valuable, these resources also provide essential aesthetic, recreational, and socioeconomic benefits to society. The analysis focuses on plant and animal species and vegetation types that are important to the functioning of local ecosystems, are of special societal importance (e.g., as subsistence or game species), or are protected under Federal or state law.

B.8.2 Regulatory Setting

The Endangered Species Act. The Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531–1544, as amended) established measures for the protection of plant and animal species that are Federally listed as threatened and endangered, and for the conservation of habitats that are critical to the continued existence of those species. Federal agencies must evaluate the effects of their proposed actions through a set of defined procedures, which can include the preparation of a Biological Assessment (BA) with formal consultation with the USFWS and/or the National Marine Fisheries Service (NMFS) under Section 7 of the ESA. The USFWS has primary management responsibility for terrestrial and freshwater species, while the NMFS has primary responsibility for marine species and anadromous fish species (species that migrate from saltwater to freshwater to spawn).

Compliance with the ESA requires communication and consultation with the USFWS and/or NMFS in cases where a Federal action could affect listed threatened or endangered species, species proposed for listing, or candidates for listing. The primary focus of this consultation is to ensure that proposed actions are not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of a critical habitat. If any listed or proposed species are present, a determination of the potential effects on the species is made through the EIS process. Potential effects would be further analyzed by the preparation of a BA. Should no species protected by the ESA be potentially affected by the proposed action, no additional action would be required.

The Marine Mammal Protection Act. Proposed activities that occur in coastal and open water areas may also be affected by the Marine Mammal Protection Act (MMPA) of 1972 (16 U.S.C. 1361 et seq.), as amended through 1997. The MMPA established a Federal responsibility to conserve marine mammals and associated essential habitats in U.S. waters, by placing, with limited exceptions including for military readiness activities, a moratorium on the "taking" of marine mammals in waters or on lands under U.S. jurisdiction. Management of the MMPA is vested in the U.S. Department of Commerce (NMFS, also known as National Oceanic and Atmospheric Administration (NOAA) Fisheries) for cetaceans (whales and dolphins) and for pinnipeds (seals and sea lions) other than walrus. The DOI agency USFWS is responsible for all other marine mammals, including sea otter, walrus, polar bear, dugong, and manatee. The MMPA generally assigns identical responsibilities to the Secretaries of the two Departments.

The Migratory Bird Treaty Act. The Migratory Bird Treaty Act (MBTA) governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. The take of all migratory birds is governed by the MBTA's regulation that affects educational, scientific, and recreational purposes, and accordingly limits the harvest to levels that prevent overuse. The MBTA also prohibits the export, selling, purchase, barter, or offering for sale, purchase, or barter of any migratory bird, its eggs, parts, and nests, except as authorized under a valid permit (50 CFR 21.11).

The Bald and Golden Eagle Protection Act. The Bald and Golden Eagle Protection Act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald or golden eagles. "Taking" is described to include their parts, nests, or eggs, molesting, or disturbing the birds. In addition to direct actions on the birds, the Act also covers disturbance that may result from human-induced changes to the traditional nest sites as such changes may interfere or interrupt their normal behavior and cause them to abandon their nests (16 U.S.C. 668-668d).

EO 13186. *Responsibilities of Federal Agencies to Protect Migratory Birds*, outlines the responsibilities of Federal agencies to protect migratory birds, in accordance with the MBTA, the Bald and Golden Eagle Protection Acts, the Fish and Wildlife Coordination Act, ESA, and NEPA. This order accomplishes the following:

- Specifies the USFWS as the lead for coordinating and implementing EO 13186
- Requires Federal agencies to incorporate migratory bird protection measures into their activities
- Requires Federal agencies to obtain permits from USFWS before any "take" occurs, even when the agency's intent is not to kill or injure migratory birds

The Clean Water Act. The CWA and the EPA Storm Water General Permit regulate pollutant discharges. Section 404 of the CWA and EO 11990, Protection of Wetlands, regulate development activities in or near streams or wetlands. Potential development actions that may affect streams and/or wetlands (e.g., road construction) require notification of the USACE and authorization for dredging and filling in wetlands under a nationwide or regional permit.

The Sikes Act. The Sikes Act (16 U.S.C. 670a) applies to Federal land under DoD control and, among other things, requires military services to establish INRMPs to conserve natural resources on military installations. The INRMPs include inventories and evaluations of threatened and endangered species, other fish and wildlife resources, wetlands, migratory bird habitat, and forest lands on each installation. INRMPs include an assessment of impacts of military activities on natural resources and describe means to mitigate these impacts. The Fish and Wildlife Cooperative Plan is the component of the INRMP that describes how the fish and wildlife resources at an installation will be managed. It is a cooperative agreement between the Sikes Act's required partners: the installation, the USFWS, and the Alaska Department of Fish and Game (ADFG). The plan provides a program for the development, maintenance, and coordination of wildlife, fish, and game conservation (USARAK 2006b). This program includes habitat improvements or modifications, wildlife considerations in all range rehabilitation, control of off-road vehicle traffic, consumptive and nonconsumptive use and protection of fish and wildlife resources, natural resources law enforcement requirements, and designated responsibilities for the control and disposal of feral animals.

Additionally, USARAK Regulation 350-2 (USARAK 2011), *Range Safety*; AR 200-1, *Environmental Protection and Enhancement* (Army 2007b)*;* AR 200-2, *Environmental Effects of Army Actions* (Army 1988); and AR 200-3, *Natural Resources – Land, Forest, and Wildlife Management* (Army 1995), provide procedures for protecting vegetation on lands used by the Army.

B.8.3 General Description of Affected Environment

B.8.3.1 Vegetation and Wildlife

B.8.3.1.1 Ecoregions

Ecoregions, as developed by Nowacki et al. (2001), provide a way to describe broad-scale characteristics of terrestrial environments. Ecoregions in the area potentially affected by the proposed actions (shown in Figure B-11) reflect the relationships between abiotic conditions (e.g., radiant energy, moisture, nutrients, disturbance) in a region and the flora and fauna supported by that region (USACE 2003). The area potentially affected by the proposed actions includes portions of 17 ecoregions.

The nine military installations within the area potentially affected by the proposed actions occur almost entirely within three ecoregions, the Yukon-Tanana Uplands, Tanana-Kuskokwim Lowlands, and the Cook Inlet Basin, with a small portion overlapping the Chugach-St. Elias Mountains. Dominant plant species and typical wildlife of these four ecoregions are presented in Figure B-11 and described below.

Table B–15. Ecoregions by Installation in the Areas Potentially Affected by the Proposed Action

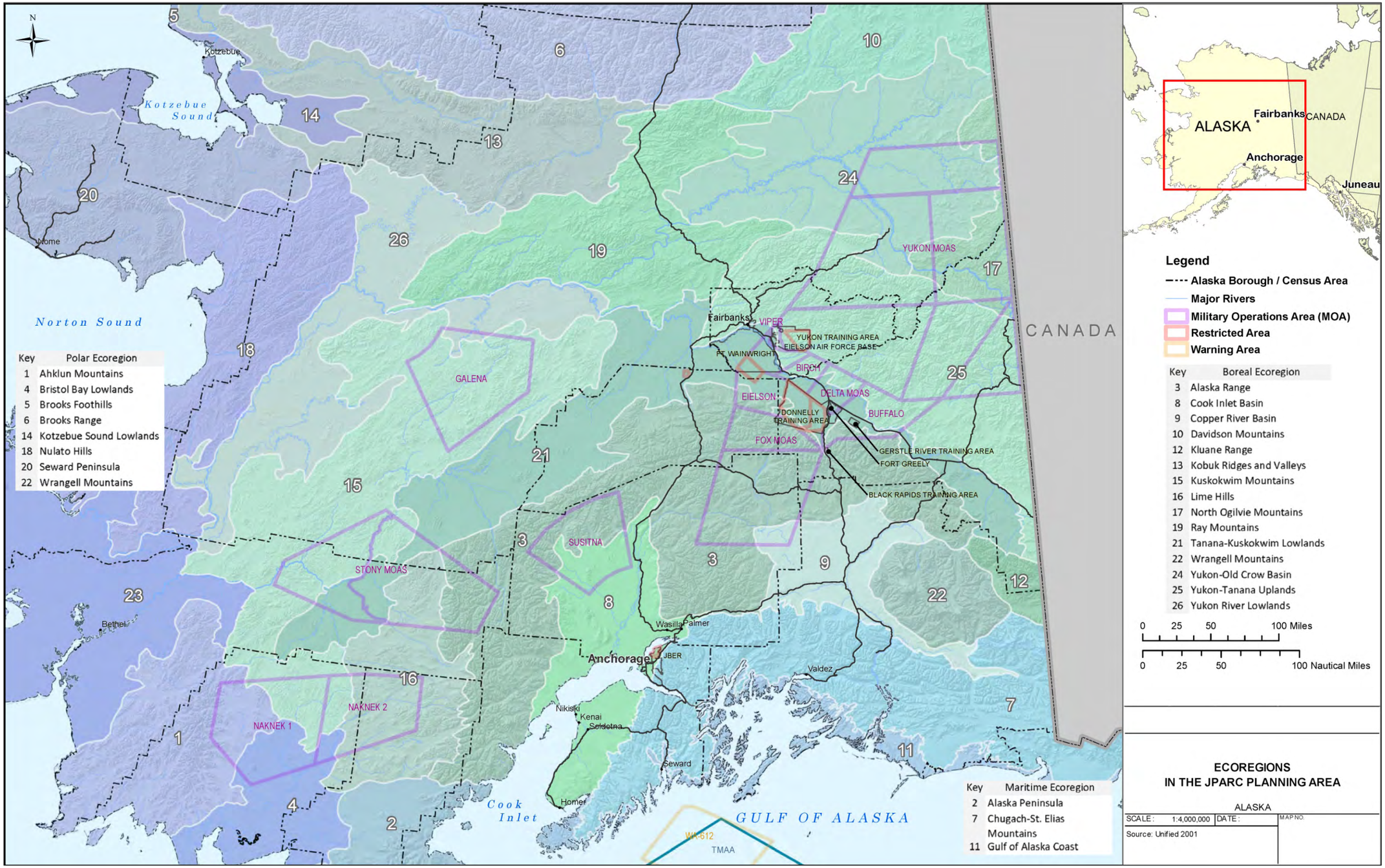
Broad Regional Type	Major Vegetation Community	Ecoregion	Dominant Plant Species or Associations	Typical Wildlife (representative species)	Installations Present
Boreal	Intermontane Boreal	Yukon-Tanana Uplands	White spruce, birch, aspen, black spruce, low shrubby birch, and lichen tundra in higher elevations	Caribou, moose, snowshoe hare, marten, lynx, black bear, brown bear, peregrine falcon, salmon	Eielson AFB, Yukon TA
		Tanana-Kuskokwim Lowlands	Bog, fens, sedges, black spruce, white spruce, balsam poplar, aspen, white birch, alder	Moose, black bear, beaver, porcupine, trumpeter swan, waterfowl	Donnelly TA, Fort Wainwright, Tanana Flats TA, Blair Lakes Range, Gerstle River TA
	Alaska Range Transition	Cook Inlet Basin	Black spruce, white spruce, Sitka spruce, aspen, birch, willow, alder	Trumpeter swan, shorebirds, Dolly Varden, whitefish, moose, black bear, beaver, muskrat	JBER
Maritime	Coastal Rainforests	Chugach-St. Elias Mountains	Alpine communities of sedges, grasses, and low shrubs in high elevations; alder shrublands and mixed forests in lower elevations	Dall sheep, hoary marmot, pika, ptarmigan, moose, brown bear, black bear, beluga whales	JBER TMAA

Key: AFB=Air Force Base; TA=training area; JBER=Joint Base Elmendorf-Richardson; TMAA=Temporary Maritime Activities Area.

Source: Nowacki et al. 2001.

Scientific names will be provided at first use, according to the USDA PLANTS database for plant species and Integrated Taxonomic Information System (ITIS) website for animals.

Yukon-Tanana Uplands. The broad, rounded mountains of moderate height within the Yukon-Tanana Uplands are affected by a strongly continental climate, with warm summers and very cold winters (Nowacki et al. 2001). Vegetation is dominated by white spruce (*Picea glauca*), birch (*Betula* spp.), and aspen (*Populus tremuloides*) on south-facing slopes; black spruce (*Picea mariana*) 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 (*Populus balsamifera*), alder (*Alnus* spp.), and willows (*Salix* spp.). Above the treeline, low shrubby birch and lichen tundra dominate. This area has the highest incidence of lightning strikes in Alaska and the Yukon Territory, causing frequent forest fires. Caribou (*Rangifera tarandus*), moose (*Alces alces*), snowshoe hare (*Lepus americanus*), marten (*Martes americana*), lynx (*Lynx canadensis*), black bear (*Ulnus americanus*), and brown bear (*U. arctos*) are plentiful. The area's abundant cliffs provide important habitat for peregrine falcons. The clear headwater streams are important spawning areas for three salmon species: Chinook (*Oncorhynchus tshawytscha*), chum (*O. keta*), and coho (*O. kisutch*).



Key	Polar Ecoregion
1	Ahklun Mountains
4	Bristol Bay Lowlands
5	Brooks Foothills
6	Brooks Range
14	Kotzebue Sound Lowlands
18	Nulato Hills
20	Seward Peninsula
22	Wrangell Mountains

Key	Boreal Ecoregion
3	Alaska Range
8	Cook Inlet Basin
9	Copper River Basin
10	Davidson Mountains
12	Kluane Range
13	Kobuk Ridges and Valleys
15	Kuskokwim Mountains
16	Lime Hills
17	North Ogilvie Mountains
19	Ray Mountains
21	Tanana-Kuskokwim Lowlands
22	Wrangell Mountains
24	Yukon-Old Crow Basin
25	Yukon-Tanana Uplands
26	Yukon River Lowlands

Key	Maritime Ecoregion
2	Alaska Peninsula
7	Chugach-St. Elias Mountains
11	Gulf of Alaska Coast

Figure B-11. Ecoregions in Central Alaska

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Tanana-Kuskokwim Lowlands. The Tanana-Kuskokwim Lowlands is an alluvial plain that slopes gently northward from the Alaska Range (Nowacki et al. 2001). 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. Bogs and fens caused by retreating permafrost are frequent and may be expected to increase in number and size with continuing climate warming (Nowacki et al. 2001). Streams flowing across these lowlands ultimately drain into one of two large river systems, the Tanana or Kuskokwim. Boreal forests dominate the landscape, with black spruce in bogs; white spruce and balsam poplar along rivers; and white spruce, white birch, and aspen on south-facing slopes. The coldest, wettest areas on permafrost flats support birch, heath shrubs, and sedge tussocks. Tall willow, birch, and alder communities are scattered throughout. The mosaic of wet habitats is ideal for moose, black bear, beaver (*Castor canadensis*), porcupine (*Erethizon dorsatus*), trumpeter swan (*Cygnus buccinator*), and numerous other waterfowl.

Cook Inlet Basin. This gently sloping lowland contains numerous lakes, ponds, and wetlands that attract large numbers of waterfowl (including trumpeter swans) and shorebirds (Nowacki et al. 2001). Several river systems support recovering salmon runs and the bears, bald eagles (*Haliaeetus leucocephalus*) and ravens (*Corvus corax*) that prey on them. A mix of maritime and continental climates prevails, with moderate fluctuations of seasonal temperature and abundant precipitation. This climate, coupled with the flat to gently sloping organic soils, supports black spruce forests and woodlands along with heath shrubs in open bogs. Mixed forests of white and Sitka spruce (*Picea sitchensis*), aspen, and birch grow on better-drained sites and grade into tall shrub communities of willow and alder on slopes along the periphery of the basin. A mixture of wetland habitats supports numerous moose, black bears, beavers, and muskrats (*Ondatra zibethicus*).

Chugach-St. Elias Mountains. This ecoregion consists of the largest collection of icefields and glaciers found on the globe outside the polar regions (Nowacki et al. 2001). This mountainous region intercepts an abundance of maritime moisture, mainly in the form of snow. In the summer, glacial meltwaters join vast amounts of water draining onto coastal flats. Some glaciers run all the way to tidewater. The sheer height of these mountains, together with their expansive icefields, serves to isolate the wildlife species that occur in the interior, with the only connective corridors along the Alsek and Copper River corridors. Alpine vegetation communities of sedges, grasses, and low shrubs support high-elevation species such as Dall sheep, mountain goats (*Oreamnos americanus*), hoary marmots (*Marmota caligata*), pikas (*Ochotona princeps*), and ptarmigans (*Lagopus* spp.). Where glaciers and icefields have receded, broad U-shaped valleys occur, many with sinuous lakes. Alder shrublands and mixed forests grow on lower slopes and valley floors where moose and brown and black bear forage.

Copper River Basin. This mountain basin lies within the former bed of Glacial Lake Ahtna on fine-textured lacustrine deposits ringed by coarse glacial tills. The basin is a large wetland complex underlain by thin to moderately thick permafrost and pockmarked with thaw lakes and ponds. A mix of low shrubs and boreal black spruce forests and woodlands grows in the wet organic soils (Nowacki et al. 2001). The extensive boreal forests in the project region are prone to wildfire, the potential extent of which is increased with direct and indirect effects of global warming and fuel buildup (Chapin et al. 2008). The forests are adapted to and require recurring fire, however, caribou tend to avoid winter habitat burned in the last 50–60 years because of a lack of adequate lichen abundance due to the slow pace of lichen regeneration after fire (Rupp et al. 2006) compared to regeneration of other boreal forest vegetation. Cottonwood, willow, and alder line rivers and streams as they braid or meander across the basin. Spring floods are common along drainages. Arctic grayling, burbot, and anadromous sockeye salmon are common fishes. Black and brown bears, caribou, wolverines, and ruffed grouse are present throughout these wetland habitats. The climate is strongly continental, with steep seasonal temperature variation. The basin acts as a cold-air sink, and winter temperatures can be bitterly cold.

B.8.3.1.2 Wildlife

Extraordinary in abundance and diversity, the vast numbers of wildlife species that occur in interior Alaska are some of the most important natural resources in the state. Most of the common large mammal species listed above by ecoregion (moose, brown and black bear, caribou, lynx) are considered big game and are hunted and/or trapped in Alaska, providing a source of recreation, subsistence, and substantial economic value for the state. Wildlife habitats sensitive to disturbance that occur within the areas potentially affected by the proposed actions are discussed below and in more detail in Chapter 3 under specific alternatives.

Mammals. Medium-size to small mammals found throughout interior Alaska include red fox (*Vulpes vulpes*), snowshoe hare, marten, red squirrel (*Tamiasciurus hudsonicus*), beaver, muskrat, mink (*Neovison [=Mustela] vison*), bats, such as little brown bat (*Myotis lucifugus*), and various voles and mice. Many of these animals are also hunted or trapped recreationally and for subsistence, and they too represent a significant economic resource. Subsistence hunting is described in more detail in Section B.13.

Bird Species. Common upland bird species that occur in interior Alaska year-round include spruce grouse (*Falcipennis canadensis*), ruffed grouse (*Bonasa umbellus*), and ptarmigan. Common breeding birds in the region that are present in spring and summer include alder flycatcher (*Empidonax alnorum*), chickadee (*Poecile* spp.), gray jay (*Perisoreus canadensis*), Swainson's thrush (*Catharus ustulatus*), myrtle warbler (*Dendroica coronata*), and slate-colored junco (*Junco hyemalis*). Olive sided flycatcher (*Contopus cooperi*), rusty blackbird (*Euphagus carolinus*), and blackpoll warbler (*Dendroica striata*) are common within JPARC training areas and are considered "sensitive" by DoD Partners in Flight. Summer resident raptors in interior Alaska include northern goshawk (*Accipiter gentilis*), sharp-shinned hawk (*A. striatus*), great horned owl (*Bubo virginianus*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), bald eagle, and American kestrel (*Falco sparverius*). These birds of prey primarily hunt the small mammals, rodents, and smaller birds of the region. Bald eagles feed on waterfowl, carrion, and fish as well. (Figure B-12 depicts the known eagle nests in the ROI.) Raptor populations in Alaska fluctuate annually in response to prey abundance and other environmental factors.

Fish and Aquatic Resources. At least five salmon species plus other sought-after game fish (e.g. Arctic char [*Salvelinus alpinus*], grayling [*Thymallus arcticus*], northern pike [*Esox lucius*], rainbow trout [*Oncorhynchus mykiss*], and Dolly Varden [*Salvelinus malma*]) breed within the many rivers and creeks that occur in the area potentially affected by the project. Fish resources are important as a wildlife food source as well as for human recreation and consumption. The aquatic resources available in the region are vital for the millions of migratory waterfowl of various species that use the wetlands for resting, stopover feeding, and to breed within the area potentially affected by the project. Waterfowl, in turn, are important to recreational and subsistence hunters.

Wildlife Travel Routes. Wildlife travel routes or corridors serve as important connections between habitats, their usage varying from daily movements of animals following the availability of food sources and cover to seasonal migration patterns across vast regions. Wildlife corridors can provide access to resources or habitat necessary for life stages such as breeding, the bearing of young, wintering, or hibernation. Wildlife movements along typical corridors usually fall into one of three categories: (1) dispersal (i.e., juvenile animals moving from natal areas or individuals extending their range); (2) seasonal migration, which can include searching for mates, breeding areas, and shelters for hibernation; and (3) local movements related to home range activities (foraging for food or water, defending territories, or locating cover). The data available on the project area includes routes used by caribou to migrate to and from seasonal ranges, as depicted in Figure B-13. Adverse impacts on wildlife travel routes can often be avoided by seasonally restricting when people and/or vehicles are in those areas. Also, the siting of new construction should avoid cutting off or blocking wildlife travel routes.

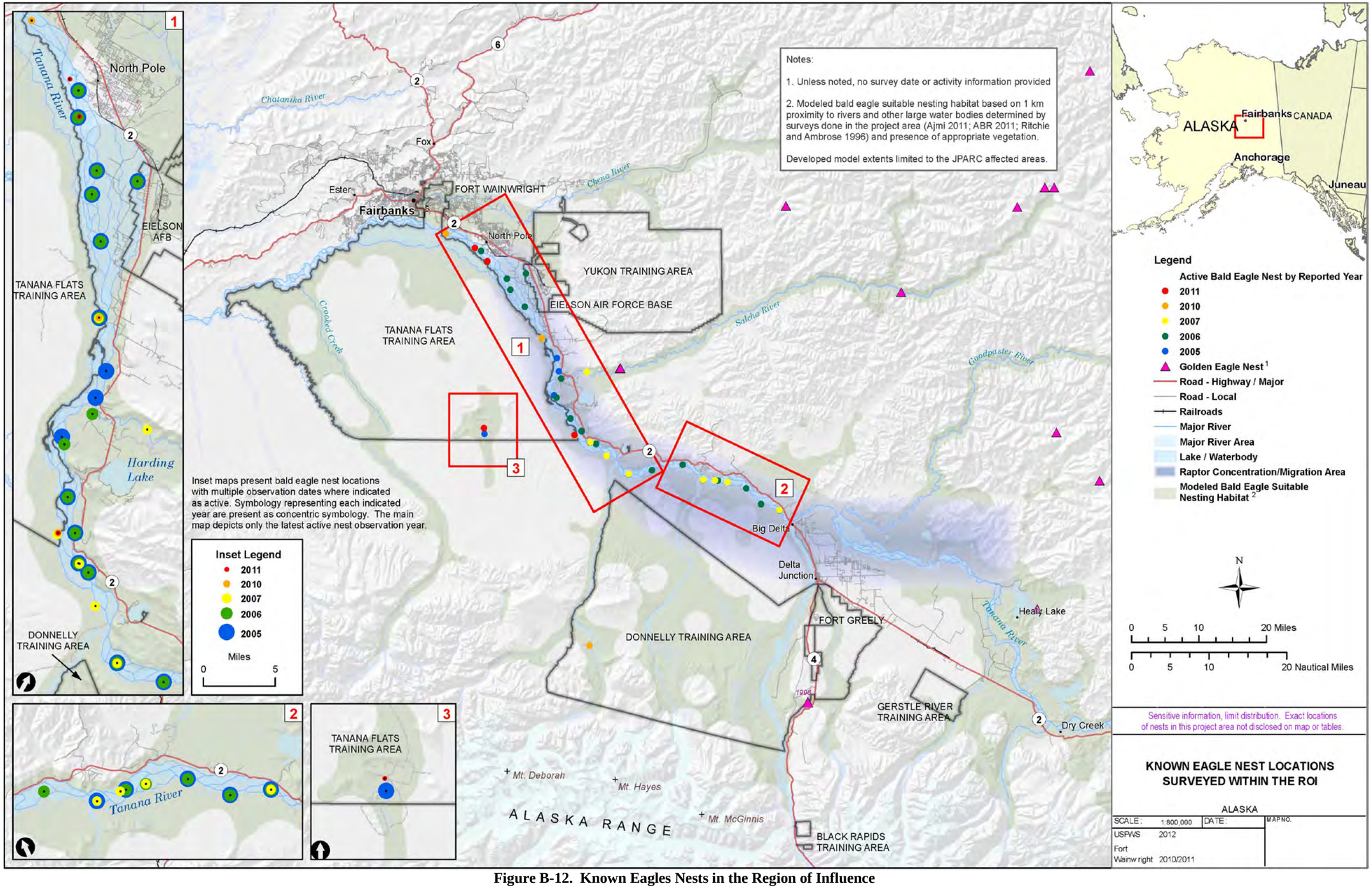

Figure B-12. Known Eagles Nests in the Region of Influence

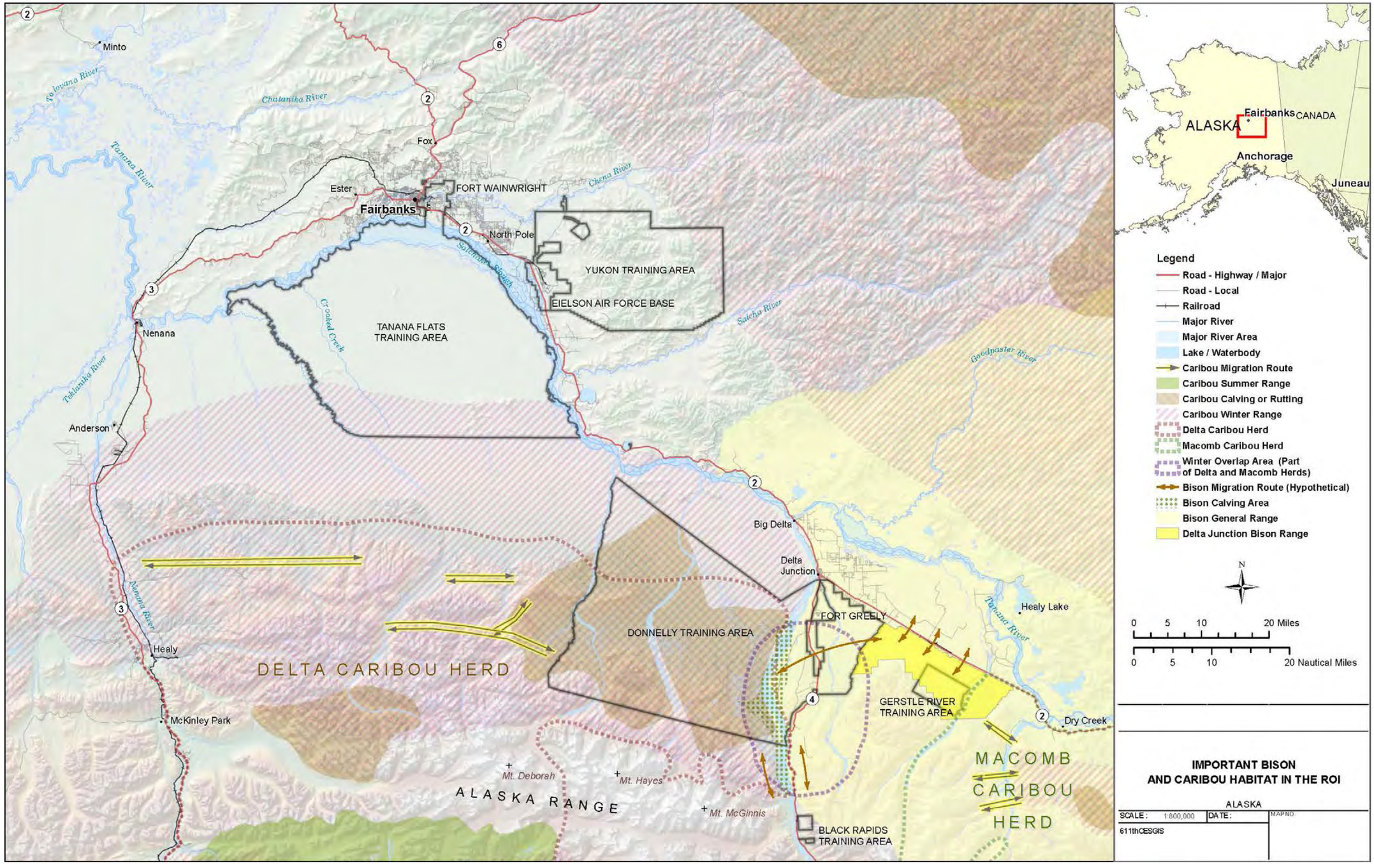

Figure B-13. Important Bison and Caribou Habitat in the ROI

Migratory Birds. Migratory bird flyways refer to established migration routes that avian species use year after year to travel between nesting and wintering areas across the United States and into adjacent countries. The continuing survival of many species is dependent upon the maintenance of access to these flyways to reach summer and winter habitats. Ensuring such access has been the object of international agreements/treaties such as the MBTA. Figure B-14 depicts the Pacific Flyway as it extends over the western Arctic, including Alaska and the Aleutian Islands and blends into the Rocky Mountain and Pacific Coast regions of Canada, the United States, and Mexico, south to where it becomes combined with other flyways in Central and South America (birdnature.com 2011). The coastal route that may be the best defined Arctic route in North America allows the passage of gulls, ducks, and other water birds across the Alaska Peninsula and the Gulf of Alaska paralleling the coastline of British Columbia, Washington, Oregon, and California. The vast delta region of the Yukon River in Alaska, a breeding ground for many species of waterfowl, marks the northern terminus for some of those birds that use the coastal route for most of their migratory flights. The longest and most important route of the Pacific Flyway is that originating in northeastern Alaska and passing for most of its length through the interior before heading south across Canada (birdnature.com 2011). Most of the waterfowl that travel along this route (e.g., ducks, geese, swans, sandhill cranes) nest in the Alaska interior. Known migration routes for waterfowl species present in the area potentially affected by the proposed actions as well as some known sensitive areas used for nesting are depicted in Figure B-15. Most military and other aviation agencies are aware of these flyways and already take precautions to avoid sensitive areas during the spring and fall migration periods.

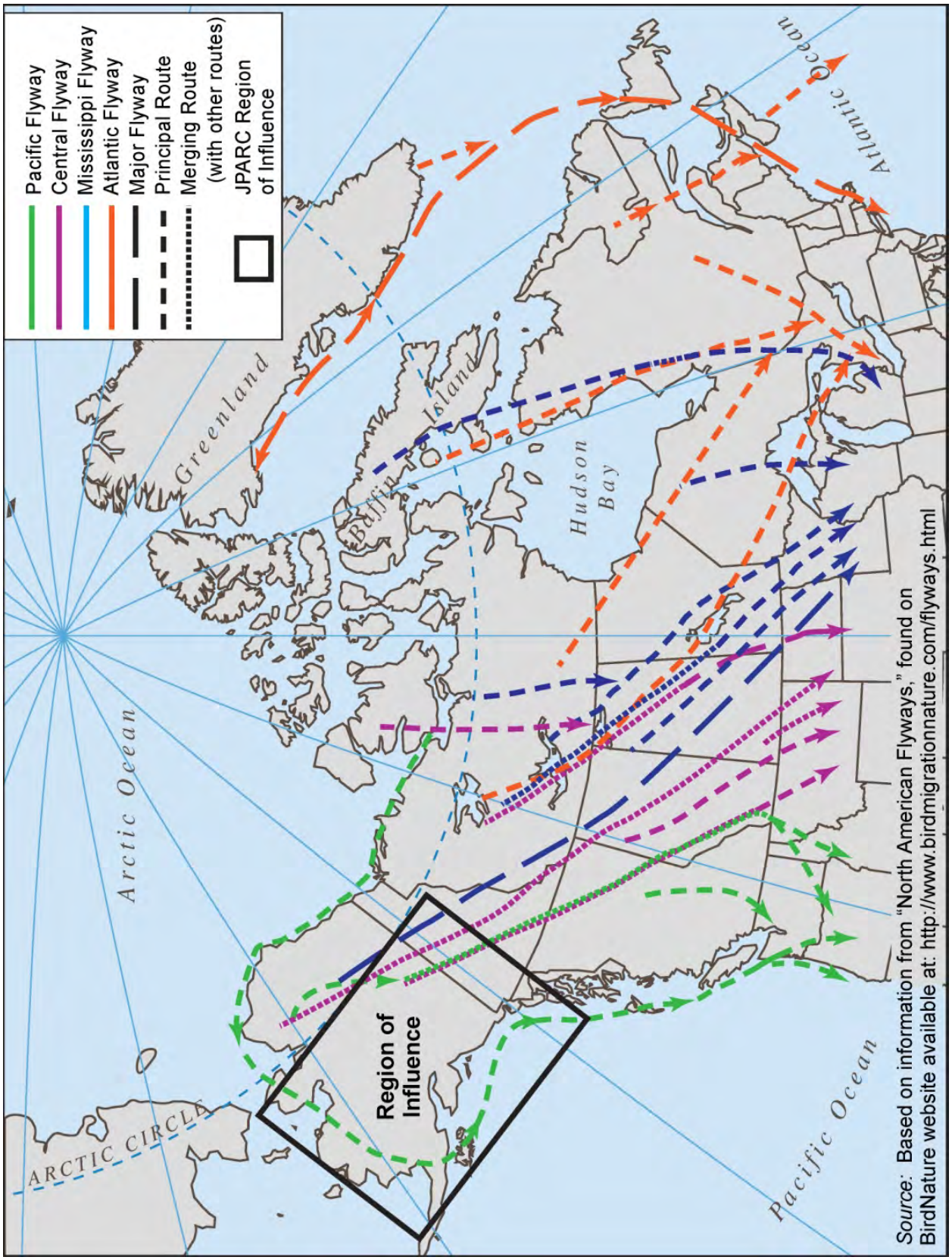

Figure B-14. Major Migratory Bird Flyways Affecting the JPARC Region

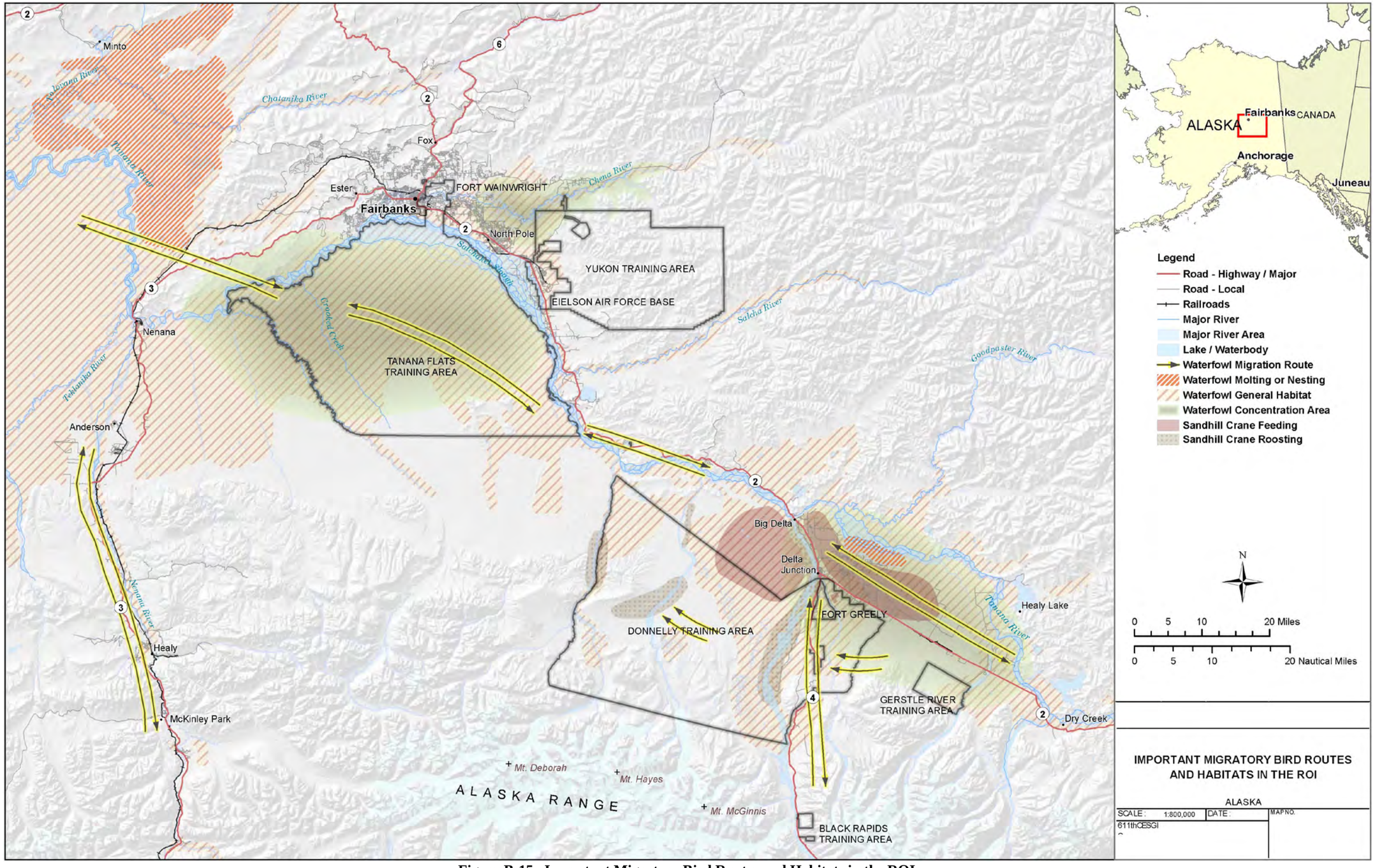

Figure B-15. Important Migratory Bird Routes and Habitats in the ROI

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B.8.3.2 Other Sensitive Habitats and Protected Species

Sensitive habitats are vulnerable to disturbance from various sources including humans, aircraft, watercraft and land vehicles, training activities, and construction activity. Sensitive wildlife habitats include those areas required to complete a portion of a species' life stage such as rutting, breeding, or special seasonal foraging (winter or spring), as well as parturition areas such as those used for lambing, calving, and nesting. Wildlife using these areas may be more alert and responsive to disturbances, and therefore may be vulnerable to adverse impacts on fitness or reproductive success. Larger, more general sensitive areas for wildlife include travel routes, migratory flyways, wetland areas, open water, and rivers. The known sensitive habitats and migration routes used by common terrestrial big game wildlife species that were available for project mapping are presented in Figure B-13 and Figure B-16. The presence of sensitive habitats or species may constrain expansion of military activities in specific areas. Sensitive areas near the area potentially affected by the proposed actions will be discussed in detail in Chapter 3.

Special Status Species. ESA- and state-listed sensitive wildlife species occurrence data were requested from the Alaska Natural Heritage Program (ANHP) and results were received March 31, 2010. No Federally listed, proposed, or candidate species are known to be present in the terrestrial areas potentially affected by the proposed actions. Nine birds (all migratory species) and one mammal with state sensitivity rankings were recorded as being present within the area potentially affected by the proposed actions. As for all heritage programs, the data reflect only those observations that have been mapped and reported to the ANHP. The specific observation points are less important to a large-scale project such as this than are the known aggregations of breeding, nesting, and other parturition habitats; seasonal ranges; and migration areas used by both common and sensitive species. Avoiding these sensitive habitat areas would reduce impacts on the largest numbers of species and would minimize safety risks. Known sensitive habitats on a project-level scale will be discussed in detail in Chapter 3.

B.8.3.3 Wetlands and Aquatic Areas

Wetland Areas. Wet areas that occur in the region include wetlands with seasonally persistent shallow open water areas interspersed with wet meadows that support emergent aquatic vegetation (e.g., sedges, grasses). More details are provided in Section B.6, Water and Wetlands. The extensive wetlands across Alaska's interior, in particular water bodies with stable water levels, are used in spring and fall by waterfowl and shorebirds for resting, feeding, breeding, and nesting. Migratory bird species expected to use wet areas in the area potentially affected by the proposed actions include a variety of waterfowl such as geese, ducks, loons, grebes, and scoters. In general, wet areas are avoided for new construction due to poor soil stability. Training may be able to take place on wet areas that are frozen from fall through winter, which would also reduce most adverse wildlife effects. Areas where waterfowl congregate during spring and fall pose seasonal safety hazards for low-altitude aircraft operations and are also generally avoided.

Permafrost

Permafrost is important to Arctic life and includes the soil layers that have remained at or colder than 0 degrees Celsius for at least two consecutive years. Precipitation is minimal in much of the area potentially affected by the proposed actions and tends to accumulate on the soil surface because it cannot penetrate into the frozen permafrost. During summer months a thin layer of soil closest to the surface can thaw, and the resulting water along with water from precipitation cannot percolate into the frozen layer beneath. This causes large portions of the Arctic landscape to be water-saturated throughout the summer months. This saturated soil provides habitat for plants, animals, and insects that rely on the abundant water source as well as the rich organic matter that occur there. Additionally, by slowing downward water movement and causing saturated conditions at the surface during the growing season, permafrost can influence the overlying vegetation, resulting in stunted forests of shallow-rooted species such as black spruce, which has some tolerance to saturated conditions in the root zone but also utilizes nutrients located near the surface.

Soil properties of permafrost are discussed in detail in Physical Resources Section B.5. Low-lying areas typically have permafrost near the surface and support stunted black spruce, whereas white spruce-birch forests are found on permafrost-free soils where roots can penetrate deeper. North-facing slopes are also most likely to contain permafrost, illustrating the importance of solar radiation in this region. Vegetation, as well as peat (decomposing vegetation), acts as a protective, insulating layer regulating ground temperature and depth of seasonal thawing for the underlying frozen soil and reducing the sun's rays that the soil receives. Removal or disturbance of vegetation, either by natural processes or by humans, causes thawing of the underlying permafrost. More extensive melting may cause sinkholes and other unstable conditions in permafrost areas.

Open Water and Rivers. The rivers present in the project area are known for supporting abundant species and numbers of fish, which are a valued biological, recreational, and subsistence resource in the region. Native fish found in the waterways potentially affected by the proposed actions include Chinook salmon, chum salmon, coho salmon, burbot, Arctic grayling, northern pike, chub, whitefish (several species), sheefish, rainbow trout, and Arctic char. Many native and exotic fish species, including rainbow trout, Arctic grayling, Arctic char, coho salmon, and Chinook salmon, are stocked by the state into waterways for recreational and subsistence angling purposes. More information on subsistence fishing is available in Section B.13. Fish-spawning locations are sensitive to changes in water quality caused by adjacent soil disturbance and subsequent sediment runoff into streams, which could limit the siting of nearby construction activities.

Maritime/Coastal Areas

Missile Live Fire with AIM-9X and AIM-120 is the only JPARC proposed action that would occur over the Gulf of Alaska (GOA) within the TMAA and warning area. The GOA is a highly productive region for a large variety of marine fish and shellfish populations and supports some of the most productive fisheries in the United States. In the GOA, most of the fishery resources are found along the broad continental shelf ecosystem (Navy 2011). Important marine fish species include salmonids (Chinook, coho, chum, pink, and sockeye salmon, and steelhead), Pacific halibut, shelf and slope groundfish (walleye pollock, Pacific, sablefish, rockfishes, rex sole, Dover sole, arrowtooth flounder), Dungeness crab, and scallops.

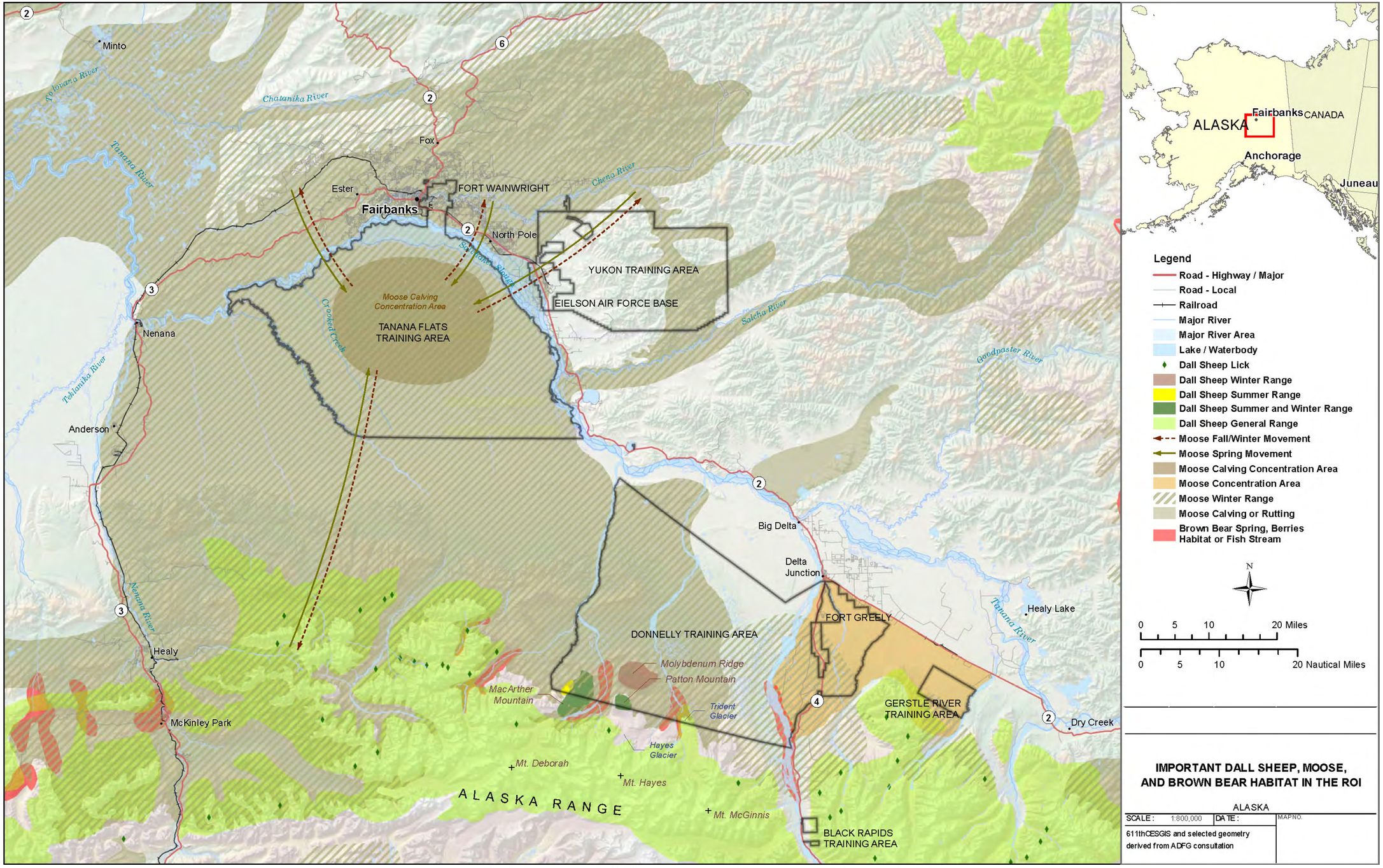

Figure B-16. Important Dall Sheep, Moose, and Brown Bear Habitat in the ROI

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The Pacific high-seas salmon are arguably the most important living marine resource within the GOA. Currently the GOA supports habitats for ESA-listed populations of high-seas Chinook, coho, chum, and sockeye salmon, and steelhead. Many species of marine mammals spend time in the GOA including cetaceans (whales and dolphins), pinnipeds (seals and sea lions), and sea otters. Occasional sightings of sea turtles also occur there. Some of the species present in the TMAA are listed as endangered or threatened under the ESA. These are identified in Section 3.11.8, Biological Resources for the Missile Live Fire AIM-9 and AIM-120 project.

B.8.3.4 Natural Resource Management

Military Installations. The regulations, purpose and importance of INRMPs were discussed in Section B.8.1 Regulatory Setting (under The Sikes Act). All available INRMPs for relevant JPARC military installations were obtained and referenced for this analysis. To guide and regulate the actions of Army personnel using and managing training lands, the Army has developed the Integrated Training Area Management (ITAM) program. The goals of ITAM are based on integration of the military mission, natural resource stewardship, and environmental compliance on Army training installations. The data provide installation-wide summaries of land use, disturbance, plant cover, vegetation communities, tactical concealment, birds, and small mammals. Other elements of ITAM include (1) Range and Training Land Assessment (RTLA), which addresses inventory and monitoring of natural resources in order to document resource conditions and assess the ability of the land to withstand impacts; (2) Land Rehabilitation and Maintenance (LRAM), which covers vegetation removal, revegetation, and preventive and corrective measures to restore the land and enhance the realism of training; (3) Sustainable Range Awareness (SRA), which educates officers, enlisted Soldiers, and community members to foster the wise use of our land; (4) Training Requirements Integration (TRI), which improves coordination and facilitates cooperation by providing information on land resource requirements; and (5) GIS, which provides standard mapping and spatial analysis capabilities that support the ITAM program components.

Aircraft Strike Hazard. Wildlife-aircraft strikes constitute a serious human safety concern; they can result in loss or damage to aircraft and death or injury to aircrew or local human populations. Because the actual threat of strikes affecting local wildlife populations is negligible compared to populations present and other sources of mortality, aircraft strikes are more of a human safety concern than a wildlife issue and more details are discussed under the Safety Section B.3. Aircraft may encounter terrestrial animals on runways and birds at altitudes up to 30,000 feet MSL or higher; however, most incidents tend to occur at lower altitudes. More than 97 percent of reported bird strikes occur below 3,000 feet AGL. Approximately 30 percent of bird strikes happen in the airport environment, and almost 55 percent, during low-altitude flight training (AFSC 2010). The potential for bird-aircraft strikes is greatest in areas used as seasonal migration corridors (flyways) or where birds congregate for foraging or resting (e.g., open water bodies, rivers, wetlands). The known and mapped migratory bird routes and general nesting, foraging, and resting areas in the project vicinity are discussed in Section B.8.3.1.2, Wildlife, and depicted in Figure B-15. The larger migratory waterfowl species (e.g., ducks, geese, swans) are the most hazardous birds to low-flying aircraft because of their size and their propensity for migrating in large flocks at various elevations and times of day. Waterfowl vary considerably in size: from 1 to 2 pounds for ducks, 5 to 8 pounds for geese, and up to 20 pounds for most swans. The two distinct migratory seasons, fall and spring are the times most likely for bird-aircraft strikes. These birds typically migrate at night, but also take advantage of optimal daytime migration weather and generally fly between 1,000 to 4,000 feet AGL (Griese 2007).

In addition to waterfowl, raptors, shorebirds, gulls, songbirds, and other birds also pose a hazard for aircraft strikes. Strike data for restricted areas show that incidents involving raptors result in the majority of serious (Class A or B) mishaps. Raptors of greatest concern in the ROI are eagles and hawks. In Alaska, migration periods for waterfowl and raptors are from August to October and from April to May.

In general, aircraft flights above 2,000 to 3,000 feet AGL would be higher than where most migrating and resident raptors occur. Songbirds are small birds, usually less than one pound, and pose less of a threat to aircraft. During nocturnal migration periods, songbirds navigate along major rivers, typically between 500 to 3,000 feet AGL.

Several installations have developed aggressive procedures (e.g., limited low-altitude operations, seasonal restrictions) designed to minimize bird-aircraft strikes. To the extent possible, airspace planning and target placement avoids large bird congregation areas and major flyways to ensure essential year-round access and training flexibility. Implementation of appropriate safety procedures is a standard method for managing bird strike risks.

State and Federal Game and Fish Management

Game Management Units (GMUs), which are designated geographic areas, specific hunting seasons, and appropriate licensing have been established by the ADFG to help manage big game populations. Refer to Section B.10.2.3, Recreation, and Section B.13, Subsistence Resources, for more details on hunting in the area potentially affected by the proposed actions. Chapter 3 also includes discussions of wildlife species that may be affected by project actions.

Fisheries

As discussed above under Fish and Aquatic Resources, fisheries are an important recreational, subsistence, and economic resource in interior Alaska. See Section B.10.2.3, Recreation, and Section B.13, Subsistence Resources, for more detailed information on Fishing/Angling Resources. The ADFG manages the resource by maintaining a database of Important Anadromous Fish Waters pursuant to Alaska Statute (AS) 16.05.871, providing maps divided into approximately 250-square-mile sections. ADFG issues fishing licenses to participate in commercial, sport, and personal use angling activities. ADFG also manages the resource by regulating activities in anadromous and resident fish-bearing streams through issuing fish habitat permits. Important species include finfish such as Arctic grayling, rainbow trout, northern pike, and Dolly Varden/Arctic char in addition to several salmon species.

Fire Management

Fire plays a natural and essential ecological role for maintaining the viability of boreal forest ecosystems. DoD personnel are well aware of fire's destructive potential in relation to human life, property, and valued resources, and are adept in the difficult decision-making process concerning fire suppression. Installation INRMPs describe the programs, policies, and procedures for integrated wildland fire management on USARAK lands and include an Integrated Wildland Fire Management Plan (USARAK 2006b). These plans reduce wildland fire potential, effectively protect and enhance valuable natural and cultural resources, integrate applicable state and local permit and reporting requirements, and implement ecosystem management goals and objectives on USARAK lands, all while directly supporting USARAK missions and remaining consistent with other plans. Wildland fire management in Alaska requires multi-agency cooperation. The Federal agencies have developed agreements that establish the Alaska Fire Service's responsibility for all fire detection and suppression on installation lands. Consistent with those agreements, the Army provides the Alaska Fire Service with the use of certain buildings, utilities, land, training services, air support, and other support services (USARAK 2006b).

In fire-prone areas, climate, human activity, and types of vegetation (or fuels) determine the level of wildland fire risk. Presuppression activities, including planning, prevention, fuels management, and prescribed burning, reduce wildland fire risk (USARAK 2006b). Prevention includes automated fire weather stations located across USARAK training areas and the FireWise Program, established nationwide to convey information to private homeowners on how to protect their property from wildland

fires. An example is "fuel modification," defined as removing and/or modifying an area of flammable vegetation, whether by constructing and maintaining a combination of fuel breaks and firebreaks or by prescribed burning. If a wildland fire escapes the initial attack, fuel breaks and other fuel modification areas provide the most logical locations for fire containment lines. Well-maintained fuel breaks and other fuel modifications provide defensible space that aids in wildland fire containment (USARAK 2006b).

B.8.3.5 Subsistence Resources

As described in Section B.13, Subsistence Resources, many local residents, particularly rural Alaskans and Alaska Native cultures, rely on native fish and game resources for part of their annual food and clothing supplies. Many Alaskan plant and wildlife species, including some considered sensitive, are legally hunted, trapped, and fished as subsistence resources. Included are salmon, freshwater fish, waterfowl, seals, moose, caribou, Dall sheep, black bear, porcupine, and many other species of small game. Subsistence also includes the collection of many native plants (e.g., berries, roots) that may be used as food, fiber, fuel, tools, or structural material.

B.9 CULTURAL RESOURCES

B.9.1 Definition of Resource

Cultural resources are prehistoric and historic sites, buildings, districts, or objects that are important to a culture or community for scientific, traditional, religious or other purposes. Cultural resources are generally divided into six categories: archaeological resources, architectural resources, traditional cultural properties, cultural landscapes, National Historic Landmarks, and National Monuments.

Archaeological resources occur in places where people altered the ground surface or left artifacts or other physical remains (e.g., arrowheads, glass bottles, pottery). Archaeological resources can be classified as either sites or isolates. Isolates generally cover a small area and often contain only one or two artifacts, while sites are usually larger in size, contain more artifacts, and sometimes contain features or structures. Archaeological resources can be either prehistoric or historic.

Architectural resources are standing buildings, dams, canals, bridges, windmills, oil wells, and other such structures. Generally, they must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (National Register), although resources dating to defined periods of historical significance, such as the Cold War era (1946–1989) may also be considered eligible.

Traditional cultural properties are properties, sites, or other resources associated with the cultural practices or beliefs of a living community that link the community to its past and help maintain its cultural identity and are listed or eligible for listing on the National Register. Traditional cultural resources are areas that are associated with the cultural practices or beliefs of a living community that link the community to its past and help maintain its cultural identity that have not been evaluated for National Register eligibility. Sacred sites are well-known areas associated with cultural practices or beliefs of a living community. Most traditional cultural properties, resources, or sacred sites in Alaska are associated with Alaska Natives. Traditional cultural properties or resources may also be associated with other traditional lifeways, such as ranching. Traditional cultural properties or resources can include archaeological resources, locations of prehistoric or historic events, sacred areas, sources of raw materials used in the manufacture of tools and/or sacred objects, certain plants, or traditional hunting and gathering areas. Historic properties (as defined in the National Historic Preservation Act [16 U.S.C. 470 et seq.] and in 36 CFR 800) are significant archaeological, architectural, or traditional resources that are listed or eligible for listing on the National Register. Both historic properties and significant traditional resources identified by Alaska Natives are evaluated for potential adverse impacts of an action.

Cultural landscapes are geographic areas where cultural and natural resources and wildlife have been associated with historic events, activities, or people, or which serve as an example of cultural or aesthetic value. The four types of cultural landscapes are: historic sites (e.g., battlefields, properties of historic figures), historic designed landscapes (e.g., parks, estates, gardens), historic vernacular landscapes (e.g., industrial parks, agricultural landscapes, villages), and ethnographic landscapes (contemporary settlements, religious sites, massive geological structures).

National Historic Landmarks are cultural resources of national historic importance and are automatically listed on the National Register. Under the implementing regulations for Section 106 (36 CFR 800.10) of the National Historic Preservation Act of 1966, as amended (NHPA), special consideration to minimize harm to National Historic Landmarks is required, and both the Advisory Council for Historic Preservation and the Secretary of the Interior are consulted if any adverse effects are likely to occur to such resources.

National Monuments were established under the Antiquities Act of 1906, which gives the President of the United States EO authority to restrict the use of public land owned by the Federal Government as parks or conservation lands. National Monuments are "historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest" (16 U.S.C. 431–433) that were identified for protection and Federal management. National Monuments that are historic in character and managed by the NPS are administratively listed on the National Register.

B.9.2 Regulatory Setting

The foundation for general legislation for preservation of cultural resources is the NHPA. Two sections of the Act, Sections 106 and 110, outline the processes Federal agencies must follow to manage and protect cultural resources or historic properties. Under the NHPA and its implementing regulations, only cultural resources that are listed or eligible for listing on the National Register (historic properties) are considered when assessing the possible effects of a Federal undertaking.

Section 106 requires Federal agencies to consider the effects of actions on historic properties through a consultation process. Evaluation studies are the mechanism by which inventories are performed and identified cultural resources are assessed against the criteria established in the National Register and upon which all subsequent management decisions are based. Processes outlined in Section 106 include resource identification/inventory, evaluation of significance, assessment of adverse effects on significant historic properties, and resolution of adverse effects. The goal of the Section 106 consultation is to identify historic properties potentially affected by the Federal undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

Archaeological and historic sites and structures are protected under a number of laws, including the Antiquities Act of 1906 (16 U.S.C. 431–433), the Historic Sites Act of 1935 (16 U.S.C. 461–467), the American Indian Religious Freedom Act of 1978 (AIRFA) (42 U.S.C. 1996), the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa–470mm), the NHPA (16 U.S.C. 470 et seq.), and the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (25 U.S.C. 3001 et seq.).

Certain Native American sites of traditional cultural and religious importance may not meet National Register criteria as historic properties, but are still considered to be cultural resources. The DoD's American Indian and Alaska Native Policy and DoD Instruction 4710.02, *Interaction with Federally Recognized Tribes* (2006) emphasize the importance of respecting and consulting with tribal governments on a government-to-government basis to assess the effects of proposed DoD actions that may have the potential to significantly affect protected tribal rights, Indian land, or resources before decisions are made by the Services (DoD 1998). Properties identified by tribes as properties of traditional cultural and

religious importance, but do not qualify for listing on the National Register, are still managed according to the DoD American Indian and Alaska Native Policy.

Several regulations address the requirement of Federal agencies to notify or consult with Native American tribes or otherwise consider their interests when planning and implementing Federal undertakings. In particular, on April 29, 1994, the President issued the *Memorandum on Government-to-Government Relations with Native American Tribal Governments*, which specifies a commitment to developing more effective day-to-day working relationships with sovereign tribal governments. In addition to the Memorandum, EO 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), reaffirms the U.S. Government's responsibility for continued collaboration and consultation with tribal governments in the development of Federal policies that have tribal implications, to strengthen the government-to-government relationships with Native American tribes, and reduce the imposition of unfunded mandates upon Native American tribes. This EO supersedes EO 13084, signed May 14, 1998.

EO 13007, *Indian Sacred Sites*, issued on May 24, 1996, requires that in managing Federal lands, agencies must accommodate access to and ceremonial use of sacred sites, which may or may not be protected by other laws or regulations, and must avoid adversely affecting the physical integrity of these sites.

EO 13287, *Preserve America*, signed March 3, 2003, directs Federal agencies to increase their knowledge of historic resources in their care and to enhance the management of these assets, and promotes intergovernmental cooperation and partnerships for the preservation and use of historic properties.

DoD Instruction 4715.16**,** *Cultural Resources Management* (DoD 2008), establishes DoD policy and assigns responsibilities to comply with applicable Federal statutory and regulatory requirements, EOs, and presidential memorandums for the integrated management of cultural resources on DoD-managed lands.

DoD Instruction 4710.02, *DoD Interactions with Federally-Recognized Tribes*, September 16, 2006 (DoD 2006), implements the DoD Native American and Alaska Native Policy, assigns responsibilities, and provides procedures for DoD interaction with Federally recognized tribes. The NHPA requires agencies to consult with Native American tribes if a proposed Federal action may affect historic properties to which they attach religious and cultural significance. The AIRFA sets the policy of the United States to "protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions of the American Indian…including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites."

AFI 32-7065, *Cultural Resources Management Program* (Air Force 2004c), supplements Air Force policy for managing cultural resources to support the military mission and to meet legal compliance requirements and establishes guidelines for managing and protecting cultural resources on property affected by Air Force operations in the United States. AFI 32-7065 implements Air Force Planning Document 32-70, *Environmental Quality* (Air Force 1994a), and DoD Instruction 4715.3, *Environmental Conservation Program* (DoD 1996).

AR 200-4, *Cultural Resources Management* (Army 1998a), is the Army's policy for managing cultural resources to meet legal compliance requirements and to support the military mission. It prescribes Army policies, procedures, and responsibilities for meeting cultural resources compliance and management requirements.

Department of the Army Pamphlet (DA PAM) 200-4, *Cultural Resources Management* (Army 1998b), provides implementing guidance for Army policy requirements contained in AR 200-4. It outlines a cultural resources management strategy, provides integrated cultural resources management plan preparation guidelines, provides implementing guidance for regulatory/statutory compliance activities, and contains guidelines for consulting with Native Americans.

The Alaska Office of History and Archaeology implements the Alaska Historic Preservation Act (Alaska Statute 41.35.70) and works to preserve sites and buildings that reflect the heritage of Alaska. The Alaska Office of History and Archaeology are consulting parties in any section 106 consultation.

B.9.3 General Description of Affected Environment

Cultural resources in the JPARC planning area include prehistoric archaeological sites; historic archaeological sites; historic buildings and structures; and properties of traditional, religious, and cultural significance. Prehistoric sites are often found in locations that are higher in elevation than the surrounding landscape, such as bluffs and terraces, and usually in proximity to water, including rivers, drainages, and lake margins. Historic sites in the region are often associated with historic roads/trails, rivers, drainages, and lake margins. Cold War–era historic properties are found on many military installations in this region. Properties of traditional, religious, and cultural significance are found throughout the region and are identified through consultation with tribes that have knowledge of the geographical area of interest.

B.9.3.1 Prehistoric and Historic Eras

Discussion of the cultural history of Alaska is commonly divided into two general periods: prehistory and history. Table B–16 outlines the dates and characteristics of the Prehistoric and Historic Periods of Alaska, and a brief historic overview is in Appendix H.

Prehistory refers to the period for which there exists no documentary (e.g., written) evidence of the events or people living during that time. Alaskan prehistory varies regionally due to natural conditions that either enhanced or limited human occupation in a given area of the state. The extent of glacial coverage and the rate and direction of glacial retreat greatly influenced the capacity of a region to support prolonged human occupancy and activity. Evidence suggests that interior portions of Alaska were inhabited at least 13,000 years ago, and coastal regions were inhabited later.

Alaska's earliest inhabitants were nomadic hunters who traveled in small bands and persisted through the arrival of European traders in the late 1810s, and their habitation in the region continues to the present day. The nomadic nature of the state's earliest inhabitants, coupled with the organic nature of the materials they manufactured and used and changing environmental conditions, has presented difficulties in finding evidence of their activities. Archaeological evidence is usually limited to lithic artifacts, such as projectile points, cutting tools, scrapers, waste flakes, and hearths.

Historic refers to the period following the introduction of written records. The transition from the prehistoric to the historic period in Alaska varies from region to region; for interior Alaska the period begins with the migration of Russian fur traders around the 1830s. The early historic period is marked by the continuation of traditional activities with the addition of a limited European presence in the region. Gold rushes began in the late 1880s and substantially altered the regional demographics and economy.

Table B–16. Summary of History and Prehistory Periods of Interior and South-Central Alaska

Era	Dates	Description
Interior Alaska Prehistory		
Paleoarctic Tradition	12,000–8,000 BP	Early inhabitants camped on terraces and bluffs above treeless steppes, hunted large mammals such as bison and mammoth; tools fashioned from stone, bone, antler, and ivory; artifacts include microblades and microblade cores.
Northern Archaic Tradition	6,500–1,000 BP	Adaptations due to boreal forest expansion, such as side-notched projectile points; tools include bifacial knives, microblades, end scrapers, and side-notched points.
Athabascan Tradition	2,500–1,500 BP	Varied settlement patterns, often nomadic culture, subsisting primarily on terrestrial animals; subgroups exhibit distinct cultural characteristics.
Interior Alaska History		
Early Contact	1810–1880s	Contact between aboriginal groups and Russians or English, probably at trading posts.
Gold Rush	1880s–1928	Period of influx of Euroamerican settlement in interior Alaska in response to multiple gold discoveries.
Development of Infrastructure	1890s–1910s	Establishment of roads and railway connecting interior Alaska with other areas.
Military Activities	1890s–Present	Increased military presence in interior, beginning with the establishment of Ladd Field.
South-Central Alaska Prehistory		
Early Holocene	8,000–6,000 BP	Oldest known sites; earliest inhabitants probably entered from interior and practiced terrestrial hunting and gathering; tools found are similar to those from the Denali Complex of interior Alaska.
Middle Holocene	6,000–3,000 BP	Probable shift in subsistence from terrestrial to marine resources; poorly represented archaeological record.
Late Holocene	3,000–1,000 BP	Pacific Eskimo cultural affiliation; Norton and Kachemak traditions represented; tools include pottery, transverse knife (ulu); multiple sites found throughout Cook Inlet.
Late Prehistoric	1,000–250 BP	Athabascan material culture; house depressions, cobble spall scrapers, fire-cracked stone; probable association with Denaina Athabascans.
South-Central Alaska History		
American Era	1867–1938	Alaska Purchase and gold rushes increase Euroamerican presence; growth of Cook Inlet as port, and later, rail terminus.
Military Era	1939–present	Fort Richardson established; World War II and Cold War lead to military increases.

Key: BP=Before the Present.
Source: USARAK 2004.

World War II and the Cold War drew thousands of people to Alaska for military service and deployment. Military installations that would eventually become Eielson AFB, Elmendorf AFB, Fort Richardson, and Fort Wainwright were constructed during and in the years directly following World War II. Since the statehood of Alaska in 1959, the Trans-Alaska Pipeline, native land claim settlements, and public lands legislation have each had profound influences on the region.

B.9.3.2 Alaska Native Villages

Alaska Natives live within the ROI of many of the proposals addressed in this EIS (refer to Figure 3–11 in the EIS, Section 3.1.9, Cultural Resources). Federally recognized Alaska Native tribes within the ROI include Native Village of Crooked Creek, settled by Eskimo and Ingalik people; Native Village of Georgetown, a seasonal fishing village; Lime Village, a Dena`ina Athabascan Indian settlement; Village of Red Devil, a village populated by a mix of Eskimo, Athabascan, and non-native inhabitants; Village of Sleetmute, founded by Ingalik Indians; Village of Stony River, a mix of Indian and Eskimo people; and New Koliganek Village Council. Other Federally recognized Alaska Native tribes in the area include the Native Village of Eagle, Circle Native Community, Chalkyitsik Village, Village of Dot Lake, and Healy Lake Village. Native lifestyle in many of these villages is based on subsistence activities. Alaska Native regional corporations in the region are Cook Inlet Region, Inc., Calista Corporation, Doyon, Ltd., Ahtna Inc., and Bristol Bay Native Corporation.

B.10 LAND USE

B.10.1 Definition of Resource

Land Use. Land use refers to general land use patterns, land ownership, land management plans, and special use areas within the EIS study area. General land use patterns within a particular area include forest, residential, military, mining and resource production, and recreational uses, with multiple uses often occurring in any given area. Land ownership is a categorization of land according to type of owner. Major landowners include the Federal Government, the state, Alaska Native corporations, and private individuals. Federal lands are described in terms of the managing agency, which may include the USFWS, the USFS, the BLM, or DoD. State of Alaska land in areas potentially affected by the proposed action is typically managed by the Departments of Fish and Game or Natural Resources. Relevant land management plans include those documents prepared by agencies to establish appropriate activities, controls, priorities, and goals for current and future use and development. As part of this process, some areas are selected by agencies as being worthy of more-rigorous management and restrictions on use.

Implicit in land uses are the resources and qualities that make such uses suitable for a particular locale. Man-made improvements, natural qualities, or both may be essential for some land uses. As an example, the suitability of land for recreational hunting depends on that land's capability to support wildlife and other factors such as accessibility, natural setting, and quietness.

Public Access. Surface access to remote areas beyond the major highways linking population centers relies on a public network of smaller roads and trails. Where these pass through land under multiple ownership, agreements provide for such access, be it simply for recreation or for more-critical purposes such as emergency service, access to isolated homes and communities, resource management, or subsistence harvesting. Public access is governed by Federal or state land management policies instituted for the highest public benefit. This may include restricting access to some areas, restricting permissible modes of access, or defining which routes are open or closed.

Recreation. Recreation is defined as leisure pursuits that occur outdoors. It includes, but is not limited to, activities such as sport hunting, sport fishing, trapping, trail use, off-road recreational vehicle (ORRV) use, camping, water sports, river floating, powerboating, mountain climbing, photography, sightseeing, hiking, cross-country skiing, snowshoeing, dog sledding, snowmachining, mountain and road cycling, wildlife watching, and berry picking. Recreation resources include land areas designated for recreational activity, including parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hikes, camping, hunting, fishing, and wildlife. In addition to these natural resources, man-made facilities are designated or made available for public recreational use. Recreation is frequently one of

many uses supported by public lands, either as a primary purpose or secondary to other uses (e.g., conservation and preservation, forestry, energy development).

B.10.2 Regulatory Setting

B.10.2.1 Land Use

The Federal Land Policy and Management Act (FLPMA). This act was enacted in 1976 for the purpose of establishing a unified, comprehensive, and systematic approach to managing and preserving public lands in a way that protects "the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." Uses of public lands that the BLM manages include commercial uses such as livestock grazing, mineral extraction, and logging; recreational uses such as fishing, hunting, birding, boating, hiking, biking, and off-roading; and conservation of biological, archeological, historical, and cultural resources. The FLPMA requires the BLM to implement principles for multiple uses of public lands and sustained yields of resources.

Wilderness Act (16 U.S.C. 1131–1136 et seq.). This act establishes the National Wilderness Preservation System. Wilderness Areas are designated by Congress and are composed of existing Federal lands that have retained a wilderness character and meet the criteria found in the act. Federal officials are required to manage Wilderness Areas in a manner conducive to retention of their wilderness character and must consider the effects on wilderness attributes of management activities on adjacent lands.

Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.). This act establishes a system of areas distinct from the traditional park concept to ensure the protection of each unique river. It also designates rivers that possess remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other values as Wild and Scenic Rivers. These rivers are protected for the benefit and enjoyment of present and future generations.

National Forest Management Act of 1976 (NFMA). This act requires every national forest or grassland managed by the USFS to develop and maintain a Land Management Plan (also known as a Forest Plan) and to develop regular reports on the status and trends of the nation's renewable resources on all forest and rangelands. It is the policy of the Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes.

Alaska National Interest Lands Conservation Act (ANILCA) (15 U.S.C. 3101–3223). This Act provides for the designation and conservation of certain public lands in the State of Alaska, including units of the National Park, National Wildlife Refuge, National Forest, National Wild and Scenic Rivers, and National Wilderness Preservation Systems, and for other purposes.

11 AAC 96.014, Special Land Use. This code lists sites and areas of state land designated as special use land. These sites and areas of land have special scenic, historic, archaeological, scientific, biological, recreational, or other special resource values warranting additional protections or other special requirements. AS 16.20, *Conservation and Protection of Alaska Fish and Game*, designates certain lands to protect and preserve natural habitat areas and game populations or to enhance habitat for particular wildlife species. These legislatively designated areas include State Wildlife Areas (sanctuaries, Critical Habitat Areas, Refuges, State Range Areas, State/National Refuges). The ADFG manages most of these areas.

The Sikes Act (16 U.S.C. 670 et seq.; PL 86-797). This act promotes effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation on military reservations. It includes a cooperative plan for conservation and rehabilitation and provides for the

sustainable multipurpose use of natural resources (hunting, fishing, trapping, and nonconsumptive uses) and public access to facilitate the use, subject to safety requirements and military security. The Sikes Act authorizes a program for the conservation, restoration, and management of migratory game birds on military installations, including the issuance of special hunting permits. Finally, it authorizes a program for the management of fish- and wildlife-oriented recreation resources at military installations and a program for public recreation.

Forests Act (AS 41.15). This act provides protection for the natural resources and watersheds on land that is owned privately, by the State of Alaska, or by a municipality. The Department of Natural Resources, Division of Forestry, manages land regulated under this act.

DoD Directive 4700.4, Natural Resources Management Program (DoD 1989). This directive prescribes policies and procedures for the integrated program for multiple-use management of natural resources on property under DoD control.

AR 200-1, Environmental Protection and Enhancement (Army 2007b). This regulation covers environmental protection and enhancement and provides the framework for the Army Environmental Management System. This regulation provides for controlled recreational access where feasible at Army installations containing land and water areas suitable for recreational use.

AR 350-19, The Army Sustainable Range Program (Army 2005). This regulation assigns responsibilities and provides policy and guidance for managing and operating Army ranges and training lands. The regulation describes use of ranges and training lands by civilians and discusses the recreational use of training land and ranges.

AR 385-63, Range Safety (Army 2003). This regulation provides range safety police for the Army and U.S. Marine Corps and establishes surface danger zones as minimum safety standards; requires establishment of range safety programs for all ranges; prohibits specific operations without specific approval; establishes risk management principles and deviation authorities; and employs the risk management process to identify and control range hazard. This regulation outlines risk management principles related to outdoor recreational activities on ranges or training areas.

B.10.2.2 Public Access

Revised Statute (RS) 2477, Refuge Rights-of-Way and Easements. This statute, which emerged from Section 8 of the Mining Act of 1866, promotes public highway construction through the largely unsettled western territories. This section granted the right-of-way for construction of highways over public lands not reserved for public uses. RS 2477 was repealed on October 21, 1976 by the FLPMA (43 U.S.C. 932). Because the FLPMA did not terminate valid existing right-of-ways, the Federal Government retains ownership of thousands of RS 2477 right-of-ways across Alaska, which, as the Congress intended, provide an important role in settling those areas. In Alaska, these right-of-ways continue to play an essential role in accessing Alaska's lands. To date, the ADNR has researched over 2,000 routes and determined that approximately 647 qualify under RS 2477.

AS 38.05.126, Navigable and Public Water. This statute provides the people of the State of Alaska with a constitutional right to free access to, and use of, the navigable or public water of the state. It also provides that ownership of land bordering navigable or public waters does not grant an exclusive right to use of the water, and that a right of the title to the land below the ordinary high water mark is subject to the rights of the people of the state to use and have access to the water for recreational purposes or other public purposes for which the water is used or capable of being used consistent with the public trust.

B.10.2.3 Recreation

National Trails System Act, as amended (16 U.S.C. 1241 et seq.). This act establishes a national system of recreational, scenic, and historic trails and prescribes the methods and standards for adding components to the system.

Outdoor Recreation Act (16 U.S.C. 4601 et seq.). This act lays out DOI's role as coordinator of all Federal agencies for programs affecting the conservation and development of recreation resources. The Secretary of the Interior is directed to prepare a nationwide recreation plan and provide technical assistance to states, local governments, and private interests to promote conservation and utilization of recreation resources.

Federal Water Project Recreation Act (16 U.S.C. 460 l-12–460 l-21; PL 89-72; 79 Stat 213 as amended by PL 93-251; 88 Stat 33 and PL 94-576; 90 Stat 2728). This act provides that recreation and fish and wildlife enhancement be given full consideration as purposes of Federal water development projects under certain circumstances. This act also authorizes the Secretary of the USFWS to provide facilities for outdoor recreation and fish and wildlife at reservoirs under USFWS control, except those within national wildlife refuges.

Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661–667e; the Act of March 10, 1934; Ch. 55; 48 Stat. 401). This act, among other provisions, authorizes the Secretaries of Agriculture and Commerce to provide assistance to and cooperate with Federal and state agencies to protect, rear, stock and increase the supply of game and fur-bearing animals.

EO 11644, Use of Off-Road Vehicles on Public Lands. This order establishes policies and provides for a procedure that ensures that the use of off-road vehicles on public lands is controlled and directed so as to protect the resources of public lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.

AS 41.21, Parks and Recreational Facilities. This statute designates state parks that foster the growth and development of a system of parks and recreational facilities and opportunities in the state for the general health, welfare, education, and enjoyment of its citizens and for the attraction of visitors to the state. These areas are managed by the ADNR, Division of Parks and Outdoor Recreation.

B.10.3 General Description of Affected Environment

B.10.3.1 Land Ownership, Management, and Use

Land Ownership. Land ownership is the primary influencing factor on what activities may take place on land and by whom. The foundation for current land ownership in Alaska was set when the Territory of Alaska became a state in 1959. The Federal Government granted the new state 28 percent ownership of its total area (about 104 million acres) (ADNR 2000a). There are currently three primary landowner types in Alaska. These include the Federal Government, State of Alaska entities, and private/municipal and Alaskan Native owners. The general distribution of these ownership categories is shown in Figure B-17.

Federal Land. The Federal Government is the largest landowner in Alaska, with control of some 60 percent of the total land area (222 million acres). This acreage includes national parks, wildlife refuges, national forests, and military reservations. More than a dozen Federal agencies manage Federal lands in Alaska. The larger Federal landowners are DoD and DOI (including the BLM, NPS, and USFWS).

State Land. The State of Alaska currently owns 101 million acres. The state's land and resources are available to support the state's economy for road construction, economic development, and construction of houses, schools, and other public and private facilities. In addition, the state can select undesignated Federal land for settlement, resource usage, and recreational needs for its citizens (ADNR 2000a). Resource uses include agriculture, forestry, commercial fisheries, mining, oil and gas development, and wildlife habitat. Recreational land provides for wildlife, back-country recreation, and varying degrees and types of developed recreation to provide a variety of experiences for Alaskans and the tourist industry (ADNR 2000a). The state has received patents to approximately 85 percent (90 million acres) of its total land selections.

Once selected, ADNR land planners develop area plans (APs). Planners consider laws and policies and the character of the land itself, recommendations made by resource experts, and public input to determine the most appropriate management of currently owned (patented) or selected state land. Plans are developed for land in selected status in anticipation of its conveyance to the state (ADNR 2000a). The ADNR has the task of managing the state-owned lands for the "maximum public benefit." The range of possibilities for how state land could be used is vast. Specifically, the Division of Mining, Land and Water has primary responsibility for land use planning. Several APs overlap with portions of the EIS study area.

Municipal Land. A small quantity of state land was transferred to local jurisdictions and boroughs. These lands generally have been used for public amenities and infrastructure, but some land is available for private individuals under a variety of mechanisms that encourage homesteading and settlement in remote areas.

Native Lands. Alaska Native corporations were established in 1971 (43 U.S.C. 1606) when the U.S. Congress passed the Alaska Native Claims Settlement Act (ANCSA), which determined land and financial claims made by the Alaska Natives and established 13 regional corporations to administer those claims. This law granted 44 million acres to village and regional corporations created under the act. These lands are classified as private land. Of this land, about 26 million acres was divided between 224 village corporations attached to villages with 25 or more residents. These village corporations own the surface rights to the lands they selected, but the larger regional corporations own the subsurface rights of both their own selections and of those of the village corporations. The remaining acres 18 million acres, which include historic sites and existing native-owned lands, went into a land pool to provide land to villages of less than 25 people.

Within the regional Native corporations, village corporations own the land in and around their communities. The primary Native corporation within the study area is Doyon, Limited, but other regional corporations with land in the region include Cook Inlet Region, Inc., Calista Corporation, Ahtna Inc., and Bristol Bay Native Corporation.

Private Land. Both the Federal government and the state may transfer tracts of land to local governments or lease and dispose of land to the private sector. Land in private ownership (other than Alaskan Native land) accounts for less than 1 percent (about 2.7 million acres) of the total land in Alaska. Much of the best land for development around Alaska's communities is, or will be, privately owned. This land also provides a tax base for cities and communities to help support public services (ADNR 2000a). Some local municipalities and boroughs have developed plans and land use controls for managing borough-owned and private lands under their jurisdictions.

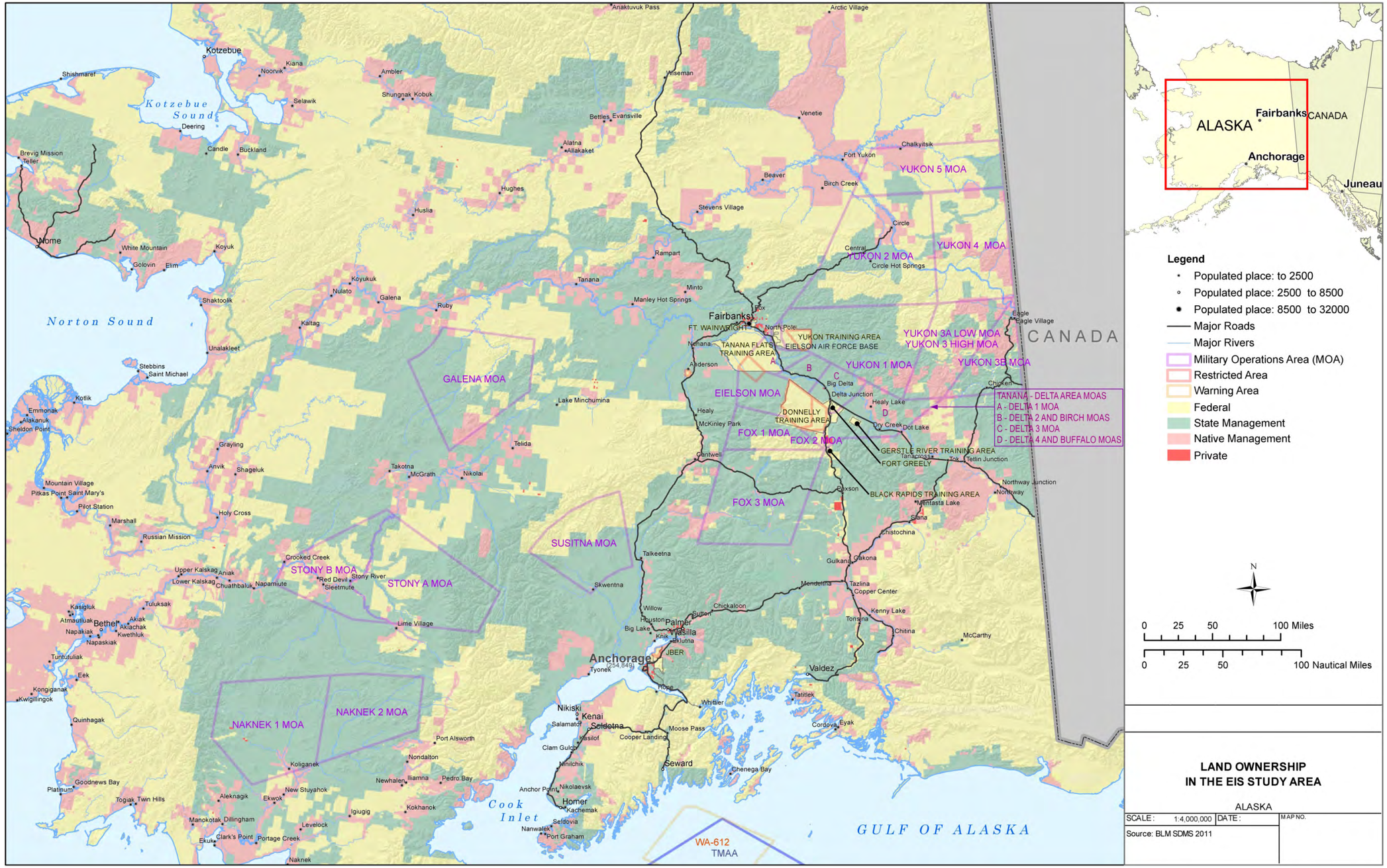

Figure B-17. Generalized Regional Land Ownership in Central Alaska

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Land Management and Use. This section describes general land uses occurring within the area affected by the EIS proposals. The following five broad categories are used for this presentation: military land (DoD withdrawn land), special use areas (Federal and state), general unspecified land (Federal and state), resource-classified and productive-use lands (Federal and state), and private land (including Native village lands).

Military Land. Approximately 1.5 million acres of land within the study area is BLM land withdrawn for military use. Withdrawn lands under DoD management serve the primary purpose of supporting military use. The original state or Federal owner is responsible for the long-term condition and use of withdrawn lands and therefore maintains an oversight interest in their ongoing management. Due to ongoing activities such as testing and training, the potential for UXO or other hazardous materials and activities exists on DoD property. As a result, much of this land is not accessible by the general public. Infrastructure and development to support military uses includes airfields, test and training ranges, billeting areas, administrative and community support facilities, operations and maintenance areas, ports, and logistics and supply areas.

The primary DoD sites and locations within the EIS study area include Fort Wainwright, Fort Greely, DTA, TFTA, YTA, GRTA, BRTA, and Eielson AFB. Activities at these locations are described in the JPARC Master Plan and under specific proposals in Chapter 3 of the EIS.

Special Use Areas (Federal and State). Special Use Areas are legislatively designated for a variety of purposes, generally with an emphasis on conserving natural qualities and providing recreational opportunities. Figure B-18 and Figure B-19 show the extent of special use areas on Federal and state lands, respectively, within the EIS study area. These areas include Federal and state parks, wilderness areas and Wild and Scenic Rivers (WSRs), and special management and conservation areas. Within these areas may be developed recreational sites, trails, and camping areas. Both Federal managers and the ADNR generally manage fish and wildlife resources for maximum sustained yields. Permits for fishing and harvesting are allocated based on relative abundance of species and Federal and state subsistence priorities (see Section B.13, Subsistence, for additional information). State legislatively designated areas include wildlife areas, special range and critical habitat areas, refuges, parks, recreation areas, forests and resource management areas, and multiple-use areas.

The BLM mission in Alaska is to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. The USFS administers the nation's national forests and grasslands. Region 10 of the USFS based in Juneau, Alaska, oversees the two national forests in Alaska, Chugach National Forest and Tongass National Forest, which together encompass a total of 2,737,735 acres. The special use areas within areas of potential impact of each of the EIS proposals are identified in Chapter 3 of the EIS. The NPS promotes and regulates the use of national parks, monuments, and reservations under its control. Within the study area, 23,188,855 acres are administered by the NPS. Land use within these parcels is in accordance with the NPS's stated objectives of managing land (NPS 2011).

National and state WSRs are designated to preserve outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other qualities. WSRs are preserved in their free-flowing condition with emphasis on maintaining their wild and/or scenic values. Similarly, wilderness areas are managed rigorously to preserve exceptional remote and pristine lands as a national asset for future generations. The National Wildlife Refuge System administers lands and waters in Alaska for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats. There are four refuges within the JPARC region totaling 24,137,366 acres: the Innoko National Wildlife Refuge, the Kanuti National Wildlife Refuge, the Nowitna National Wildlife Refuge, and the

Yukon Flats National Wildlife Refuge. These Federal lands are typically subject only to anthropogenic disturbances from recreation, education, and research activities.

State Land Classifications. In various area plans, ADNR classifies state land according to its highest value and management priority. These classifications include habitat, recreation, disposal, special use, and general use. Most land supports multiple uses that are secondary to the classified use. Special use lands are those with special scenic, historic, archaeological, scientific, biological, recreational, or other special value warranting special requirements.

General Unspecified Land (Federal and State). This land use includes undeveloped land areas that do not fall into other classifications but are managed for multiple uses according to Federal and state agency land management plans. Activities and users of such Federal and state land must follow regulations that meet basic requirements under Federal, state, and local laws as to use and conservation of land and water resources (such as minimizing disturbance) for sustainable yields. Activities that are generally allowed on state-owned public domain land without permit or other written authorization (per 11 AAC 96.020) include non-commercial hiking, camping, backpacking, skiing, climbing, bicycling, travel by horse or dogsled with pack animal, use of highway vehicles, use of recreational-type off-road or all-terrain vehicles, landing of aircraft, use of watercraft, hunting, fishing, trapping, berry picking, and recreational gold panning. Also allowed are noncommercial (i.e., personal use) trapping; harvesting of wild plants, mushrooms, and other plant material; use of dead and down wood for a cooking or warming fire; and hard-rock mineral prospecting or mining on a small scale (ADNR 2009).

Productive-Use. Productive use of land (in this EIS) generally refers to commercial operations that extract, harvest, produce, or use a natural resource. Both Federal and state managers regulate the terms and conditions for these uses on public land. Uses on private and Native lands must comply with any applicable laws and regulations. The primary productive uses found in the EIS study are described below. The locations of non-renewable resources (and high-potential areas) and major sites are shown in Figure B-20. Figure B-21 shows the location of renewable resources in the study area.

Leasable minerals include oil, gas, coal, geothermal resources, oil, shale, gilsonite, phosphate, potassium, and sodium (USARAK 2006b). Potential for mining leasable mineral resources is ideal within the vicinity, west of Fairbanks, and south-southwest of Anchorage. Coal mining potential is high west of George Parks Highway, northwest of Anchorage, west of Kenai Fjords National Park, and in the Lake Louise area. There is also the potential for mining coal on Joint Base Elmendorf-Richardson (USARAK 2006b).

For oil and gas extraction in Alaska, an extensive pipeline system has been established. The Trans-Alaska Pipeline System and the proposed Trans-Alaska Gas System run from Prudhoe Bay to Valdez, Alaska. The Trans-Alaska Pipeline System right-of-way extends through the YTA, East DTA, and BRTA. An additional right-of-way for the Alaska Natural Gas Transportation System is adjacent to the Trans-Alaska Pipeline System right-of-way (USARAK 2006b).

Oil and gas extraction and production is a huge industry, with the largest reserves along the North Slope; however, there are limited reserves within the study area. Operations and leasing are managed by the BLM and Alaskan corporations. An active coal mining area is located around Healy, Alaska. Five coal-supplied power plants are located in the Fairbanks region.

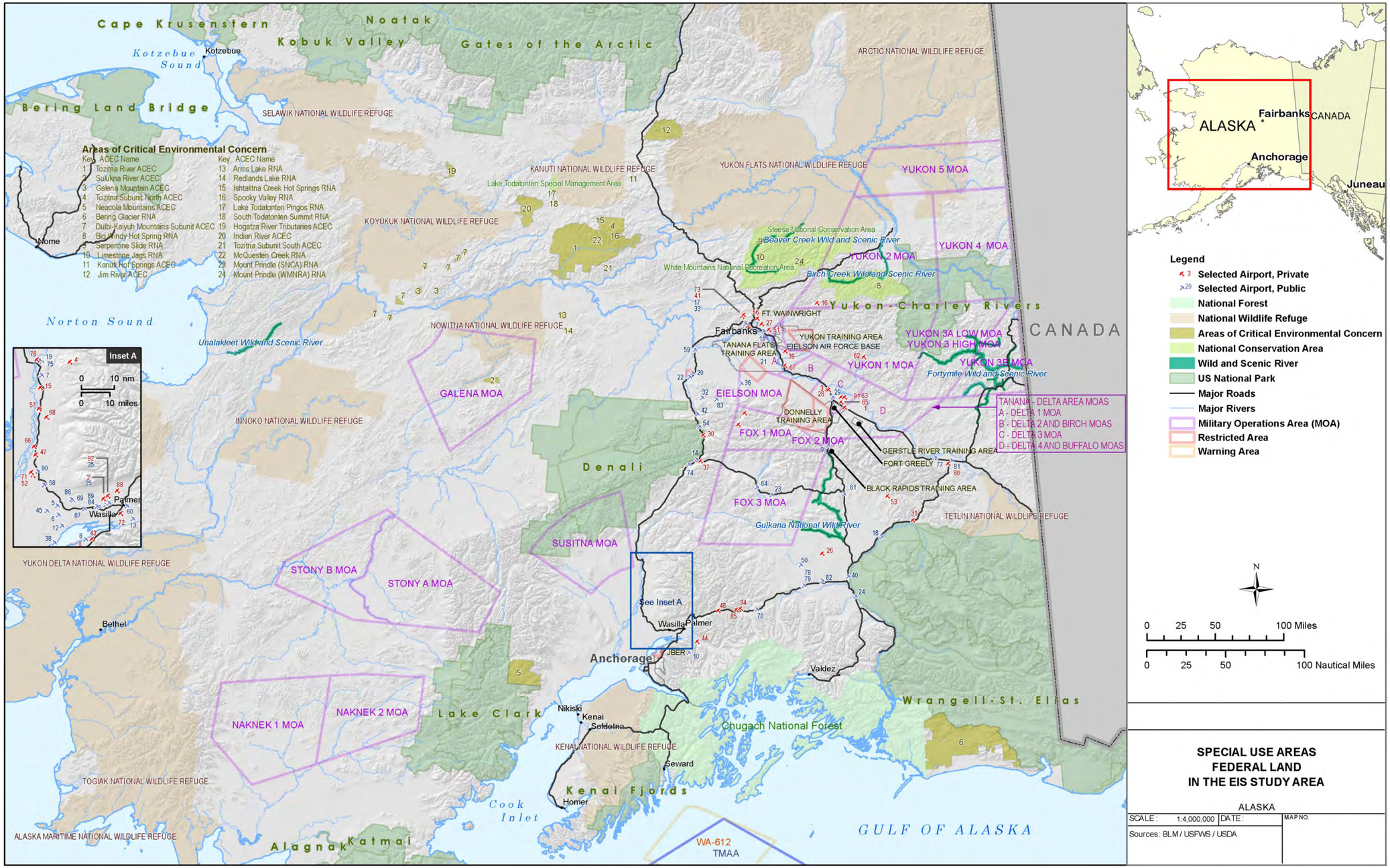

Figure B-18. Central Alaska Special Use Areas – Federal Land

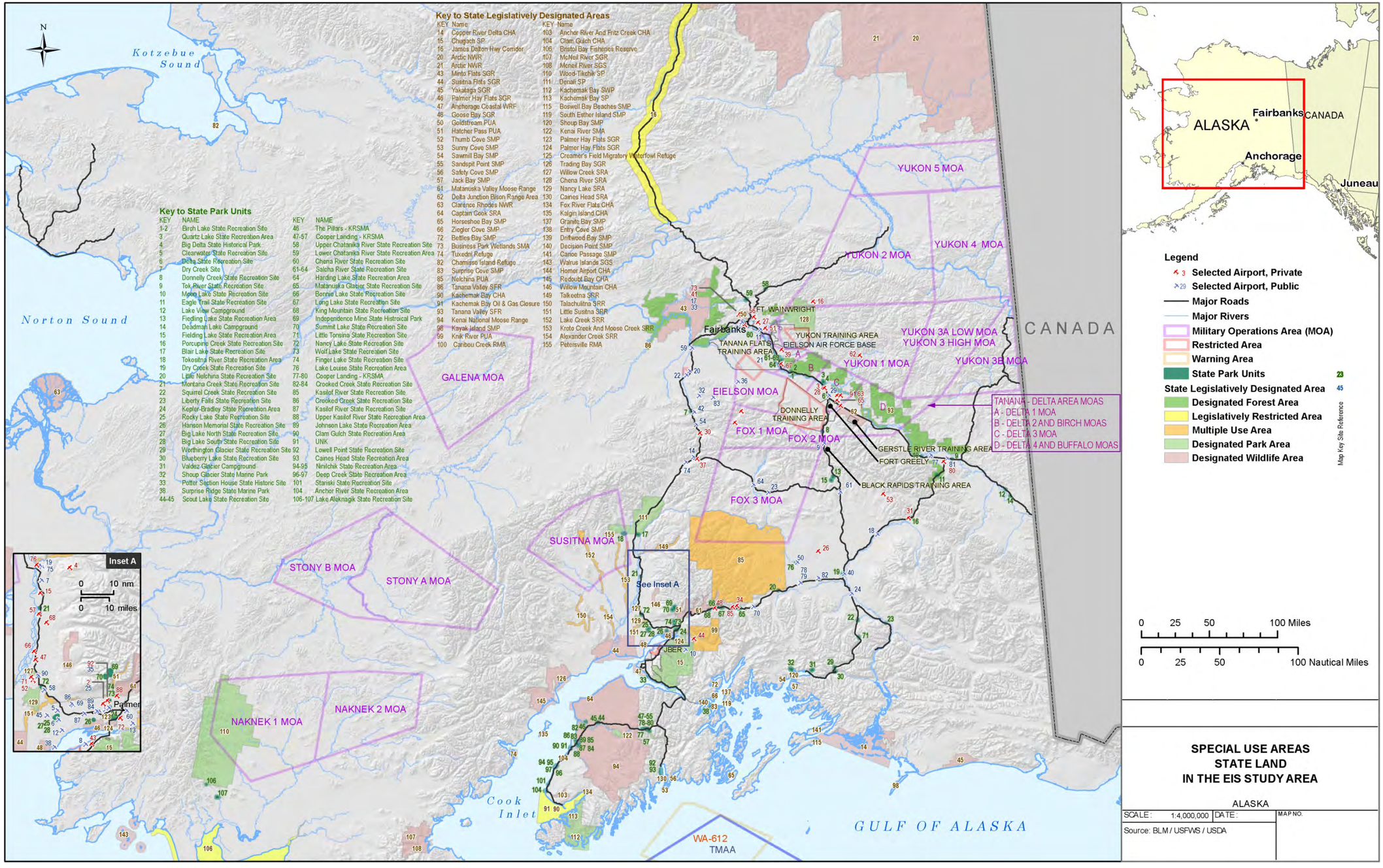

Figure B-19. Central Alaska Special Use Areas – State Lands

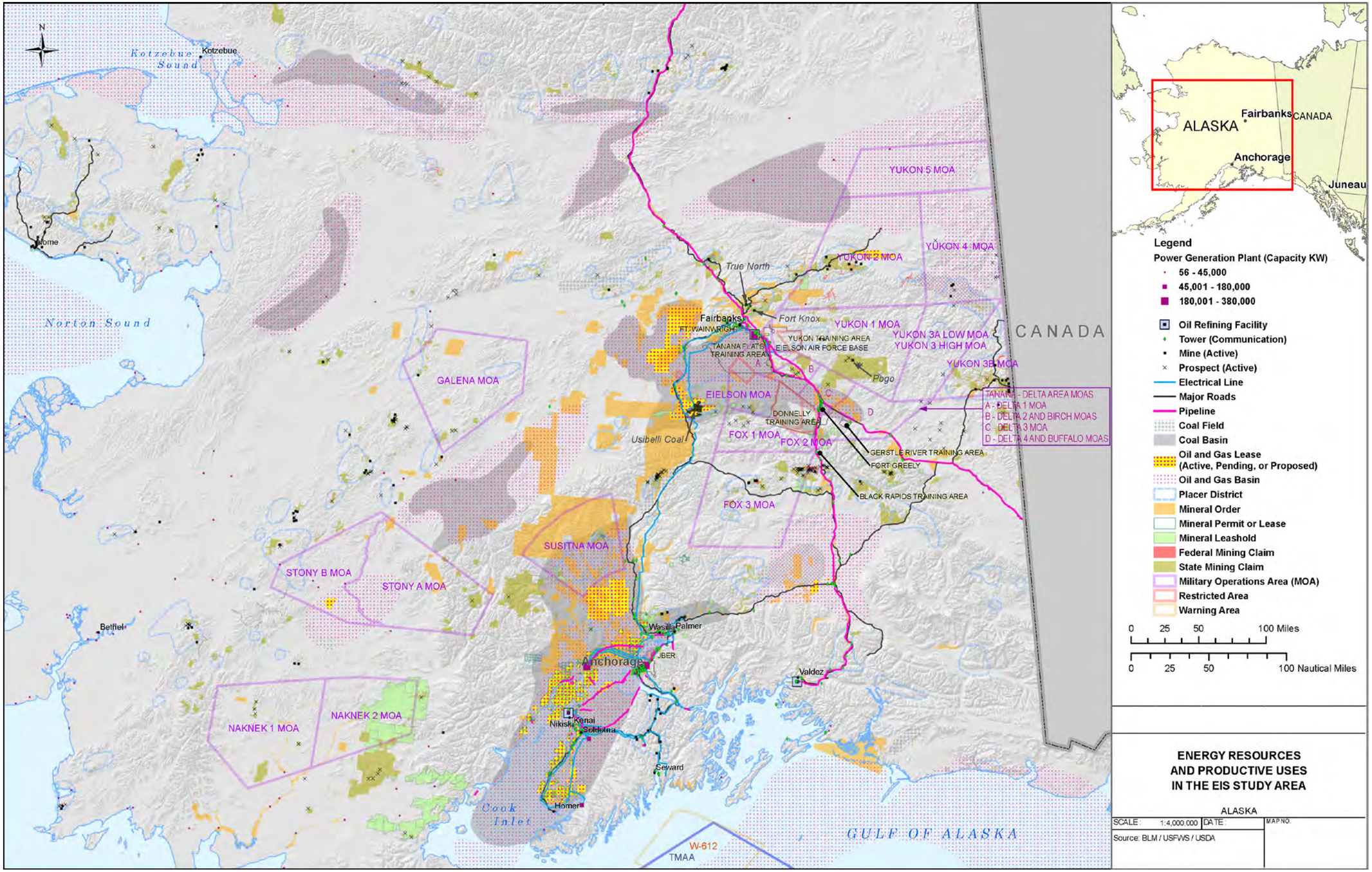

Figure B-20. Non-Renewable Energy Resources in Central Alaska

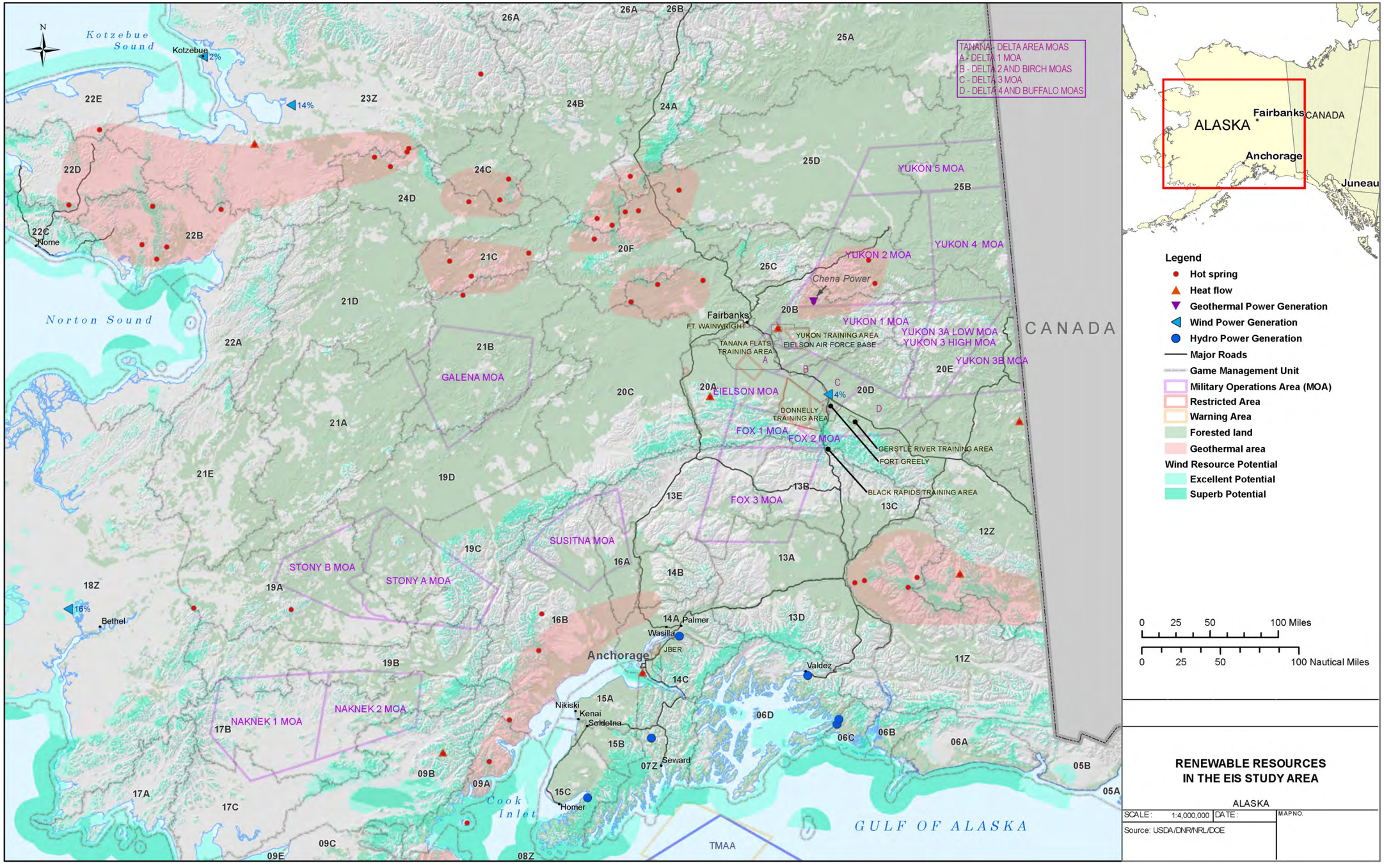

Figure B-21. Renewable Energy Resources in Central Alaska

Mining on Federal lands includes surface and underground mining of locatable, leasable, and saleable minerals, as defined by the Alaska Bureau of Land Management. Mining is excluded from a majority of Federal lands in Alaska, as such lands are typically designated national parks, preserves, monuments, wildlife refuges, or other areas on which mining ventures are restricted (ADNR 2010a).

Locatable minerals include precious metals, base metals, and uncommon rock varieties from the ground (USARAK 2006b). The potential for mining locatable mineral resources is ideal within the vicinity and south of Fairbanks. Gold is one of the primary resources found in the EIS study area, particularly northeast of Fairbanks. Small-scale placer mining occurs in discrete areas throughout the EIS study area.

Saleable minerals consist basically of construction materials such as sand, gravel, riprap, cinders, pumice, clay, limestone, and dolomite (USARAK 2006b). There is a potential to mine gravel and sand on Joint Base Elmendorf-Richardson (USARAK 2006b).

Recreational gold panning is not permitted on military lands. No commercial extraction of resources is permitted on military lands as per the BLM Resource Management plan within the military withdrawal agreement. Molybdenum Ridge on Fort Wainwright has potential molybdenum resource potential.

Renewable energy production in Alaska includes biomass, geothermal, hydroelectric, ocean energy, solar energy, and wind energy. The potential for renewable energy production within the EIS study area is excellent due to proximity to major populated areas (Fairbanks, North Pole, and Delta Junction) and the existence of conditions necessary to harness renewable energy resources. Locations of key renewable resource areas and sites are shown in Figure B-21. Geothermal production occurs at the Chena Power Plant northeast of Fairbanks. Wind energy potential is ideal along the Alaska Range from Mount McKinley to Tok and south-southeast of Anchorage.

Over 125 million acres of forested land in the State of Alaska is owned and managed by the Federal government, the State of Alaska, Alaska Native corporations, municipalities, private landowners, and trust lands. The Federal government and the state own the majority of the commercial grade forested lands (ADNR 2010b). Alaska's forests provide both timber (including lumber and firewood) and non-timber products. Despite past declines in the timber industry, small mills and other manufacturing facilities have shown some growth recently in the Anchorage and Fairbanks regions (ADNR 2006a) as locals look for cheaper heating sources as fuel prices have risen (ADNR 2010b). Forestry products (and harvesting) are expected to have significant growth in the south-central and interior portions of Alaska, including the Tanana Valley State Forest in the EIS study area (ADNR 2010b). Currently, forestry management and harvesting is focused in areas with existing infrastructure and lower production costs rather than remote inaccessible areas (ADNR 2010b). Non-timber products include herbs, foods, art materials, and tree sap to produce syrup (ADNR 2006b).

Agricultural cultivation in the State of Alaska includes crops and livestock (USDA 2007). The major crops are varieties of grains and root vegetables (USDA 2007). Select areas within Alaska provide a unique environment of extended daylight hours during the summer and suitable soils allowing hearty crop production despite extreme temperature ranges (Alaska Agriculture in the Classroom, Unknown). Alaska's top livestock markets are in aquaculture (i.e., farming of fish, crustaceans, and other aquatic life) and cattle (USDA 2007). The Matanuska-Susitna Valley (north of Anchorage) and Tanana Valley (east of Fairbanks) produce the most agricultural products within Alaska (AFB n.d.), although Anchorage and Juneau have the highest market value (USDA 2007). The University of Alaska Fairbanks also has field research sites for agriculture and forestry near Fairbanks, south of Gateway, and south of Delta Junction (UAF 2010). There is potential for agricultural farm growth in and around Fairbanks and Anchorage due to the favorable climate, soil types, and proximity to markets and transportation networks.

State of Alaska Mental Health Trust properties generally support productive uses (described above) for the purpose of producing revenue. The state also classifies lands based on attributes for particular productive or beneficial use. The general classifications used include habitat (conservation), forestry, agriculture, recreation, and settlement. Commercial timbering occurs on Federal and state land, following prescriptions and stipulations for maintaining sustainable yields. Also, several major rivers in the EIS study area provide exceptional fishing resources. These serve commercial, subsistence, and personal use/recreational users. Several lakes and rivers are stocked by the ADNR in order to sustain yields in accessible areas for these various users.

Private Land (Including Native Land). This category includes urbanized land devoted to a variety of public and private uses. Typical land use categories include residences (single- and multifamily residences and mobile homes), offices and businesses, retail stores, restaurants and lodging, commercial operations (e.g., auto shops), industry and manufacturing, warehousing, utilities and transportation networks, and community services (e.g., schools, churches, hospitals, local government). Ownership may be public or private, and generally must conform to ordinances of the governing jurisdiction. Most land use is encumbered (through ownership rights both surface and subsurface) which influences potential options for future use. Native lands are encumbered by amendments to the ANCSA and, as a result, specific developments or usage may be precluded.

Locations of Concern. During public scoping for the EIS, members of the public and agencies provided information and expressed concern about potential impacts of the EIS proposals in many areas. Many comments included descriptions of specific or general locations and the associated activity, resource, or value. Figure A–1 and Table A–6 in Appendix A shows these locations in the EIS study area.

B.10.3.2 Public Access

For the EIS, public access is defined as access of the public to Federally and state-owned property, including the navigable or public waters of the state and RS 2477 rights-of-way.

Public Access to Military Lands. In accordance with the Sikes Act, installations seek to provide access to military land for public use to the extent possible while meeting the primary purpose of the military mission. Beyond that, security and safety are the limiting factors. Consequently, some areas are defined as off-limits or have access restrictions. Public access is managed and controlled by a permit system. With a permit, private citizens may access military lands for a variety of recreational uses, such as hunting, fishing, trapping, and ORRV use. Permit holders must follow procedures for checking in prior to entering military land and follow particular seasonal or daily restrictions. USARAK allows for the following modes of access:

- *Ground vehicle* (car and truck) use is allowed on maintained roadways. Ground vehicles must obey all military rules and regulations involving posted speed limits and are not allowed in restricted areas.
- *Boats* are considered those aquatic vehicles that require open channels and waterways to operate. Boat access is allowed in some areas of military installations. As boats are already limited to open waterways, there are only certain areas available for boat use. Boats may not operate in restricted areas, some of which may have waterways flowing through them.
- *Off-road recreational vehicles* include motorized vehicles such as snowmobiles, all-terrain vehicles (three- and four-wheeled), and airboats, which do not require maintained roads or open waterways. ORRV use is allowed on maintained roadways and trails in designated areas. Military regulations describe the restrictions for each installation. ORRV use also varies seasonally. Three- and four-wheeled all-terrain vehicles are common ORRVs during summer,

while many recreators use snowmobiles on military lands in the winter. ORRVs usually stay on cleared trails, and snowmobiles often use frozen waterways in winter as corridors.

- *Aerial access* involves small aircraft, such as single-engine planes and ultralight aircraft. Public aerial access is allowed over military lands, subject to military and FAA regulations. USARAK Regulation 350-2 addresses use of restricted airspace over USARAK lands. Further information on airspace use over military lands can be found in Section B.1, Airspace Management and Use.

Unauthorized access or illegal entry onto military land is the most common form of trespass. Only a small portion of each installation's boundary is fenced or posted with installation boundary signs. Crossing installation boundaries or the internal boundary of an off-limits area without approval constitutes trespass.

Accessible Areas on Military Land. The USARAK has defined four primary categories of use areas on its lands: Open Use, Modified Use, Limited Use, and Off-Limits Areas. These recreational categories, defined below, are subject to periodic change or restrictions.

- *Open Use Areas* are those areas that are available year-round for all forms of recreation. Ground and ORRV access and vehicular use are permissible in this area.
- *Modified Use Areas* are those areas that are open year-round to all nonmotorized forms of recreation. Motorized vehicular recreation or access is limited to those frozen periods with six or more inches of snow cover. Modified Use restrictions are largely applicable to USARAK's wetlands.
- *Limited Use Areas* are closed to all forms of recreation at all times. This is due primarily to either conflicts with military use and the primary military mission, or to human health and safety issues.
- *Off-Limits Areas* include impact areas that are only accessible to trained military personnel.

General categories of military land use affecting public access are urban areas (cantonment), training areas and nonfiring facilities, firing ranges, SDZs, nondudded impact areas, and dudded impact areas. The degree of hazard (and whether permanent or discontinuous) is a determining factor. The military is required to post warning signs near all permanently closed and/or dangerous areas.

Public Access to Nonmilitary Lands. Federal and state statutes and management plans govern special management intent for, accessibility to, and use of any particular area. Land managers have the authority to close or restrict all or some public use or activities within its jurisdiction. The managing agency may close an area either temporarily or permanently to conserve resource values or for public safety concerns (such as during a high fire hazard period). Access to nonmilitary public lands varies depending on the facility, but typically occurs via ground transportation, watercraft, or aerial access, and in some areas via snow machines, foot travel, bicycle, and pack animal.

Surface transportation between Alaska's rural communities and public areas relies heavily on cross-country trails, primarily used in winter by snow machines, dogsled teams, and four-wheel all-terrain vehicles (ADNR 2000b). Typically, RS 2477 rights-of-way are available for public use under ADNR's regulations. The location of the RS 2477 network of roads and trails in the EIS study area is shown in Figure B-22. A description of RS 2477 rights-of-way within the region of influence for each proposed action is provided in Chapter 3.

Alaska statutes protect the public's right to access and use navigable and public waters regardless of who owns the underlying bed. A navigable water body under state law includes waters of the state that are navigable for any useful purpose, including boating, hunting, fishing, and other recreational activities

(AS 38.05.965(13)). Public water also includes habitat for fish and wildlife in which there is a public interest (AS 38.05.965(18)). Any land below the ordinary high water mark of navigable or public waters is generally accessible for recreational or other purposes such as fishing, trapping, boating, and hunting. A more-detailed description of public access on specific navigable or public waters of the state within the ROI for each proposed action is provided in Chapter 3.

B.10.3.3 Recreation

Outdoor recreation includes, but is not limited to, activities such as camping, water sports, river floating, powerboating, mountain climbing, photography, sightseeing, hiking, cross-country skiing, snowshoeing, dog mushing, snow machining, wildlife watching, sport hunting, and sport fishing. Most of the 322 million acres of public land in Alaska are available for recreation, and about 168 million acres are specifically managed for wildland recreation. Twenty-five of the rivers in Alaska comprising over 3,200 river miles are protected by national WSR designations. As a result, recreation in Alaska is highly valued for both quality of life and economic reasons.

Recreation on Military Land. Recreation on military lands is managed in accordance with appropriate Federal and state policies and regulations. In addition, each installation manages outdoor recreational opportunities through its INRMP. This section generally addresses recreational opportunities on military lands in Alaska. A more-detailed description of recreation on specific military lands within the ROI for each proposed action is provided in Chapter 3.

Hunting, Trapping, and Fishing. Military lands support numerous game species (moose, bear, caribou, bison, and small game). Hunting, trapping, and fishing are conducted under ADFG regulations to ensure a sustainable harvest of fish, game, and furbearer species. The military determines which areas are available and dates in coordination with ADFG seasons. Military installations also may institute fishing, hunting, and trapping regulations (including season closures, creel limit decreases, or bag limit decreases) that are more restrictive than those of the ADFG. Hunters must hold state hunting licenses and follow all Federal and state guidelines while hunting on military property. Hunting occurs on military lands throughout the year, with the most activity in the fall. Most big game seasons begin in August or September.

Trapping occurs on some military lands. Popular furbearer species for trapping include lynx, beaver, pine marten, and fox.

Fishing is a popular recreational activity on military lands. In addition to naturally existing populations of many sport fish, there are a number of stocked lakes on military lands. The ADFG is responsible for maintaining stocked fish populations on military lands.

As an indicator of recreational use, the reported number of hunters using YTA between 2001 and 2004 was 500 to 800 annually, and in TFTA it was between 800 and 1,200 annually (ASCG 2006).

Off-Road Recreational Vehicles. ORRVs and watercraft are used in association with many activities in Alaska. These vehicles are used to access hunting, fishing, and trapping areas, for recreational riding, and for other activities. Military lands may be designated for one or more types of ORRV use in response to a demonstrated need, providing there are sufficient suitable areas available. Areas and trails are typically classified as either open to the public with access controlled by manageable quotas, or closed to the public.

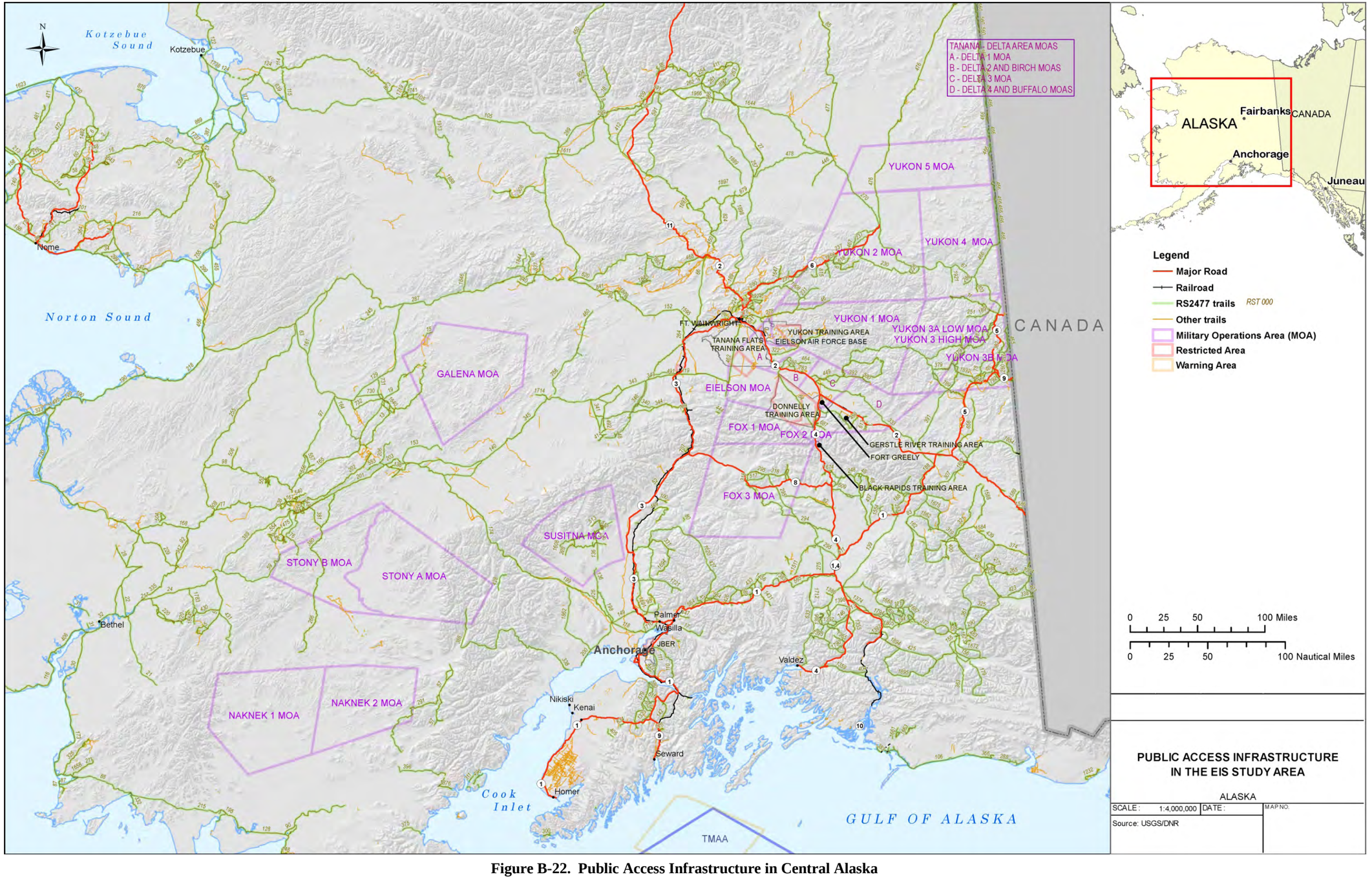

Figure B-22. Public Access Infrastructure in Central Alaska

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Trail Use. Hiking opportunities exist within most military locations. Hiking is most popular in mountainous or hilly terrain and much less popular throughout lowland and wet areas. Hiking on military land usually occurs on training and maneuver trails.

***Camping*.** Overnight camping on military lands is permitted within designated areas with a Recreational Access Permit. Camping is not permitted in cantonment areas, except for designated fee campgrounds. In some areas, cabins are available along trail systems for overnight use in conjunction with hiking or skiing.

Boating and Rafting. Boating and rafting are popular recreational activities on authorized lakes on military properties. All persons using watercraft are subject to Alaska state law with regard to safety and registration requirements. In addition, most installations require that individuals wear Coast Guard-approved personal flotation devices while operating boats or rafts on installations. Boating and rafting occurs mainly during the summer months.

Recreation on Nonmilitary Public Land. Several nonmilitary public lands within the ROI of this EIS provide recreation opportunities. The following discussion focuses on the main types of recreational areas under Federal and state ownership in the ROI and their associated recreational uses. There are other smaller state, regional, and local parks and recreation areas in the ROI that support a spectrum of recreational activities. Specific recreational uses and locations within the ROI for each proposed action are discussed in Chapter 3.

National Parks and Preserves. NPS is a bureau of the DOI whose fundamental purpose is to promote and regulate the use of national parks, monuments, and reservations under its control. Two national parks and preserves are located within the EIS study area. National parks generally have a minimum overflight restriction to preserve a level of quietude. Denali National Park and Preserve and the Yukon-Charley River National Preserve are located within the EIS study area. Further description of this area is provided in Appendix I, *Land Use, Public Access, and Recreation.*

National Forests. The USFS is an agency of the U.S. Department of Agriculture that administers the nation's 155 national forests and 20 national grasslands, which encompass 193 million acres. Major divisions of the agency include the National Forest System, State and Private Forestry, and the Research and Development branch. USFS Region 10, based in Juneau, Alaska, oversees Alaska's two national forests.

National Wildlife Refuge Lands. The National Wildlife Refuge System administers a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States. Minimum flying altitude restrictions (generally 5,000 feet AGL) are in effect in military training airspace over most national wildlife refuges to preserve a level of quietude. Only the Yukon Flats National Wildlife Refuge is within the EIS study area.

National Wild and Scenic Rivers. National WSRs are protected areas in the United States that are preserved because they possess remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other values. These WSRs are preserved in their free-flowing condition. In Alaska, national WSRs include 25 rivers managed by Federal agencies (e.g., BLM, USFWS, NPS) or state government. Four National Wild and Scenic Rivers are located within the EIS study area: Delta WSR, Gulkana Wild River, Birch Creek WSR, and Fortymile WSR.

Fishing and Game Activities. Fish and game activities are regulated by the ADFG. Subsistence use of fish and wildlife resources is discussed in Section B.13, Subsistence.

Individuals must have a Sport Fishing License to participate in sport fishing in Alaska. The ADFG divides the state into three major regions (interior, south-central, and southeast), which are further broken down into individual management units. Alaska is home to 10 species of big game animals and also offers small-game and waterfowl hunting opportunities. The ADFG established 26 Game Management Units (GMUs) to effectively manage and control hunting in Alaska. The locations of GMUs in the EIS study area are shown in Figure B-21. Each GMU is managed to provide hunters with an optimal experience and ensure appropriate control of game populations from year to year. The ADFG decides which species are harvestable, and at what levels and locations. Additional information about the portions of GMUs 20, 13, 14, and 25 within the EIS study area are described in Appendix I, *Land Use, Public Access, and Recreation*. The two primary affected units are the following:

- *GMU 13* consists of the area that lies to the west of the east bank of the Copper River and is drained by all tributaries into the west bank of the river. GMU 13 is divided into five subunits: Units 13A through 13E. Game species managed within GMU 13 include caribou, mountain goat, bison, moose, Dall sheep, brown/grizzly bear, and black bear.
- *GMU 20* consists of the Yukon River drainage upstream from and including the Tozitna River drainage to and including the Hamlin Creek drainage; drainages into the south bank of the Yukon River upstream from and including the Charley River, Ladue River, and Fortymile River drainages; and the Tanana River drainage north of Unit 13 and downstream from the east bank of the Robertson River. GMU 20 is divided into six subunits: Units 20A through 20F. Game species managed within GMU 20 include caribou, bison, moose, Dall sheep, brown/grizzly bear, and black bear.

State Parks and Recreation Areas. State Park and Recreation Areas provide a broad spectrum of outdoor recreation opportunities, while protecting the area's natural values. These areas are managed by the ADNR Division of Parks and Outdoor Recreation. There are sixteen state park and recreation areas within the EIS study area including: Birch Lake State Recreation Area, Chena River State Recreation Area, Clearwater State Recreation Site, Delta State Recreation Area, Donnelly Creek State Recreation Site, Fielding Lake State Recreation Area, Harding Lake State Recreation Area, Lake Louise State Recreation Area, Quartz Lake State Recreation Area, and Salcha River State Recreation Area.

State Forest. State Forests are managed by the ADNR Department of Forestry and provide for multiple uses and sustained yield of renewable resources. There is one state forest, Tanana Valley State Forest, located within the EIS study area.

Public Use Areas. Public use areas are legislatively designated areas established for special multiple use management of state public land and water resources by ADNR, and management of public wildlife resources by the ADFG.

Moose Range. Moose ranges maintain, improve, and enhance moose populations, wildlife habitat, and other wildlife resources; and perpetuate public multiple use. These areas are managed jointly by the ADNR and the ADFG. There is one moose range, the Matanuska Valley Moose Range within the EIS study area.

B.11 INFRASTRUCTURE AND TRANSPORTATION

B.11.1 Definition of Resource

Analysis of infrastructure considers the utility systems required to support JPARC and other users of public utility systems. It includes the capacities of the electric power transmission and distribution system, natural gas and liquid fuel (fuel oil, diesel fuel, and gasoline) supply systems, and the water supply system to meet the demands of all their existing and planned users.

Transportation is the multimodal network of roads, railways, and trails that link centers of population or activity and provide access to remote areas within the study area. The ability of current systems to handle anticipated traffic and provide for access are key attributes to consider when evaluating transportation.

B.11.2 Regulatory Setting

EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007), sets goals for Federal agencies to conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions and in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009), sets goals for the expansion of the energy reduction and environmental performance requirements of EO 13423. EO 13514 sets numerous Federal energy requirements in several areas, including accountability and transparency, strategic sustainability performance planning, greenhouse gas management, sustainable buildings and communities, water efficiency, electronic products and services, fleet and transportation management, and pollution prevention and waste reduction. Activities under all of the alternatives would have to be conducted to comply with this order. While military training functions and support are generally excluded from the requirements of the EO, DoD and the various Services have established policies and goals for improving performance, and there are benchmarks for considering how proposals may impact achievement of the goals.

The Clean Water Act (33 U.S.C. 1151 et seq.; 33 U.S.C. 1251 et seq.) is the basic Federal legislation governing wastewater discharges. The implementing Federal regulations include the NPDES permitting process (40 CFR 122), general pretreatment programs (40 CFR 403), and categorical effluent limitations, including limitations for pretreatment of direct discharges (40 CFR 405 et seq.).

The Federal Water Pollution Control Act/Clean Water Act, Section 404, Dredged or Fill Permit Program (33 U.S.C. 1344) regulates development in streams and wetlands by requiring a permit from the Army Corps of Engineers for discharge of dredged or fill material into navigable waters. A Section 401 (33 U.S.C. 1341) Certification is required from the state as well.

The Safe Drinking Water Act (42 U.S.C. 300f et seq.) requires the promulgation of drinking water standards, or maximum contaminant levels, which are often used as cleanup values in remediation; establishes the underground injection well program; and establishes a wellhead protection program.

AR 420-1, *Army Facilities Management* (Army 2008b), establishes the policies and responsibilities for the operation, maintenance, repair, and construction of facilities and systems for the efficient, economical, and environmentally sound management of utility services at all Army installations.

USARAK Regulation 55-2, *Transportation Operations and Planning in Alaska* (USARAK 2001), provides detailed regulations for convoy preparation and implementation.

AFI 32-7041, *Water Quality Compliance* (Air Force 2003), instructs the Air Force on maintaining compliance with the CWA; other Federal, state, and local environmental regulations; and related DoD and Air Force water quality directives.

AFI 32-7064, *Integrated Natural Resources Management* (Air Force 2004a), sets forth requirements for addressing wetlands, floodplains and coastal and marine resources in an INRMP for each installation.

There are no specific regulations associated with electrical or natural gas infrastructure or supply.

B.11.3 General Description of Affected Environment

B.11.3.1 Infrastructure

B.11.3.1.1 Regional Energy Supplies

Alaska's electrical infrastructure is different from that of the lower 48 states, which rely on a comprehensive interconnected grid for power transmission. Alaska has only one primary interconnected grid that serves the two major population centers of the state. The layout of the overall system is shown in Figure B-23. This transmission corridor is known as the Railbelt Service Area. All other transmission lines are considered part of the non-Railbelt Alaska.

Railbelt Service Area. The Railbelt Service Area consists of a corridor stretching from the Kenai Peninsula to Delta Junction along the Parks and Richardson Highways (Figure B-24). The corridor includes the two major population centers of the state: Anchorage and Fairbanks. The Railbelt Service Area is served by six utilities: Golden Valley Electric Association (GVEA), Chugach Electric Association (CEA), Matanuska Electric Association, Homer Electric Association (HEA), Anchorage Municipal Light & Power (ML&P), and the City of Seward Electric System (SES). These utilities, along with state-owned assets, serve roughly 75 percent of Alaska's population and account for over 80 percent of the electricity generated in the state.

The primary types of generating plants in the Railbelt include gas-fired, oil-fired, and hydroelectric. The five largest plants include Beluga (CEA, gas-fired), George M. Sullivan (ML&P, gas-fired), Bradley Lake (CEA, hydroelectric), North Pole (GVEA, oil-fired), and Anchorage Plant No. 1 (ML&P, gas-fired).

Transmission within the Railbelt is typically divided into three main load centers: northern, central, and southern. It is assumed that power flows freely within each load center without transmission constraints. GVEA is the lone provider within the northern load center. Their primary transmission assets include a 138-kilovolt (kV) line from Healy to Delta Junction and the Northern Intertie. The Northern Intertie is a redundant and much-needed 97-mile, 230-kV line between Healy and Fairbanks that reduces line losses, increases the transfer capacity, and improves reliability. The northern load center is connected to the central load center via the Alaska Intertie. The Alaska Intertie is a 170-mile, 345-kV line (operated at 138 kV) between Healy and Willow that is owned by the Alaska Energy Authority. The transfer capability between the Intertie and the northern load center transmission lines is assumed to be 75 megawatts (MW) and 140 MW.

The central load center consists of the CEA, Matanuska Electric Association, and ML&P service areas and has multiple transmission lines with capacities of 230-, 138-, and 115-kV. The central load center is tied the southern load center via CEA's Southern Intertie. The Southern Intertie is a 135-mile, 115-kV transmission line with an assumed transfer capability of 75 MW. The southern load center consists of the HEA and SES service areas, which operate 115- and 69-kV transmission lines.

Non–Railbelt Alaska. Non–Railbelt Alaska is diverse; it contains both rural and urban customers and both roadless and road-accessible communities. These communities rely on their own power sources, which typically involves the use of diesel generators. Their most common energy denominator is that none of the areas are connected to the Railbelt energy grid. The largest non–Railbelt Alaska cooperative within the study area is the Copper Valley Electric Association (CVEA). CVEA's service areas are connected with a 106-mile, 138-kV transmission line between Valdez and Glennallen. The transmission line is owned by the Four Dam Pool Power Agency but is operated by CVEA.

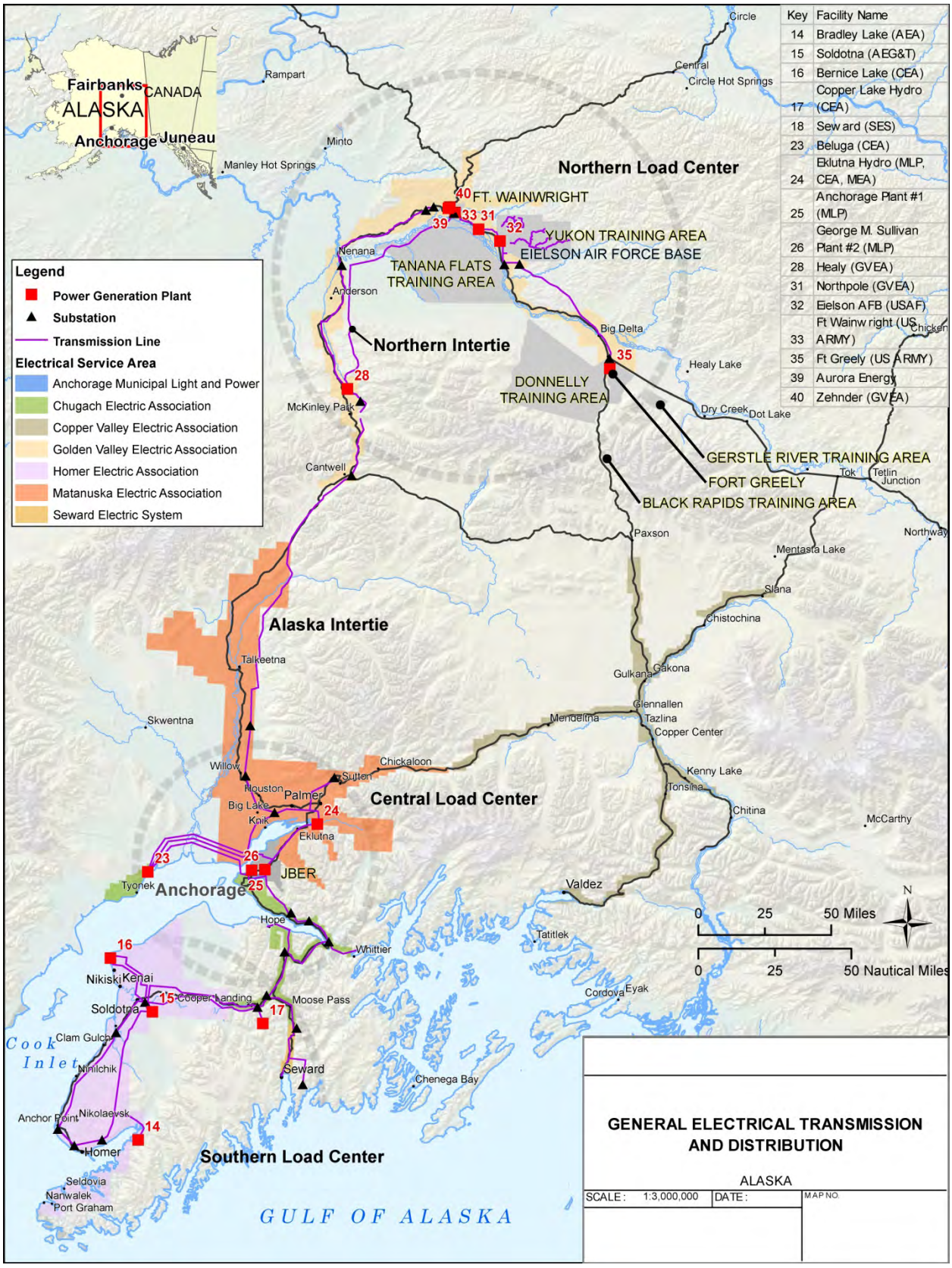

Figure B-23. General Electrical Transmission and Distribution

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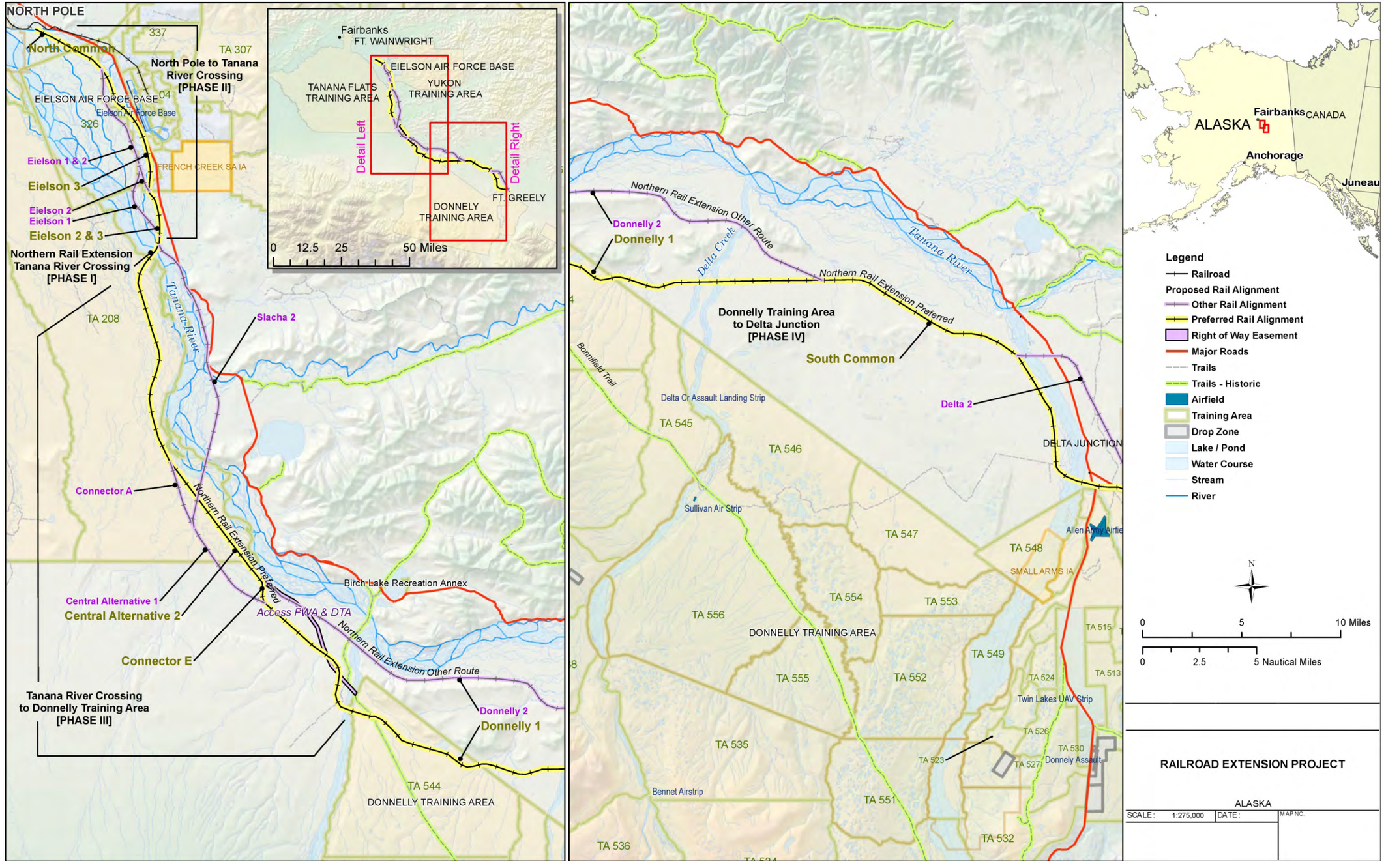

Figure B-24. Northern Rail Extension Project

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Military Installations and Training Areas Energy Supply. Electricity, water, sewage, and natural gas are necessary to support various missions and to maintain the residences of military personnel. An extensive system supplies these resources to personnel at JPARC facilities and training areas, with the highest concentration of infrastructure in primary installation cantonments (i.e., JBER, Fort Wainwright, Eielson AFB, and Fort Greely).

In 2007, a 50-year contract was awarded to Doyon Utilities for assumption of ownership, operation, and maintenance of the electric power generation and distribution systems, central heat and heat distribution systems, natural gas distribution systems, potable water distribution systems, and the wastewater collection systems of USARAK facilities, including JBER, Fort Wainwright, and Fort Greely. Aurora Energy serves as a subcontractor for the operation of electric power and heat utilities and power generation assets. In addition to the three installations listed above, the contract includes three remote sites: Black Rapids, Bolio Lakes, and YTA.

Yukon Training Area. YTA is supplied with power from GVEA and by the Eielson AFB power plant. Electrical distribution lines extend northeast into and around the Chena River Research Site and along primary roads within the training area. Where overhead power is not available; constant-run generators are used for power generation.

Donnelly Training Area. Electrical distribution within DTA is limited to the area east of the Delta River. Within this area, however, not all range facilities have electric power. DTA falls within the GVEA service area.

Tanana Flats Training Area. Currently no commercial power is available in TFTA. GVEA's Northern Intertie is routed along the northwestern and northern sections of TFTA.

B.11.3.1.2 Water Supply

The cities of Anchorage and Fairbanks overlie coarse-grained alluvial aquifers, which yield large quantities of rather high-quality water; information on groundwater outside Alaska's urban areas is sparse (USGS 1999). Permafrost presents unusual groundwater development and withdrawal problems, and continuous permafrost yields little groundwater. Maintaining a potable water supply could pose a challenge for military activities in areas without a water supply infrastructure. Groundwater exploration should be conducted prior to siting military activities with long-term water requirements. In 2000, the water utilities in the Anchorage, Fairbanks, and Juneau areas used 61 percent of all water withdrawn in the state for public supply. The mean rate of water withdrawn by the principal public-supply utilities servicing these three areas from January 1990 to September 2005 has ranged from a monthly minimum of 3 million gallons per day in Juneau to a maximum of 48 million gallons per day in Anchorage. Higher-usage periods occur during the summer months in Anchorage and Fairbanks due to tourism, commercial activity, industrial activity, and seasonal climatic effects (USGS 2005).

In 2000, Alaska's average usage of water was 190 gallons per day per person, while the nation´s average was 180 gallons per day. Approximately 70 percent of Alaska's public-water supply comes from surface water in these three cities, while ground water is the source for the remainder. The greater Fairbanks area's water supply is taken from four wells along the Chena River. The primary water treatment plant produces nearly 1.3 billion gallons of treated water annually. Due to the Arctic environment, the entire water treatment and storage process takes place indoors (USA 2011). Juneau obtained 71 percent of its public-supply water from groundwater sources in 2005; for Fairbanks, the figure was 100 percent (USGS 2005).

B.11.3.2 Surface Transportation

The study area broadly covers southeast Alaska from JBER in southern Alaska, near Anchorage; Fort Wainwright and Eielson AFB in central Alaska, near Fairbanks; and Fort Greely in central Alaska, near Delta Junction. Situated within this region are a number of military land-based training areas, including YTA and TFTA, near Fort Wainwright and Eielson AFB; DTA and GRTA, near Fort Greely; and BRTA, just south of Fort Greely.

Interstate Highways. Alaska's interstate highways are concentrated in the south-central region of the state. The interstate highways in that area include A1, A2, A3, and A4. These highways are not typically known in Alaska by their interstate designations on any available Alaska Department of Transportation maps or on any highway/roadway signage. Rather, the interstate and state highways are known and signed primarily by their highway name and secondarily by their Alaska state highway (SH#) number (Figure B-25).

Below is a brief description of the four interstate highways within the study region and in the entire State of Alaska. Table B–17 provides more-detailed descriptions of these interstate highways.

- ***Interstate A1***. From Anchorage, Interstate A1 runs in a northeasterly direction to Tok, then in a southeasterly direction to the Canadian border. The segment from Anchorage to the Gakona junction at SH4 is also designated as SH1 and Glenn Highway. The segment from the Gakona junction to Tok is also designated as SH1 and the Tok Cut-Off Highway. The third segment from Tok to the Canadian border is also designated as SH2 and the Alaska Highway.
- ***Interstate A2***. Originating in Fairbanks, Interstate A2 runs in a southeasterly direction to Tok. The interstate is also known as SH2 and Richardson Highway from Fairbanks to Delta Junction and as SH2 and the Alaska Highway from Delta Junction to Tok.
- ***Interstate A3***. From Anchorage, Interstate A3 runs in a southeasterly direction around the Turnagain Arm of Cook Inlet, then in a southwesterly direction to Soldotna. The segment from Anchorage to the junction of SH9 is also known as SH1 and the Seward Highway. From the SH9 junction to Soldotna, the segment is also known as SH1 and the Sterling Highway.
- ***Interstate A4***. From Fairbanks, Interstate A4 runs in a southerly direction to the junction of Interstate A1 on the east side of Wasilla. Interstate A4 is also known as SH3 and the George Parks Highway.

State Highways. The state highways within the region that are also on the National Highway System (NHS) include SH1, SH2, SH4, SH9, and SH11. As described above, these state highways are known and signed primarily by their highway name and secondarily by their Alaska SH# number. The following is a brief description of the five NHS state highways within the study region.

- ***State Highway 1***. SH1, also known as Sterling Highway, runs in a northerly direction from Homer to Soldotna. SH1 continues past Soldotna in a northeasterly direction as Interstate A3 to Anchorage and Interstate A1 to Tok.
- ***State Highway 2***. The northern route of SH2 is known as the Steese Highway from Fairbanks to Fox. SH2 continues as Elliot Highway in a northwesterly direction from Fox to Livengood. The southern route of SH2 is known as Richardson Highway from Fairbanks to Delta Junction and the Alaska Highway from Delta Junction to the Canadian border. The southern route of SH2 is also designated as Interstate A2 from Fairbanks to Tok and Interstate A1 from Tok to the Canadian border.

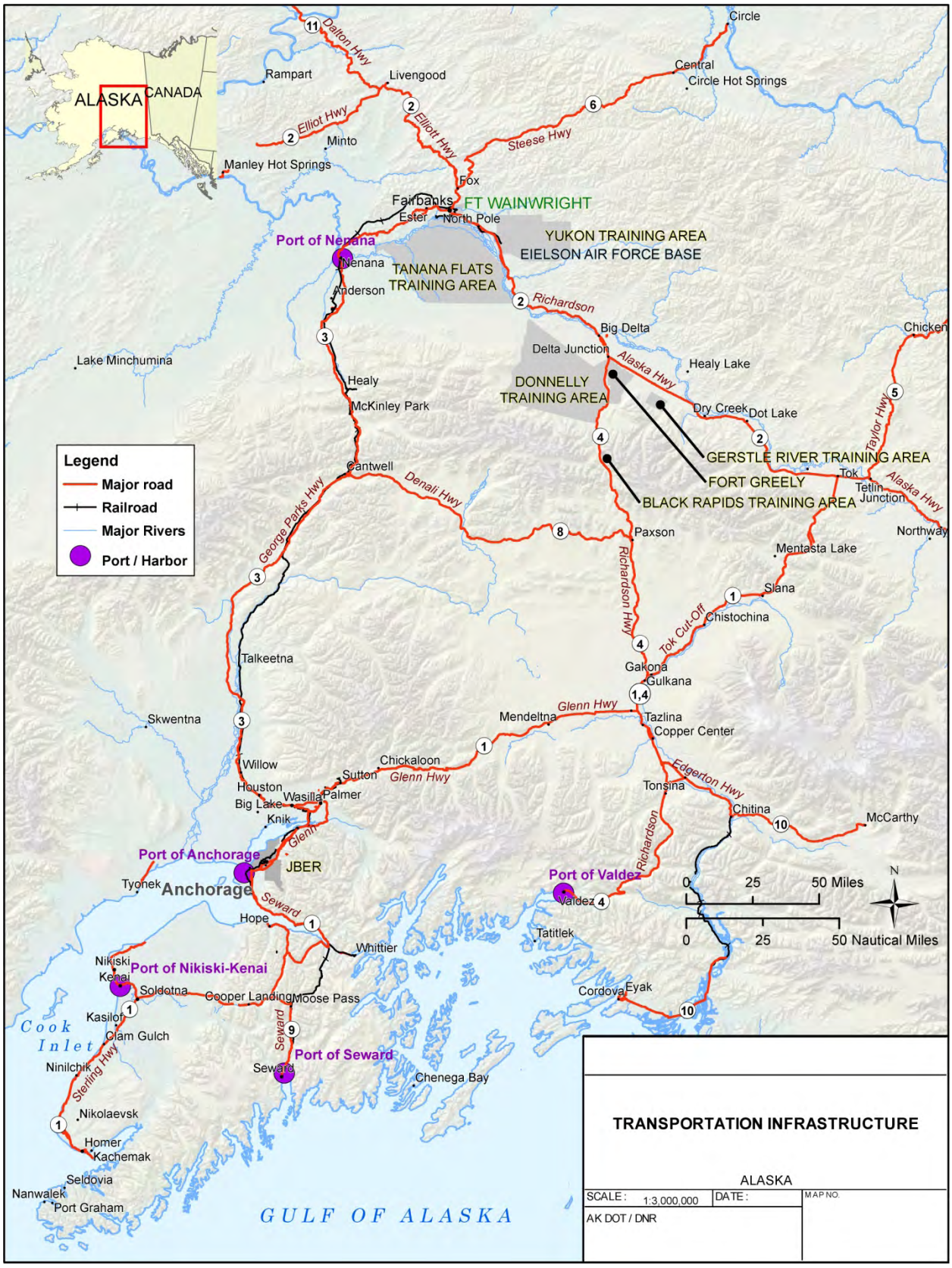

Figure B-25. Transportation Infrastructure

Table B–17. Surface Transportation: Interstate and State Highways

Highway Name - Segment Description	Interstate Designation	State Highway Designation	Lane Configuration	Pavement Type	Roadway Miles	Limitations	Weather Restrictions
Glenn Highway							
- Downtown Anchorage to Hiland Drive (Anchorage)	A-1	SH 1	6-Lane divided	Bituminous concrete	10		
- Hiland Drive (Anchorage) to Eagle River	A-1	SH 1	5-Lane divided	Bituminous concrete	1		
- Eagle River to Matanuska Junction	A-1	SH 1	4-Lane divided	Bituminous concrete	23		
- Matanuska Junction to Glennallen at Richardson Hwy	A-1	SH 1	2 - Lane undivided	Bituminous concrete	145		
- Gakona Junction to Tok at Alaska Highway (aka Glenn Highway/Tok Cutoff)	A-1	SH 1	2-Lane undivided	Bituminous concrete	122		
Richardson Highway							
- Airport Way (Fairbanks) to Mitchell Expressway Junction (Fairbanks)		SH 2	4-Lane divided	Bituminous concrete	1		
- Mitchell Expressway Junction (Fairbanks) to Eielson Air Force Base	A-2	SH 2	4-Lane divided	Bituminous concrete	20		
- Eielson Air Force Base to Delta Junction	A-2	SH 2	2-Lane undivided	Bituminous concrete	73		
- Delta Junction to Fort Greely		SH 4	2-Lane undivided	Bituminous concrete	4		
- Fort Greely to Gakona Junction		SH 4	2-Lane undivided	Bituminous concrete	133		
- Gakona Junction to Glennallen at Glenn Highway	A-1	SH 4	2-Lane undivided	Bituminous concrete	14		
- Glennallen at Glenn Highway to Valdez		SH 4	2-Lane undivided	Bituminous concrete	117		

Table B-17. Surface Transportation: Interstate and State Highways (*continued*)

Highway Name - Segment Description	Interstate Designation	State Highway Designation	Lane Configuration	Pavement Type	Roadway Miles	Limitations	Weather Restrictions
Alaska Highway							
- Delta Junction to Tok at Glenn Highway	A-2	SH 2	2-Lane undivided	Bituminous concrete	107		
- Tok at Glenn Highway to Canadian border - Airport Way (Fairbanks) to Mitchell Expressway Junction (Fairbanks)	A-2	SH 2 SH 2	2-Lane undivided 4-Lane divided	Bituminous concrete Bituminous concrete	90 1		
George Parks Highway							
- Matanuska Junction to Wasilla at Broadview Avenue	A-4	SH 3	4-Lane divided	Bituminous concrete	6		
- Wasilla at Broadview Avenue to Wasilla at Deskas Street	A-4	SH 3	5-Lane undivided	Bituminous concrete	4		
- Wasilla at Deskas Street to Denali Highway	A-4	SH 3	2- to 3-Lane undivided	Bituminous concrete	165		
- Denali Highway to Fairbanks East	A-4	SH 3	2- to 3-Lane undivided	Bituminous concrete	143		
- Fairbanks East to Airport Way (Fairbanks)	A-4	SH 3	4-Lane divided	Bituminous concrete	1		
Seward Highway							
- Downtown Anchorage to Fireweed (Anchorage)		SH 1	8-Lane divided/city street	Bituminous concrete	1.3		
- Fireweed (Anchorage) to Tudor Road (Anchorage)		SH 1	6-Lane divided	Bituminous concrete	1.2		
- Tudor Road (Anchorage) to Dowling Road (Anchorage)	A-3	SH 1	4-Lane divided	Bituminous concrete	1		
- Dowling Road (Anchorage) to Potter Hill	A-3	SH 1	4-Lane divided	Bituminous concrete	7		

Table B-17. Surface Transportation: Interstate and State Highways (*continued*)

Highway Name - Segment Description	Interstate Designation	State Highway Designation	Lane Configuration	Pavement Type	Roadway Miles	Limitations	Weather Restrictions
- Potter Hill to Sterling Highway Junction	A-3	SH 1	2- to 4-Lane undivided	Bituminous concrete	79		
- Sterling Highway Junction to Seward		SH 9	2- to 3-Lane undivided	Bituminous concrete	37		
Sterling Highway							
- SH9 Junction to Devin Drive (Soldotna)	A-3	SH 1	2- to 3-Lane undivided	Bituminous concrete	57		
- Devin Drive (Soldotna) to Kenai Spur Highway (Soldotna)	A-3	SH 1	5-Lane undivided	Bituminous concrete	0.2		
- Kenai Spur Highway (Soldotna) to Kalifornsky Beach Road (Soldotna)		SH 1	5-Lane undivided	Bituminous concrete	1.3		
- Kalifornsky Beach Road (Soldotna) to Lake Street (Homer)		SH 1	2- to 4-Lane undivided	Bituminous concrete	74		
Steese Highway							
- Airport Way (Fairbanks) to Winch Road (Fairbanks)		SH 2	4- to 5-Lane divided	Bituminous concrete	8		
- Winch Road (Fairbanks) to Fox		SH 2	2-Lane undivided	Bituminous concrete	3		
- Fox to Nome Creek Road		SH 6	2-Lane undivided	Bituminous concrete	44		
- Nome Creek Road to End of Bituminous Concrete Section		SH 6	2-Lane undivided	Bituminous concrete	5		Closed winters
- End of Bituminous Concrete Section to Circle		SH 6	2-Lane undivided	Graded aggregate	95		Closed winters
Elliot Highway							
- Fox to Livengood		SH 2	2-Lane undivided	Bituminous concrete	68		

Table B-17. Surface Transportation: Interstate and State Highways (*continued*)

Highway Name - Segment Description	Interstate Designation	State Highway Designation	Lane Configuration	Pavement Type	Roadway Miles	Limitations	Weather Restrictions
- Livengood to Eureka		SH 2	2-Lane undivided	Graded aggregate	57		
Dalton Highway (North Slope Haul Rd)							
- Livengood to Deadhorse		SH 2	2-Lane undivided	Bit. conc. and grad. aggr.	415		
Denali Highway							
- George Parks Highway (Cantwell) to Richardson Highway (Paxson)		SH 8	2-Lane undivided	Bit. conc. and grad. aggr.	134		Closed winters
Taylor Highway							
- Tetlin Junction to Chicken		SH 5	2-Lane undivided	Bituminous concrete	65		Closed winters
- Chicken to SH9 Junction		SH 5	2-Lane undivided	Graded aggregate	29		Closed winters
- SH9 Junction to Eagle		SH 5	2-Lane undivided	Graded aggregate	62		Closed sinters
Edgerton Highway							
- Pippin Lake to Chitina		SH 10	2-Lane undivided	Bituminous concrete	33		
Cooper River Highway							
- Cordova to miles Lake		SH 10	2 - Lane Un-Divided	Bit. Conc. and Grad. Aggr.	57		Closed winters
Top of the World Highway							
- SH5 Junction to Canadian border		SH 9	2 - Lane Un-Divided	Bit. Conc. and Grad. Aggr.	13		Closed winters

- ***State Highway 4***. SH4, also known as Richardson Highway, runs in a northerly direction from Valdez to Delta Junction. SH4 intersects Interstate A1 near Glennallen and is designated as Interstate A1 until just south of Gakona.
- ***State Highway 9***. SH9, also known as Seward Highway, runs in a northerly direction from Seward until it intersects Interstate A3/SH1 east of Cooper Landing.
- ***State Highway 11***. A continuation of SH2 out of Livengood, SH11 (also known as Dalton Highway) runs in a northerly direction to the town of Deadhorse at Prudhoe Bay.

Other Public Roads and Bridges. One current project is the proposed Tanana River Bridge project just north of Salcha. This crossing will replace the existing Tanana River winter land bridge. The Tanana River Crossing will provide a single-lane bridge for vehicular traffic in addition to the rail bridge. Phase 2 connects the river crossing bridge to the mainline, while the third phase provides access from the river crossing into DTA. The final phase will provide access from DTA into Delta Junction with a crossing over the Delta River.

Ice roads and bridges are important arteries of transportation in the winter months in Alaska. Typically these are constructed in areas where construction of solid surface roads is not practical due to landscape and soil limitations or the presence of bodies of water. In addition, off-road trails are an extremely important part of the transportation network in Alaska. These trails provide a link to more-remote and less-populated areas of Alaska and are heavily used by hunters, recreationalists, and local citizens for land access, subsistence, and other uses.

Rail Network. The first railroad in Alaska was constructed by the Alaska Central Railway in 1903. The initial track began in Seward and extended northward approximately 50 miles. In 1914, the U.S. Congress authorized construction and operation of a railroad from Seward to Fairbanks, and in 1923, the golden spike was driven at Nenana to mark completion of the project. The U.S. Government operated the rail system until it was purchased by the State of Alaska in 1985. The State of Alaska formed the Alaska Railroad Corporation (ARRC) and appointed a Board of Directors to operate the system as a self-sustaining corporation.

Today, the Alaska Railroad extends from Seward northward into Anchorage, and continues in a northerly direction to Fairbanks. From Fairbanks, the rail extends in a southeasterly direction to Eielson AFB. The rail system consists of 467 miles of main line and has another 189 miles of branch lines, yard rail, and sidings. The ARRC owns or leases 1,381 freight cars, 45 passenger cars and 51 locomotives. During 2010, the Alaska Railroad had a ridership of more than 405,000 and a freight tonnage in excess of 6.3 million tons (ARRC 2011).

Proposed Rail. The ARRC maintains a comprehensive inventory of capital improvement projects. The purpose of these projects varies from safety and efficiency enhancements to facility upgrades and expansion.

The recently approved Northern Rail Extension Project, shown in Figure B-24, would have the greatest impact on military operations. The project will extend the Alaska Railroad from the Chena River Overflow Structure near Eielson AFB to Delta Junction. The 80-mile extension project consists of four phases and is currently underway.

The first phase includes the Tanana River Crossing just north of Salcha. The Tanana River Crossing will provide a single-lane bridge for vehicular traffic in addition to the rail bridge. Phase 2 connects the river crossing bridge to the mainline, while the third phase provides access from the river crossing into DTA. The final phase will provide access from DTA into Delta Junction with a crossing over the Delta River.

B.12 SOCIOECONOMICS

B.12.1 Definition of Resource

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income, and regional industries. It may also include local and state tax revenues that are the basis for expenditures on public infrastructure and services. Changes to these fundamental socioeconomic components can influence other resources such as housing availability, utility capabilities, and community services.

The EIS study area includes all or portions of nine census-defined areas including four boroughs and five census areas and is defined as the ROI. In Alaska, boroughs are equivalent to counties. Census areas are also equivalent to counties; however, census areas denote a rural area that is not part of an organized borough. The actions described in Chapter 2 would involve expansion of MOAs, restricted airspace, SUA, and construction of facilities and intermediate staging bases (ISBs). Therefore, the following resources are addressed under socioeconomics as the indicators that could be impacted by these activities: demographics, housing, economic activity (employment and earnings), and key industries in the ROI.

B.12.2 Regulatory Setting

There are no specific regulations for managing or evaluating socioeconomic effects. However, social and economic sustainability is considered an important factor in Federal decisions. Not only does this topic cover aspects that can directly impact citizens in an affected area, but capacities of the social systems and the local economy are interwoven with the military mission and quality of life. Enhancing military capabilities can stimulate a local economy, but related activities may affect certain industries and qualities of an area that indirectly impact the economy.

Land owned by the Federal government is generally not subject to taxation by state or local governments. Under PL 94-565, enacted in 1976, the Federal Government began a program of making payments in lieu of taxation to local governments affected by this reduction in their tax bases.

B.12.3 General Description of Affected Environment

B.12.3.1 Population and Housing

The two largest population centers in the ROI, the Fairbanks North Star Borough (which includes the city of Fairbanks) and the Matanuska-Susitna Borough, had 2010 populations of about 97,581 and 88,995 persons, respectively (Table B–18). Combined, these areas represent approximately 80 percent of the total population in the ROI and 26.3 percent of the total population in Alaska. The fastest rate of population growth in the ROI between 2000 and 2010 occurred in the Matanuska-Susitna Borough (immediately north of Anchorage), with an average annual increase of 4.14 percent, this followed by the Fairbanks North Star Borough, with 1.65 percent (USCB 2011).

Based on 2010 census data, the Fairbanks North Star Borough is the most densely populated area in the ROI, with more than 13 persons per square mile, as compared with the rural areas such as the Denali Borough, the Lake and Peninsula Borough or the Yukon-Koyukuk Census Area, where population density is approximately 1 person per 10 square miles. The Matanuska–Susitna Borough (north of Anchorage) has a larger population and higher population density than other areas in the ROI mainly due to its proximity to Anchorage (USCB 2011).

Table B–18. Population and Housing Characteristics

Area	Population				Housing		
	2000	2010	Average Annual Percent Change	Population Density, 2010 (persons per square mile)	2000	2010	Average Annual Percent Change
Fairbanks North Star Borough	82,840	97,581	1.65	13.2	33,291	41,783	2.30
Valdez-Cordova Census Area	10,194	9,636	–0.56	0.3	5,148	6,102	1.71
Matanuska-Susitna Borough	59,323	88,995	4.14	3.6	27,329	41,329	4.23
Bethel Census Area	16,046	17,013	0.59	0.4	5,188	5,919	1.33
Dillingham Census Area	4,922	4,847	–0.15	0.3	2,332	2,427	0.40
Lake and Peninsula Borough	1,823	1,631	–1.11	0.1	1,557	1,502	–0.36
Denali Borough	1,893	1,826	–0.36	0.1	1,351	1,771	2.74
Southeast Fairbanks Census Area	6,174	7,029	1.31	0.3	3,225	3,915	1.96
Yukon-Koyukuk Census Area	6,510	5,588	–1.52	Z	3,917	4,038	0.30
State of Alaska	626,931	710,231	1.23	1.2	260,978	306,967	1.64

Key: Z=value greater than zero but less than half unit of measure shown.
Source: USCB 2011.

As the two largest population centers in the ROI, the Fairbanks North Star Borough and the Matanuska-Susitna Borough are also large housing centers. In 2010, the total number of housing units in the Fairbanks North Star Borough totaled 41,783 units, while the total number of housing units in the Matanuska-Susitna Borough was estimated at 41,329 units (USCB 2011). Both of these areas have experienced rather strong growth in the number of housing units, with housing increasing in the Matanuska-Susitna Borough at an average annual rate of 4.23 percent and 2.3 percent in the Fairbanks North Star Borough between 2000 and 2010 (USCB 2011). The only area in the ROI to experience a decline in the total number of housing units was the Lake and Peninsula Borough, which experienced an average annual percent decrease of 0.36 percent (USCB 2011).

B.12.3.2 Economic Activity

The economy in the State of Alaska is largely dependent on natural resources, particularly oil and gas production, though tourism and the military are also major contributors. The Fairbanks North Star Borough, which includes the city of Fairbanks, is one of the largest economic and employment centers. Residents of the rural areas of Alaska focus on extraction of natural resources and subsistence resources. Subsistence resources, characteristic of Alaska, are discussed in a following section.

Government and government enterprises provide many jobs in the cities and in the rural regions and provide a measure of stability through year-round employment. Seasonal employment that includes commercial fishing, guided hunting, and related industries is also an important source of income. Resource-based tourism, mining, and oil/gas extraction and production also contribute to regional economic activity.

The regional economy in remote rural areas of Alaska depends on the people, the way of life, the local government structure, and the Alaska Native corporations (Goldsmith 2008). Standard economic measures do not typically capture subsistence, sharing, and non-cash trading activities, which are important components of rural economies in Alaska. Thus, collecting data for these regions is often difficult and costly (Goldsmith 2008). However, on average, the rural areas included in the planning

areas have lower levels of employment (and higher levels of unemployment). This is due to several reasons including: the government directly accounts for most personal income; jobs available in remote areas often do not match the local labor supply; many workers are non-locals; and many households depend on jobs and subsistence activities (Goldsmith 2008).

Unemployment typically refers to any person that is aged 16 and older, that has not been employed for one week, is physically capable of working, and is actively looking for employment. As reflected in Table B–19, rural regions that have the highest unemployment rates include the Yukon-Koyukuk Census Area, with 15.4 percent, and the Bethel Census Area, with 15.0 percent. In contrast, the highly populated Fairbanks North Star Borough had the lowest unemployment rate of the areas in the ROI during 2010 (BLS 2011). Unemployment and employment figures, particularly for rural regions in Alaska, provide estimates, and might not fully capture the number of jobs held by self-employed people that are mostly seasonal, and often part-time, that do not appear in the state's official employment figures (Goldsmith 2008). The three areas in the ROI with the lowest population density were also the only areas in the ROI to experience a negative average annual percent change in employment between 2001 and 2009.

The Denali Borough had the highest per capita personal income in 2009 of the areas in the ROI. The Valdez-Cordova Census Area and the Southeast Fairbanks Census Area also had a high per capita personal income in 2009 (Table B–19). The Southeast Fairbanks Census Area experienced the largest average annual percent change with 7.0 percent between 2001 and 2009 (BEA 2010).

B.12.3.3 Key Industries in the EIS Study Area

Energy Production. The drilling and extraction of oil and natural gas contribute a large portion to the economic activity of Alaska. Alaska is the second-ranked oil producing state in the United States behind Texas. The oil and gas industry is the largest source of state revenue and provides some of the highest paying jobs in the state. Oil and gas activities are primarily confined to the northernmost portion of Alaska in the North Slope Borough or along the Cook Inlet south of Anchorage, predominantly outside the Fairbanks ROI.

Due to the size, population, and geography of Alaska, renewable energy will play a key role in supplying the state's growing demand for electricity, heat, and transportation fuel. Hydroelectric power is Alaska's largest source of renewable energy and provides almost a quarter of the state's electrical energy. The majority of the state's developed hydroelectric resources are located near communities in Southcentral, the Alaska Peninsula, and Southeast. Major communities that are supplied with hydropower include Kodiak, Valdez, Cordova, and Glennallen (AEA 2009).

Exploration of geothermal sources is increasing statewide, while other various energy sources, including wind, ocean and wave energy and solar energy, are also becoming more attractive. There is high potential for geothermal and wind energy in the Fairbanks area. Wind energy potential is outstanding along the south coast and south and southeast of DTA under the Fox MOA. However, the equipment used for capturing wind energy interferes with electromagnetic signatures and causes localized wind vortexes, both of which are incompatible with military operations (particularly air operations).

Mining. The minerals industry is a cornerstone of Alaska's economy. Major communities such as Fairbanks were founded on the mining industry, which includes exploration, mine development, and mineral production (RDC 2011a). In 2009, the mineral production value in the state totaled $2.5 billion, while exploration and development expenditures totaled $180 million and $330.8 million, respectively. Statewide, the industry provided approximately 3,280 full-time jobs with an estimated payroll of $320 million (ADOC 2009). The largest producing mines within the ROI include the Pogo gold mine

near Delta Junction, the Fort Knox gold mine and Livengood Project near Fairbanks, and the Usibelli coal mine near Healy (ADOC 2009).

Recreation and Tourism. Outdoor recreation, including hunting, fishing, boating, hiking, camping, and observing wildlife, occurs on Federal, state, and private land, and contributes largely to the local communities. Businesses such as hunting and fishing guides, lodges, air taxis, and other tourist related services benefit from recreational activities. More details regarding recreational areas are provided in Section B.10.2.3, Recreation.

Table B–19. Employment, Unemployment, and Income Characteristics

Area	Employment			Unemployment Rate, 2010 (percent)	Per Capita Income		
	2001	2009	Average Annual Percent Change		2001 (dollars)	2009 (dollars)	Average Annual Percent Change
Fairbanks North Star Borough	52,639	58,761	1.4	7.1	28,481	38,895	4.0
Valdez-Cordova Census Area	7,081	7,235	0.3	8.7	32,038	45,177	4.4
Matanuska-Susitna Borough	23,268	31,896	4.0	9.1	28,428	38,508	3.9
Bethel Census Area	8,122	8,629	0.8	15.0	21,676	29,173	3.8
Dillingham Census Area	3,923	4,128	0.6	10.1	27,341	35,828	3.4
Lake and Peninsula Borough	959	847	–1.5	8.1	25,277	36,694	4.8
Denali Borough	2,181	2,099	–0.5	9.3	40,697	54,097	3.6
Southeast Fairbanks Census Area	2,473	3,777	5.4	10.6	24,786	42,508	7.0
Yukon-Koyukuk Census Area	3,302	3,014	–1.1	15.4	21,494	32,135	5.2
State of Alaska	401,252	445,663	1.3	8.0	32,271	43,212	3.7

Source: BEA 2010; BLS 2011.

Nonresident travel to Alaska occurs year-round, however, the majority of visitors come to Alaska during the "summer" season between May 1 and September 30. The Alaska Visitors Statistics Program estimated 1.58 million out-of-state visitors to Alaska between May and September 2009, a decline of 7.3 percent from the previous year (McDowell Group 2010). The majority of visitors came to Alaska by cruise ship or air, while less-popular modes of transportation included highway or ferry. During the 2008–2009 visitor season, Alaska's visitor industry accounted for a total of 36,200 full- and part-time jobs, $1.1 billion in labor, $3.4 billion in total spending, and $208.6 million in taxes and revenues to municipal and state governments (including direct, indirect, and induced impacts). The most popular tourist destination area was the Southcentral region, followed by the Southeast region and the Interior (McDowell Group 2010).

Fishing. Alaska constitutes one of the most bountiful fishing regions in the world, with more than 3 million lakes, 3,000 rivers, and 34,000 miles of coastline on three different seas (RDC 2011b). There are four types of fishing available in Alaska: sport, subsistence, personal use, or commercial. Commercial fisheries are an integral part of many communities and local economies in the state. The total wholesale value of commercial fisheries is more than $3 billion. The combined economic impact of

commercial and sport fishing is $7.4 billion and support of 89,915 full-time-equivalent jobs (ADFG 2011). Regulations governing fishing depend on the type of fishing and the location.

Civilian Aviation. In 2007, the aviation industry was estimated to contribute $3.5 billion to the state's economy. In addition, estimates suggest that the industry provides more than 27,000 on-site jobs and 20,000 off-site jobs in the state, the majority around international airports such as Anchorage and Fairbanks (Northern Economics, Inc. 2009). Civilian aviation represents a category of flying that includes private and commercial aviation activities but not military aviation activities. Civilian aviation in Alaska contributes significantly to the state's economy and is heavily relied upon for travel, safety, firefighting, recreation, hunting, mining, oil and gas development, and supplies. There are numerous open public airports and airfields located within the ROI. More information regarding the airports and airfields within the ROI is provided in Section B.1, Airspace Management.

B.13 SUBSISTENCE RESOURCES

B.13.1 Definition of Resource

Subsistence plays a vital role in the lifestyles of Alaska residents, particularly rural residents and the Alaska Native culture, and is a unique characteristic of life in Alaska. *Subsistence Management Regulations for Public Lands in Alaska* (36 CFR 242) defines subsistence 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 non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade." In the rural regions of Alaska, services and products are not always accessible, and subsistence fishing and hunting are important to supplement employment and nutrition in these regions. Approximately 50 percent of the food for three-quarters of the Alaska Native families in the state's smaller communities is acquired through subsistence activities. Other important uses of subsistence products are as follows:

- Clothing, including the use of wild furs and hides for ruffs, mitts, parkas, clothes lining, and winter boots.
- Fuel, specifically wood, a major source of heat for rural homes that do not have access to centralized utilities. Wood is also used for smoking and preserving fish or meat.
- Food (fish, seals, and other products) for dog teams that are used as transportation.
- Construction materials, specifically spruce, birch, hemlock, willow, and cottonwood, used for house logs, sleds, and fish racks, among other items.
- Hides, often used as sleeping mats; seal skins, to store food; and wild grasses, made into baskets and mats.
- Specialized products for barter and exchange between communities in traditional trade networks. Furs are sold to outside markets to provide an important source of income for rural communities. Ivory, grass, wood, skins, and furs are also crafted into items for use and sale in outside markets.
- For Alaska Natives, traditional ceremonies such as funerals, potlatches, marriages, and native dances.

Under state regulations, subsistence is open to all Alaska residents on state or private land, but under Federal regulations, subsistence is limited to rural residents on Federally owned lands. Due to the disparity between Federal and state subsistence regulations, the jurisdiction for managing subsistence has been divided between the Federal Subsistence Board and the State of Alaska. Under Federal regulations, all communities and areas in Alaska are considered rural, with the exception of major towns and cities

and their surrounding areas. Access to subsistence resources using a preference system is tied to the permit system for hunting and take limits.

B.13.2 Regulatory Setting

In 1978, the State of Alaska passed legislation regulating subsistence and applying subsistence to rural residents. Additional state legislation was passed in 1989 extending subsistence to all residents. In 1980, Congress passed ANILCA, a priority subsistence law for Federal lands in Alaska. Federal and state law defines subsistence as the "customary and traditional uses" of wild resources for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade. Under these laws and related regulations, Alaska residents are given priority in harvesting game and nongame resources for personal use over individuals harvesting game and nongame resources for sport or commercial reasons.

ANILCA obligates Federal agencies to manage their lands to support customary and traditional subsistence activities on Federal land, with preference for rural Alaskans' desire to harvest fish and wildlife on Federal lands, particularly when resources (i.e., species traditionally harvested for subsistence) are scarce (16 U.S.C. 314).

B.13.3 General Description of Affected Environment

The affected environment for subsistence resources is defined as the areas in which subsistence resources, including subsistence wildlife and vegetation, are present and accessible. Additional areas identified as traditional use areas for Alaska Natives are also included.

Subsistence users tend to harvest in traditional use areas accessible to their communities and for particular resources. These harvest areas are defined, for each individual community, based on their historic use and the availability of wildlife in the area. Due to the large size of the planning area, it would not be feasible to delineate every traditional use area for each community. In general, traditional subsistence areas are closely related to the major habitats or migration routes of the most common subsistence species (moose, caribou, Dall sheep, and fish). These habitats and migration routes are discussed in more detail in Section B.8.3. Communities participating in subsistence, traditional subsistence areas in the vicinity of the existing Air Force and Army installations and ranges or SUA, and species typically harvested by the communities for subsistence are reflected in Table B–20. Since a component of subsistence resources is related to cultural and ceremonial practices of Alaska Natives, Table B–20 also provides the population characteristics and identifies communities where Federally-recognized tribes are traditionally located. As ANILCA obligates Federal agencies to manage their lands in support of subsistence activities, there are identified areas on military installations in which subsistence activities are permitted. JBER, Fort Wainwright, Fort Greely, TFTA, YTA, and DTA have such designated areas, and species are available to the public for subsistence harvesting in accordance with defined access procedures. More detail on these areas and the access procedures are provided in Section 3.13 in Chapter 3 of the EIS.

Table B–20. Community Subsistence Characteristics in the Study Area

Village	Population (2010)	Location	Alaska Native Population Percentage	Federally-Recognized Tribe Located in Community	Primary Subsistence Species/Activity
Aleknagik	219	Dillingham Census Area	84.6	Yes	Salmon, freshwater fish, moose, caribou, berries, trapping
Anderson	246	Denali Borough	6.5	No	N/A
Aniak	501	Bethel Census Area	73.3	Yes	Salmon, moose, bear, birds, berries, gardening
Anvik	85	Yukon-Koyukuk Census Area	90.4	Yes	Salmon, moose, black bear, small game, trapping, handicrafts, gardening
Beaver	84	Yukon-Koyukuk Census Area	95.2	Yes	Moose, salmon, freshwater fish, bear, waterfowl, gardening, berries
Big Delta	591	Southeast Fairbanks Census Area	2.1	No	N/A
Birch Creek	33	Yukon-Koyukuk Census Area	100.0	Yes	Salmon, whitefish, moose, black bear, waterfowl, berries
Central	96	Yukon-Koyukuk Census Area	9.7	No	N/A
Chickaloon	272	Matanuska-Susitna Borough	6.3	Yes	Salmon, non-salmon, black bear, moose, caribou, Dall sheep, squirrel, porcupine
Chicken	7	Southeast Fairbanks Census Area	0.0	No	N/A
Chistochina	93	Valdez-Cordova Census Area	63.4	Yes	Hunting, fishing, trapping, gathering
Chuathbaluk	118	Bethel Census Area	94.1	Yes	Salmon, moose, black bear, porcupine, waterfowl, fur garments
Circle	104	Yukon-Koyukuk Census Area	85.0	Yes	Salmon, freshwater fish, moose, bear, trapping, handicrafts
Copper Center/Kluti Kaah	328	Valdez-Cordova Census Area	50.6	Yes	Hunting, fishing, trapping, gathering
Crooked Creek	105	Bethel Census Area	93.4	Yes	Salmon, moose, caribou, waterfowl, trapping
Delta Junction	958	Southeast Fairbanks Census Area	5.6	No	Moose, caribou, bear, sheep, waterfowl, trapping
Dillingham	2,329	Dillingham Census Area	60.9	Yes	Salmon, grayling, pike, moose, bear, caribou, berries, trapping
Dot Lake	13	Southeast Fairbanks Census Area	5.3	No	N/A

Table B-20. Community Subsistence Characteristics in the Study Area (*continued*)

Village	Population (2010)	Location	Alaska Native Population Percentage	Federally-Recognized Tribe Located in Community	Primary Subsistence Species/Activity
Dot Lake Village	62	Southeast Fairbanks Census Area	73.7	Yes	Moose, duck, geese, ptarmigan, porcupines, caribou, whitefish, other freshwater fish
Ekuk/Clarks Point	62	Dillingham Census Area	92.0	Yes	Salmon, smelt, moose, bear, rabbit, ptarmigan, duck, geese, trade for whitefish and ling cod
Ekwok	115	Dillingham Census Area	93.8	Yes	Salmon, pike, moose, caribou, duck, berries, gardening
Ferry	33	Denali Borough	0.0	No	N/A
Fort Yukon	583	Yukon-Koyukuk Census Area	88.7	Yes	Salmon, whitefish, moose, bear, caribou, waterfowl, trapping, handicrafts
Fox	417	Fairbanks-North Star Borough	9.7	No	N/A
Gakona	218	Valdez-Cordova Census Area	17.7	Yes	N/A
Galena	470	Yukon-Koyukuk Census Area	67.4	Yes	N/A
Glennallen	483	Valdez-Cordova Census Area	12.1	No	N/A
Grayling	194	Yukon-Koyukuk Census Area	91.8	Yes	Salmon, moose, black bear, small game, waterfowl, trapping, gathering, gardening
Gulkana	119	Valdez-Cordova Census Area	73.9	Yes	Hunting, fishing, trapping, gathering
Healy	1,021	Denali Borough	5.3	No	N/A
Healy Lake	13	Southeast Fairbanks Census Area	73.0	Yes	N/A
Holy Cross	178	Yukon-Koyukuk Census Area	96.5	Yes	Hunting, fishing, trapping, gardening
Huslia	275	Yukon-Koyukuk Census Area	95.2	Yes	Salmon, whitefish, moose, bear, caribou, waterfowl, berries
Igiugig	50	Lake and Peninsula Borough	83.0	Yes	Salmon, trout, whitefish, moose, caribou, rabbit
Iliamna	109	Lake and Peninsula Borough	57.8	Yes	Salmon, trout, grayling, moose, caribou, bear, seal, porcupine, rabbit
Kokhanok	170	Lake and Peninsula Borough	90.8	Yes	Salmon, trout, grayling, moose, bear, rabbit, porcupine, seal

Table B–20. Community Subsistence Characteristics in the Study Area (*continued*)

Village	Population (2010)	Location	Alaska Native Population Percentage	Federally-Recognized Tribe Located in Community	Primary Subsistence Species/Activity
Koliganek	209	Dillingham Census Area	87.4	Yes	N/A
Lake Minchumina	13	Yukon-Koyukuk Census Area	12.5	No	N/A
Lime Village	29	Bethel Census Area	0.0	Yes	Salmon, moose, bear, caribou, waterfowl, berries
Manley Hot Springs	89	Yukon-Koyukuk Census Area	23.6	Yes	Salmon, moose, fishing, gardening
Manokotak	442	Dillingham Census Area	94.7	Yes	Salmon, herring, sea lion, beluga whale, trout, ptarmigan, duck, berries
McGrath	346	Yukon-Koyukuk Census Area	54.6	Yes	Salmon, moose, caribou, bear, rabbit, trapping, gardening
McKinley Park	185	Denali Borough	3.5	No	N/A
Mentasta Lake	112	Valdez-Cordova Census Area	71.1	Yes	Hunting, fishing, trapping
Minto	210	Yukon-Koyukuk Census Area	92.2	Yes	Salmon, whitefish, moose, bear, small game, waterfowl, berries, handicrafts, furs
Naknek	544	Bristol Bay Borough	47.1	Yes	N/A
Nenana	378	Yukon-Koyukuk Census Area	47.3	Yes	Salmon, moose, caribou, bear, waterfowl, berries
Newhalen	190	Lake and Peninsula Borough	91.3	Yes	Salmon, trout, grayling, moose, caribou, rabbit, porcupine, seal
New Stuyahok	510	Dillingham Census Area	96.0	Yes	Salmon, moose, caribou, rabbit, ptarmigan, duck, geese
Nikolai	94	Yukon-Koyukuk Census Area	81.0	Yes	Salmon, moose, caribou, rabbits, bear, trapping, handicrafts
Nondalton	164	Lake and Peninsula Borough	90.0	Yes	Salmon, trout, grayling, moose, caribou, bear, Dall sheep, rabbit, porcupine
Northway	71	Southeast Fairbanks Census Area	82.1	No	N/A
Northway Village	98	Southeast Fairbanks Census Area	77.6	Yes	Birds and eggs, including migratory birds
Paxson	40	Valdez-Cordova Census Area	0.0	No	N/A

Table B-20. Community Subsistence Characteristics in the Study Area (*continued*)

Village	Population (2010)	Location	Alaska Native Population Percentage	Federally-Recognized Tribe Located in Community	Primary Subsistence Species/Activity
Port Alsworth	159	Lake and Peninsula Borough	22.1	No	N/A
Rampart	24	Yukon-Koyukuk Census Area	91.1	Yes	Salmon, whitefish, moose, caribou, waterfowl, small game, gardening, berries
Red Devil	23	Bethel Census Area	52.1	Yes	Salmon, bear, moose, caribou, rabbit, waterfowl, berries
Ruby	166	Yukon-Koyukuk Census Area	86.2	Yes	Salmon, whitefish, moose, bear, ptarmigan, waterfowl, berries
Shageluk	83	Yukon-Koyukuk Census Area	96.9	Yes	Salmon, moose, bear, small game, waterfowl, trapping, gardening
Skwentna	37	Matanuska-Susitna Borough	7.2	No	N/A
Slana	147	Valdez-Cordova Census Area	15.3	No	N/A
Sleetmute	86	Bethel Census Area	89.0	Yes	Salmon, moose, bear, porcupine, rabbit, waterfowl, berries
Stony River	54	Bethel Census Area	85.2	Yes	Salmon, moose, caribou, bear, porcupine, waterfowl, berries
Takotna	52	Yukon-Koyukuk Census Area	42.0	Yes	Moose, salmon, gardening
Tanacross	136	Southeast Fairbanks Census Area	90.0	Yes	Whitefish, moose, porcupine, rabbit, ptarmigan, duck, geese, caribou, salmon, trapping, handicrafts
Tazlina	297	Valdez-Cordova Census Area	30.2	Yes	Fishing and hunting
Telida	3	Yukon-Koyukuk Census Area	100.0	Yes	N/A
Tetlin	127	Southeast Fairbanks Census Area	97.4	Yes	Whitefish, moose, duck, geese, spruce hens, rabbit, berries, roots
Tok	1,258	Southeast Fairbanks Census Area	19.0	No	Moose, bear, rabbit, grouse, ptarmigan, Dall sheep, caribou, salmon, berries, gardening
Tyonek	171	Kenai Peninsula Borough	95.3	Yes	Salmon, moose, beluga whale, waterfowl, trapping

Key: N/A=Information on species is not available.
Source: ADOC 2010.

B.14 ENVIRONMENTAL JUSTICE

B.14.1 Definition of Resource

Analysis of environmental justice considers whether impacts of an action are unequally borne by a particular segment of the affected population, specifically, persons who belong to an ethnic or racial minority, low-income persons, or children. For the purpose of the environmental justice analysis, these populations are defined as follows:

Minority Populations: All persons identified by the U.S. Census Bureau to be of Hispanic or Latino origin, regardless of race, plus non-Hispanic persons who are Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, or members of some other (i.e., non-white) race or two or more races.

Low-Income Populations: All persons who fall within the statistical poverty thresholds established by the U. S. Census Bureau. For the purposes of this analysis, low-income populations are defined as persons living below the poverty level. The percentage of low-income persons is calculated as the percentage of all persons for whom the Census Bureau determines poverty status, which is generally a different number than the total population because it excludes institutionalized persons, persons in military group quarters and college dormitories, and unrelated individuals under 15 years of age. Starting with the 2010 decennial census, poverty data will be provided through the annual American Community Survey rather than as part of the decennial census.

Children: All persons identified by the Census to be under the age of 18 years.

B.14.2 Regulatory Setting

In 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (Environmental Justice)*, was issued to focus the attention of Federal agencies on how their actions affect the human health and environmental conditions to which minority and low-income populations are exposed. This EO was also established to ensure that, if there were disproportionately high and adverse human health or environmental effects of Federal actions on these populations, those effects would be identified and addressed. The environmental justice analysis addresses the characteristics of race, ethnicity, and poverty status for populations residing in areas potentially affected by implementation of the proposed action.

In 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (*Protection of Children*), was issued to identify and address anticipated health or safety issues that affect children. The protection-of-children analysis addresses the distribution of population by age in areas potentially affected by implementation of the proposed action.

Regulations governing Native land claims, conservation lands, and subsistence activities, such as ANCSA and ANILCA are addressed in Section B.10, Land Use, and Section B.13, Subsistence Resources.

B.14.3 General Description of Affected Environment

As with socioeconomic resources, environmental justice analysis identifies nine census-defined areas, including four boroughs and five census areas, within the broad study area. Boroughs and census areas in Alaska are equivalent to counties in other states.

Alaska Natives live on many lands in the planning area. In Alaska Native villages, the Native lifestyle is based on, or supplemented by, subsistence activities. Section B.13, Subsistence Resources, provides a list

of Federally recognized Alaska Native villages and the subsistence activities available in the vicinity of each village.

Based on data from the 2005–2009 American Community Survey, the incidence of persons in the study area with incomes below the poverty level generally exceeds state levels, particularly in the rural areas and areas with high minority and Alaska Native populations. Poverty rates in the study area over that 5-year period ranged from a low of 6.1 percent in the Denali Borough to a high of 24.1 percent in the Yukon-Koyukuk Census Area, as compared with the state's poverty rate of 9.6 percent (USCB 2010) (see Table B–21; Figure B-26).

Minority persons represent between 11.6 and 89.1 percent of each locale's total population. Alaska Natives are the largest minority group, constituting over 80 percent of the total population in some locales. By comparison, minority persons represent 35.9 percent of the state's total population, with Alaska Natives constituting only 14.8 percent (USCB 2011) (see Table B–21 and Figure B-27).

Children make up between 22.5 and 36.5 percent of each locale's population, as compared with 26.4 percent of the state's total population (Table B–21).

The levels of minorities (including Alaska Natives) and low-income persons living in the rural areas of Alaska is noteworthy, because noise levels in low-altitude military training airspace may be incompatible with residential life and aspects of subsistence practices. Avoidance of populated areas by minimum vertical and lateral distances is a method used to alleviate some degree of noise intrusion.

Table B–21. Minority Population, Low-Income Population and Children by Area

Area	Total Population	Percent Low-Income	Percent Minority	Percent Alaska Native	Percent Children
Fairbanks North Star Borough	97,581	8.0	25.9	7.0	25.6
Valdez-Cordova Census Area	9,636	8.1	27.9	13.6	24.4
Matanuska-Susitna Borough	88,995	10.3	17.2	5.5	28.9
Bethel Census Area	17,013	18.2	89.1	82.9	36.5
Dillingham Census Area	4,847	18.3	82.4	71.6	32.9
Lake and Peninsula Borough	1,631	22.1	77.8	65.1	30.2
Denali Borough	1,826	6.1	11.6	3.6	22.5
Southeast Fairbanks Census Area	7,029	11.6	21.3	11.5	26.3
Yukon-Koyukuk Census Area	5,588	24.1	78.2	71.4	27.8
State of Alaska	710,231	9.6	35.9	14.8	26.4

Note: Except for percent low-income, which is derived from the 2005–2009 American Community Survey, numbers represent 2010 census data.
Source: USCB 2010, 2011.

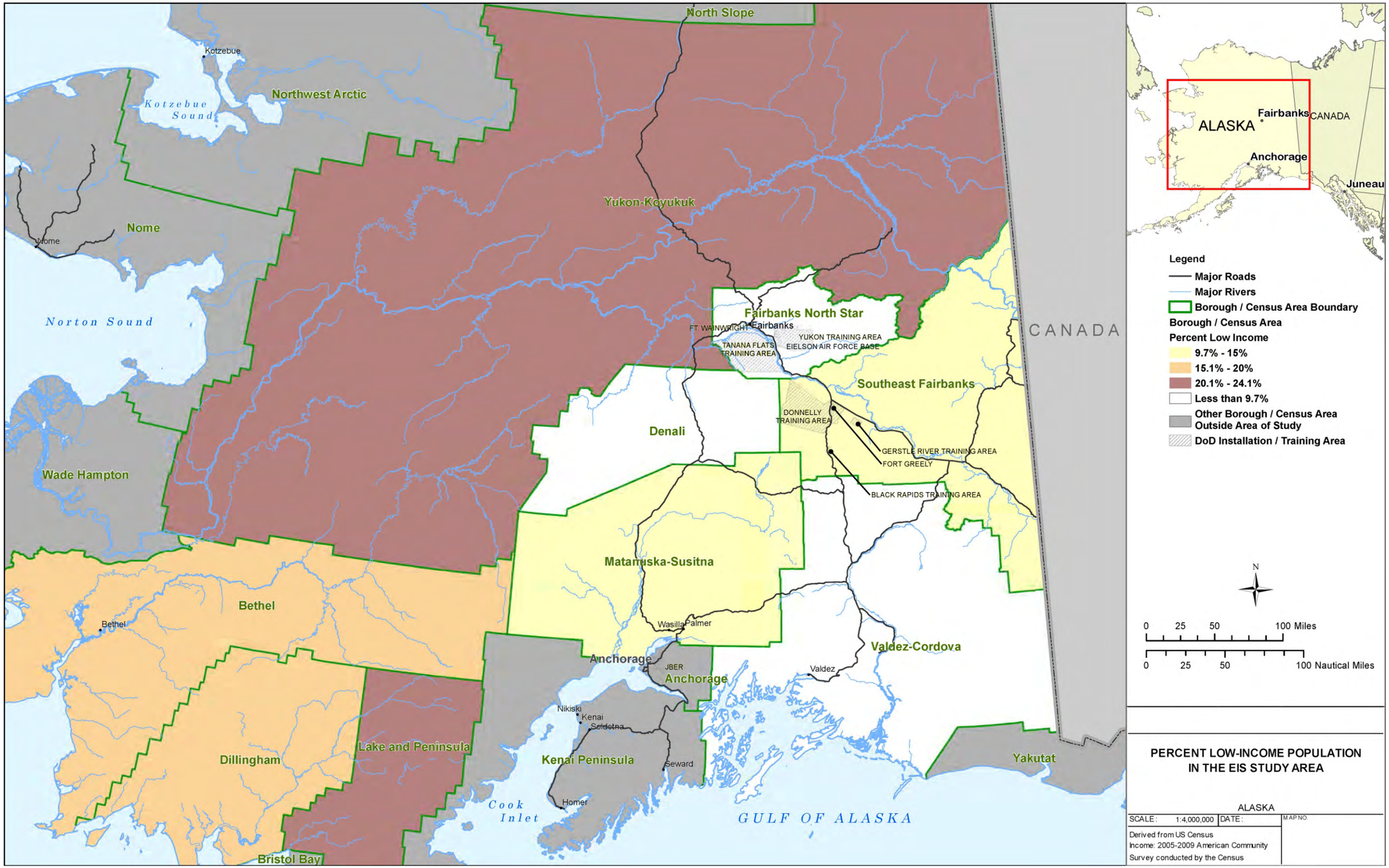

Figure B-26. Percent Low-Income Population in EIS Study Area

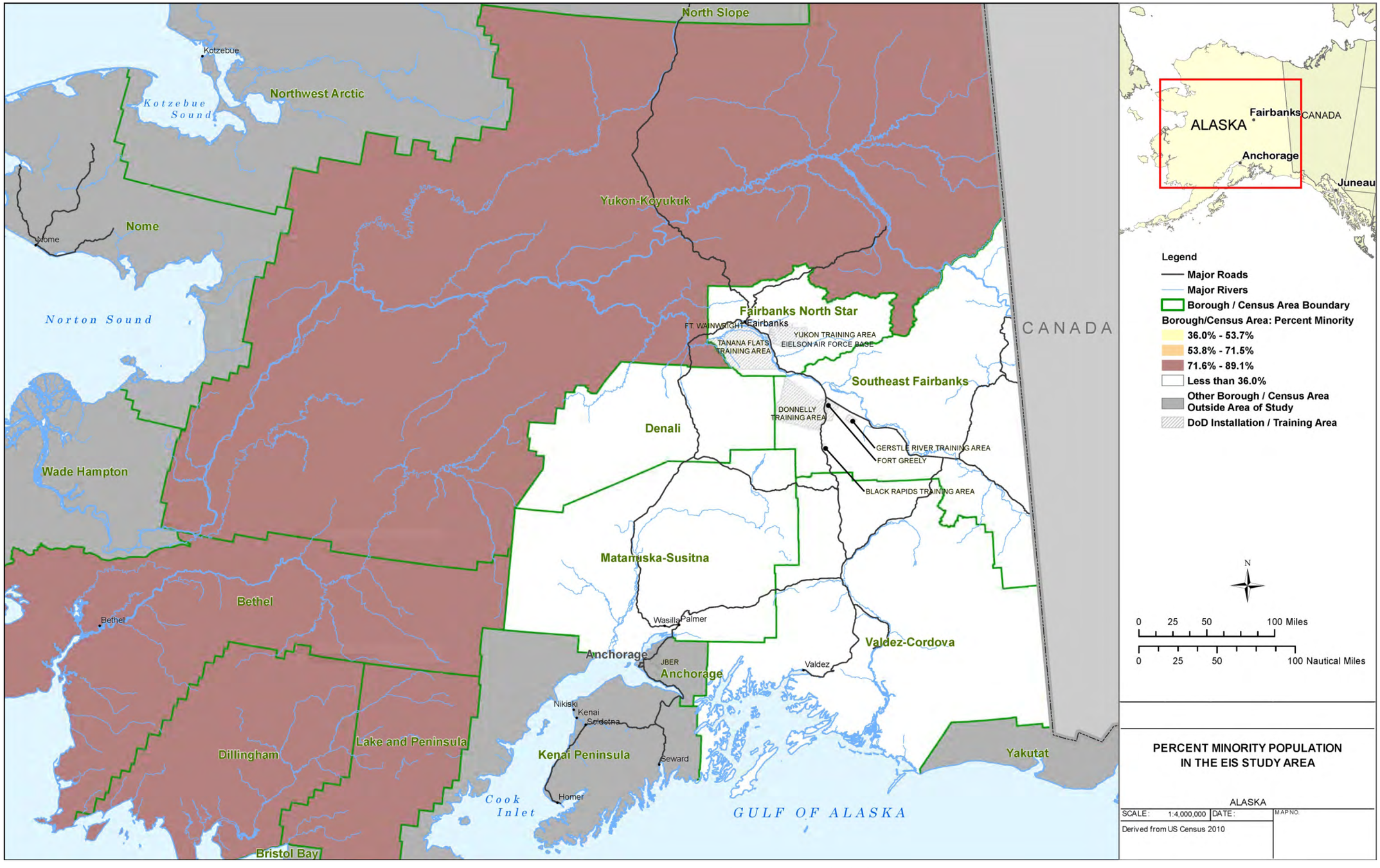

Figure B-27. Percent Minority Population in Central Alaska

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