

8. The Permittee may be requested by the AO to furnish quarters and transportation for designated field representatives or observers to inspect operations.

Environmental Winter – Seismic

1. Permittee will conduct an environmental briefing for all employees, contractors, and subcontractors that will cover the stipulations attached to the permit.

2. All operations will be conducted in such a manner as not to cause damage or disturbance to any fish or wildlife and subsistence resources.
   a. No seismic vehicle operations within one-half mile of any denning barren ground grizzly or any denning polar bear.
   b. No chasing by vehicles or buzzing by aircraft of any wildlife. Particular attention will be given to not disturbing caribou.
   c. Operators shall prohibit their employees, agents, contractors, subcontractors and their employees, while on duty or living at any camp or mobile camp, from feeding wild animals or birds or from leaving garbage or other potentially edible items which would attract wild animals or birds. Garbage will be kept in covered containers while waiting incineration.
   d. Aircraft shall maintain 1,000 foot altitude (except for takeoff and landings) over designated caribou concentration areas during the specific time period designated unless doing so would endanger human life or be an unsafe flying practice.

3. All operations shall be conducted with due regard for good resource management and in such a manner as not to block any stream or drainage system, to change the character or course of a stream, or to cause the pollution or siltation of any stream or lake.

4. All activities shall be conducted so as to avoid or minimize disturbance to vegetation.

5. Seismic operations will begin only after the seasonal frost in the tundra and underlying mineral soils has reached a depth of 12 inches, and the average snow cover is a depth of 6 inches.

6. Seismic operations will cease when the spring melt of snow begins; approximately May 5 in the foothill areas exceeding 300 feet in elevation; approximately 15 May in the northern coastal areas. The cut-off date will be determined by the AO.

7. To prevent surface disturbance, tracked vehicles will not execute tight turns by locking one track.

8. The Antiquities Act (34 Stat 225; 16 U.S.C. 431-433) prohibits the appropriation, excavation, injury or destruction of any historic or prehistoric ruin or monument, or any other object of antiquity, situated on lands owned or controlled by the United States. No historic site, archeological site or camp, either active or abandoned, shall be disturbed in any manner nor shall any item be removed. Should such sites be discovered during the course of field operations, the AO will be promptly notified.

9. All operations must not impede rural residents from pursuing their traditional subsistence activities (ANILCA, PL 96-487).

Operational Winter – Seismic

1. Exploration activities will use low ground pressure vehicles of the rolligon, ARDCO, Trackmaster, Nodwell or of a similar type. The limited use of tractors, equipped with wide tracks or "shoes," will be allowed to pull the camp and fuel trailers. Any exceptions to this stipulation will require the written approval of the AO.

2. Crossing of waterway courses shall be made using a low-angle approach to not disrupt the naturally occurring stream or lake banks.
   a. Alteration of the banks of a watercourse is prohibited.
   b. If snow ramps or snow bridges are utilized at watercourse crossings for bank protection, they shall be substantially free of soil and/or debris. Snow bridges shall be removed or breached immediately after use or before spring break-up.
   c. Equipment shall not enter open-water areas of watercourses.
   d. To avoid additional freezedown of deep water pools harboring overwintering fish, watercourses shall be crossed at shallow riffle areas from point bar to point bar whenever possible.
   e. Compaction or removal of the insulating snow cover from the deep-water pool areas of rivers known to harbor overwintering fish shall be avoided.

3. No bulldozing of tundra areas, trails, or seismic lines will be allowed. This stipulation, however, does not prohibit the clearing of drifted snow along a trail or seismic line nor in a camp, to the extent that the tundra mat is not disturbed. Also, it does not prohibit the clearing of snow on a lake or river ice surface to prepare an aircraft runway.

4. Camps will be situated on gravel bars, sand, or other durable lands. Where leveling of trailers or modules is required and the surface has a vegetative mat, leveling will be accomplished with blocking rather than leveling with a bulldozer.

5. Camps will not be located on frozen lakes or on river ice. The location of camps on river sand or gravel bars is allowed and, where feasible, encouraged.

6. The contractor shall protect all survey monuments, witness corners, and reference monuments against destruction, obliteration, or damage. He shall, at his expense, re-establish damaged, destroyed, or obliterated monuments and corners in their original exact position. A record of the re-establishment shall be submitted to the AO.

7. Water Quality: all parties shall comply with applicable "Water Quality Standards" of the State of Alaska as approved by the Environmental Protection Agency.

a. Waste water shall receive treatment conforming to federal requirements for secondary treatment if Arctic-tested package treatment facilities are used.
b. If chemical recirculating sewage facilities are used, they shall be kept separate from the gray wash and kitchen waste water. Gray wash water and kitchen waste water may be filtered to remove the solids and the liquid discharged to the land surface. All solids and sludges shall be incinerated.

8. Emissions from equipment and burning materials shall be held within federal and State air quality standards.

9. Solid Waste
   a. A solid waste management plan must be approved by Alaska Department of Environmental Conservation (ADEC) prior to initiating field work (Ref. PL 94-580). If approved by the ADEC, all combustible solid waste, including cartons and used lubricating oils will be incinerated or returned to the base of operations for approved disposal. All non-combustible solid waste, including fuel drums, will be returned to the base of operations for approved disposal. There will be no burial of garbage or bulldozing of any area for the burial of anything.
   b. Seismic lines shall be left clean of all foreign debris including, but not limited to, wire, lathe, pin flags and reflectors.

10. Fuel Handling and Storage
    a. A hazardous liquid spill control and contingency plan for each geophysical party will be submitted to the AO prior to beginning operations (40 CFR 112).
    b. Oil spills will be incinerated in approved receptacles but not on lake or river ice.
    c. Although fuels may be off-loaded from aircraft on the ice, there will be no storage of fuels on lake or river ice, even on a temporary basis. This applies to any activity on any river or lake.
    d. All fuel spills will be cleaned up immediately, taking precedence over all other matters, except the health and safety of personnel. Spills will be cleaned up utilizing absorbent pads or other approved methods. As soon as possible, but not later than 24 hours, notice of any such discharge as defined in Alaska Statute Title 18, Chapter 75, Article 2, will be given to: the AO in Fairbanks and such other federal and State officials as are required by law to be given such notice.
    e. Ample oil spill cleanup materials (absorbents) will be carried by each seismic crew and stored at all fueling points and vehicle maintenance areas.
    f. State and federal safety standards for fuel handling will be followed.
    g. Drip basins or absorbent diapers will be placed under all non dry-disconnect-type fuel line couplings.

11. All fuel containers used, including barrels and propane tanks, must be marked with Permittee's name, fuel type, and purchase date (e.g., GSI, Hydraulic Fluid,1983).

12. Field parties will keep daily records of seismic lines completed, fuel haul and camp move routes, and campsites utilized.

13. The foregoing provisions do not relieve the contractor or his subcontractors of any responsibilities or provisions required by any applicable laws or regulations.

14. A copy of these stipulations shall be posted in a conspicuous place in each camp site established for the purpose of geophysical exploration within NPR-A.

15. More than one Permittee may be approved to conduct geophysical activities in the same area within NPPR-A or other public lands. In such a case, it is incumbent upon the Permittees to resolve any conflicts in their activities. The AO will curtail all activities within certain areas if resolution cannot be achieved by the Permittees.

Notice of Completion

1. A final summary report shall be submitted to the AO within 30 days of completion or cessation of operations. This report shall include:
   a. Program completion date.
   b. Field effort in crew weeks.
   c. Line miles of surveys completed.
   d. Summary of incidents or accidents (including reported oil spills).
   e. Location map on 1:250,000 scale showing location of lines actually shot, campsites utilized, and routes used for fuel hauls and camp moves.
   f. The AO shall receive copies of Permittee's notification to the BLM Alaska Chief, Division of Minerals, in order to demonstrate satisfaction of permit stipulations 1.6 and Permit Attachment 1.

Bonding

1. Permittee must file with the AO evidence of bonding. A rider to either a $50,000 nationwide or $25,000 statewide bond shall pertain to the NPR-A and Arctic Resource Area seismic activities. This bonding requirement shall apply separately to each seismic train.

Geophysical Data

1. Inspection, selection, and submission of geophysical information and data:
   a. The Permittee shall notify the BLM Alaska Chief, Division of Mineral Assessment (CDM), immediately, in writing, of the acquisition, processing, reprocessing, or interpretation of any geophysical information or data collected under this permit.
   b. All such data and information collected by the Permittee shall be available for inspection by the CDM. At any time within five years after receiving a notice of the acquisition, processing, reprocessing, or interpretation of any geophysical information and data, the CDM may select all or part of the geophysical information.
   c. If the CDM decides to keep all or a portion of the geophysical information and data, he shall notify the Permittee, in writing, of his decision.
   d. In the event that geophysical data, processed geophysical information, reprocessed geophysical information, or interpreted geophysical information is transferred from the Permittee to a third party, or from a third party to another third party, the transferor shall, in writing, so notify the CDM and shall require the receiving third party, in writing, to abide by the obligations of the Permittee as specified in this section as a condition precedent to the transfer of information or data.
   e. Each submission of geophysical data, processed geophysical information, reprocessed geophysical information, and interpreted geophysical information, shall contain, unless otherwise specified by the CDM, the following:
      i. An accurate and complete record of each geophysical survey conducted under the permit, including digital location data and final allocation maps of all survey stations.
      ii. All seismic data developed under a permit presented in a format and of a quality suitable for processing.

iii. Processed geophysical information derived from seismic data with extraneous signals and interference removed, presented in a format and of a quality suitable for interpretive evaluation, reflecting state-of-the-art processing techniques.

iv. Other geophysical data, processed geophysical information, reprocessed geophysical information, and interpreted geophysical information obtained from, but not limited to, vibroseis logs, gravity and magnetic surveys, and special studies such as refraction and velocity surveys.

2. Reimbursement to Permittees:

a. After the delivery of geophysical data, processed geophysical information, and reprocessed geophysical information selected by the CDM, and upon receipt of a request for reimbursement and a determination that the requested reimbursement is proper, the Permittee or third party shall be reimbursed for the cost of reproducing the selected information and data at the Permittee's or third party's lowest rate or at the lowest commercial rate established in the area, whichever is less.

b. The Permittee shall not be reimbursed for the cost of any interpretations performed or reproductions thereof submitted.

3. Disclosure of information and data to the public:

a. The CDM may only make information and data submitted by a Permittee available in accordance with the requirements of and subject to the limitations of the Freedom of Information Act (5 U.S.C. 552) and the implementing regulations (43 CFR Part 2).

b. No information or data, determined by the CDM to be exempt from public disclosure, shall be provided to any affected state, or be made available to the executive of any affected local government or to the public, unless the Permittee and all persons to whom such Permittee has sold the information or data under promise of confidentiality agree to such an action.

4. Disclosure to independent contractors:

a. The CDM reserves the right to disclose any information or data acquired from a Permittee to an independent contractor or agent for the purpose of reproducing, processing, reprocessing or interpreting such information or data. The CDM shall notify the Permittee who provided the information or data of intent to disclose the information or data to such independent contractor or agent.

b. Prior to any such disclosure, the contractor or agent shall be required to execute a written commitment not to transfer or to otherwise disclose any information or data to anyone without the expressed consent of the CDM. The contractor or agent shall be liable for any unauthorized use by or disclosure of information or data to third parties.

Chapter 4. Areas of Ecological Importance

Identifying areas of relative ecological importance helps show the trade-offs when establishing land use allocations and management requirements. Understanding relative ecological importance should guide land use allocations, rather than preclude uses. This information should feed into alternative development by helping to identify opportunities for maintaining or restoring habitats.

4.1. Areas of Relative Ecological Importance to Guide Land Uses and Management

The following list describes areas of ecological importance in the Central Yukon Planning Area.

- Areas that have ice laden or permafrost soils are sensitive to overland vehicle use and can be susceptible to melting and thermokarsting if the surface organic layer is disturbed. Using construction techniques that provide ground insulation will avoid disturbing permafrost and ice-laden soils.

- Lowland wetland areas can be impacted by overland vehicle use and travel resulting in extensive mud holes developing along travel routes. As vehicles attempt to go around these muddy areas, they cause ever-widening disturbances that can result in multiple parallel trails hundreds of feet wide. In many situations, locating routes in the uplands with better soil conditions can reduce resource impacts and damage.

- Limiting travel methods and routes in sensitive areas, such as riparian zones, critical habitat, or calving areas, can reduce conflicts and resource impacts.

- Undisturbed hot springs contain unique hydrologic processes and vegetative communities that are sensitive to disturbance. Locating surface disturbance well away from these areas will reduce damage and preserve hydrologic functions.

- Riparian-wetlands are recognized as some of the Nation's most ecologically important areas, which is the reason that their protection has been incorporated into law and BLM policy. Riparian-wetlands only make up about 2.4 percent of the planning area (area of non-permafrost-controlled riparian-wetlands) and yet are considered a keystone element necessary for maintaining ecological processes. The natural functions that riparian-wetlands perform fall into three major categories: (1) hydrology and sediment dynamics, (2) biogeochemistry and nutrient cycling, and (3) habitat and food web maintenance (NRC 2002).

  These functions are displayed in a variety of services to which society has assigned value. These services include: the maintenance of water quality and water quantity; fish and wildlife production; flood protection; recreational opportunities and aesthetic value; wildlife viewing opportunities; maintenance of genetic diversity and species richness; production of wood (for fuel and building material); a moderating influence on the microclimate of streams and forests and related fire behavior; lake shoreline and streambank erosion control; maintenance of stream form, floodplain connectivity; hyporheic and ground water connectivity; exchange of nutrients; and the counter-balancing function of methane release and carbon sequestration as it relates to overall greenhouse gas emission. In addition, lotic riparian-wetlands span elevational gradients, thus providing landscape connectivity and migratory corridors that will allow many species to evolutionarily adapt to a changing climate regime. Riparian-wetlands are very sensitive to land-use activities that alter vegetation cover and/or alter geomorphic or hydrologic formative processes. Recovery following disturbance is largely dictated by the pace of natural processes

and commonly spans multiple decades. Recovery after disturbance of permafrost controlled riparian-wetland is often not possible and the area is considered an irretrievable loss.

- Unique vegetation communities and animal habitats are associated with special geological features within the planning area (e.g., bluffs, sand dunes, hot springs, mineral licks). Some of these unique features are recognized within the current plans as ACECs or RNAs, but not all locations of these unique geological features are known or listed in any records. It is important that areas such as these are identified prior to human disturbance.

- Some human-created features are prone to colonization by birds (e.g., raven nests on tower-like structures, bank swallow colonies in sand/gravel piles, cliff swallows on building eaves). Although the habitat is created by humans, the same restrictions apply to "take" of the species under the Migratory Bird Treaty Act. Standard language in the permitting process should encourage permittees to reduce or eliminate habitat creation in areas of ongoing use where the animals may restrict development activities and/or be a nuisance.

- Beaver are common within the planning area. Beaver activity on the Alaskan landscape has been demonstrated to have some important roles in ecosystem function, including potentially essential roles in vegetation succession as well the creation and retention of waterfowl and moose habitat. Although they are often considered nuisances, their role in ecosystem function should be taken into account and considered prior to large-scale disturbance of beaver-inhabited landscapes.

- Areas of Critical Environmental Concern (ACECs) designated in each of the existing plans (including those proposed for the new plan) focus management on areas where special attention is needed to protect important historical, cultural, and scenic values, fish and wildlife resources, natural systems and processes, and to protect human life and safety from natural hazards. Established ACECs in the two current plans have significant values with established special management measures.

- Key ecological areas for fish are those habitats that support specific life history stages (overwintering, spawning, rearing) and provide connectivity as fish move between habitat types as part of their life cycle. Areas of human use of fish through subsistence, commercial, and sport harvest also determines important areas for protection and guides land use allocation and management.

  Known important watersheds include those with streams that were previously designated as ACECs in the Central Yukon and Utility Corridor plans because of their high-quality fish habitat. Additional streams including Accomplishment Creek, Section Creek, South Fork Koyukuk River, Teedriinjik (Chandalar) River, Wheeler Creek, Klikhtentotzna Creek, and Sethkokna River also have a high level of importance either as habitat or to users.

  Areas of high fish resource values in the planning area will be verified through a Watershed Aquatic Resource Value rating index developed for the Central Yukon Field Office in conjunction with this plan. Once completed, these data will help guide land use allocation and management decisions related to fisheries resources.

Chapter 5. Consistency / Coordination with Other Plans

The table below lists some of the existing plans applicable to the planning area or to lands adjacent to the planning area. Other plans will be identified as the planning process progresses.

Table 5.1. Consistency/Coordination with Other Plans

Document Title	Date/Adopted	Summary
Alaska Federal Lands Long Range Transportation Plan	September 2012	Interagency approach to long-range transportation planning in Alaska.
Dalton Highway Recreation Area Management Plan	November 1991	Recreation management plan for the Dalton Highway corridor.
National Petroleum Reserve-Alaska Integrated Activity Plan Environmental Impact Statement	February 21, 2013	Established best management practices for the National Petroleum Reserve-Alaska which is adjacent to the CAMA WSA and Nigu-Iteriak ACEC.
FNSB Regional Comprehensive Plan	September 13, 2005	Fairbanks North Star Borough's overall plan for land use and community growth over the next few decades
AK DNR Tanana Basin Area Plan	Amended 2009	State of Alaska resource management plan for the area specified
AK DNR Eastern Tanana Area Plan	In development	State of Alaska resource management plan for the area specified
AK DNR Yukon Tanana Area Plan	In development	State of Alaska resource management plan for the area specified
AK DNR Kuskokwim Area Plan	March 22, 1988	State of Alaska resource management plan for the area specified
Tanana Valley State Forest Management Plan	Updated 2001	Alaska Division of Forestry plan for management of Tanana Valley State Forest
Final Environmental Impact Statement, Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way	November 2002	The BLM is the lead federal agency for monitoring the Trans-Alaska Pipeline System operations. The EIS evaluated alternative decisions, analyzed impacts, and considered mitigation measures applicable to all parts, and any part, of the Trans-Alaskan Pipeline System, regardless of the underlying land ownership.
U.S. Fish and Wildlife Service National Wildlife Refuge System *National Invasive Species Management Strategy*	Completed 2003	The National Strategy provides specific action items to achieve the following four invasive species management goals: (1) increase awareness; (2) reduce the impacts to refuge habitats; (3) reduce impacts to neighboring lands; and (4) use and develop new integrated pest management approaches.
U.S. Fish and Wildlife Service Kanuti National Wildlife Refuge *Comprehensive Conservation Plan*	Revised 2008	The plan provides vision, goals, and objectives for future management of these refuges. It does not specifically address invasive species; however, the emphasis on preserving biodiversity includes the prevention of invasive plant establishment and proliferation.
U.S. Fish and Wildlife Service Koyukuk, Northern Unit Innoko, and Nowitna National Wildlife Refuge *Revised Comprehensive Conservation Plan*	Revised 2009	The plan provides vision, goals, and objectives for future management of these refuges. Management categories include Minimal Management (91 percent), Wild River (2 percent), and designated Wilderness (7 percent).
U.S. Fish and Wildlife Service Arctic National Wildlife Refuge *Revised Comprehensive Conservation Plan*	Record of decision for revised plan 2015	The plan provides vision, goals, and objectives for future management of the refuge. Management strategies include Wilderness Management, Wild River, and Minimal Management.
U.S. Fish and Wildlife Service Yukon Flats National Wildlife Refuge *Revised Comprehensive Conservation Plan*	Completed 1997	The plan provides vision, goals, and objectives for future management of the refuge.

Document Title	Date/Adopted	Summary
U.S. National Park Service *General Management Plan, Land Protection Plan, and Wilderness Suitability Review, Gates of the Arctic National Park and Preserve*	Completed 1986	The plan provides direction for management of wilderness, wild rivers, natural and cultural resources, access, subsistence, recreation and visitor use, and NPS operations and facilities. It also includes measures to protect park purposes and values and determine suitability of nonwilderness lands within the park for inclusion in wilderness.
U.S. National Park Service *Fire Management Plan for Gates of the Arctic National Park and Preserve*	Completed 2003	Provides direction for the fire management program that is responsive to the park's natural and cultural resource objectives and to safety considerations for park visitors, employees, and facilities.
U.S. National Park Service *Consolidated General Management Plan Denali National Park and Preserve*	Completed in 1986. Amended in 1997 and 2006.	Amendments have replaced large sections of the 1986 General Management Plan. Sections of the original plan that are still valid have been combined with amendments into this consolidated plan.
U.S. Department of the Interior National Park Service *Invasive Plant Management Plan*	Approved 2010	The plan uses an adaptive management approach to controlling infestations on park lands throughout the Alaska Region. A decision tree identifies appropriate control methods, including physical and chemical treatments. It also includes monitoring of program effectiveness as well as the effectiveness of mitigating measures with best management practices.
North Yukon Planning Commission *North Yukon Land Use Plan*	June 2009	The plan is designed to protect the significant natural and cultural resources of the region while still allowing for current and future economic development opportunities. It does not address nonnative invasive species directly, but it does define best management practices for reclamation of surface disturbances including the use of native, endemic plants whenever possible.
State of Alaska Department of Transportation and Public Facilities (ADOT&PF)*Integrated Vegetation Management Plan*	Adopted 2013	This plan will assist ADOT&PF in its responsibility to manage the vegetation upon its lands to improve safety and to control invasive plant species in a cost-effective manner. The plan is for the Northern Region, which overlaps the planning area.
Alaska Federal Lands *Long Range Transportation Plan*	Adopted 2012	Joint plan between BLM, NPS, USFWS, Forest Service, Federal Highway Administration, and ADOT&PF. Provides for coordinated planning and decision making for long-term transportation systems in Alaska.
National Invasive Species Council *2008–2012 National Invasive Species Management Plan*	Adopted 2008	This is not a comprehensive list of all federal invasive species actions. It is a targeted set of priority strategic action plans with objectives and implementation tasks that are intended to be completed over a 5 year period. The over-arching strategic goals and strategic action plan objectives remain consistent with the 2001 Plan, of which this is the first revision. The accomplishment of specific implementation tasks and performance elements will be dependent upon agency budgets, and in some cases, legal or regulatory changes.

Chapter 6. Specific Mandates and Authority

6.1. Mandates and Authorities Pertaining to All Resources

This chapter lists mandates and authorities applicable to public lands managed by the BLM. It provides an overview of the legal and policy direction guiding management of BLM-managed lands in Alaska. While an effort was made to include all relevant laws, regulations, and policies, it is not a comprehensive list.

The mandates and authorities listed apply broadly to all BLM programs. In most cases, these will not be repeated under specific program areas. Additional program-specific laws and regulations are listed under each program. Each section lists relevant laws, executive orders, federal regulations, general policy, applicable NEPA documents, memoranda of understanding (MOUs), BLM manuals and handbooks, and any applicable State laws and regulations that may affect BLM management. In some cases, programs with a lot of overlapping authorities were combined into one section (such as Fish, Wildlife, and Special Status Species). For programs where there are no applicable MOUs, NEPA documents, or relevant State laws, these sections are not listed.

6.1.1. Federal Laws, Regulations, Statutes and Orders

Alaska National Interest Lands Conservation Act (ANILCA) of 1980 (16 U.S.C. 3101 et seq.): Provides for the special designation of certain public lands in Alaska and conservation of their fish and wildlife values; management for subsistence uses of fish, wildlife, and other renewable resources on public lands by residents of rural Alaska; and protection of wildlife resources on North Slope lands impacted by oil and gas exploration and development activities.

Alaska Native Claims Settlement Act (ANCSA) of 1971 (43 U.S.C. 16011629f, 16311642): Provides for a fair and just settlement of all claims by Natives and Native groups of Alaska, based on aboriginal land claims. It requires transfer of 45 million acres of public land to Native corporations.

The Alaska Statehood Act of 1958 (PL 85508): Requires the transfer of 104 million acres of public land to the State of Alaska.

Federal Land Policy and Management Act (FLPMA) of 1976, as amended (43 U.S.C. 1701 et seq.): Provides for administration of public lands through the BLM, provides for management of the public lands on a multiple-use basis, and requires land use planning. The act establishes as public policy that in general, public lands will remain in federal ownership, and also authorizes: acquisition of lands or interests in lands consistent with the mission of the Department and land use plans; protection of resource values; preservation of certain lands in their natural condition; compliance with pollution control laws; delineation of boundaries in which the federal government has right, title, or interest; review of land classifications in land use planning; and modification or termination of land classifications when consistent with land use plans; sale of lands if the sale meets disposal criteria; issuance, modification, or revocation of withdrawals; exchange or conveyance of public lands if in the public interest; outdoor recreation and human occupancy and use; management of the use, occupancy, and development of public lands through leases and permits; determination of the suitability of public lands for rights-of-way purposes and specifications of the boundaries of each right-of-way; and recordation of mining claims. The act further directs the Secretary of the Interior to take any action necessary to prevent "unnecessary or undue degradation of the lands."

National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.): Establishes a national policy for the protecting and enhancing the human environment. This act requires that agencies prepare environmental impact statements for federal actions expected to significantly affect the quality of the human environment. In addition, agencies are required to use a systematic, interdisciplinary approach in planning and decision-making processes that will affect the environment.

Environmental Quality Improvement Act as amended (42 U.S.C. §4371 et seq.): Establishes the Office of Environmental Quality to support the work of the Council of Environmental Quality and to further assure that each federal department and agency involved with programs affecting the environment implement appropriate policies.

Executive Order (EO) 13148, Leadership in Environmental Management, April 21, 2000: Makes federal agencies responsible for ensuring that all necessary actions are taken to integrate environmental accountability into day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Environmental management considerations must be a fundamental and integral component of federal government policies, operations, planning, and management.

EO 11514, Protection and Enhancement of Environmental Quality, March 5, 1970 (35 FR 4247), as amended by EO 11991, May 24, 1977: States that the federal government shall provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life. It provides for monitoring, evaluating, and control on a continuing basis of the activities of each federal agency to protect and enhance the quality of the environment.

Secretarial Order 3226A1, Climate Change Impacts, January 16, 2009: Directs agencies to consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multiyear management plans, and/or when making major decisions regarding the potential utilization of resources.

6.1.2. Policies

BLM policies are outlined in a variety of sources including manuals, handbooks, executive orders (EO), and Instruction Memoranda (IM), and are too numerous to list here. The FLPMA is BLM's organic act and it establishes a national policy that "... public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values…" BLM manuals include specific policy for each subject. The BLM Alaska Statewide Land Health Standards (BLM 2004) outline BLM Alaska's policy on land health.

1. BLM Manual 1601: Land Use Planning (BLM 2000)
2. BLM Land Use Planning Handbook H-1601-1 (BLM 2005a)
3. BLM Handbook H-1790-1, National Environmental Policy Handbook (BLM 2008c)
4. A Desk Guide to Cooperating Agency Relationships and Coordination with Intergovernmental Partners (BLM 2012b)

6.2. Air Quality

6.2.1. Federal Laws, Regulations, Statutes, and Orders

Clean Air Act of 1990, as amended (42 U.S.C. 7418): Requires federal agencies to comply with all federal, state, and local requirements regarding the control and abatement of air pollution. This includes abiding by the requirements of State Implementation Plans.

Pollution Prevention Act of 1990 (42 U.S.C. 13101-13109): Requires and encourages preventing and reducing waste streams and other pollution through minimization, process change, and recycling. Encourages and requires developing of new technology and markets to meet objectives.

EO 11738, September 10, 1973: This order directs each federal agency to enforce the Clean Air Act and the Clean Water Act when procuring goods, materials, and services.

EO 12088, Federal Compliance with Pollution Control Standards, October 13, 1978 (43 FR 47707): This amended EO states that each agency is responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution, with respect to federal facilities and activities under the control of the agency.

- **29 Code of Federal Regulations (CFR) 1910:** Occupational Safety and Health Standards, special provisions for air contaminants.
- **40 CFR Protection of the Environment; PART 50:** National Primary and Secondary Ambient Air Quality Standards.
- **40 CFR 61:** National Emission Standards for Hazardous Air Pollutants.
- **43 CFR 3809:** Surface Management Regulations.
- **43 CFR 3715:** Use and Occupancy Under Mining Laws.

6.2.2. Policies

Department of Interior and BLM policies are generally encompassed by the federal laws and regulations listed above and may provide specific guidance for particular issues. It is the policy of the BLM to ensure BLM activities are conducted in a manner that achieves and maintains air quality standards in cooperation with other agencies responsible for maintaining air quality (BLM Manual 7300).

6.2.3. MOUs

- Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, Regarding Air Quality Analysis and Mitigation for Federal Oil and Gas Decisions Through the National Environmental Policy Act Process (2011).

6.2.4. BLM Manuals and Handbooks

- **BLM Manual 7000 Series:** Soil, Water, and Air Management (various release dates)
- **BLM Manual 7200 Series:** Water Resources (various release dates)
- **BLM Manual 7300:** Air Resources (2009)
- **BLM Manual 9211:** Fire Planning (2012)

- **BLM Handbook 9211-1:** Fire Planning (2012)

6.2.5. State Laws and Regulations

- **Alaska Statute (AS):** Water, Air, Energy and Environmental Conservation (Title 46): Environmental conservation laws for the State of Alaska.
- **Alaska Administrative Code (18 AAC 50)** State of Alaska Ambient Air Quality Standards and Regulations

6.3. Soil Resources

6.3.1. Federal Laws, Regulations, Statutes and Orders

Classification and Multiple-Use Act (78 stat. 986, U.S.C. 1411-18), 43 CFR 1725.3-3(h) as of October 1, 1981: One of the objectives of public land management listed in the act is "Watershed Protection," which is defined as the protection, regulated use, and development of any public lands in a manner to control runoff; to minimize soil erosion, siltation, and other destructive consequences of uncontrolled water flows; and to maintain and improve storage, yield, quality, and quantity of surface and subsurface waters.

Farmland Protection Policy Act of 1984 (7 U.S.C. 4201–4209): Federal agencies are to (a) identify and take into account the adverse effects of their programs on the preservation of farmland, (b) consider alternative actions, as appropriate, that could lessen adverse effects, and (c) ensure that their programs, to the extent practicable, are compatible with state and units of local government and private programs and policies to protect farmland.

Soil Conservation and Domestic Allotment Act of 1935, as amended, April 27, 1935 (PL 74-46): By Reorganization Plan No. IV and Secretary Order 2835, this act authorizes the BLM to conduct and publish surveys, investigations, and research relating to the character of soil erosion; to disseminate information on erosion prevention measures; and to conduct demonstration projects in areas subject to wind and water erosion. The act further provides for the "preservation and improvement of soil fertility, promotion of economic use and conservation of land, and diminution of exploitation and wasteful and unscientific use of national soil resources."

Soil and Water Resource Conservation Act of November 18, 1977 (16 U.S.C. 2001): This act directs the Secretary of Agriculture to appraise the Nation's soil and water resources on a continuing basis and to develop and update periodically a program for furthering the conservation, protection, and enhancement of the soil and water resources.

Soil Information Assistance for Community Planning and Resource Development Act of 1966, September 7, 1966 (42 U.S.C. 3271 et seq.): This Act directs the Secretary of Agriculture to provide assistance to states and other public agencies in classifying and interpreting kinds of soil and in intensifying use and benefits of the National Cooperative Soil Survey. The act further provides for consulting with other federal agencies to assure coordination of work.

Pollution Prevention Act of 1990 (42 U.S.C. 13101-13109): Requires and encourages preventing and reducing waste streams and other pollution through minimization, process change, and recycling. Encourages and requires developing new technology and markets to meet objectives.

Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.): Requires considering protection and/or reestablishment of fish and wildlife habitat during the design, assessment, and implementation of reclamation plans and during designation of areas unsuitable for mining. It requires applying unsuitability criteria prior to coal leasing and proposed mining operations for minerals or mineral materials other than coal.

Watershed Protection and Flood Control Act of 1954, as amended, August 4, 1954: Under this act, the federal government is directed to cooperate with states and their political subdivisions, soil or water conservation planning areas, flood prevention or control planning areas, and other local public agencies to prevent erosion or floodwater and sediment damage.

EO 11988, Floodplain Management, May 24, 1977 (42 FR 26951): Directs federal agencies to provide leadership and take action on federal lands to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. Agencies are required to avoid the direct or indirect support of development on floodplains whenever there are practical alternatives and evaluate the potential effects of any proposed action on floodplains.

EO 11989, Off-road Vehicles, May 24, 1977 (42 FR 26959): Directs heads of federal agencies to close areas to off-road vehicle use whenever it is determined that use of off-road vehicles is causing or will cause considerable adverse impact to soil, vegetation, wildlife, wildlife habitat, or certain other resources on the public lands.

- **40 CFR 1500-1508**, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, July 1, 1986.

6.3.2. Policies

Department of Interior and BLM policies are generally encompassed by the federal laws and regulations listed above and may provide specific guidance for particular issues. In general, it is BLM policy to collect and maintain soil resource information consistent with management needs and to develop, test, and apply soil interpretations to guide use and management of soils and related resources. (BLM Manual 7100).

6.3.3. MOUs

National Cooperative Soil Survey Memorandum of Understanding (1978).

6.3.4. BLM Manuals and Handbooks

- **BLM Manual 7000:** Soil, Water, and Air Management
- **BLM Manual 7100:** Soil Resource Management
- **BLM Technical Reference 1734-7:** Ecological Site Inventory (2001)
- **BLM Technical Reference 1737-19:** Riparian-Wetland Soils (2003)
- **BLM Manual 6521:** State Agencies
- **BLM Technical Note 405:** A framework for analyzing the hydrologic condition of watersheds. (1998)
- **BLM Technical Note 371:** Determining hydrologic properties of soils

6.3.5. State Laws and Regulations

Alaska Statute 41.10: Soil and Water Conservation

6.4. Water Resources

See section 6.5, Vegetative Communities for additional authorities related to water resources.

6.4.1. Federal Laws, Regulations, Statutes and Orders

Classification and Multiple-Use Act (78 stat. 986, U.S.C. 1411-18), 43 CFR 1725.3-3(h) as of October 1, 1981: One of the 10 objectives of public land management listed in the act is "Watershed Protection," which is defined as the protection, regulated use, and development of any public lands in manner to control runoff; to minimize soil erosion, siltation, and other destructive consequences of uncontrolled water flows; and to maintain and improve storage, yield, quality, and quantity of surface and subsurface waters.

Coastal Zone Management Act of 1972 as amended through PL 104-150, the Coastal Zone Protection Act of 1996: Sets a national policy to protect, develop, and restore or enhance the Nation's coastal zone. It authorizes the states to take over management of the coastal zone management program. The State of Alaska manages this program through the Department of Governmental Coordination (DGC).

Control of Pollution from Federal Facilities (33 U.S.C. 1323) 1970: Establishes that federal agencies shall be subject to all requirements and administrative authorities, processes, and sanctions respecting the control and abatement of water pollution in the same manner, and to the same extent as any nongovernmental entity, including the payment of reasonable service charges.

Emergency Wetlands Resources Act of 1986 (PL 99-645): This act authorizes the purchase of wetlands from Land and Water Conservation Fund monies and requires the Secretary to establish a National Wetlands Priority Conservation Plan and to continue the national wetlands inventory.

Federal Water Pollution Control Act (Clean Water Act) (33 U. S. C. 1151, 1251, 1254, 1323, 1324, 1329, 1342, 1344) as amended. The act intends to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Required are: (1) compliance with state and other federal pollution control rules, (2) no degradation of instream water quality needed to support designated uses, (3) control of nonpoint source water pollution by using conservation or best management practices, (4) federal agency leadership in controlling non-point pollution from managed lands, and (5) rigorous criteria for controlling discharge of pollutants into waters of the United States.

Geothermal Steam Act of 1970, as amended (30 U.S.C. 1001): Authorizes the Secretary to issue leases for the developing and using geothermal resources on lands administered by the Secretary, including public, withdrawn, and acquired lands; national forests or other lands administered by the Forest Service, including public, withdrawn, and acquired lands; lands conveyed by the U.S. subject to a reservation to the U.S. of geothermal steam and associated geothermal resources. This authority has been delegated to the BLM, given the assurance that the land may continue to be used adequately for the purposes for which it was withdrawn or acquired.

North American Wetlands Conservation Act of 1989 (16 U.S.C. §§ 4401-4413): Provides federal matching funds to public-private partnerships for wetland habitat conservation projects in North America.

Pollution Prevention Act of 1990 (42 U.S.C. 13101-13109): Requires and encourages preventing and reducing waste streams and other pollution through minimization, process change, and recycling. Encourages and requires developing new technology and markets to meet objectives.

Safe Drinking Water Act Amendments of 1977 (42 U.S.C. 210): Requires compliance with all federal, state, or local statutes for safe drinking water.

Safe Drinking Water Act 1996 (PL 104-182): Provides the states with more resources and authority to enact the Safe Drinking Water Act of 1977 (42 U.S.C. 300f). This amendment directs the states to identify source areas for public water supplies that serve at least 25 people or 15 connections at least 60 days a year.

Soil and Water Resource Conservation Act of November 18, 1977 (16 U.S.C. 2001): Directs the Secretary of Agriculture to appraise the Nation's soil and water resources on a continuing basis and to develop and update periodically a program for furthering the conservation, protection, and enhancement of the soil and water resources.

Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.): Requires considering protection and/or reestablishment of fish and wildlife habitat during the design, assessment, and implementation of reclamation plans and during designation of areas unsuitable for mining. It requires applying unsuitability criteria prior to coal leasing and proposed mining operations for minerals or mineral materials other than coal.

Water Quality Act of 1987, as amended from the Federal Water Pollution Control Act of 1977 (33 U.S.C. 1271 et seq.): Reauthorizes the Water Pollution Control Act of 1972 and strengthen pollution standards.

Watershed Protection and Flood Control Act of 1954, as amended, August 4, 1954: Directs the federal government to cooperate with states and their political subdivisions, soil or water conservation planning areas, flood prevention or control planning areas, and other local public agencies to prevent erosion or floodwater and sediment damage.

Wild and Scenic Rivers Act of 1968, as amended (16 U.S.C. 1271 et seq.): Provides for the development and management of certain rivers. The purposes for which Wild and Scenic Rivers are added to the National Wild and Scenic Rivers System (National System) are made explicit in section 1(b)—specifically, to protect a river's free-flowing condition, water quality, and outstandingly remarkable values.

EO 11644, Use of Off-road Vehicles on Public Lands, February, 8, 1972 (37 FR 2877): Establishes policies and provides procedures for controlling or directing use of off-road vehicles on public lands, with the goal of protecting resources, promoting the safety of all users, and minimizing conflicts among various uses.

EO 11738, September 10, 1973: Directs each federal agency to enforce the Clean Air Act and the Clean Water Act when procuring goods, materials, and services.

EO 11752 - December 19, 1973: Mandates that federal agencies shall provide national leadership to protect and enhance the quality of air, water, and land resources through compliance with

applicable federal, state, interstate, and local pollution standards. This order directs federal agencies to design, construct, manage, operate, and maintain their facilities in a manner to protect and enhance environmental quality through cooperation with state and local governments. This order cross-references the need to comply with several environmental acts such as the Clean Air Act, Federal Water Pollution Control Act, Solid Waste Act, Noise Control Act, Insecticide and Pesticide Acts, and NEPA.

EO 11988, Floodplain Management, May 24, 1977 (42 FR 26951): Directs federal agencies to provide leadership and take action on federal lands to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. Agencies are required to avoid the direct or indirect support of development on floodplains whenever there are practical alternatives and evaluate the potential effects of any proposed action on floodplains.

EO 11989, Off-road Vehicles, May 24, 1977 (42 FR 26959): Directs heads of federal agencies to close areas to off-road vehicle use whenever it is determined that use of off-road vehicles is or will cause considerable adverse impact to soil, vegetation, wildlife, wildlife habitat, or certain other resources on the public lands.

EO 11990, Protection of Wetlands, May 25, 1977 (42 FR 26961): Requires federal agencies exercising statutory authority over federal lands to avoid to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. It directs federal agencies to identify, protect, enhance, and manage wetlands on public lands.

6.4.2. Policies

Department of Interior and BLM policies are generally encompassed by the federal laws and regulations listed above and may provide specific guidance for particular issues. In general, it is BLM policy to collect and maintain water resource information consistent with management needs and to develop, test, and apply water interpretations to guide use and management of water and related resources (BLM Manual 7000).

6.4.3. MOUs

- Memorandum of Understanding between the National Association of Conservation Districts and the United States Department of the Interior Bureau of Land Management (2013).

6.4.4. BLM Manuals and Handbooks

- **BLM Manual 7000:** Soil, Water, and Air Management
- **BLM Manual 7200 Series:** Water Resources (various release dates)
- **BLM Manual 1737:** Riparian and Wetland Management
- **BLM Handbook H-1741-2:** Water Developments
- **BLM Manual 6521:** State Agencies

6.4.5. State Laws and Regulations

Alaska Statute (AS): Water, Air, Energy and Environmental Conservation (Title 46): Environmental Conservation laws for the State of Alaska.

- AS 46.03.710
- AS 46.03.070
- AS 46.03.850(a)-(c)
- AS 46.03.780(a)
- AS 16.10.010(a)(1)
- AS 16.10.010(a)(2),(3)
- AS 41.17.010(5)
- AS 41.17.055(d)
- AS 41.17.060(b)(2)
- AS 41.17.060(b)(5)
- Alaska Administrative Code (AAC) 70.020(b)(9)
- AAC 70.020(b)(12)

6.5. Vegetative Communities and Invasive Species

6.5.1. Federal Laws, Regulations, Statutes and Orders

Carlson-Foley Act 1968 (PL 90-583): Directs agencies to enter upon lands under their jurisdiction and destroy noxious plants growing on such lands.

Coastal Wetlands Planning, Protection, and Restoration Act of 1990 (PL 101-646): Expands the administration of federal grants to acquire, restore, and enhance wetlands of coastal states. This act provides for a matching grant program to fund wetland conservation projects.

Federal Noxious Weed Act of 1974, as amended by Sec. 15, Management of Undesirable Plants on Federal Lands, 1990 (PL 93-629): "…cooperate with other federal and state agencies, and others in carrying out operations or measures to eradicate, suppress, control or prevent or retard the spread of any noxious weed."

Federal Insecticide, Fungicide, and Rodenticide Act of 1975 (7 U.S.C. 136 et seq.): Establishes an extensive regulatory system for controlling the sale, distribution, and application of pesticides.

Federal Land Policy and Management Act of 1976: Directs the BLM to take any action necessary to prevent unnecessary and/or undue degradation of public lands and authorizes the BLM to enter into cooperative agreements.

Emergency Wetlands Resources Act of 1986 (PL 99-645): Authorizes the purchase of wetlands from Land and Water Conservation Fund monies and requires the Secretary to establish a National Wetlands Priority Conservation Plan and to continue the national wetlands inventory.

Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901-1908): Establishes a national policy and commitment to improve conditions on public rangelands. It provides for the improvement of range conditions to assure that rangelands become as productive as feasible for watershed protection, livestock grazing, wildlife habitat, and other rangeland values. This act establishes a national policy to inventory and identify current public rangelands, soil and water conditions, and trends, and to manage, maintain, and improve the condition of these lands. Range improvement is defined to include providing water, stabilizing soil and water conditions, and providing habitat for wildlife. The act also requires monitoring to reflect changes in soil and water conditions over time.

North American Wetlands Conservation Act of 1989 (16 U.S.C. §§ 4401-4413): Provides federal matching funds to public-private partnerships for wetland habitat conservation projects in North America.

Noxious Weed Control Act of October 2004: Establishes a program to provide assistance to eligible weed-management agencies for noxious weed problems through the Secretary of Agriculture.

Plant Protection Act 2000: Replaces the Federal Noxious Weed Act of 1974. Consolidates and modernizes statutes pertaining to plant protection and quarantine. It permits the Animal and Plant Health Inspection Service to address all types of weed issues and to take emergency action to address incursion of noxious weeds.

Federal Seed Act of 1939 [7 U.S.C. 1551-1611].

Federal Plant Pest Act of 1957 [7 U.S.C., Section 150aa-jj].

EO 11990, Protection of Wetlands, May 25, 1977 (42 FR 26961): Requires federal agencies exercising statutory authority over federal lands to avoid to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands. It directs federal agencies to identify, protect, enhance, and manage wetlands on public lands.

EO 11987, Exotic Organisms, May 24, 1977 (42 FR 26949): Directs federal agencies, to the extent permitted by law, to restrict the introduction and/or importation, and funding of exotic species into natural ecosystems on lands they administer. It also encourages state and local governments, and private citizens to prevent introduction of exotic species.

EO 31112, Invasive Species, February 3, 1999 (64 FR 27655): Directs federal agencies to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.

6.5.2. Policies

The BLM's policy is to maintain, restore, or improve riparian-wetland ecosystems to achieve a healthy and proper functioning condition that assures biological diversity, productivity, and sustainability. The BLM Alaska policy is outlined in: BLM-Alaska Invasive Species Management 2010.

It is the policy of the BLM to adhere to the following policies pertaining to nonnative, invasive species:

- Effectively integrate invasive species prevention, control, and management activities into all affected programs within all Field Offices. All employees must be responsible, in some part, for invasive species prevention, reporting, and control. On all district and cooperative invasive species control projects, district personnel will explore all available techniques (manual, mechanical, cultural, biological and chemical) of integrated invasive species management, in determining invasive species control recommendations. Human safety, the environment, efficacy, and economics will be considered in all proposed invasive species projects. The health of those individuals using herbicides will be protected by complying with all pertinent label instructions and BLM Manual requirements.

- Preventive measures will be considered and included in permitted actions when practical and are listed under *Appendix C: Annual Weed Prevention and Treatments Schedule – BMPs* (BLM 2010b). In general, larger existing invasive species infestations will be treated either by contracted licensed applicators under the supervision of BLM Project Inspectors (District/Field Office invasive species coordinators), by Alaska Department of Agriculture (DOA) employees via the BLM State Office contract with DOA, the borough invasive species supervisors or their employees, and or staff/contractors from other official partners authorized to treat invasive species within the State identified on lands managed by the BLM.

- Consider invasive species issues in NEPA and ensure that all planning documents, include prevention, early detection and rapid response, risk assessment results, recommendations, or mitigation measures to prevent invasive species spread and to control invasive species infestations. W.O. Instruction Memo No. 99-178, makes invasive species a part of the NEPA Critical Elements list (1999).

- District invasive species team members will report the acres treated, monitored, or inventoried and invasive species outreach/education contacts made monthly. Report these actions by the correct activity, program element and project code. Most any activity code can be used to fund invasive species projects. The district invasive species coordinator will be the district program element lead for program elements specific to invasive species accomplishments. If applicable, ensure that pesticide application reports are properly completed. Other district employees authorized to spray will submit their pesticide application reports to the invasive species team at least weekly.

6.5.3. NEPA Documents

Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (September 2007). The record of decision for this document allows for the use of four new approved herbicides, provides updated analysis on 17 currently approved herbicides, and identifies those herbicides that the BLM will no longer use on public lands. The decision also guides the use of herbicides for field-level planning and on-the-ground projects designed to restore and sustain important riparian, range, and wildlife habitat on public lands under BLM management. In addition, the decision establishes a protocol for assessing human health and ecological risks of future herbicide use. The record of decision does not authorize any specific actions on the ground; site-specific analysis under the NEPA is still required at the project level.

6.5.4. MOUs

Memorandum of Understanding for the Establishment, Endorsement and Support of the Alaska Committee for Noxious and Invasive Plants Management. The BLM signed this MOU on September 21, 2000.

6.5.5. BLM Manuals and Handbooks

- **BLM Manual 5800:** Forest Protection and Forest Pest Management
- **BLM Manual 1737:** Riparian-Wetland Area Management
- **BLM Manual 1740:** Renewable Resource Improvement and Treatment

- **BLM Manual 1745:** Introduction, Transplant, Augmentation and Reestablishment of Fish, Wildlife and Plants
- **BLM Manual 9011:** Chemical Pest Control
- **BLM Manual 9014:** Use of Biological Control Agents of Pests on Public Lands
- **BLM Manual 9015:** Integrated Weed Management
- **BLM Manual 9220:** Integrated Pest Management
- **Partners Against Weeds:** An Action Plan for the Bureau of Land Management, January 1996.

6.5.6. State Laws and Regulations

State agencies may designate a species as noxious if it directly or indirectly imposes economic or ecological effects to agriculture, navigation, fish and wildlife, wild lands, or public health. Most states have developed lists of prohibited or regulated noxious and invasive plant species. Alaska Administrative Code (AAC) Title 11 34.020, designed for agricultural purposes, lists prohibited and restricted noxious weeds and refers to prohibitions against contamination with seed of select species for commercial sale.

Alaska provides statutory support for management activities through AS 03.05.010 and AS 44.37.030, which authorize the Department of Natural Resources, Division of Agriculture to prevent the importation and spread of pests that are injurious to public interest and for the protection of the agricultural industry. Statutory support is expanded in AAC Title 11 Chapter 34 with regulations for noxious weed control and rules for the establishment of quarantines, inspections, noxious weed lists, and control measures. More recent State regulatory developments include the prohibition of footgear with absorbent felt or other fibrous material on the soles while sport fishing in the fresh waters of Alaska, effective January 1, 2012. It was adopted to reduce the potential for introduction and spread of invasive organisms, including plants, into Alaska waters. Aquatic nonnative invasive plants are not yet a threat to the planning area, however, prevention efforts may preclude future infestations with species such as *Elodea nuttallii*.

6.6. Fish, Wildlife, and Special Status Species

See sections 6.4 Water Resources, 6.5 Vegetative Communities and Invasive Species, and 6.20 Tribal Interest and Subsistence for additional mandates and authorities pertaining to fish and wildlife.

6.6.1. Federal Laws, Regulations, Statutes and Orders

Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C. 3101 et seq.): Provides for the special designation of certain public lands in Alaska and conservation of their fish and wildlife values; management for subsistence uses of fish and wildlife resources on public lands by residents of rural Alaska; and protection of wildlife resources on North Slope lands impacted by oil and gas exploration and development activities.

Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668d) as amended by the Eagle Protection Act of 1962 (PL 870884): Provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds (including their parts, nests, or eggs).

Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.): Provides for the protection of endangered species, threatened species, and their habitats, and requires federal agencies to ensure that the continued existence of listed species is not jeopardized and that designated critical habitat of listed species is not destroyed or adversely modified. This act directs federal agencies to ensure that their actions do not jeopardize threatened and endangered species, and to use their authority to assist in the recovery of these species.

Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901-2911): Authorizes financial and technical assistance to the states for the developing, revising, and implementing conservation plans and programs for non-game fish and wildlife.

Fish and Wildlife Coordination Act of 1958 (16 U.S.C. 661 et seq.): Directs that wildlife conservation be given equal consideration and be coordinated with other features of water-resource development.

Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 7421; 92 Stat. 3110): Authorizes the Secretary of the Interior and the Secretary of Commerce to assist in training of state fish and wildlife enforcement personnel; to cooperate with other federal or State agencies for enforcement of fish and wildlife laws; and to use appropriations to pay for rewards and undercover operations.

Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265) as amended in 1996: Defines the term essential fish habitat (EFH), and provides guidelines for the description, identification, conservation, and enhancement of EFH. The National Marine Fisheries Service considers all waters listed in the State of Alaska's *Catalogue of waters important for the spawning, rearing, and migration of anadromous fish* as EFH. This act calls for direct action to stop or reverse the continued loss of fish habitats and requires federal agencies to consult with the Secretary of Commerce regarding any activity, or proposed activity, authorized, funded, or undertaken by the agency that may adversely affect EFH.

Migratory Bird Conservation Act of 1929, as amended (16 U.S.C. 715) and treaties pertaining thereto: Establishes federal responsibility to protect migratory birds and authorizes the Secretary of the Interior to regulate hunting of migratory birds.

Migratory Bird Treaty Act of 1918 as amended (16 U.S.C. 703-712): Implements conventions or treaties between the U.S. and Canada, Japan, Russia, and Mexico for protecting migratory birds. It establishes a federal prohibition on take of migratory birds.

Secretarial Order 3206, American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act: Clarifies the responsibilities of the component agencies, bureaus and offices of the Department of the Interior, when actions taken under authority of the Endangered Species Act and associated implementing regulations affect, or may affect, Indian lands, tribal trust resources, or the exercise of American Indian tribal rights. This order acknowledges the trust responsibility and treaty obligations of the United States toward Indian tribes and tribal members and its government-to-government relationship in dealing with tribes.

Sikes Act of 1974 as amended (16 U.S.C. 670 et seq.): Provides for the conservation, restoration, and management of wildlife species and their habitats in cooperation with state wildlife agencies, including establishment of a hunting and fishing stamp program with revenues to be spent upon lands on which fees are collected.

Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.): Requires the consideration of protection and/or reestablishment of fish and wildlife habitat during the design, assessment, and implementation of reclamation plans and during designation of areas unsuitable for mining. It requires application of unsuitability criteria prior to coal leasing and proposed mining operations for minerals or mineral materials other than coal.

Sustainable Fisheries Act (Public Law 104 297) October 11, 1996: Amended the habitat provisions of the Magnuson Act. The re-named Magnuson-Stevens Fish Conservation Act (16 U.S.C. 757a-757g; 79 Stat. 1125) authorizes the Secretaries of the Interior and Commerce to enter into cooperative agreements with the states and other non-federal interests for conservation, development, and enhancement of anadromous fish and to contribute up to 50 percent as the federal share of the cost of carrying out such agreements. Authorized are investigations, engineering and biological surveys, research, stream clearance, construction, maintenance, and operations of hatcheries and devices and structures for improving movement, feeding, and spawning conditions. The BLM is authorized to conduct studies and make recommendations to the Environmental Protection Agency concerning measures for eliminating or reducing polluting substances detrimental to fish and wildlife in interstate or navigable waters, or their tributaries.

EO 12962, Recreational Fisheries, June 7, 1995 (60 FR 30769): Directs all federal agencies to enhance recreational fish species and provide increased recreational fishing opportunities.

EO 13186, Migratory Birds, January 10, 2001 (66 FR 3853): Directs agencies within the Executive Branch to take certain actions to further implement the Migratory Bird Treaty Act, with the goal of promoting the conservation of migratory bird populations.

EO 13443, Facilitation of Hunting Heritage and Wildlife Conservation, August 16, 2007 (66 FR): Directs federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

36 CFR 242 and 50 CFR 100, Subsistence Management Regulations for Public Lands in Alaska: Implements the Federal Subsistence Management Program on public lands within the State of Alaska, pursuant to Title VIII of ANILCA.

43 CFR 24, Department of the Interior Fish and Wildlife Policy: State-Federal Relationships: Clarifies and supports the authorities and responsibilities of federal and state agencies responsible for managing the Nation's fish and wildlife and promotes cooperative agency management relationships which advance science based resource management programs. This policy is intended to reaffirm the basic role of the states in fish and resident wildlife management and to foster improved conservation of fish and wildlife.

50 CFR 17, Endangered and Threatened Wildlife and Plants: Implements the Endangered Species Act of 1973, and identifies species of wildlife and plants determined to be endangered or threatened with extinction.

50 CFR 600.905, Magnuson-Stevens Act Provisions, Purpose, Scope, and NMFS/Regional Fishery Management Council Cooperation: Addresses the coordination, consultation, and recommendation requirements of sections 305(b)(1)(D) and 305(b)(2–4) of the Magnuson-Stevens Act. The purpose of these procedures is to promote the protection of Essential Fish Habitat (EFH) in the review of federal and state actions that may adversely affect EFH.

PLO 7372, Withdrawal of Public Land for the Lake Todatonten Special Management Area; Alaska: Creates the Lake Todatonten Special Management Area to protect fish, wildlife, and habitat. Withdraws approximately 37,579 acres from location, entry, and patent under the mining laws. This order may only be amended or revoked by an act of Congress.

6.6.2. Policies

It is BLM policy to manage habitat with an emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on public land (BLM Manual 6500). It is the policy of the BLM to conserve listed species and the ecosystems upon which they depend; to use the BLM's existing authority in furtherance of the purposes of the Endangered Species Act; to ensure that all actions authorized, funded, or carried out by the BLM are in compliance with the Endangered Species Act; to cooperate with the U.S. Fish and Wildlife Service and National Marine Fisheries Service in planning and providing for the recovery of listed species; to retain in federal ownership all habitat essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival (BLM Manual 6840). Additionally, consistent with existing laws, the BLM shall implement management plans that conserve candidate species and their habitats and shall ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for these species to become listed (BLM Manual 6840).

Instruction Memorandum 2008-050, Migratory Bird Treaty Act–Interim Management Guidance: Provides interim guidance to enhance coordination and communication toward meeting BLM's responsibilities under the Migratory Bird Treaty Act and Executive Order 13186, and is considered a primary agency effort to minimize unintentional take of migratory birds and optimize migratory bird management related to BLM activities.

Instruction Memorandum AK-2010-007, BLM Alaska Policy regarding Predator Control by the State of Alaska: "Unless predator control activities conflict with on-going or anticipated BLM authorized actions, land use plan decisions for a given area, or create a threat to public safety, the BLM's position on the State's predator control program is: Predator control is a State function."

6.6.3. MOUs

Master Memorandum of Understanding between Alaska Department of Fish and Game and the BLM: Parties agree to cooperate in the management of fish and wildlife resources and habitat on BLM lands in such a way as to conserve and enhance fish and wildlife populations.

Memorandum of Understanding between the U.S. Department of the Interior BLM and the U.S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds: Parties agree to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds through enhanced collaboration.

6.6.4. BLM Manuals and Handbooks

- **BLM Manual 1745:** Introduction, Transplant, Augmentation, and Reestablishment of Fish, Wildlife, and Plants

- **BLM Manual 6500:** Wildlife and Fisheries Management
- **BLM Manual 6521:** Cooperative Relations
- **BLM Manual 6523:** Nongovernmental Organizations
- **BLM Manual 6524:** Research
- **BLM Manual 6525:** Sikes Act Wildlife Programs
- **BLM Manual 6600:** Fish, Wildlife and Special Status Plants Inventory and Monitoring
- **BLM Manual 6720:** Aquatic Resources Management
- **BLM Manual 6780:** Habitat Management Plans
- **BLM Manual 6840:** Special Status Species Policy

6.6.5. State Laws and Regulations

AS 41.14.840: Requires construction and maintenance of a fishway and a device for downstream passage of migrants for any obstruction built across a stream frequented by anadromous or resident fish species. Plans and specifications are subject to review and approval by the Alaska Department of Natural Resources.

AS 41.14.870: Requires the Alaska Department of Natural Resources (ADNR) to specify the rivers, lakes, and streams that are important for the spawning, rearing, or migration of anadromous fish. In addition, anyone wanting to construct a hydraulic project, or use, divert, obstruct, pollute, or change the natural flow or bed of a specified water body, or operate a vehicle in these waterbodies, is required to contact ADNR for written approval before beginning the activity.

Alaska State Regulation 5 AAC 39.222: Policy for the Management of Sustainable Salmon Fisheries requires that the State manage salmon fisheries such that salmon stocks and habitat are maintained at levels of resource productivity that assure sustained yields.

Alaska State Regulation 11 AAC 195.010: The *Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes* is the means by which the Alaska Department of Natural Resources specifies waterbodies that are important for the spawning, rearing, or migration of anadromous fish.

AS 16.20.180–16.20.210: The purpose of this statute is to establish a program for the continued conservation, protection, restoration, and propagation of fish or wildlife that are now and may in the future be threatened with extinction.

6.7. Wildland Fire Ecology and Management

6.7.1. Federal Laws, Regulations, Statutes and Orders

Wildfire Suppression Assistance Act of 1989 (PL 100-428, as amended by PL 101-11, April 7, 1989)

Reciprocal Fire Protection Act of May 27, 1955, as amended (42 U.S.C. 1856): Authorizes agencies that provide fire protection for any property of the U.S. to enter into reciprocal agreements with other fire organizations to provide mutual aid for fire protection.

Healthy Forests Restoration Act of 2003: Provides direction for the fuels management program.

Federal Fire Prevention and Control Act of October 29, 1974 (88 Stat. 1535; 15 U.S.C. 1601): Established the United States Fire Administration and its National Fire Academy to improve safety.

6.7.2. Policies

BLM fire policies are outlined in the following documents.

- **1995 Federal Wildland Fire Management Policy and Program Review, U. S. Departments of Interior and Agriculture:** National fire policy document.
- **Review and Update of the 1995 Federal Wildland Fire Management Policy, January 2001, U. S. Departments of Interior and Agriculture:** Update of national fire policy.
- **Guidance for Implementation of Federal Wildland Fire Management Policy, February 13, 2009, Fire Executive Council**

6.7.3. NEPA Documents

Alaska Land Use Plan Amendment for Wildland Fire and Fuels Management Environmental Assessment and FONSI and Decision Record (BLM 2005b): Amended all land use plans in Alaska for wildland fire and fuels management.

Alaska Interagency Wildland Fire Management Plan Tanana/Minchumina Planning Area 1982 and Amendment 1984: First of 13 Interagency Wildland Fire Management Plans for Alaska. This includes an environmental assessment.

6.7.4. MOUs

Alaska Statewide Master Agreement with Exhibits, July 2012. Updated annually.

6.7.5. BLM Manuals and Handbooks

- **Department of Interior Manual 620, April 1998:** Gives fire policy direction with a chapter specific to Alaska.
- **BLM Manual 9211–1, various release dates:** BLM fire planning direction.
- **BLM Manual 9238–1, various release dates:** BLM fire trespass direction.
- **BLM Manual 9235–1, various release dates:** BLM fire prevention direction.

6.7.6. Other Local Plans

Alaska Interagency Wildland Fire Management Plan 1998 (AIWFMP): Fire management plan that consolidates and supersedes the 13 original Alaska interagency fire plans into one document. It covers the entire state of Alaska.

Alaska Interagency Wildland Fire Management Plan 2010 (AIWFMP): Fire management plan that updates and supersedes the 1998 version.

Bureau of Land Management-Alaska Wildland Fire Management Plan 2005: Updates BLM Alaska fire management direction.

The following Alaska Interagency Fire Management Plans cover the planning area along with the NEPA document for Tanana/Minchumina Planning Area 1982 and Amendment 1984.

1. Arctic Slope Planning Area, March 1986
2. Upper Yukon/Tanana Planning Area, April 1984
3. Kobuk Planning Area, April 1984
4. Seward Peninsula Planning Area, April 1984
5. Yukon/Togiak Planning Area, June 1983
6. Kuskokwim/Illiamna Planning Area, June 1983

6.8. Cultural and Paleontological Resources

6.8.1. Federal Laws, Regulations, Statutes and Orders

Cultural Resources

Antiquities Act of 1906 (16 U.S.C. 431 et seq.): Protects cultural resources on federal lands and imposes penalties for excavation or appropriation without a permit.

Historic Sites Act of 1935 (16 U.S.C. 461-467): Declares national policy to identify and preserve historic sites, buildings, objects, and antiquities of national significance, providing a foundation for the National Register of Historic Places.

National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.): Established the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO), and mandates their role in the oversight of federal undertakings. Section 106 of the act requires federal agencies to provide the SHPO and/or the ACHP an opportunity to comment on any undertakings that might affect historic properties. Other important provisions of the act require federal agencies to inventory their lands and to consult and cooperate with other managers and interested publics.

National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.): Establishes a national policy to "… preserve important historic, cultural, and natural aspects of our national heritage…."

EO 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971 (36 CFR 8921): Directs federal agencies to locate, inventory, nominate, and protect federally owned cultural resources eligible for the National Register of Historic Places, and ensure that their plans and programs contribute to the preservation and enhancement of non federally owned resources.

Archaeological and Historic Preservation Act of 1974, which amends the Reservoir Salvage Act of 1960 (PL 86-523; PL 93-291; 16 U.S.C. 469 et seq.): Directs all federal agencies, in regards to all manner of projects, to take into account their impacts on archaeological, historical, and scientific data, and provide funding if necessary to recover such data.

Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.): Establishes a national policy that "... the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values…."

American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996) and EO 13007 Indian Sacred Sites (1996): Declares the United States policy of protecting and preserving the inherent right of freedom to believe, express, and exercise traditional religions; including access to religious sites, use and possession of sacred objects, and freedom to worship through ceremonials and traditional rites, for the American Indian, Eskimo, Aleut, and Native Hawaiian.

Archeological Resources Protection Act of 1979, as amended (PL 96-95; 16 U.S.C. 470aa-mm): Establishes the authority to require permits to excavate or collect archaeological resources from the public lands, and provides serious penalties for those convicted of violating the act.

Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 1241-1249): Requires the repatriation of American Native human remains, funerary objects, and objects of cultural patrimony that are housed in museum collections controlled by federal agencies or in museums that have accepted federal funds. It also contains provisions that apply to the future excavation of such materials.

Curation of Federally Owned and Administered Archaeological Collections (36 CFR 79), 1990: These federal regulations, as required by NHPA, the Reservoir Salvage Act, and Archeological Resources Protection Act, provide minimum standards for the long-term management and care of new and existing archeological collections, including the associated records and reports. The regulations acknowledge that curation involves real costs to the owners of collections, and that it is the responsibility of the federal agency that manages or managed the land on which a collection was recovered to fund its long-term care.

EO 13287, Preserve America, March 3, 2003: Supports efforts to preserve, maintain and use the nation's federally owned historic properties by promoting community economic development, particularly heritage tourism, through local private-federal partnerships.

Paleontological Resources

Paleontological Resources Preservation Act of 2009 (PL 111–11; 16 U.S.C. 470aaa.): Provides requirements for managing and protecting paleontological resources on federal land. The act includes provisions allowing for casual or hobby collecting of common invertebrate and plant fossils on BLM and Forest Service land, permit and curation requirements, prohibited acts, data confidentiality requirements, and criminal and civil penalties resulting from the theft or vandalism of resources.

Archeological Resources Protection Act of 1979, as amended (PL 96-95; 16 U.S.C. 470ee): Prohibits the unauthorized removal of fossils that are in an archaeological context.

Damage to Government Property (18 U.S.C. 1361): Fossils on federal lands have been interpreted as a type of government property, and their unauthorized disturbance resulting in damage is regarded as damage of government property.

Federal Cave Resources Protection Act of 1988 (PL 100-691) and Title 43 CFR Subpart 37: Address protection of significant caves and cave resources, including paleontological resources.

Federal Land Policy and Management Act of 1976 (PL 94-579; 43 U.S.C. 1701 et seq.): Requires that the public lands be managed in a manner that protects the "… quality of scientific …" and other values, which has been interpreted to include paleontological resources. The act

also requires the public lands to be inventoried and provides that permits may be required for the use, occupancy, and development of the public lands.

National Environmental Policy Act of 1969 (PL 91-190; 42 U.S.C. 4321 et seq.): Establishes a national policy to "… preserve important historic, cultural, and natural aspects of our national heritage…," which has been interpreted to include paleontological resources. The act also indicates that "…a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences … in planning and decision making…" be followed.

Onshore Oil and Gas Order No. 1 and 43 CFR Title 3162: Provide for the protection of natural resources and other environmental concerns and can be used to protect paleontological resources where appropriate.

Offer to Lease and Lease for Oil and Gas Form 3100-11: Provides for inventories and other short-term studies to protect objects of scientific interest, such as significant fossil occurrences, and requires that operations conducted under oil and gas leases minimize adverse impacts to natural and cultural resources.

Theft of Government Property (18 U.S.C. 641): Fossils on federal lands have been interpreted as a type of government property, and their unauthorized collection is regarded as theft of government property.

Secretarial Order 3104: Grants to the BLM the authority to issue paleontological resource use permits for lands under its jurisdiction.

- **36 CFR, Subpart 62:** Addresses procedures to identify, designate, and recognize National Natural Landmarks, which include fossil areas.
- **43 CFR 3622:** Addresses the free use collection of petrified wood as a mineral material for non-commercial purposes.
- **43 CFR 3621:** Addresses collection of petrified wood for specimens exceeding 250 pounds in weight.
- **43 CFR 3610:** Addresses the sale of petrified wood as a mineral material for commercial purposes.
- **43 CFR, Subparts 3802 and 3809:** Address protection of paleontological resources from operations authorized under the mining laws.
- **43 CFR 8200:** Addresses procedures and practices for managing lands that have outstanding natural history values, such as fossils, which are of scientific interest.
- **43 CFR 1610.7-2:** Addresses the establishment of Areas of Critical Environmental Concern for managing and protecting significant natural resources, such as paleontological localities.
- **43 CFR 8364:** Addresses the use of closure or restriction of public lands to protect resources. Such closures or restrictions may be used to protect important fossil localities.
- **43 CFR 8365.1-5:** Addresses the willful disturbance, removal and destruction of scientific resources or natural objects and 8360.0-7 identifies the penalties for such violations.

6.8.2. Policies

The BLM recognizes paleontological resources as constituting a fragile and nonrenewable scientific record of the history of life on Earth, thus representing an important and critical component of America's natural heritage. The BLM will exercise stewardship of these resources as a part of its public land management responsibility (BLM Manual 8270).

Cultural resources are recognized as fragile, irreplaceable resources with potential public and scientific uses, representing an important and integral part of our Nation's heritage. The BLM manages cultural resources under its jurisdiction or control according to their relative importance, protecting against impairment, destruction, and inadvertent loss, and encouraging and accommodating the uses determined appropriate through planning and public participation. Apart from certain considerations derived from specific cultural resource statutes, management of cultural resources on public lands is primarily based on FLPMA, and is governed by the same multiple-use principles and the same planning and decision-making processes as are followed in managing other public land resources (BLM Manual 8100).

6.8.3. MOUs

National Programmatic Agreement with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers (1997): The BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (SHPO) signed a nationwide agreement in March 1997, with the purpose of simplifying and streamlining the process for compliance with Section 106 of the National Historic Preservation Act. One of the major driving forces behind development of the agreement was the expectation that by simplifying compliance, BLM cultural resource personnel and funds could be freed up to accomplish more proactive management. Under the programmatic agreement, each BLM state was to work with the local SHPO to develop a protocol setting out the specifics of the compliance process.

Alaska protocol (2014): In February 2014, the State Director and the Alaska State Historic Preservation Officer (SHPO) signed a new Programmatic Agreement to replace 1998 Alaska protocol, which was called for in the National Programmatic Agreement. The protocol provides for the discretionary involvement of the SHPO in a wide range of BLM activities, including planning and fieldwork. BLM Alaska is free under the protocol to determine what type of inventory is appropriate for undertakings without consulting with the SHPO, and may avoid case-by-case review except for certain specified circumstances or where BLM has determined that there is a probability of cultural resources being impacted. The BLM is required to submit copies of all reviews of cultural resources annually for SHPO review.

Programmatic Agreement Regarding Congressionally Authorized Land Transfers to the State of Alaska (2002): The Programmatic Agreement, signed by the BLM State Office, Alaska Department of Natural Resources, Alaska State Historic Preservation Officer, and the Advisory Council on Historic Preservation in September 2002, and its accompanying Instruction Memorandum No. AK-2004-005, establishes and provides instruction to BLM employees on how to handle the transfer of lands from federal to state jurisdiction in lieu of complying with Section 106 of the National Historic Preservation Act.

6.8.4. BLM Manuals and Handbooks

Cultural Resources

The BLM cultural resource program is laid out in the 8100 section of the BLM Manual (various release dates). Various sections establish appropriate levels of inventory, procedures for evaluating sites, protection of sites, issuance of permits under the Archaeological Resources Protection Act of 1979, and other aspects of the program.

- **BLM Manual 8100:** The Foundation for Managing Cultural Resources
- **BLM Manual 8110:** Identifying and Evaluating Cultural Resources
- **BLM Manual 8120:** Tribal Consultation Under Cultural Resources
- **BLM Manual 8130:** Planning for Uses of Cultural Resources
- **BLM Manual 8140:** Protecting Cultural Resources
- **BLM Manual 8150:** Permitting Uses of Cultural Resources
- **BLM Manual 8170:** Interpreting Cultural Resources for the Public

Paleontological Resources

The BLM paleontological resource program is laid out in the 8270 section of the BLM Manual. Various sections discuss land-use planning and environmental review, assessment and mitigation, proactive management, and issuance of permits.

- **BLM Manual 8270:** Paleontological Resource Management
- **Handbook H-8270-1:** General Procedural Guidance for Paleontological Resource Management.

6.8.5. State Laws and Regulations

AS 41.35.200: Which applies only to State lands, makes the disturbance of "historic, prehistoric, or archeological resources" a class A misdemeanor. According to AS 41.35.230, "historic, prehistoric, and archeological resources" includes "deposits, structures, ruins, sites, buildings, graves, artifacts, fossils, or other objects of antiquity which provide information pertaining to the historical or prehistorical culture of people in the state as well as to the natural history of the state."

AS 11.46.482(a)(6): Which applies to all lands in Alaska, makes the intentional disturbance of a grave site and the intentional destruction and unauthorized removal of any human remains from a site a class C felony.

AS 12.65.5: Which applies to all lands in Alaska, requires, in part, the immediate notification of a peace officer of the State and the State Medical Examiner of the discovery of any human body or its remains when death has been caused by unknown or criminal means. The Alaskan State Troopers interprets this statute to include all human remains, regardless of age. The State Troopers or State Medical Examiner may defer to the opinions of the field archaeologist on scene if ancient remains (over 100 years old) are found, and may initiate no further investigation.

6.9. Visual Resources

6.9.1. Federal Laws, Regulations, Statutes and Orders

FLPMA, NEPA, and the Surface Mining Control and Reclamation Act of 1977 (see section 6.13) are the primary federal laws providing authority for visual resource management.

6.9.2. Policies

The BLM has a basic stewardship responsibility to identify and protect visual values on public lands (BLM Manual 8400).

6.9.3. BLM Manuals and Handbooks

- **BLM Manual 8400:** Visual Resource Management
- **BLM Manual 8431:** Visual Resource Contrast Rating
- **BLM Handbook H-8410-1:** Visual Resource Inventory

6.10. Wilderness Characteristics

6.10.1. Policies

Managing wilderness resources is part of the BLM's multiple-use mission. The BLM will consider the wilderness characteristics of public lands when undertaking land use planning and will use the land use planning process to determine how to manage lands with wilderness characteristics as part of the BLM's multiple-use mandate. BLM policy is described more fully in BLM Manuals listed in section 6.10.5.

6.10.2. BLM Manuals and Handbooks

BLM Manual 6310: Conducting Wilderness Characteristics Inventory on BLM Lands. March 15, 2012

BLM Manual 6320: Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process. March 15, 2012

6.11. Forestry and Woodland Products

See section 6.15 Renewable Energy for additional information regarding woody biomass.

6.11.1. Federal laws, regulations, statutes and orders

Act of May 14, 1898, Section 11: allows eligible applicants the opportunity to harvest free use timber in Alaska. 16 U.S.C. 615a amends this act to allow the sale of small sales of timber in Alaska.

Protection Act of September 20, 1922 (16 U.S.C. 594): Authorizes the Secretary of the Interior to protect and preserve timber owned by the United States on public lands under the jurisdiction of the Department of Interior.

Department of Interior Appropriations Act of 1976 (PL 94-165): Prohibits the sale of unprocessed timber on federal lands west of the 100th meridian.

- **43 CFR 5400:** Sales of Forest Products, General
- **43 CFR 5500:** Nonsale Disposals, General
- **43 CFR 5510:** Free Use of Timber

6.11.2. MOUs

The Establishment of a Reciprocal Commercial Mushroom Permit Program; between BLM, Northern Field Office, and State of Alaska DNR/Northern Regions. This MOU was established after the 2004 fire season to address an anticipated high level of commercial mushroom harvest and provide coordination on permit sales between the two agencies.

6.11.3. BLM Manuals and Handbooks

Specific policies regarding forest management and forest product sales may be found in the BLM Manual sections listed below.

- **BLM Manual 5000:** Forest Management
- **BLM Manual 5400:** Sales of Forest Products
- **BLM Handbook H-5400-1, Timber Sale Procedure Handbook:** Contains basic authorities and policies for the sale of forest products from BLM managed lands.

6.11.4. State Laws and Regulations

Alaska State regulations (11 AAC 95.185 - 11 AAC 95.255) describe specific forest management harvest practices required by Alaska State law.

6.12. Livestock Grazing

The BLM removed the grazing regulations under 43 CFR Part 4200, which implemented the livestock grazing program on BLM-managed lands in Alaska in October 1998, because they were considered obsolete (*Federal Register* 1998). There are currently no grazing permit holders under BLM's livestock grazing program in Alaska. The BLM does not anticipate receiving new applications. The amount of BLM-managed lands suitable for livestock grazing has decreased dramatically because of conveyance of land to Native corporations and the State of Alaska.

6.12.1. Federal Laws, Regulations, Statutes and Orders

Alaska Livestock Grazing Act of March 1927 (43 U.S.C. 316, 316a-316o): This act allows the government to lease the grazing privileges on the grazing districts established in Alaska to qualified applicants.

The Reindeer Industry Act 1937 (25 U.S.C. Subsection 500m) authorizes the Secretary's regulation of reindeer grazing on federal public lands.

EO 12548, Grazing Fees, February 11, 1986 (51 FR 5985): Provides for establishment of appropriate fees for grazing domestic livestock on public rangelands.

- **43 CFR Part 4200-1:** Authority for grazing privileges. The BLM is authorized under the Alaska Livestock Grazing Act (Act of March 4, 1927, 43 U.S.C. 316, 316a-316o) to lease to qualified applicants the grazing privileges on the grazing districts established in Alaska.

- **43 CFR Part 4300:** Grazing Administration, Reindeer, General

6.13. Minerals

This section is split into three parts: Leasable Minerals, Locatable Minerals, and Mineral Materials. The laws listed below generally apply to all three categories of minerals.

Mining and Minerals Policy Act of 1970 (30 U.S.C. 21a) (30 U.S.C. 1601 et seq.): Establishes policy of fostering development of economically stable mining and minerals industries, their orderly and economic development, and studying methods for disposal of waste and reclamation.

Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.): Requires the consideration of protection and/or reestablishment of fish and wildlife habitat during the design, assessment, and implementation of reclamation plans and during designation of areas unsuitable for mining. It requires application of unsuitability criteria prior to coal leasing and proposed mining operations for minerals or mineral materials other than coal.

6.13.1. Leasable Minerals

6.13.1.1. Federal laws, regulations, statutes and orders

Mineral Leasing Act of 1920 as amended (30 U.S.C. 181 et seq.): Provides for leasing of coal, phosphate, sodium, potassium, oil, gas, oil shale, native asphalt, solid and semi-solid bitumen, bituminous rock, and gilsonite on lands owned by the United States.

Mineral Leasing Act for Acquired Lands of 1947 (30 U.S.C. 351-359): Provides for leasing of coal, phosphate, sodium, potassium, oil, gas, oil shale, and sulfur on lands owned or acquired by the United States.

Geothermal Steam Act of 1970, as amended (30 U.S.C. 1001): Authorizes the Secretary to issue leases for developing and using geothermal resources on lands administered by the Secretary, including public, withdrawn and acquired lands; lands conveyed by the U.S. subject to a reservation to the U.S. of geothermal steam and associated geothermal resources. This authority has been delegated to the BLM, given the assurance that the land may continue to be used adequately for the purposes for which it was withdrawn or acquired.

Federal Coal Leasing Amendments Act of 1976: Requires that all public lands available for coal leasing be leased competitively. With two exceptions: (1) preference right lease applications where a lease may be issued on a noncompetitive basis to owners of prospecting permits pre-dating the Federal Coal Leasing Amendment Act of 1976; and (2) modifications of existing leases where contiguous lands of less than 160 acres are added non-competitively to an existing lease.

Federal Oil and Gas Royalty Management Act of 1982 (30 U.S.C. 1701): Authorizes the Secretary of the Interior to implement and maintain a royalty management system for oil and gas leases on federal lands, Indian lands, and the Outer Continental Shelf. It includes the development of enforcement practices that ensure the prompt and proper collection and disbursement of oil and gas revenues owed to the U.S. and Indian lessors, and those inuring to the benefit of states.

Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 226, et seq.): Establishes a new oil and gas leasing system, and changes certain operational procedures for onshore federal lands. It requires the BLM to offer all lands available for leasing competitively

prior to leasing noncompetitively and adds environmental provisions to the leasing process. The act also provides for inspections and enforcement of operations once commenced.

Oil Pollution Act of 1990 (33 U.S.C. §2701 et seq.): Mandates extensive planning for oil spills from tank vessels and onshore and offshore facilities. It establishes comprehensive elements of damage for oil spills, and disposes strict liability on those responsible for oil spills.

Energy Policy Act of 1992: Among other things, this act authorizes issuance of both competitive and noncompetitive leases for a 10-year period. Both types of leases continue for as long thereafter as oil or gas is produced in paying quantities.

Alaska Land Status Technical Corrections Act of 1992: Amends Section 905 of ANILCA. It reserves to the U.S. all interests in oil, gas, and coal in the conveyed lands, and the right of the U.S. or of lessee or assignee of the U.S., to enter on lands conveyed to the applicant or to the heirs of the applicant, to drill, explore, mine, produce, and remove the oil, gas, or coal.

Energy Policy Act of 2005 (P.L 109-58, 42 U.S.C. 15801): Encourages energy efficiency and conservation, promotes alternative and renewable energy sources, reduces our dependence on foreign sources of energy, increases domestic production, modernizes the electricity grid, and encourages the expansion of nuclear energy.

- **43 CFR 2880:** Rights-of-Way under the Mineral Leasing Act
- **43 CFR 3000:** Minerals Management
- **43 CFR 3100:** Oil and Gas Leasing
- **43 CFR 3150:** Onshore Oil and Gas Geophysical Exploration
- **43 CFR 3160:** Onshore Oil and Gas Operations
- **43 CFR 3200:** Geothermal Resource Leasing
- **43 CFR 3400:** Coal Leasing

6.13.1.2. Policies

- Maintain opportunities for mineral exploration and development while maintaining other resource values.
- Ensure that oil and gas operations on federal lands are conducted in accordance with all applicable regulations, Onshore Orders, Notices to Lessees, and permit conditions of approval.

6.13.1.3. BLM Manuals and Handbooks

- **BLM Manual 2880:** Oil and Gas Pipelines
- **BLM Manual 3107:** Continuation, Extension or Renewal
- **BLM Manual 3150:** Onshore Oil and Gas Geophysical Exploration Surface Management Requirements

6.13.2. Locatable Minerals

6.13.2.1. Federal laws, regulations, statutes and orders

General Mining Law of 1872, as amended (30 U.S.C. 22 et seq.): Provides for locating and patenting mining claims for locatable minerals on public lands in specified states. This act established few details on how to regulate mining on the public lands. Therefore, rules and

regulations have been developed largely in response to extensive mineral case law established through Interior Board of Land Appeals and the courts.

- **43 CFR 3809 (Surface Management):** Prevent unnecessary and undue degradation of the public lands by operations authorized by the mining laws.

- **43CFR 3715 (Use and Occupancy Under the Mining Laws):** The purpose of this subpart is to manage the use and occupancy of the public lands for developing locatable mineral deposits by limiting such use or occupancy to that which is reasonably incident. The Bureau of Land Management (BLM) will prevent abuse of the public lands while recognizing valid rights and uses under the Mining Law of 1872 (30 U.S.C. 22 et seq.) and related laws governing the public lands, regardless of when those rights were created. The BLM will take appropriate action to eliminate invalid uses, including unauthorized residential occupancy of the public lands.

- **43 CFR 3600 (Mineral Materials Disposal):** The regulations in this part establish procedures for exploring, developing, and disposing of mineral material resources on the public lands, and for protecting resources and the environment. The regulations apply to permits for free use and contracts for sale of mineral materials.

6.13.2.2. Policies

- Encourage the domestic mining industry to explore, develop, and extract minerals from the public lands, and reserved federal mineral estates, while regulating such uses to ensure that the public lands are not subject to unnecessary or undue degradation from such activities.

- Ensure that the public lands, and federal interests in reserved mineral estates, are not misused or abused by parties that use the General Mining Laws for purposes over than what is permissible under the General Mining Laws or FLPMA (BLM Manual 3800).

6.13.2.3. BLM Manuals and Handbooks

BLM Manual series 3800 (various release dates) provides guidance and policy for management of locatable minerals.

- **BLM Manual 3800:** Mining Claims Under the General Mining Laws
- **BLM Manual 3830:** Location, Recording and Maintenance of Mining Claims, Mill and Tunnel Sites
- **BLM Manual 3833:** Recordation of Mining Claims
- **BLM Manual 3860:** Mineral Patent Applications
- **BLM Manual 3861:** Surveys and Plats
- **BLM Manual 3862:** Lode Mining Patent Applications
- **BLM Manual 3863:** Placer Mining Claim Patent Applications
- **BLM Manual 3864:** Mill Site Claim Patent Applications
- **BLM Manual 3870:** Adverse Claims, Protests, Contests, and Appeals
- **BLM Manual 3890:** Mineral Investigations

6.13.3. Salable Minerals

6.13.3.1. Federal Laws, Regulations, Statutes and Orders

Act of July 23, 1955; 69 Stat. 934: Removed common varieties of sand, gravel, cinders, pumice, and clay from the category of locatable minerals and placed them under the Materials Act of 1947, establishing them as salable minerals. The act also provides for multiple use of the lands and surface resources on mining claims (primarily affected public access across mining claims and the use and development of timber resources on mining claims).

Alaska Native Allotment Act of 1906, (43 U.S.C. 270-273, 34 Stat. 197, as amended by 70 Stat. 954).

Alaska Native Claims Settlement Act of 1971, (43 U.S.C. 1601).

Materials Act of 1947, as amended (61 Stat. 681, 30 U.S.C. 601-604 et seq.) as amended: Provides for the sale of common variety materials (sand, stone, gravel, and common clay) for personal, commercial, or industrial uses.

- **43 CFR 3600:** Mineral Materials Disposal
- **43 CFR 3710:** Public Law 167; Act of July 23, 1955
- **43 CFR 3814:** Disposal of Reserved Minerals Under the Stockraising Homestead Act

6.13.3.2. Policies

BLM policy is to dispose of mineral materials, provided adequate measures are taken to protect the environment and that damage to public health and safety is minimized. Since disposal of mineral materials is discretionary, no disposals will be made if it is determined by the Authorized Officer that the total damage to public lands and resources would exceed the expected public benefits derived from any proposed disposal (BLM Manual 3600, BLM 2013).

6.13.3.3. BLM Manuals and Handbooks

Manual section 3600: Mineral Materials Disposal (2002) provides the policies, procedures, and references for processing the disposal, exploration, development, and mining of mineral materials, and reclamation of lands disturbed by such activities.

6.14. Recreation and Visitor Services

See section 6.16 Transportation and Access for additional authorities affecting recreation and visitor services.

6.14.1. Federal Laws, Regulations, Statutes and Orders

Americans with Disabilities Act Accessibility Guidelines: Sets guidelines for accessibility to places of public accommodation and commercial facilities by individuals with disabilities.

Architectural Barriers Act of 1968 (42 U.S.C. 4151 et seq.): Requires access to facilities designed, built, altered, or leased with federal funds.

Department of Interior and Related Agencies Appropriations Act, 1996 (PL 104-134): Directs the Secretary of the Interior, acting through the BLM, to develop and implement a pilot recreation fee demonstration program to determine the feasibility of cost recovery for operation and maintenance of recreation areas and sites.

Land and Water Conservation Fund Act of 1965, as amended (16 U.S.C. 460 et seq.)

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users of 2005 (PL 109-59): Provides funding for recreational trails.

The Transportation Equity Act for the 21st Century of 1998 (Public Law 105-178): Provides funding for recreational trails.

Wild and Scenic Rivers Act of 1968, as amended (16 U.S.C. 1271 et seq.)

EO 11200: Providing for Establishing User Fees Pursuant to the Land and Water Conservation Act of 1965, February 26, 1965 (30 FR 2645)

EO 13195: Trails for America, January 18, 2001 (66 FR 7391).

EO 12962: Recreational Fisheries, June 7, 1995 (60 FR 30769)

6.14.2. Policies

It is BLM policy to ensure the continued availability of public lands and related waters for a diversity of resource-dependent outdoor recreation opportunities while maintaining its commitment to managing the public lands as a national resource in harmony with the principle of balanced multiple use (BLM Manual 8300).

It is BLM policy that a complete and up-to-date inventory of recreation values, uses, and opportunities be maintained for input into, and monitoring of, resource management plans, recreation area management plans, recreation project plans, environmental assessments and impact statements, operational plans, recreation information management system, and annual statistical reports. The level and detail of the inventory will depend on the complexity and importance of the recreation issues (BLM Manual 8310).

It is BLM policy to plan for outdoor recreation in response to the issues, concerns, and problems identified in the resource management planning (RMP) process. In this context, the BLM identifies and evaluates public recreation needs and recreation resources on the public lands to determine the allocation of resource for recreation and the extent of required services and management (BLM Manual 8320).

It is BLM policy that proposed recreation projects are identified in, and derived from, approved recreation area management plans, and fulfill identified management objectives for specific areas (BLM Manual 8323).

6.14.3. MOUs

Federal Lands Hunting, Fishing, and Shooting Sports Roundtable Memorandum of Understanding among the U.S. Department of Agriculture, Forest Service, U.S. Department of the Interior,

Bureau of Land Management, and U.S. Fish and Wildlife Service; and multiple Private Organizations. BLM MOU WO-250–2007–03, August 2006.

6.14.4. BLM Manuals and Handbooks

- **BLM Handbook H-2930-1:** Recreation Permit Administration
- **BLM Handbook H-8410-1:** Visual Resource Inventory
- **BLM Handbook H-8431-1:** Visual Resource Contrast Rating
- **BLM Manual 2930:** Recreation Permits and Fees
- **BLM Manual 8300 Series:** Recreation Management
- **BLM Manual 8310:** Recreation Inventory
- **BLM Manual 8320:** Planning for Recreation Resources
- **BLM Manual 8322:** Recreation Area Management Plans
- **BLM Manual 8323:** Recreation Project Planning
- **BLM Manual 8351:** Wild and Scenic Rivers - Policy and Program Direction for Identification, Evaluation, and Management
- **BLM Manual 8360:** Visitor Services
- **BLM Manual 8362:** Interpretive Services
- **BLM Manual 8400 Series:** Visual Resource Management
- **BLM Manual 8410:** Visual Resource Inventory
- **BLM Manual 8430:** Application of Visual Resource Management Principles to Protect Planning and Design
- **BLM Manual 8431:** Visual Resource Contrast Rating
- **BLM Manual 9100:** Facilities Planning, Design, Construction and Maintenance
- **BLM Manual 9130:** Sign Manual

6.15. Renewable Energy

6.15.1. Federal Laws, Regulations, Statutes and Orders

See section 6.13, Leasable Minerals for more detail.

- **Energy Policy Act of 2005 (P.L 109-58, 42 U.S.C. 15801)**
- **Geothermal Steam Act of 1970, as amended (30 U.S.C. 1001)**

6.15.2. Policies

Wind: It is the BLM's general policy to encourage development of wind energy in acceptable areas. Wind energy site testing and monitoring activities are usually in conformance with and can be accommodated by existing land use plans without a need for a land use plan amendment (IM 2006-216).

Solar: The BLM's general policy is to facilitate environmentally responsible commercial development of solar energy projects on public lands (IM 2007-097).

Biomass: The BLM's general policy is to encourage use of biomass from public lands.

6.15.3. NEPA Documents

Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States. December 2008. BLM-WO-GI-09-003-100-FES-08-44.

6.15.4. MOUs

Memorandum of Understanding On Policy Principles For Woody Biomass Utilization for Restoration and Fuel Treatments On Forests, Woodlands, and Rangelands between the U.S. Department of Interior, U.S. Department of Agriculture, and the U.S. Department of Energy (June 18, 2003). The purpose of the MOU is to demonstrate a commitment to develop and apply consistent and complementary policies and procedures across three federal departments to encourage utilization of woody biomass by-products when ecologically, economically, and legally appropriate, and consistent with locally developed land management plans.

6.16. Transportation and Access

This section addresses federal laws and authorizations that allow the BLM to construct and maintain transportation features and infrastructure, and to administer and manage access across BLM-managed lands.

BLM's Byways Program, established in 1989, is a component of the National Scenic Byways Program. BLM State Directors designate BLM Back Country Byways on BLM public lands. Other Byway designations – such as National Scenic Byways, All-American Roads, State Scenic Byways, or National Forest Scenic Byways – may also occur on portions of BLM—managed lands, but must be designated through a State Department of Transportation or other federal agency. Since many BLM-designated byways cross other federal, state, county, and private lands, their designation and management can vary based on the agency responsible for managing the byway.

6.16.1. Federal Laws, Regulations, Statutes and Orders

Alaska Native Claims Settlement Act of 1971:

Access to public lands from most villages is provided by section 17(b) easements reserved on or across lands conveyed to Native corporations under the Alaska Native Settlement Claims Act (ANCSA). To date, approximately 135 ANCSA section 17(b) easements have been reserved within the planning area. More will be added as remaining entitlements are conveyed to village and regional corporations. The Native corporations' final selection priorities were submitted on June 10, 2008, and the identification of easements on these final selections has been completed, with the Central Yukon FO recommendations forwarded to the BLM Alaska State Office.

Easement management issues are resolved through the development of memoranda of understanding and cooperative agreements. While many easements allow motorized use, some easements are limited to non-motorized travel only, or seasonally to summer or winter travel due to trail conditions. Access by ANCSA section 17(b) easements may be temporarily closed or restricted to protect public health and safety, or the condition of the trail.

Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C. 3101 et. seq.):

The Alaska National Interest Lands Conservation Act (ANILCA) has provisions that allow access for specific purposes on federally managed lands in Alaska.

Section 811: Ensures that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on all federal public lands in Alaska by use of snowmobiles, motorboats, and other means of surface transportation traditionally used for such purposes by local residents, subject to reasonable regulation.

Section 1109: Ensures any valid right of access which existed prior to ANILCA.

Section 1110(a): Ensures the use of snowmobiles (during periods of adequate snow cover, or frozen river conditions in the case of wild and scenic rivers), motorboats, airplanes, and non-motorized surface transportation methods for traditional activities (where such activities are permitted by this act or other law) and for travel to and from villages and home sites on conservation system units, national recreation areas, national conservation areas, and those public lands designated as wilderness study areas.

Section 1110(b): Ensures adequate and feasible access shall be allowed to inholdings and other valid occupiers within or effectively surrounded by conservation system units and wilderness study areas in Alaska, including valid mining claims and subsurface rights.

Section 1111(a): Allows access across conservation system units and wilderness study areas to adjacent State or private lands for the purposes of survey, geophysical, exploratory, or other temporary uses.

Section 1310: Allows the use of reasonable access for operating and maintaining new and existing air and water navigation aids, communication sites and related facilities, and facilities for weather, climate, and fisheries research.

Americans with Disabilities Act Accessibility Guidelines: Sets guidelines for accessibility to places of public accommodation and commercial facilities by individuals with disabilities.

Architectural Barriers Act of 1968 (42 U.S.C. 4151 et seq.): Requires access to facilities designed, built, altered, or leased with federal funds.

Intermodal Surface Transportation Efficiency Act of 1991.

Land and Water Conservation Fund Act of 1965, as amended (16 U.S.C. 460 et seq.)

Moving Ahead for Progress in the 21st Century: Provides funding for access to federal lands and for BLM roads.

National Trails System Act of 1968, as amended (16 U.S.C. 1241 et seq.): Establishes a national trails system and requires that federal rights in abandoned railroads be retained for trail or recreation purposes, or sold with the receipts to be deposited in the Land and Water Conservation Fund.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users of 2005 (PL 109-59): Provides funding for transportation enhancements and recreational trails.

Transportation Equity Act for the 21st Century of 1998 (Public Law 105-178): Provides funding for recreational trails.

EO 11644, Use of Off-road Vehicles on Public Lands, February, 8, 1972 (37 FR 2877): Establishes policies and provides procedures for controlling or directing use of off-road vehicles on public lands, with the goal of protecting resources, promoting the safety of all users, and minimizing conflicts among various uses.

EO 11989, Off-road Vehicles, May 24, 1977 (42 FR 26959): Directs heads of federal agencies to close areas to off-road vehicle use whenever it is determined that such use is causing or will cause considerable adverse impact to soil, vegetation, wildlife, wildlife habitat, or certain other resources on the public lands.

EO 13195, Trails for America, January 18, 2001 (66 FR 7391): Directs federal agencies to protect, connect, promote, and assist trails of all types throughout the United States to the extent permitted by law and where practicable, and in cooperation with tribes, states, local governments, and interested groups.

6.16.2. Policies

It is BLM policy that off-road vehicle use is an acceptable use of public land wherever it is compatible with established resource management objectives (BLM Manual 1626, BLM 2011).

Historic Routes and Revised Statute 2477

"Revised Statute 2477" (R.S. 2477) was adopted by Congress in the 1866 Lode Mining Act and granted rights-of-way for constructing highways across public land not reserved for public uses. Congress repealed R.S. 2477 in 1976 with enactment of the FLPMA; however, it expressly preserved those rights-of-way which existed on the date that FLPMA was passed. Over the years BLM's policy regarding recognition of those rights granted pursuant to R.S. 2477 has undergone several changes. The most recent change came with the Tenth Circuit Court of Appeals' decision in the case of *Southern Utah Wilderness Alliance* v. *Bureau of Land Management,* 425 F.3d 735 10th Cir. 2005. In short, the court found that the BLM lacks the authority to make binding determinations on the validity of R.S. 2477 rights-of-way. As a result of that decision, current BLM policy is to make only informal, nonbinding determinations (of the validity of an R.S. 2477) for its own land use planning and management purposes.

The issue of determining the validity of R.S. 2477 rights-of-way is outside the scope of the RMP. Land use planning does not affect valid R.S. 2477 rights or future assertions. In the absence of specific regulation or law, the validity of all R.S. 2477 rights-of-way is determined on a case-by-case basis through the federal courts.

The State of Alaska and the Alaska Outdoor Council have identified approximately 50 potential R.S. 2477 trails in the planning area; however, only one has been determined to be valid by a court of appropriate jurisdiction. The State of Alaska initiated litigation in 2004 (*State of Alaska* v. *United States, F970009CV*) seeking to quiet title an R.S. 2477 route (Slate Creek) across BLM-managed public lands between Coldfoot and Chandalar Lake. The parties reached a settlement agreement in 2005, which concluded the litigation and resulted in the State holding a 60 foot wide right-of-way along Slate Creek to State lands outside the Utility Corridor. The Final Judgement from U.S. District Court states that except for the question of width, the right-of-way shall be treated as if it were established under R.S. 2477 for the purposes of determining the scope

of property rights, permissible uses, and extent of any federal regulatory authority. Although treated like an R.S. 2477 right-of-way, settlement of the case did not establish one way or the other whether the Slate Creek route was established under R.S. 2477.

6.16.3. MOUs

The BLM and the Alaska Department of Transportation and Public Facilities have several memoranda of understanding (MOU) which address construction and maintenance of waysides along the Dalton Highway. These MOUs were approved from 1999 to 2006. These MOUs are being considered for revision with a goal of combining them all into one master MOU covering maintenance of facilities along the Dalton Highway.

Federal Lands Management Agencies Regional Long Range Transportation Plan – Alaska Region, 2009: Developed by the BLM, NPS, USFWS, USDA, and Alaska Department of Transportation and Public Facilities. Provides a tool for the agencies to work together to set statewide transportation policies and leverage funding. Meets requirements for federal land management agencies to conduct long-range transportation planning.

6.16.4. BLM Manuals and Handbooks

- **BLM Manual 1626:** Travel and Transportation Management (BLM 2011).
- **BLM Manual 6250:** National Scenic and Historic Trail Administration.
- **BLM Manual 8330:** Trail Management Areas—Secretarial Designated National Recreation, Water, and Connecting and Side Trails.
- **BLM Manual 8353:** Trail Management Areas—Secretarial Designated National Recreation, Water, and Connecting and Side Trails.
- **BLM Handbook H-8342-1:** Travel and Transportation Management (BLM 2012c).
- **BLM Handbook H-9113-1:** Roads Design.
- **BLM Handbook H-9115-1:** Primitive Roads Design.

6.16.5. State Laws and Regulations

- **11 Alaska Administrative Code 96.020:** Generally Allowed Uses on State Land
- **19 Alaska Administrative Code 40.210:**

  James Dalton Highway, Prohibition of Off-Road Vehicles

6.17. Land Tenure, Land Use, and Withdrawals

6.17.1. Federal Laws, Regulations, Statutes and Orders

Alaska Native Claims Settlement Act (Public Law 92-203, 85 Stat. 688): Requires the transfer of 45 million acres of public land to Alaska Native corporations.

Alaska Native Vietnam Veterans Act of 1998 (Section 432 of Public Law 105-276, Sect. 432, 112 Stat. 2516): Amends the Alaska Native Claims Settlement Act to allow certain Alaska

Native veterans serving in the military between 1969 and 1971 an opportunity to apply for a 160-acre Native allotment on eligible federal lands.

The Act of May 24, 1928, as amended (49 U.S.C. App. 211-213): Authorizes the Secretary to lease contiguous unappropriated public lands (not to exceed 2,560 acres) for a public airport.

Condemnation Act of 1888, as amended (40 U.S.C. 257): Authorizes officers of the government to procure real estate for erecting a public building or other public uses, through condemnation, under judicial process, whenever it is necessary or advantageous to the government to do so.

Engle Act of 1958 (43 U.S.C. 156): Provides that withdrawals for the Department of Defense for more than 5,000 acres shall be made by Congress.

Federal Land Policy and Management Act of 1976 as amended (43 U.S.C. 1701 et seq.): Authorizes: acquisition of lands or interests in lands; delineation of boundaries in which the federal government has right, title, or interest; sale of lands; exchange or conveyance of public lands; management of the use, occupancy, and development of public lands through leases and permits; determination of the suitability of public lands for rights-of-way purposes; review of land classifications in land use planning; modification or termination of land classifications when consistent with land use plans; modification, or revocation of withdrawals.

Federal Land Transaction Facilitation Act of 2000 (43 U.S.C. 2301): Allows the BLM to retain receipts from land sales and to use them to cover administrative costs and acquire properties to improve the Nation's land management pattern.

Federal Power Act of 1920 as amended (16 U.S.C. 818): Allows other uses of federal waterpower withdrawals with Federal Energy Regulatory Commission approval.

Land and Water Conservation Fund Act of 1965, as amended (16 U.S.C. 460 et seq.): Provides for the establishment of the Land and Water Conservation Fund, special BLM accounts in the Treasury, the collection and disposition of recreation fees, the authorization for appropriation of recreation fee receipts, and other purposes. Authorizes planning, acquisition, and development of needed land and water areas and facilities.

Native Allotment Act of 1906, as amended in 1956: The act allowed an Alaskan Indian and/or Eskimo to receive up to 160 acres of vacant and unappropriated land. It requires the adjudication of hundreds of small acreage sites throughout Alaska, which must be settled prior to completing the final survey and transfer of lands under both the ANCSA and the Statehood Act.

Recreation and Public Purposes Act of 1926, as amended (43 U.S.C. 869): Authorizes the Secretary to classify public lands for lease or sale for recreation or public purposes. The act was amended in 1988 to provide for suitable public lands to be made available for use as solid waste disposal sites, in a manner that will protect the United States against unforeseen liability.

Trans-Alaska Pipeline Authorization Act, November 16, 1973: Authorizes the Secretary of the Interior to oversee the construction, maintenance, operation, and termination of the Trans-Alaska Pipeline.

Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1971 (42 U.S.C. 4601): Provides policy for federal acquisition of lands and interests in lands, and ensures the fair treatment of persons whose real property is acquired or who are displaced as a result of a federal project.

6.17.2. Policies

FLPMA establishes as public policy that in general, public lands will remain in federal ownership. Additional policy is laid out in the BLM manual sections listed below.

It is general policy of the BLM to: give proper consideration to the major or principal right-of-way use on the public lands; provide for right-of-way use of the public land; and allow owners of non-federal lands surrounded by public land managed under FLPMA, a degree of access that will provide for the reasonable use and enjoyment of the non-federal land (BLM Manual 2801).

6.17.3. NEPA Documents

Final Environmental Impact Statement Renewal of the Federal Grant for the Trans-Alaska Pipeline System Right-of-Way. U.S. Department of the Interior, Bureau of Land Management. November 2002.

6.17.4. BLM Manuals and Handbooks

- **BLM Manual 2200:** Land Exchanges
- **BLM Manual 2801:** Rights-of-Way General
- **BLM Manual 2802:** Lands Available for FLPMA Grants
- **BLM Manual 2803:** Qualifications for Holding FLPMA Grants
- **BLM Manual 2804:** Applying for FLPMA Grants
- **BLM Manual 2805:** Terms and Conditions for FLPMA Grants
- **BLM Manual 2806:** Rent
- **BLM Manual 2807:** Grant Administration
- **BLM Manual 2808:** Instruction Memoranda
- **BLM Manual 2809:** Special Considerations
- **BLM Manual 9310:** Appraisal of Real Property
- **Department of the Interior Manual 603:** Withdrawals

6.18. Areas of Critical Environmental Concern

This section includes discussion of Research Natural Areas (RNAs) which are considered a type of area of critical environmental concern (ACEC).

Section 202 (c)(3) of FLPMA mandates that the BLM give priority to the designation and protection of ACECs in the development and revision of land use plans. ACECs must meet the relevance and importance criteria in 43 CFR 1610.7-2(b) and must require special management to: protect the area and prevent irreparable damage to resources or natural systems; or protect life and promote safety in areas where natural hazards exist.

Research Natural Areas (RNA) are established and maintained for the purpose of research and education because the land has one or more of the following characteristics: (1) A typical representation of a common plant or animal association; (2) an unusual plant or animal association; (3) a threatened or endangered plant or animal species; (4) a typical representation of common geologic, soil, or water features; or (5) outstanding or unusual geologic, soil, or water features (43 CFR 8223).

6.18.1. Federal Laws, Regulations, Statutes and Orders

43 CFR Part 1610.7-2(b): Designation of Areas of Critical Environmental Concern: Areas having potential for Area of Critical Environmental Concern (ACEC) designation and protective management shall be identified and considered throughout the resource management planning process.

43 CFR Part 8223: Areas established as research natural areas shall be of sufficient number and size to adequately provide for scientific study, research, and demonstration purposes.

Federal Land Policy and Management Act of 1976 as amended (Section 202 (c)(3)): Gives priority to the designation and protection of areas of critical environmental concern.

6.18.2. BLM Manuals and Handbooks

BLM Manual 1613: Areas of Critical Environmental Concern. This manual section provides direction regarding research natural areas.

6.19. Wilderness Study Areas

This section addresses federal laws and authorizations that pertain to the management of the Central Arctic Management Area Wilderness Study Area (WSA).

6.19.1. Federal Laws, Regulations, Statutes and Orders

Wilderness Act of 1964: Established a national policy to preserve wilderness, established a definition of wilderness, and asserted the exclusive power of the Congress to designate wilderness areas.

Federal Land Policy and Management Act of 1976 (Public Law 94–579) (Section 603): Provides for areas recommended for designation as wilderness to be managed in such a way as to not impair the suitability of such areas for preservation as wilderness.

ANILCA (Public Law 96–487) Section 707, 1001, 1004, 1315, 1317, 1320: Requires the BLM to conduct an interdisciplinary study of natural resources on the federal lands within the Central Arctic Management Area and directs the Secretary of the Interior to review the suitability or nonsuitability of the lands for preservation as wilderness.

ANILCA Section 1001 Report Findings and Recommendations (BLM 1988b): The report serves as the wilderness study report for the Central Arctic Management Area required by the BLM's wilderness study process.

Omnibus Parks and Public Lands Management Act of 1976 (PL- 104–333): Section 302 Anaktuvuk Pass Land Exchange transferred lands from a portion of the Nigu River area from the Central Arctic Management Area WSA to the National Park Service, Gates of the Arctic National Park and Preserve.

American Rivers Settlement (August 30, 1993): *American Rivers et al.* v. *Bruce Babbitt et al.*: As part of the suit settlement, the BLM agreed to manage lands west of the Killik River

in a manner that would protect their wilderness values until Congress acts on the wilderness recommendation.

Public Land Orders (PLOs) affecting the planning area:

- PLO 5179 3/9/1972: Withdrew lands for classification – no selections allowed, no mining, no mineral leasing
- PLO 5250 9/12/1972: Added lands within the Central Arctic Management Area WSA to PLO 5179. No selections allowed, no mining, no mineral leasing.
- PLO 5396 9/14/1973: Amended 5179 allowing regional corporation to select lands. Retains closure to mining and mineral leasing.
- PLO 5556 12/10/1975: Amended PLO 5179 by deleting lands. No mineral leasing.
- PLO 5653 11/16/1978: Emergency withdrawal of certain lands in Alaska for protection of resources. No selections allowed.
- PLO 5654 11/17/1978: Legal description for lands in PLO 5653.
- PLO 5860 5/4/1981: Allowed Arctic Slope Regional Corporation to select lands. Closed to State selection, mining, and mineral leasing.
- PLO 5951 5/29/1981: Amended PLO 5179 to allow State selections. No mineral leasing.
- PLO 7032 2/28/1994: Withdraws 2,560 acres to protect paleoindian site known as the Mesa site for a period of 20 years. Closes lands to settlement, sale, and mining, but not to mineral leasing.
- PLO 7231 12/20/1996: Amended PLO 5860 to allow the State to select lands.
- PLO 7823: Extends duration of the withdrawal created by PLO 7032 for an additional 20-year period.

6.19.2. NEPA Documents

Final Environmental Impact Statement and Wilderness Recommendations for the Central Arctic Management Area Wilderness Study Area Alaska. Department of the Interior, BLM September 1988.

6.19.3. BLM Manuals and Handbooks

BLM Manual 6330: Management of BLM Wilderness Study Areas

6.20. Tribal Interest and Subsistence

6.20.1. Federal Laws, Regulations, Statutes and Orders

Alaska National Interest Lands Conservation Act of 1980 (16 U.S.C. 3101 et. seq.): Title VIII provides for the opportunity for subsistence uses by rural residents of Alaska, including both Natives and non-Natives, on the public lands.

EO 13084, Consultation and Coordination with Indian Tribal Governments, May 19, 1998 (63 FR 27655): Provides, in part, that each federal agency shall establish regular and meaningful consultation and collaboration with Indian tribal governments in developing regulatory practices on federal matters that significantly or uniquely affect their communities.

EO 13007, American Indian and Alaska Native Religious Freedom and Sacred Land Protections, May 24, 1996 (61 FR 26771): Directs federal agencies to accommodate access to

and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sites.

6.20.2. Policies

Instruction Memorandum AK-86-350: Policy for Section 810 Compliance with the Alaska National Interest Lands Conservation Act (August 26, 1986).

6.21. Social and Economic Conditions

6.21.1. Federal Laws, Regulations, Statutes and Orders

EO 12898, Environmental Justice, February 11, 1994 (49 FR 7629): Requires that each federal agency consider the impacts of its programs on minority and low income populations.

Pollution Prevention Act of 1990 (42 U.S.C. 13101-13109): Requires and encourages preventing and reducing waste streams and other pollution through minimization, process change, and recycling. Encourages and requires developing new technology and markets to meet objectives.

6.21.2. Policies

Instruction Memorandum No. 2002-167, Social and Economic Analysis for Land Use Planning: Provides guidance on integrating social science and economic information into land use planning; supplements guidance in the BLM Land Use Planning Handbook (H-1601-1).

Instruction Memorandum No. 2003-169, Use of the Economic Profile System in Planning and Collaboration: describes the Economic Profile System (EPS) and provides guidance for the use of EPS as a community involvement technique and a source of economic data in planning and NEPA analysis.

Instruction Memorandum No. 2013-131, Guidance on estimating nonmarket values: directs BLM managers and staff to utilize estimates of nonmarket environmental values in NEPA analysis supporting planning and other decision-making where relevant and feasible.

Environmental Justice: Guidance Under the National Environmental Policy Act, 1997: The Council on Environmental Quality guidance on complying with environmental justice objectives during the NEPA process. Available online at http://ceq.eh.doe.gov/nepa/regs/ej/justice.pdf

Acronyms

ACC:	Alaska Administrative Code
ACEC:	Area of Critical Environmental Concern
ADFG:	Alaska Department of Fish and Game
AIVC:	Alaska Interagency Visitor Center
ANCSA:	Alaska Native Claims Settlement Act
ANILCA:	Alaska National Interest Lands Conservation Act
AO:	Authorized Officer
AS:	Alaska Statute
ASRC:	Arctic Slope Regional Corporation
ATV:	All-terrain vehicle
BLM:	Bureau of Land Management
CAA:	Clean Air Act
CAMA:	Central Arctic Management Area
CFR:	Code of Federal Regulations
DHCMA:	Dalton Highway Corridor Management Area
DOI:	U.S. Department of the Interior
EFH:	Essential fish habitat
EIS:	Environmental impact statement
EO:	Executive Order
EPA:	Environmental Protection Agency
FLPMA:	Federal Land Policy and Management Act
IM:	Instruction Memorandum
MFP:	Management Framework Plan
NEPA:	National Environmental Policy Act
NPS:	National Park Service
NSO:	No surface occupancy
OHV:	Off-highway vehicle [new terminology]

ORV:	Off-road vehicle [old terminology]
ORV:	Outstandingly remarkable value [pertaining to wild and scenic rivers]
P.L.:	Public Law
PLO:	Public Land Order
R:	Range
RAMP:	Recreation Activity Management Plan
RMP:	Resource Management Plan
RNA:	Research Natural Area
ROD:	Record of Decision
ROW:	Right-of-way
SRMA:	Special Recreation Management Area
SRP:	Special Recreation Permit
T:	Township
TAPS:	Trans-Alaska Pipeline System
TE:	Threatened and Endangered [species]
U.S.C.:	U.S. Code
USFWS:	U.S. Fish and Wildlife Service
USGS:	U.S. Geological Survey
VRI:	Visual Resource Inventory
VRM:	Visual Resource Management
WSA:	Wilderness Study Area (CAMA WSA)
WSR:	Wild and Scenic River [Unalakleet WSR]

Glossary

Adaptive Management: A system of management practices based on clearly identified outcomes, including monitoring, to determine if management actions are meeting outcomes, and, if not, facilitating management changes that will best ensure that outcomes are either met or the outcomes are re-evaluated. Adaptive management recognizes that knowledge about natural resource systems is sometimes uncertain, making this the preferred method of management in those cases.

Area of Critical Environmental Concern (ACEC): An area within the public lands where special management attention is required to protect important historic, cultural, or scenic values; fish and wildlife or natural systems or processes; or to protect life and safety from natural hazards.

Casual Use: Means any short-term non-commercial activity that causes no appreciable damage or disturbance to the public lands, their resources or improvements, and which is not prohibited by closure of the lands to such activities. See 43 CFR 2920.0-5(k).

Curb Weight: Weight of a vehicle with a full tank of fuel and all fluids full, but with no people or cargo loaded. "Curb weight" is synonymous with "wet weight" and "operating weight."

Designated Trail: A narrow section of developed linear travel way, with an approved designation for traversing by means of human-powered, stock, or off-highway vehicle forms of transportation. Travel on designated trails allows a 100 foot wide travel way (50 feet 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 will not cause 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, allow another party to pass, perform a repair, allow dispersed camping off the trail, and allow enough area to navigate around obstacles until a trail can be repaired.

Gross Vehicle Weight Rating: Total weight of vehicle plus the maximum loaded carrying capacity of the vehicle as specified by the manufacturer (i.e., GVWR = weight of vehicle + fuel + passengers + cargo, as per manufacturer's limitations). Pull-behind trailers are not included in the GVWR calculation for the vehicle.

Linear Transportation Feature: Engineering term used to describe building and non-building facility and transportation construction, which includes roads, primitive roads, and trails that are included in the Facility Asset Management System (FAMS). Assets are maintained through the annual maintenance and deferred maintenance programs. (See the BLM Roads and Trails Terminology Report.)

- Road: A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.

- Primitive Road: A linear route managed for use by four-wheel drive or high-clearance vehicles. These routes do not customarily meet any BLM road design standards. Unless specifically prohibited, primitive roads can also include other uses such as hiking, biking, or horseback riding.

- Trail: Linear routes managed for human-powered, stock, or off-highway vehicle forms of transportation or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Off-highway Vehicle (OHV):

OHV is synonymous with off-road vehicles (ORV). ORV is defined in 43 CFR 8340.0-5 (a): Off-road vehicle means any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: (1) Any non-amphibious registered motorboat; (2) Any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) Any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) Vehicles in official use; and (5) Any combat or combat support vehicle when used in times of national defense emergencies.

Off-highway Vehicle Area Designations:

Refers to the land use plan decisions that permit, establish conditions, or prohibit OHV activities on specific areas of public lands. All public lands are required to have OHV designations (43 CFR 8342.1). The CFR requires all the BLM-managed public lands to be designated as Open, Limited or Closed to off-road vehicles, and provides guidelines for designation. The definitions of Open, Limited and Closed are provided in 43 CFR 8340.0-5 (f), (g) and (h), respectively.

- "Open" designations are used for intensive OHV use areas where there are no special restrictions or where there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel. See 43 CFR 8340.05(f).

- "Limited" designations are used where OHV use is managed to meet specific resource management objectives. Management of OHVs may include limiting the number or type of vehicles, time, or season of use; allowing permitted or licensed use only; limiting OHV use to designated roads and trails; or other limitations necessary to meet resource management objectives, including certain competitive or intensive use areas that have special limitations. See 43 CFR 8340.05(g).

- "Closed" designations are used for an area or trail where off-road vehicle use is prohibited, except where authorized by the BLM. See 43 CFR 8340.05(h).

Off-road Vehicle (ORV): The legal term used in the 43 CFR 8340 regulations. See the Off-highway Vehicle definition.

Public Land Order (PLO): Congressional or secretarial orders defining withdrawals of public lands by statute or secretarial order from operation of some or all of the public land laws.

R.S. 2477: A provision originally part of the 1866 Mining Act that states in its entirety, "The right-of-way for the construction of highways over public lands, not reserved for public uses, is hereby granted." In 1873, the provision was separated from the Mining Act and reenacted as Revised Statute (R.S.) 2477. In 1938, it was recodified as 43 U.S.C. Section 932. FLPMA repealed both the 1866 Mining Act and R.S. 2477, but all rights-of-way that existed on the date of the repeal (October 21, 1976) are preserved under 43 U.S.C. Section 1769. The State of Alaska recognizes approximately 650 R.S. 2477 routes throughout the State. The assertion of these routes has not been recognized, and current BLM policy is to defer any processing of R.S. 2477 assertions except where there is a demonstrated and compelling need to make a determination.

R&PP lease: A lease issued by the federal government under the Recreation & Public Purposes Act for use of public lands for community and recreational purposes, such as parks and cemeteries.

Record of decision (ROD): A public document associated with an environmental impact statement (EIS) that identifies all alternatives, provides the final decision, the rationale behind that decision, and commitments to monitoring and mitigation.

Recreation activity management plan (RAMP): An activity-level or step-down plan to develop more specific management guidelines for a special recreation management area.

Recreation and Public Purposes (R&PP) Act: An act authorizing the sale or lease of public lands for recreational or public purposes to State and local governments and to qualified non-profit organizations.

Rectify, mitigation: Rectifying the impact by repairing, rehabilitating, or restoring the affected environment. (40 CFR 1508.20)

Reduce or eliminate over time, mitigation: Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. (40 CFR 1508.20)

Research Natural Area (RNA): An area that is established and maintained for the primary purpose of research and education because the land has one or more of the following characteristics: (1) a typical representation of a

	common plant or animal association; (2) an unusual plant or animal association; (3) a threatened or endangered plant or animal species; (4) a typical representation of common geologic, soil, or water features; or (5) outstanding or unusual geologic, soil, or water features. Uses of RNAs are defined in 43 CFR 8223.1.
Residual impact:	Impacts from a land-use authorization that remain after applying avoidance, minimization, rectification, and reduction/elimination measures; also referred to as unavoidable impacts.
Right-of-way (ROW):	The legal right to pass over another owner's land, or the area over which a right-of-way exists.
Scoping:	The process used to determine, through public involvement, the range of issues that the RMP should address.
Sensitive Species:	Those wildlife, fish, or plant species designated by the BLM Alaska State Director, usually in cooperation with the State agency responsible for managing the species, as sensitive. They are: (1) species under status review by U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service; (2) species whose numbers are declining so rapidly that federal listing may be necessary; (3) species with typically small and widely dispersed populations; or (4) species inhabiting ecological refugia or other specialized or unique habitats.
Snowmobile:	A motorized vehicle designed for use over snow that runs on track or tracks and uses a ski or skis for steering, has a curb weight of 1,000 pounds or less, maximum width of 50 inches or less, is steered using handlebars, and has a seat designed to be straddled by the operator. A snowmobile does not include machinery used strictly for grooming non-motorized trails.
Special Forest Products:	Any “non-timber” forest resource. Special forest products may include: bark, boughs, burls, floral greenery, mushrooms, sap, wild berries, and Christmas trees.
Special Recreation Management Area (SRMA):	Areas where the management emphasis is on recreation, though other resource uses and development are allowed.
Special recreation permit:	A means of authorizing recreational uses of public lands and waters. Special recreation permits are issued for specific recreational uses as a means to manage visitor use, protect natural and cultural resources, and provide a mechanism to accommodate commercial recreational uses. There are four types of permits: commercial, competitive, organized groups/events, and individuals or groups in special areas.

Special Status Species: Special Status Species include: endangered species, threatened species, proposed species, candidate species, State-listed species, and BLM Alaska sensitive species.

State-selected: Formerly unappropriated and unreserved public lands that were selected by the State of Alaska as part of the Alaska Statehood Act of 1958 and Alaska National Interest Lands Conservation Act (ANILCA) of 1980. Until conveyance, State-selected lands outside of National Park System lands or National Wildlife refuges will be managed by the BLM. ANILCA allowed for overselection by the State by up to 25 percent of the entitlement (sec. 906 (f)). Therefore, some State-selected lands will eventually be retained in long-term federal management.

Subsistence: Subsistence is defined by federal law as "the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools or transportation; for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption; and for the customary trade, barter or sharing for personal or family consumption."

Sustained yield: The achievement and maintenance in perpetuity of a high-level annual or regular output of the various renewable resources of the national forests without impairment of the productivity of the land. (43 U.S.C. sec. 1702(h)).

Travel Management Area (TMA): Polygons or delineated areas where travel management (either motorized or non-motorized) needs particular focus. These areas may be designated as Open, Limited and Closed to motorized use and will typically have an identified and/or designated network of roads, trails, ways and other routes that provide for public access and travel across the planning area. All designated travel routes within travel management areas should have a clearly identified need and purpose, as well as clearly defined activity types, modes of travel, and seasons or timeframes for allowable access or other limitations.

Travel Management Objective (TMO): A documented description of each route to identify management objectives, establish maintenance levels, and ensure resource management objectives are being met.

Travel Management Plan (TMP): The document that describes the process and decisions related to the selection and management of the transportation network. This document can be an appendix to the RMP or a stand-alone document subsequent to the RMP.

Unencumbered/ unencumbered BLM lands: Public lands that have not been selected by the State of Alaska or Native organizations. These lands will be retained in long-term federal management.

Utility Type / Terrain Vehicle (UTV): Any recreational motor vehicle other than an all-terrain vehicle, motorcycle, or snowmobile designed for and capable of travel over unpaved roads, traveling on four or more low-pressure tires, a curb weight less than 1,500 pounds or less, and a maximum width of 64 inches or less. Utility type vehicles do not include vehicles specially designed to carry a person with disabilities.

Visual Resource Management (VRM): A means of managing visual resources by designating areas as one of four classes: Class I– maintaining a landscape setting that appears unaltered by humans; Class II– designing proposed alterations so as to retain the existing character of the landscape; Class III– designing proposed alterations so as to partially retain the existing character of the landscape; and, Class IV– providing for management activities which require major modifications of the existing character of the landscape.

Wild and Scenic River, Wild River: A river that is part of the National Wild and Scenic River System. In Alaska, most Wild and Scenic Rivers (WSR) were designated through the ANILCA.

Wilderness characteristics: These attributes include 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.

Withdrawal: Federal land set aside and dedicated to a present, governmental use; public land set aside for some other public purpose, e.g., pending a determination of how the land is to be used; an action approved by the Secretary or a law enacted by Congress that closes land to specific uses under the public land laws (usually sale, settlement, location, and entry), or limits use to maintain public values or reserves area for particular public use or program, or that transfers jurisdiction of an area to another federal agency. Usually enacted through a public land order or legislation.

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Appendix A. List of Preparers

Table A.1. List of Preparers

Name	Responsibility	Participation
Stewart Allen	Economics	Author
Robert Brumbaugh	Leasable Minerals	Author
Tara Callear	Non-native invasive species	Author
Jeanie Cole	Chapter 1, Chapter 5	Author and editor
Karen Deatherage	Environmental Education	Author
Dave Esse	Water Resources	Author
Kelly Egger	Recreation and Visitor Services	Author
Stacey Fritz	Environmental Justice and Social Systems	Author
Randy Goodwin	Transportation and Travel Management	Author
Tim Hammond	Forest and Woodland Products	Author
Bill Hedman	Cultural and Paleontological	Author
Lisa Shon Jodwalis	Wilderness Characteristics, Wild and Scenic Rivers	Author
Erin Julianus	Wildlife and Subsistence	Author
Bob Karlen	Fish and Aquatic Species	Author
Ben Kennedy	Air and Water Resources	Author
Carl Kretsinger	Fish and Aquatic Species	Author
Jen McMillan	Vegetation and Special Status Species	Author
Dave Parker	Fish and Aquatic Species	Author
Thomas St. Clair	Fire Management and Ecology	Reviewer
Skip Theisen	Fire Management	Author
Peggy Thigpen	Lands and Realty	Author
Darrel VandeWeg	Locatable and Salable Minerals	Author
Cal Westcott	Visual Resources	Author
Donna Wixon	Wilderness Study Areas	Author

Appendix B. Water Quality Standards

The following table lists the Alaska Department of Environmental (ADEC) water quality standards for fresh water uses. The complete regulation and the notes referred to in the table are available on the ADEC Web Page at: http://dec.alaska.gov/commish/regulations/pdfs/18%20AAC%2070.pdf

Water Quality Standards for Designated Uses **ADEC Water Quality Standards (18 AAC 70), amended as of April 8, 2012**	
POLLUTANT & WATER USE	**CRITERIA**
(1) COLOR, FOR FRESH WATER USES (See note 8)	
(A) Water Supply (i) drinking, culinary, and food processing	May not exceed 15 color units or the natural condition, whichever is greater.
(A) Water Supply(ii) agriculture, including irrigation and stock watering	Not applicable.
(A) Water Supply (iii) aquaculture	May not exceed 50 color units or the natural condition, whichever is greater.
(A) Water Supply (iv) industrial	May not cause detrimental effects on established water supply treatment levels.
(B) Water Recreation (i) contact recreation	Same as (1)(A)(i).
(B) Water Recreation (ii) secondary recreation	May not interfere with or make the water unfit or unsafe for the use.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Color or apparent color may not reduce the depth of the compensation point for photosynthetic activity by more than 10% from the seasonally established norm for aquatic life. For all waters without a seasonally established norm for aquatic life, color or apparent color may not exceed 50 color units or the natural condition, whichever is greater.
(2) FECAL COLIFORM BACTERIA (FC), FOR FRESH WATER USES (See note 1)	
(A) Water Supply (i) drinking, culinary, and food processing	In a 30-day period, the geometric mean may not exceed 20 FC/100 ml, and not more than 10% of the samples may exceed 40 FC/100 ml. For groundwater, the FC concentration must be less than 1 FC/100 ml, using the fecal coliform Membrane Filter Technique, or less than 3 FC/100 ml, using the fecal coliform most probable number (MPN) technique.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	The geometric mean of samples taken in a 30-day period may not exceed 200 FC/100 ml, and not more than 10% of the samples may exceed 400 FC/100 ml. For products not normally cooked and for dairy sanitation of unpasteurized products, the criteria for drinking water supply, (2)(A)(i), apply.
(A) Water Supply (iii) aquaculture	For products normally cooked, the geometric mean of samples taken in a 30-day period may not exceed 200 FC/100 ml, and not more than 10% of the samples may exceed 400 FC/100 ml. For products not normally cooked, the criteria for drinking water supply, (2)(A)(i),
(A) Water Supply (iv) industrial	Where worker contact is present, the geometric mean of samples taken in a 30-day period may not exceed 200 FC/100 ml, and not more than 10% of the samples may exceed 400 FC/100 ml.
(B) Water Recreation (i) contact recreation	In a 30-day period, the geometric mean of samples may not exceed 100 FC/100 ml, and not more than one sample, or more than 10% of the samples if there are more than 10 samples, may exceed 200 FC/100 ml.
(B) Water Recreation (ii) secondary recreation	In a 30-day period, the geometric mean of samples may not exceed 200 FC/100 ml, and not more than 10% of the total samples may exceed 400 FC/100 ml.

Water Quality Standards for Designated Uses ADEC Water Quality Standards (18 AAC 70), amended as of April 8, 2012	
POLLUTANT & WATER USE	**CRITERIA**
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Not applicable.
(3) DISSOLVED GAS, FOR FRESH WATER USES	
(A) Water Supply (i) drinking, culinary, and food processing	Dissolved oxygen (D.O.) must be greater than or equal to 4 mg/l (this does not apply to lakes or reservoirs in which supplies are taken from below the thermocline, or to groundwater).
A) Water Supply (ii) agriculture, including irrigation and stock watering	D.O. must be greater than 3 mg/l in surface waters.
(A) Water Supply (iii) aquaculture	D.O. must be greater than 7 mg/l in surface waters. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection.
(A) Water Supply (iv) industrial	May not cause detrimental effects on established water supply treatment levels.
(B) Water Recreation (i) contact recreation	Dissolved oxygen (D.O.) must be greater than or equal to 4 mg/l.
(B) Water Recreation (ii) secondary recreation	Same as (3)(B)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	D.O. must be greater than 7 mg/l in waters used by anadromous or resident fish. In no case may D.O. be less than 5 mg/l to a depth of 20 cm in the interstitial waters of gravel used by anadromous or resident fish for spawning (see note 2). For waters not used by anadromous or resident fish, D.O. must be greater than or equal to 5 mg/l. In no case may D.O. be greater than 17 mg/l. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection.
(4) DISSOLVED INORGANIC SUBSTANCES, FOR FRESH WATER USES	
(A) Water Supply (i) drinking, culinary, and food processing	Total dissolved solids (TDS) from all sources may not exceed 500 mg/l. Neither chlorides nor sulfates may exceed 250 mg/l.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	TDS may not exceed 1,000 mg/l. Sodium adsorption ratio must be less than 2.5, sodium percentage less than 60%, and residual carbonate less than 1.25 milliequivalents/liter (see note 6).
(A) Water Supply (iii) aquaculture	TDS may not exceed 1,000 mg/l. A concentration of TDS may not be present in water if that concentration causes or reasonably could be expected to cause an adverse effect to aquatic life (see note 12).
(A) Water Supply (iv) industrial	No amounts above natural conditions that can cause corrosion, scaling, or process problems.
(B) Water Recreation (i) contact recreation	Not applicable.
(B) Water Recreation (ii) secondary recreation	Not applicable.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (4)(A)(iii).
(5) PETROLEUM HYDROCARBONS, OILS AND GREASE, FOR FRESH WATER USES	

Water Quality Standards for Designated Uses ADEC Water Quality Standards (18 AAC 70), amended as of April 8, 2012	
POLLUTANT & WATER USE	**CRITERIA**
(A) Water Supply (i) drinking, culinary, and food processing	May not cause a visible sheen upon the surface of the water. May not exceed concentrations that individually or in combination impart odor or taste as determined by organoleptic tests.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	May not cause a visible sheen upon the surface of the
(A) Water Supply (iii) aquaculture	Total aqueous hydrocarbons (TAqH) in the water column may not exceed 15 µg/l (see note 7). Total aromatic hydrocarbons (TAH) in the water column may not exceed 10 µg/l (see note 7). There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration.
(A) Water Supply (iv) industrial	May not make the water unfit or unsafe for the use.
(B) Water Recreation (i) contact recreation	May not cause a film, sheen, or discoloration on the surface or floor of the waterbody or adjoining shorelines. Surface waters must be virtually free from floating oils.
(B) Water Recreation (ii) secondary recreation	Same as (5)(B)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (5)(A)(iii).
(6) pH, FOR FRESH WATER USES (variation of pH for water naturally outside the specified range must be toward the range)	
(A) Water Supply (i) drinking, culinary, and food processing	May not be less than 6.0 or greater than 8.5.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	May not be less than 5.0 or greater than 9.0
(A) Water Supply (iii) aquaculture	May not be less than 6.5 or greater than 8.5. May not vary more than 0.5 pH unit from natural conditions.
(A) Water Supply (iv) industrial	May not be less than 5.0 or greater than 9.0.
(B) Water Recreation (i) contact recreation	May not be less than 6.5 or greater than 8.5. If the natural condition pH is outside this range, substances may not be added that cause an increase in the buffering capacity of the water.
(B) Water Recreation (ii) secondary recreation	Same as (6)(A)(iv).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	May not be less than 6.5 or greater than 8.5. May not vary more than 0.5 pH unit from natural conditions.
(7) RADIOACTIVITY, FOR FRESH WATER USES	

Water Quality Standards for Designated Uses ADEC Water Quality Standards (18 AAC 70), amended as of April 8, 2012	
POLLUTANT & WATER USE	**CRITERIA**
(A) Water Supply (i) drinking, culinary, and food processing	May not exceed the concentrations specified in Table I of the Alaska Water Quality Criteria Manual (see note 5) for radioactive contaminants and may not exceed limits specified in 10 C.F.R. 20 (see note 9) and National Bureau of Standards, Handbook 69 (see note 10).
(A) Water Supply (ii) agriculture, including irrigation and stock watering	Same as (7)(A)(i).
(A) Water Supply (iii) aquaculture	Same as (7)(A)(i) except that concentration factors for organisms involved may not exceed maximum permissible limits for specific radioisotopes and unidentified mixtures as established by 10 C.F.R. 20 (see note 9) and National Bureau of Standards, *Handbook 69* (see note 10).
(A) Water Supply (iv) industrial	Same as (7)(A)(i).
(B) Water Recreation (i) contact recreation	Same as (7)(A)(i).
(B) Water Recreation (ii) secondary recreation	Same as (7)(A)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (7)(A)(iii).
(8) RESIDUES, FOR FRESH WATER USES: Floating solids, debris, sludge, deposits, foam, scum, or other residues (criteria are not applicable to groundwater) (See note 13)	
(A) Water Supply (i) drinking, culinary, and food processing	May not, alone or in combination with other substances, be present in concentrations or amounts that: form objectionable deposits; constitute a nuisance; produce objectionable odor or taste; or result in undesirable or nuisance species.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	Same as (8)(A)(i).
(A) Water Supply (iii) aquaculture	Same as (8)(A)(i).
(A) Water Supply (iv) industrial	Same as (8)(A)(i).
(B) Water Recreation (i) contact recreation	Same as (8)(A)(i).
(B) Water Recreation (ii) secondary recreation	Same as (8)(A)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Residues are not allowed in surface waters of the state, in concentrations or amounts that have the following effects: • may impair designated uses; • cause nuisance or objectionable conditions; or • result in undesirable or nuisance species.
(9) SEDIMENT, FOR FRESH WATER USES (criteria are not applicable to groundwater)	
(A) Water Supply (i) drinking, culinary, and food processing	No measurable increase in concentration of settleable solids above natural conditions, as measured by the volumetric Imhoff cone method (see note 11).

Water Quality Standards for Designated Uses ADEC Water Quality Standards (18 AAC 70), amended as of April 8, 2012	
POLLUTANT & WATER USE	**CRITERIA**
(A) Water Supply (ii) agriculture, including irrigation and stock watering	For sprinkler irrigation, water must be free of particles of 0.074 mm or coarser. For irrigation or water spreading, may not exceed 200 mg/l for an extended period of time.
(A) Water Supply (iii) aquaculture	No imposed loads that will interfere with established water supply treatment levels.
(A) Water Supply (iv) industrial	Same as (9)(A)(iii).
(B) Water Recreation (i) contact recreation	Same as (9)(A)(i).
(B) Water Recreation (ii) secondary recreation	May not pose hazards to incidental human contact or cause interference with the use.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	The percent accumulation of fine sediment in the range of 0.1 mm to 4.0 mm in the gravel bed of waters used by anadromous or resident fish for spawning may not be increased more than 5% by weight above natural conditions (as shown from grain size accumulation graph). In no case may the 0.1 mm to 4.0 mm fine sediment range in those gravel beds exceed a maximum of 30% by weight (as shown from grain size accumulation graph) (see notes 3 and 4). In all other surface waters no sediment loads (suspended or deposited) that can cause adverse effects on aquatic animal or plant life, their reproduction or habitat may be present.
(10) TEMPERATURE, FOR FRESH WATER USES	
(A) Water Supply (i) drinking, culinary, and food processing	May not exceed 15 °C.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	May not exceed 30 °C.
(A) Water Supply (iii) aquaculture	May not exceed 20o C at any time. The following maximum temperatures may not be exceeded, where applicable: ● Migration routes 15 °C ● Spawning areas 13 °C ● Rearing areas 15 °C ● Egg & fry incubation 13 °C ● For all other waters, the weekly average temperature may not exceed site-specific requirements needed to preserve normal species diversity or to prevent appearance of nuisance organisms.
(A) Water Supply (iv) industrial	May not exceed 25 °C.
(B) Water Recreation (i) contact recreation	Same as (10)(A)(ii).
(B) Water Recreation (ii) secondary recreation	Not applicable.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (10)(A)(iii).
(11) TOXIC AND OTHER DELETERIOUS ORGANIC AND INORGANIC SUBSTANCES, FOR FRESH WATER USES	
(A) Water Supply (i) drinking, culinary, and food processing	The concentration of substances in water may not exceed the criteria shown in Table I and in Table V, column A of the Alaska Water Quality Criteria Manual (see note 5).

Water Quality Standards for Designated Uses ADEC Water Quality Standards (18 AAC 70), amended as of April 8, 2012	
POLLUTANT & WATER USE	**CRITERIA**
(A) Water Supply (ii) agriculture, including irrigation and stock watering	The concentration of substances in water may not exceed the numeric criteria for drinking and stockwater and irrigation water shown in the Alaska Water Quality *Criteria Manual* (see note 5). Substances may not be introduced at concentrations that cause, or can reasonably be expected to cause, either singly or in combination, odor, taste, or other adverse effects on the
(A) Water Supply (iii) aquaculture	Same as (11)(C).
(A) Water Supply (iv) industrial	Concentrations of substances that pose hazards to worker contact may not be present.
(B) Water Recreation (i) contact recreation	The concentration of substances in water may not exceed the criteria shown in Table I of the Alaska Water Quality Criteria Manual (see note 5). The concentration of substances in water may not exceed the numeric criteria for drinking water shown in the *Alaska Water Quality Criteria Manual* (see note 5). Substances may not be introduced at concentrations that cause, or can reasonably be expected to cause, either singly or in combination, odor, taste, or other adverse effects on the use
(B) Water Recreation (ii) secondary recreation	Concentrations of substances that pose hazards to incidental human contact may not be present.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	The concentration of substances in water may not exceed the numeric criteria for aquatic life for fresh water and human health for consumption of aquatic organisms only shown in the Alaska Water Quality *Criteria Manual* (see note 5), or any chronic and acute criteria established in this chapter, for a toxic pollutant of concern to protect sensitive and biologically important life stages of resident species of this state. There may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, adverse effects on aquatic life or produce undesirable or nuisance aquatic life, except as authorized by this chapter. Substances may not be present in concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms, as determined by either bioassay or organoleptic tests.
(12) TURBIDITY, FOR FRESH WATER USES (criteria are not applicable to groundwater)	
(A) Water Supply (i) drinking, culinary, and food processing	May not exceed 5 nephelometric turbidity units (NTU) above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 25 NTU.
(A) Water Supply (ii) agriculture, including irrigation and stock watering	May not cause detrimental effects on indicated use.
(A) Water Supply (iii) aquaculture	May not exceed 25 NTU above natural conditions. For Tall lake waters, may not exceed 5 NTU above natural conditions.
(A) Water Supply (iv) industrial	May not cause detrimental effects on established water supply treatment levels.
(B) Water Recreation (i) contact recreation	May not exceed 5 NTU above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 15 NTU. May not exceed 5 NTU above natural turbidity for all lake waters.

Water Quality Standards for Designated Uses ADEC Water Quality Standards (18 AAC 70), amended as of April 8, 2012	
POLLUTANT & WATER USE	**CRITERIA**
(B) Water Recreation (ii) secondary recreation	May not exceed 10 NTU above natural conditions when natural turbidity is 50 NTU or less, and may not have more than 20% increase in turbidity when the natural turbidity is greater than 50 NTU, not to exceed a maximum increase of 15 NTU. For all lake waters, turbidity may not exceed 5 NTU above natural turbidity.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (12)(A)(iii).

Appendix C. Maps

The list of maps below provides links to 11 x 17 inch PDF versions of the maps. Additionally further down in this Appendix, smaller versions of the same maps are displayed.

These maps are for illustrative purposes only. Land status is based on a generalized land status accurate only to the nearest square mile. Some details may be not be visible due to the scale of the map.

Map C.1. **Fairbanks Subunit of the Central Yukon Planning Area**

Map C.2. **Middle Yukon Subunit of the Central Yukon Planning Area**

Map C.3. **Utility Corridor Subunit of the Central Yukon Planning Area**

Map C.4. **Caribou Herd Ranges in the Central Yukon Planning Area**

Map C.5. **Dall Sheep Distribution**

Map C.6. **Game Management Units in the Central Yukon Planning Area**

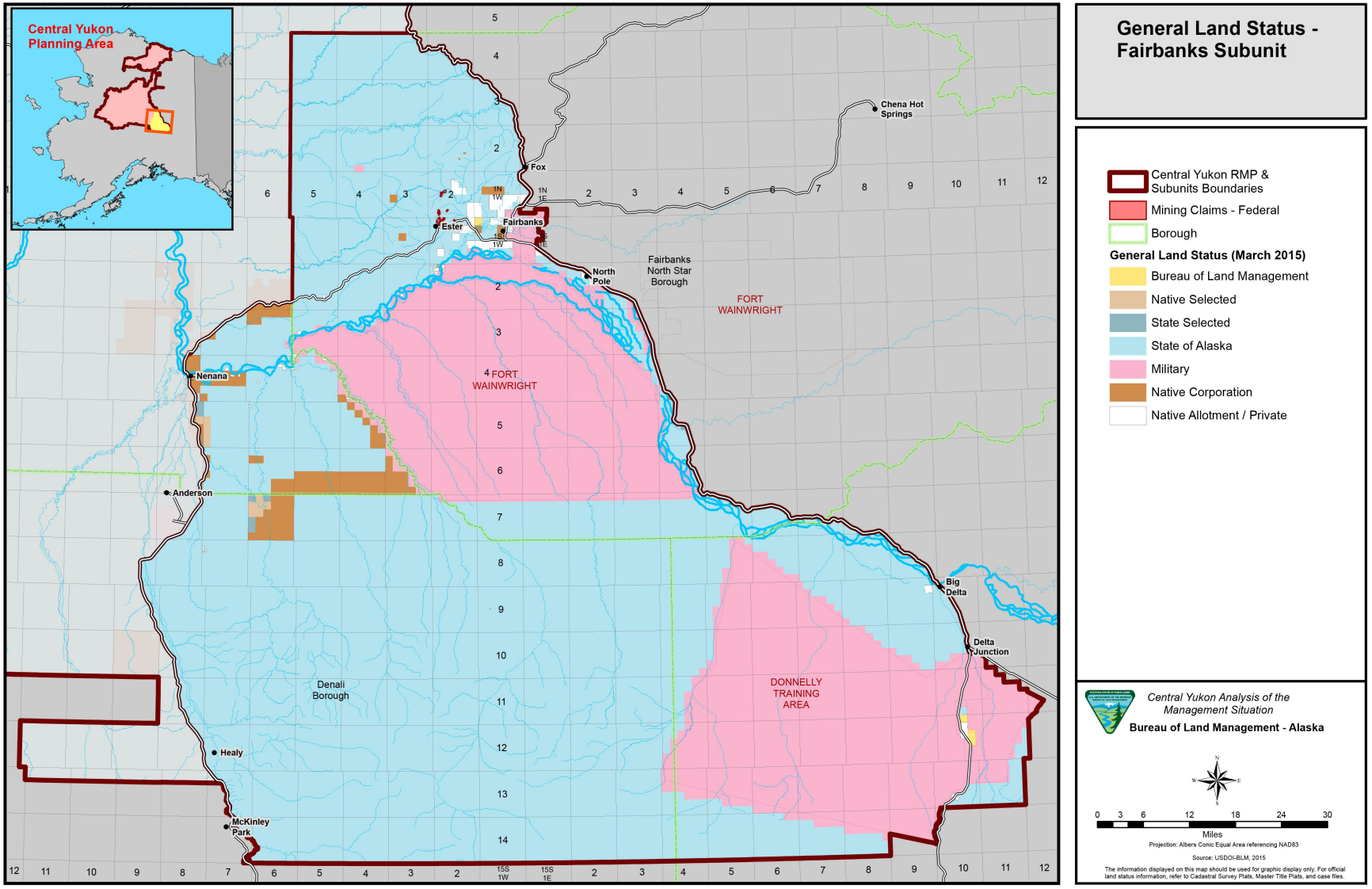

Figure C.1. Fairbanks Subunit of the Central Yukon Planning Area

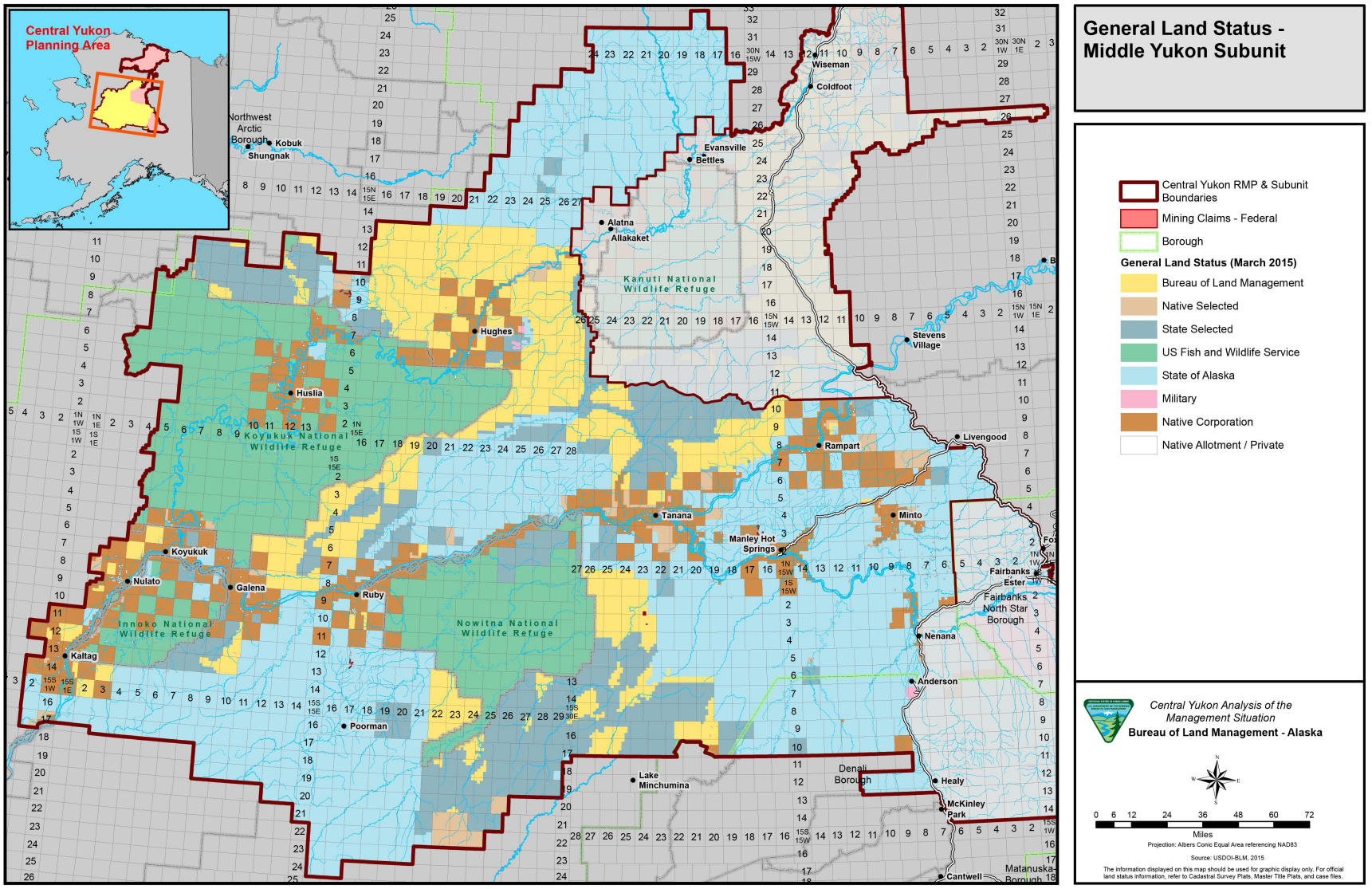

Figure C.2. Middle Yukon Subunit of the Central Yukon Planning Area

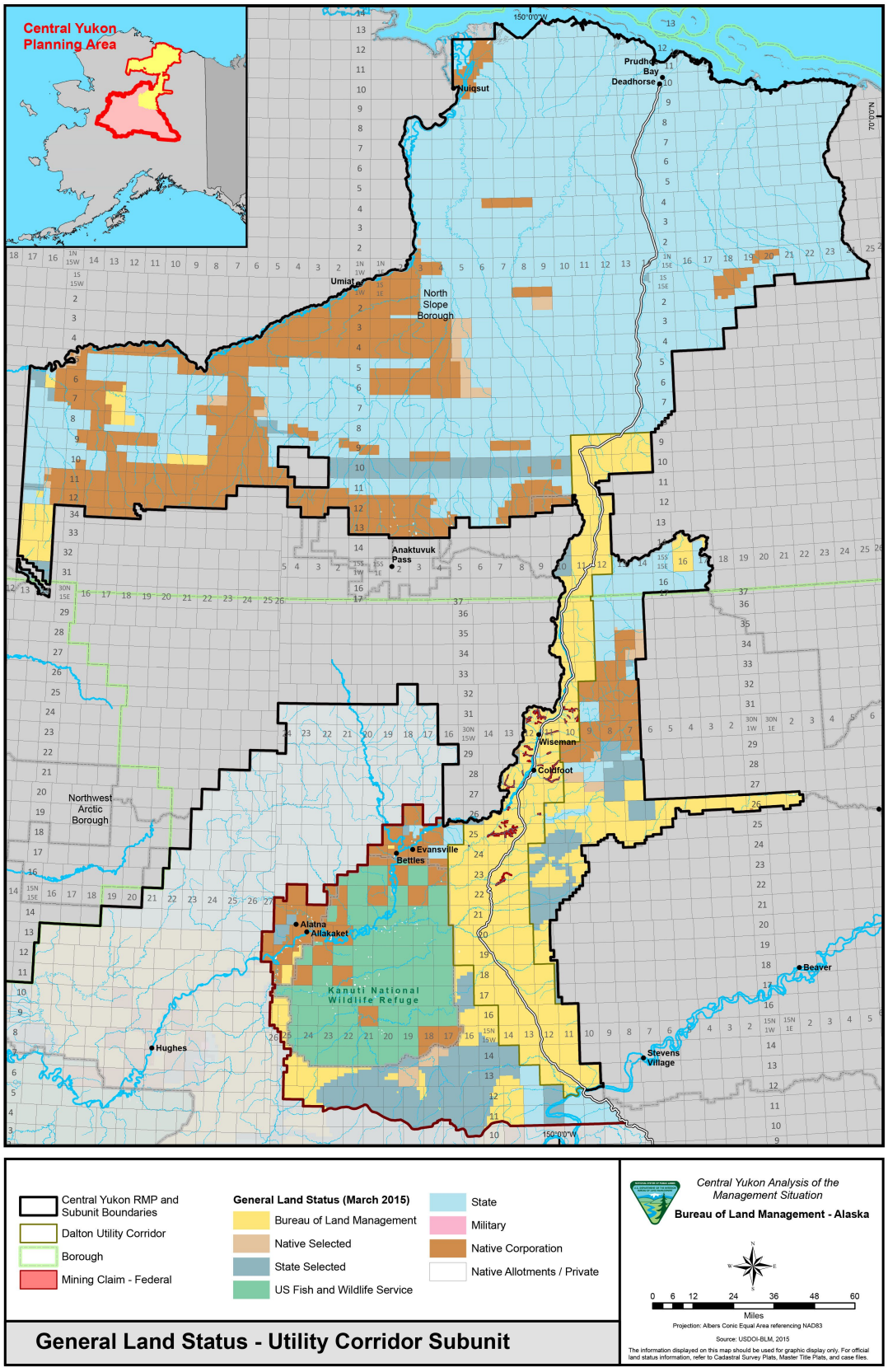

Figure C.3. Utility Corridor Subunit of the Central Yukon Planning Area

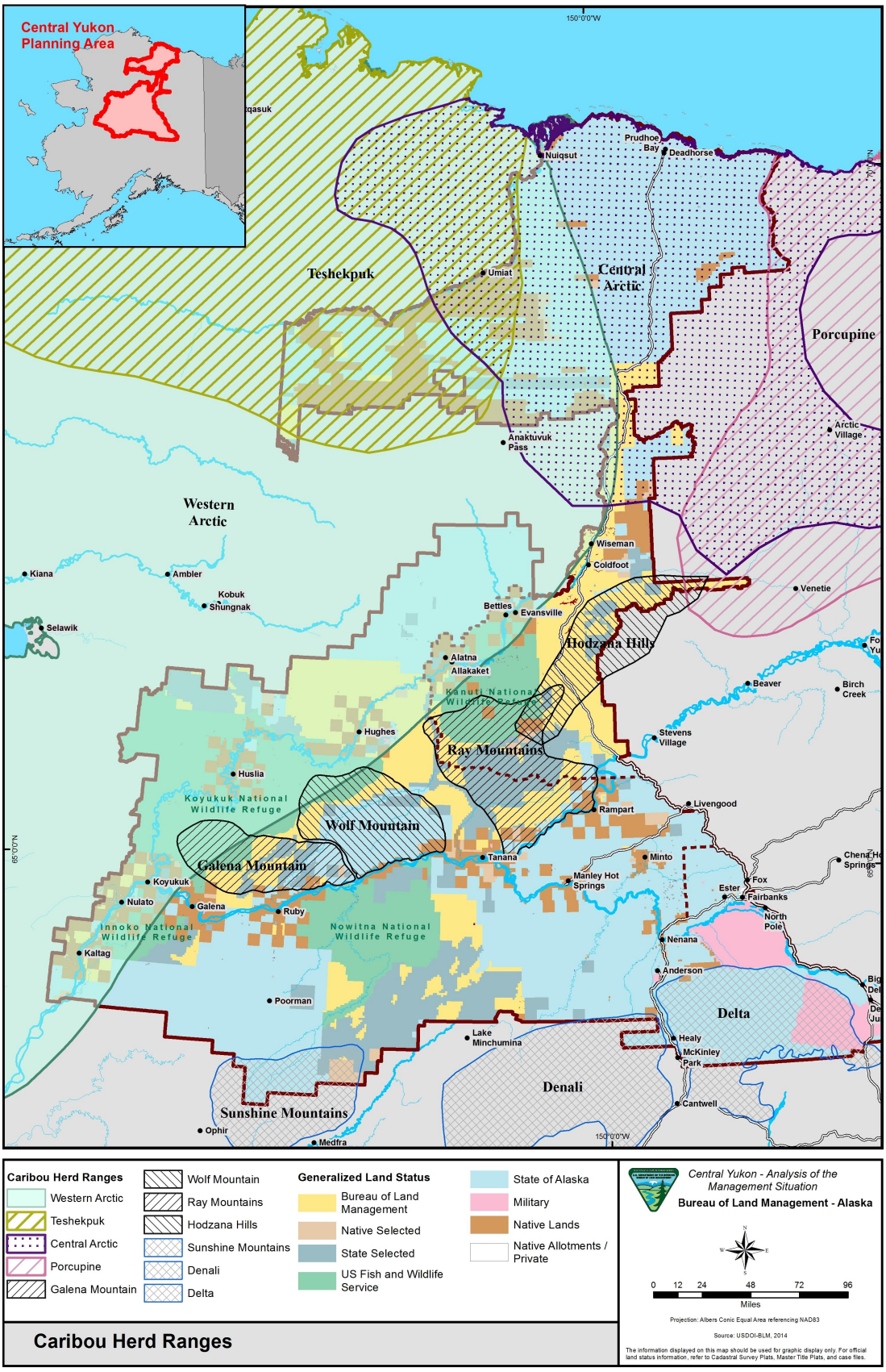

Figure C.4. Caribou Herd Ranges in the Central Yukon Planning Area

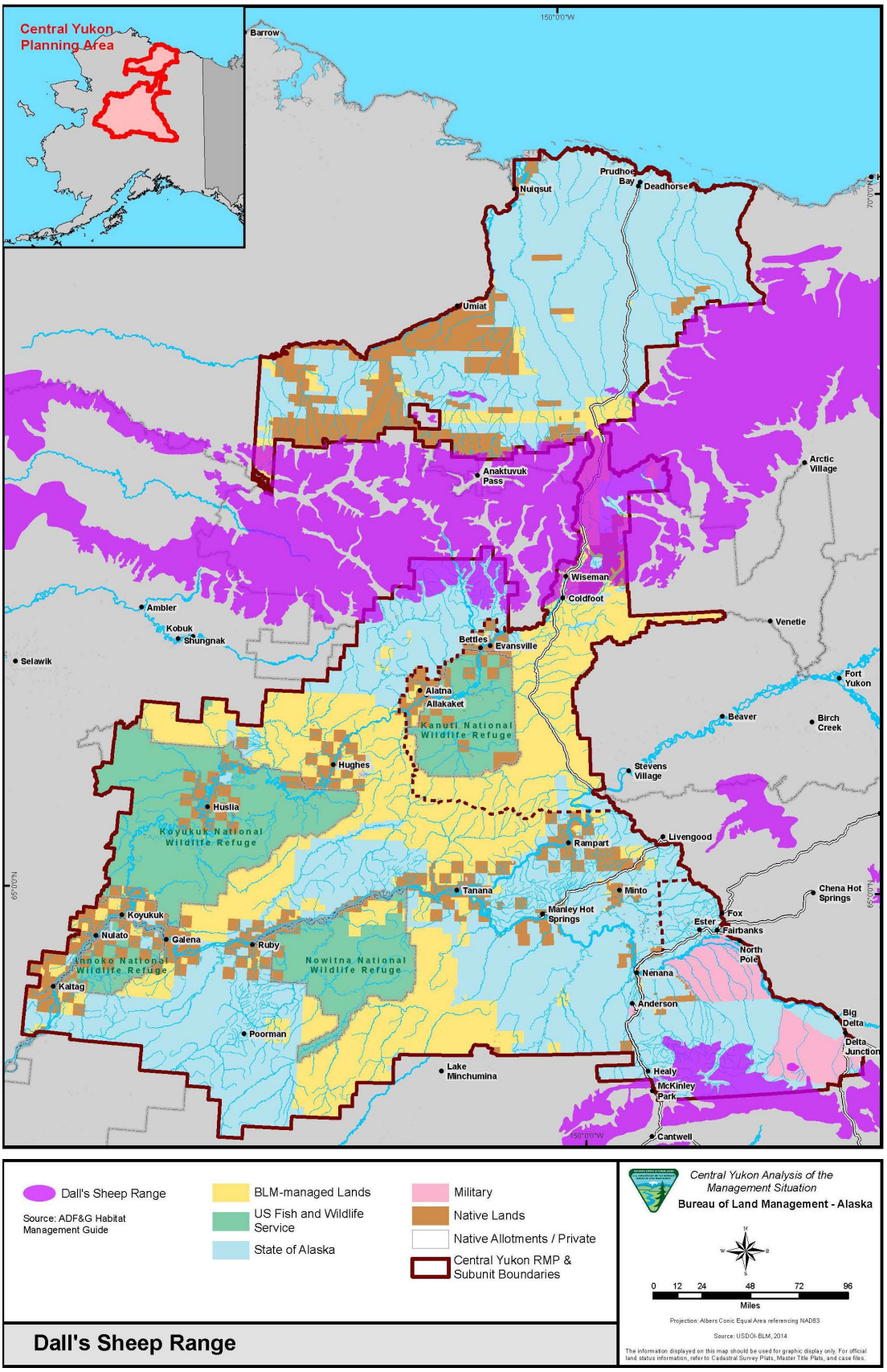

Figure C.5. Dall Sheep Distribution

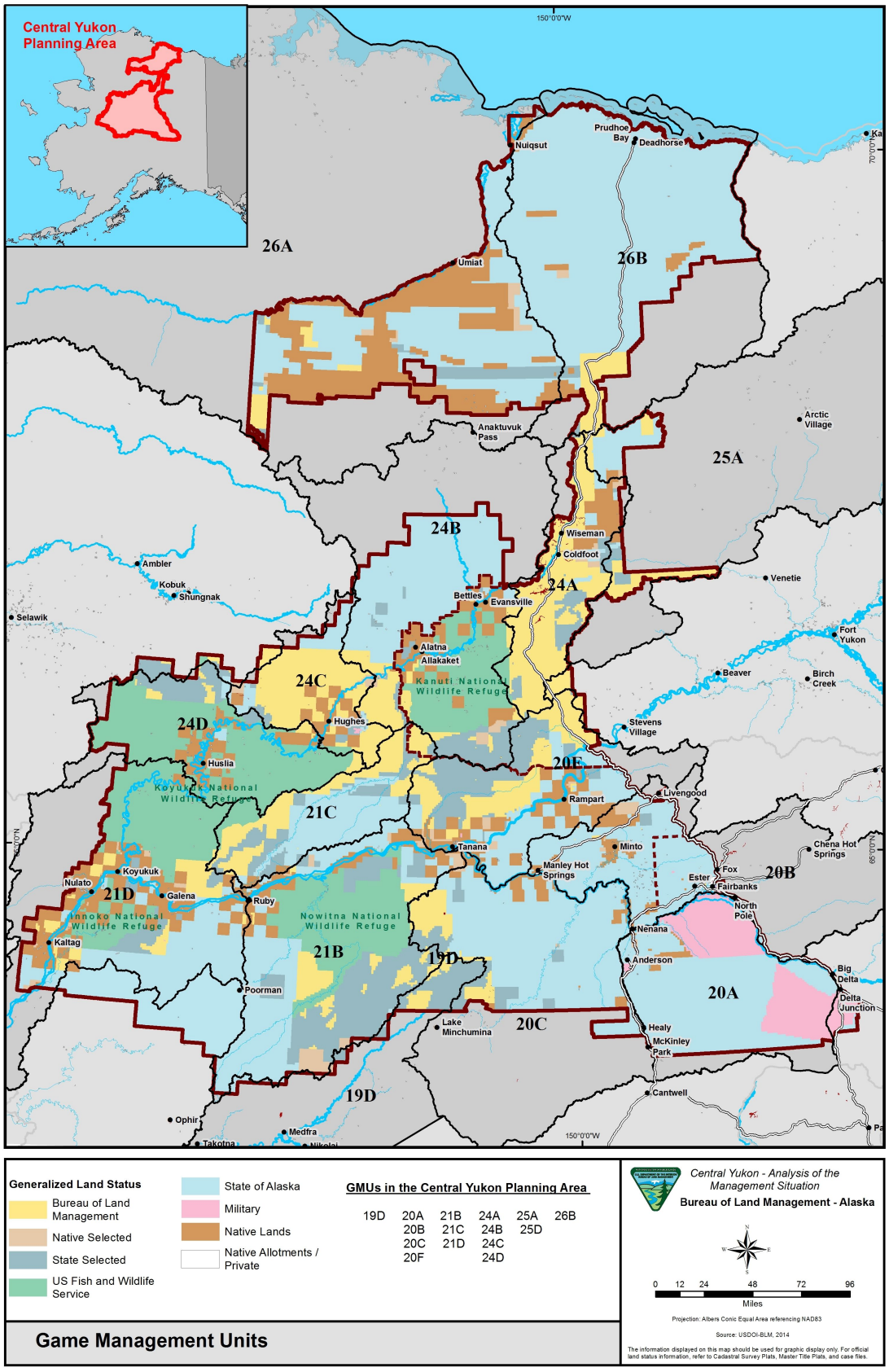

Figure C.6. Game Management Units in the Central Yukon Planning Area