

***(5) Effects to Fisheries and Aquatic Habitat from Wild and Scenic River Nominations (Alternative B)***

Under Alternative B, there would be no Wild and Scenic Rivers recommended for designation under the National System. Additional protections and regulations to fish habitat would continue to be limited to those outlined in the Stipulations, ROPs, and project-specific approved Plans of Operations.

**d) Effects to Fisheries and Aquatic Habitat for Alternative C**

***(1) Effects to Fisheries and Aquatic Habitats from Minerals (Alternative C)***

**Fluid Leasable Minerals.** The anticipated level of fluid mineral leasing under Alternative C would be the same as that identified under Alternative B, but would include retaining 17(d)(1) withdrawals for proposed Wild River segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres) as an interim measure to provide an opportunity for Congressional action. Retention of these 17 (d)(1) withdrawals would further minimize impacts to fish and fisheries habitat from oil and gas leasing activity. The potential level of oil and gas leasing activity would be slightly greater under Alternatives B and D than under Alternative C.

**Locatable Minerals.** The anticipated level of exploration and development for locatable minerals under Alternative C would be similar to that identified under Alternative B, but would include retaining 17(d)(1) withdrawals for proposed Wild River segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres) as an interim measure to provide an opportunity for Congressional action. Retention of these 17 (d)(1) withdrawals would further minimize impacts to fish from what limited oil and gas leasing activity might occur. The potential level of locatable minerals activity could be slightly greater under Alternatives A and B than under Alternative C. The protection provided to fish and fish habitat under Alternatives B and C would be superior to that provided under Alternative A.

**Salable Minerals.** The anticipated level of exploration and development for salable minerals under Alternative C would be similar to that identified under Alternative B, but the following lands would be closed to sale: (1) Proposed Carter Spit ACEC (52,862 acres); (2) Proposed Bristol Bay ACEC (989,202); and (3) Retain 17(d)(1) withdrawals for proposed Wild River segments of the Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres) as an interim measure to provide an opportunity for Congressional action. There are approximately 1,176,269 acres available for the sale of mineral materials. Under Alternatives B, C, and D, Required Operating Procedures would minimize the effects of gravel extraction on fish by avoiding gravel mine sites within active channels. The potential level of salable minerals activity would be greater under Alternatives A and B, than under Alternative C. The protection provided to fish and fish habitat under Alternatives C and D would be superior to that provided under Alternative A.

***(2) Effects to Fisheries and Aquatic Habitats from Lands and Realty (Alternative C)***

**Disposal or Land Exchange** - Impacts are the same as those discussed under Alternative B.

**Withdrawals** - The anticipated level of withdrawals under Alternative C would be similar to those identified under Alternative B, but would include retaining 17(d)(1) withdrawals for the proposed wild river segments of Alagnak, Goodnews mainstem, and Goodnews Middle Fork (15,125 acres). The potential level of withdrawals would be greater under Alternatives A and C, than under Alternatives B and D. The protection provided to fish and fish habitat under Alternatives A and C would be superior to that provided under Alternative B and D.

**Rights-of-Way** - The anticipated avoidance area level for Rights-of-Way grants and easements under Alternative C would be similar to those identified under Alternative B, but the proposed Bristol Bay ACEC (989,202 acres) and the proposed Carter Spit ACEC (62,862 acres) would be identified as avoidance areas for Rights-of-Way. The potential level of avoidance for Rights-of-Way would be greater under

Alternatives C and D, than under Alternatives A and B. The protection provided to fish and fish habitat under Alternative C would be superior to that provided under Alternative A, B, or D.

### ***(3) Effects to Fisheries and Aquatic Habitat from Recreation (Alternative C)***

**Off-Highway Vehicles** - Under Alternative C, OHV use would be limited to existing roads and rails, providing less opportunity for potential impact to fisheries and aquatic habitat from OHV use than in Alternative A or B. Under this Alternative, OHV trails would be managed with the objective of minimizing the unmanaged proliferation of trails. Locations that may include important fish habitat have not been identified. Inventoried OHV trails have authorized anadromous stream crossings with a permit from the State Department of Natural Resources. Potential adverse effects to fish habitat from OHV use are discussed under Impacts Common to All Alternatives. There are no SRMAs that would set recreation objectives or develop visitor use limits. Alternative C includes vehicle weights limits for limited areas to 2,000 pounds gross vehicle weight rating (GVWR includes load capacity).

### ***(4) Effects to Fisheries and Aquatic Habitat from Wild and Scenic Rivers (Alternative C)***

Under Alternative C, BLM would propose Wild and Scenic River designation of identified river segments under the National System. The following river segments would be recommended for Wild and Scenic River designation: Alagnak River (626 acres), Goodnews River mainstem (7,138 acres), and Goodnews River Middle Fork (7,361 acres).

This designation would provide legal protections from adverse development and would provide a mechanism for management of the river's resources. Wild rivers would allow unobtrusive development and activities, but typically do not allow motorized use. Scenic rivers can allow motorized use, though mining and leasing operations must be conducted in accordance with the Stipulations, Required Operating Procedures and/or project-specific Approved Plans of Operations, if motorized use is tied to a project such as oil and gas exploration or development, locatable mineral exploration or development, or some other form of permitted activity. Recreational rivers contain the least stringent regulations, but activities must still not produce any adverse effects on the river and its immediate environment. Some recreational rivers would perhaps see increases in use levels, but in general these designations would provide increased protections for fish and fish habitat.

## **e) Effects to Fisheries and Aquatic Habitat for Alternative D**

### ***(1) Effects to Fisheries and Aquatic Habitat from Leasable, Locatable, and Salable Minerals (Alternative D)***

**Fluid Leasable Minerals.** The anticipated level of mineral leasing under Alternative D would be the same as identified under Alternative C, but the Proposed Carter Spit ACEC (62,862 acres) and specific blocks of unencumbered land in the Bristol Bay area (Koggiling, Yellow Creek, Kvichak, Iliamna West, Alagnak, and Klutuk blocks (989,202 acres) would be subject to Stipulations, Required Operating Procedures, and other special requirements on a project-specific basis, such as seasonal restrictions. Such restrictions would further minimize potential impacts to fish and fisheries habitat from oil and gas leasing. The potential level of oil and gas leasing would be greater under Alternative B than under Alternatives A, C or D.

**Locatable Minerals.** The anticipated level of locatable mineral exploration and extraction under Alternative D would be the same as identified under Alternative C. All BLM lands would be subject to Required Operating Procedures. The potential level of locatable mineral exploration and extraction would be greater under Alternatives B, C, and D than under Alternative A.

**Salable Minerals.** The anticipated level of exploration and development for salable minerals under Alternative D would be similar as identified under Alternative B, but the proposed Carter Spit ACEC (62,862 acres) would be closed to sale. There would be approximately 1,176,269 acres of salable



materials available. Under Alternatives B, C, and D, the Required Operating Procedures would minimize the effects of gravel extraction on fish by avoiding gravel mine sites within active channels. The potential level of salable minerals activity would be greater under Alternatives A and B than under Alternative D. The protection provided to fish and fish habitat under Alternatives B, C, and D would be superior to that provided under Alternative A.

## ***(2) Effects on Fisheries and Aquatic Habitat from Lands and Realty (Alternative D)***

**Rights-of-Way** - The anticipated level of Rights-of-Way grants and easements under Alternative C would be similar to those identified under Alternative B, but the Carter Spit ACEC would be identified as an avoidance area for Rights-of-Way (62,862 acres). The potential level of impacts from Rights-of-Way would be greater under Alternatives A and B, than under Alternative C or D. The protection provided to fish and fish habitat under Alternatives C and D would be superior to that provided under Alternative A and B.

**Off-Highway Vehicles** - The anticipated impact of OHV use would be the similar to that identified under Alternative B, but would include limitations defined within the proposed Cater Spit ACEC.

Alternatives B, C, and D include vehicle weights limits for limited areas to 2,000 pounds gross vehicle weight rating (GVWR includes load capacity). OHV use under Alternative D would be restricted to existing roads and trails, resulting in fewer potential impacts to fish and fish habitat from unauthorized stream crossings or sedimentation into streams or rivers.

## ***5. Direct and Indirect Effects to Wildlife and Wildlife Habitat***

### **a) Direct and Indirect Effects to Wildlife Common for All Alternatives**

Proposed management of the following resources/resource uses/programs would have no anticipated impacts to wildlife management: Air Quality, Fisheries Management, Special Status Species, Cultural Resources, Paleontological Resources, Visual Resources, Wilderness Characteristics, Public Safety, Forest Products, Social and Economic Conditions, and Subsistence.

#### ***(1) Effects to Wildlife from Soil, Water, and Vegetation (Common to all)***

There would be beneficial effects to wildlife from proper management of soils, vegetation, and water resources. Implementation of mitigation measures to protect soil, water, vegetation, and air on a project specific basis would reduce disturbance to wildlife habitats and aid in the recovery of habitat from permitted uses.

#### ***(2) Effects to Wildlife from Fire and Fuels Management (Common to all)***

A large percentage of the planning areas is comprised of herbaceous or shrub habitats. Fire is less prevalent in these vegetation types compared to boreal forests; therefore, effects of fire on wildlife and habitats are lower in the planning area than may be anticipated for Interior Alaska.

Fire has both direct and indirect effects on wildlife and their habitats. These effects are described in detail in the Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska (BLM 2004). Generally, the effects on habitat are much greater than the effects on resident animals. Short-term negative impacts from fire on resident wildlife include displacement, disruption of reproductive activities, and occasional mortalities. However, populations of certain species can recover quickly if suitable habitat is available. Adverse effects to current individuals are generally offset by the benefits of beneficial habitat changes for future generations.

Fire helps maintain a mixture of vegetation types and age classes that provide habitat and forage for a variety of wildlife. Fire alters habitats and may improve habitat components for some species while degrading habitat for other species. Over time, as vegetation recovers from fire disturbance, various species of wildlife will benefit from various successional stages of vegetation. Herbivores are directly affected by the changes in vegetative cover and forage associated with fire, whereas predators respond to both changes in cover and abundance of prey.

Wildlife has evolved in the presence of fire and has adapted to it. Overall, a natural fire regime has a beneficial effect on maintaining a diversity of wildlife and wildlife habitats. Grasses, sedges and herbaceous plants that quickly re-sprout after fire provide forage and cover for small mammals, wet and alpine tundra birds, and grazing species. Browsers such as moose, hares, and ptarmigan benefit from fire when trees and shrubs reestablish themselves. If fires are not too severe, sprouting of some shrub species will occur soon after burning.

Moose generally benefit from fire due to increased production of high quality browse for 23-30 years after fire (McCracken and Viereck 1990). Prescribed fires are a management tool used to increase moose habitat. Moose populations generally react in a strongly positive manner to areas with increased browse. The level of effect is variable, depending upon the health of the moose population prior to the fire and the amount of browse available. If browse is not a limiting factor on moose populations, then fire will have little impact on populations over the short-term (BLM 2004b).

The short-term effects of fire on caribou winter range are negative, and vary depending upon the severity of the burn. Lichens, which are primary winter forage for caribou, are highly susceptible to wildland fire. Impacts to habitat include reduced availability of forage lichens for up to 80 years after a fire (Klein 1982, Joly et al. 2003). On caribou summer ranges, forage quality of vascular plants is improved by fire. Fire also affects caribou movement patterns. Research has shown that caribou actively avoid burned areas for 35-50 years after a fire (Joly et al. 2003). Over the long-term, fire is likely beneficial to caribou as it helps maintain the ecological diversity of the habitat and may prevent mosses from out-competing forage lichens. Light fires may rejuvenate stands of lichen and replace old forest stands where lichen has been replaced by moss. Periodic fires create a mosaic of fuel types and fire conditions that naturally preclude large, extensive fires (BLM 2004b).

Fire is very rare in subalpine habitats used by Dall sheep. Fire may enhance sheep habitat by reducing encroachment of shrubs and spruce into subalpine habitats. Fire can also increase the amount or quality of herbaceous and graminoid forage available and reduce cover used by bears and wolves when hunting sheep.

Fire has both beneficial and negative effects on bears. Beneficial effects include increasing the availability of forage plants such as berries, grasses and forbs. On the negative side, some forage species may be reduced or temporarily eliminated by fire. Moose calves are an important prey item for both black and grizzly bears. Early stages of plant succession due to fire tend to increase moose production, resulting in more calves available for prey (BLM 2004b). Fire has little direct effect on grizzly bears as it is infrequent in tundra habitats and tundra fires tend to be small.

The effects of fire on furbearers are variable depending on the species. Carnivorous furbearers (e.g., coyote, fox, wolf, wolverine, lynx) respond to fire in a manner similar to their prey species, though there tends to be a lag period. If prey species benefit from fire, predators do as well. Snowshoe hares, voles, and other small mammals tend to respond positively to vigorous re-growth triggered by wild fires. Species such as marten and lynx tend to increase as well, tracking these prey species (Johnson et al. 1990). Fire is not common in the coastal habitats favored by Arctic foxes and so they are minimally affected. Herbivorous furbearers (such as muskrats) may benefit from fire due to rejuvenation of forage plants and maintenance of open water. Beavers may be negatively affected by severe fires until forage species recolonize the area.

Fire near wetlands can consume dead grass and sedges, opening up dense marsh vegetation to maintain habitat for waterfowl. Burning also stimulates new shoots that have greater forage value. Under the right conditions, fire may create new ponds or prevent old ponds from filling in with vegetation. Fire can have

short-term negative effects on waterfowl when it occurs during nesting or molting periods, or when it eliminates woody vegetative cover (BLM 2004b).

### ***(3) Effects to Wildlife from Livestock Grazing (Common to all)***

Livestock grazing permits could be considered on a case-by-case basis under any Alternative. Grazing by reindeer can indirectly impact wildlife by degrading habitat or reducing the availability of preferred forage species. The greatest potential for impact would be on caribou as they have the same forage requirements as reindeer. Reindeer remain in the same allotment yearlong, and may overuse lichen in localized areas. Reindeer herders utilize the same area year after year. This may result in reduction of lichen biomass in some areas and may decrease the opportunity and potential for the area to support caribou in key seasonal or life function habitats.

Herding activities may result in disturbance impacts to wildlife. These impacts would be negative, especially during stressful times such as winter or reproductive periods. Reindeer herders may attempt to separate their reindeer from caribou, resulting in disturbance impacts to caribou. Disturbance to wintering moose by reindeer herding activities may result in increased stress on these animals.

Effects of grazing on riparian, wetlands and stream habitats can decrease quality and quantity of fish habitat and productivity. Such impacts have indirect impact on terrestrial predators and scavengers such as bears, osprey, and eagles that are dependent upon abundant fish resources for food.

Authorization of grazing may negatively impact brown bear and wolf populations due to the increased number of predators harvested by reindeer herders in defense of life and property and predator control programs. Harvest of predators by reindeer herders in some parts of the Seward Peninsula, outside of the Bay planning area, has been substantial in the past (ADF&G 2002). From 1996 to 1998, nine bears were reported harvested in defense of life and property (DLP) in GMU 22. This reported total does not accurately represent the actual number of non-hunting kills due to low compliance with reporting requirements. Nelson (1993) estimated that an additional 10 to 30 bears were killed annually and not reported in GMU 22.

Approval of grazing permits may result in conflicts between wildlife management and reindeer grazing. ADF&G and the Federal subsistence program intensively manage caribou hunts and public outreach relative to caribou movement in areas that overlap with reindeer ranges in an attempt to reduce accidental harvest of reindeer by hunters in regions outside of the Bay planning area where reindeer grazing is currently engaged in.

Disease and parasite transmission between reindeer and caribou may negatively affect the caribou. Reindeer and caribou are the same species. If disease transmission did occur, it could have serious, negative impacts on the Mulchatna Caribou Herd and other herds in the planning area. Grazing associated with Special Recreation Permits (SRPs) could be authorized under all Alternatives on a case-by-case basis. Potential impacts include transmission of disease and parasites to wildlife from a variety of domestic animals; reduction of forage availability; and introduction of noxious or invasive plants from manure and feed carried in for pack animals.

### ***(4) Effects to Wildlife from Hazardous Materials (Common to all)***

Hazardous materials in the planning area have the potential to enter the food chain and contaminate wildlife species that are consumed by humans, causing negative health effects. This could occur in sport hunted species, and particularly in subsistence species where human consumption levels are higher. Hazardous materials may also directly and indirectly affect wildlife by causing direct mortality, reduced survival, and reduced productivity thereby reducing species abundance.

The hazardous materials program could have a beneficial effect on wildlife by identifying and rehabilitating hazardous sites.

### ***(5) Effects to Wildlife from Fluid Mineral Leasing (Common to all)***

Although Leasable Mineral development is not anticipated under every Alternative, some mineral-related activities may occur under any Alternative. Mining and oil and gas leasing could have adverse effects to wildlife species and important habitat. Ancillary infrastructure including separation ponds, pipelines, and roads would cause surface disturbance and loss of wildlife habitat. There is also potential for oil spills that would further degrade habitat. Where Rights of Way are associated with development on non-BLM-managed lands, or associated with mining or oil and gas leasing, there could be localized impacts to habitat, migratory patterns, and wildlife abundance and distribution. Direct habitat loss may also lead to wildlife displacement and habitat fragmentation. Surface disturbing activities may displace animals into lower quality habitat and increase competition for available resources with other species uses. Direct mortality of wildlife from vehicle collisions, oil associated with treatment and production facilities, hydrogen sulfide poisoning, oil field worker access, and enhanced access for non-oil industry related individuals would increase authorized and non-authorized harvests. Effects are likely to occur during construction and mineral extraction activities, and could cause long and short term effects resulting in permanent loss or alteration of wildlife habitat and disruption of migratory patterns. Direct and indirect impacts to fish and fish habitat may result in impacts to terrestrial predators and scavengers by reducing or contaminating forage sources.

#### ***(6) Effects to Wildlife from Minerals (Common to all)***

**Locatable Minerals.** Locatable Mineral exploration and development to some degree may occur under every Alternative. Potential impacts to wildlife would include temporary displacement in localized areas, temporary and long term loss of habitat, long-term degradation of habitat, and possible direct mortality of small mammals or nestlings and brooding birds. Both direct and indirect impacts may be reduced under all Alternatives due to implementation of the Required Operating Procedures.

**Salable Minerals.** Mineral material mining and disposal has both direct and indirect impacts on wildlife and their habitat. Habitat is degraded or destroyed, depending upon the location of the material site. Some sites may recover to the original vegetation cover within a relatively short time frame. Other sites may never recover to the original vegetative cover due to loss of soil from the site. In some cases, disturbance to the site by mining of mineral materials may result in improved habitat for species which depend upon habitats in a low seral stage. Temporary displacement and disturbance impacts would occur to larger and more mobile animals. Direct mortality may result to smaller and less mobile animals such as lemmings, voles, or nestling birds. Both direct and indirect impacts may be reduced under all Alternatives due to implementation of mitigation measures developed during NEPA analysis of specific mineral materials actions.

Impacts to wildlife from mineral material mining and disposal would be minimal under most Alternatives. Sufficient material sources exist on private lands to meet the needs of most communities within the planning area. Under all Alternatives mineral material mining and disposal would occur in association with transportation infrastructure development and minerals development and would impact wildlife.

#### ***(7) Effects to Wildlife from Recreation Management (Common to all)***

There may be impacts to wildlife from both commercial and non-commercial recreation activities. The primary impacts may be temporary stress, displacement, enhanced or excessive harvest, or habitat abandonment of wildlife due to recreational activities, or to recreation associated access (aircraft overflight and landing in remote areas). In areas that are repeatedly used for camping sites, there may be minor, site-specific degradation of habitat. Special recreation permits for guiding and outfitting game species may result in population effects to caribou, moose, and bears.

#### ***(8) Effects to Wildlife from Travel Management (Common to all)***

The noise and activity associated with OHV use (including snowmachines) can adversely affect wildlife both directly and indirectly. Direct effects include stress and displacement of animals, possibly to less suitable habitats, especially in important seasonal habitats. Stress and displacement may result in reduced productivity (ADF&G 1990). Changes to traditional movement patterns, distribution and behavior



of wildlife, and increased harvest vulnerability, can result from exposure to OHVs. Wildlife are particularly vulnerable to disturbance at periods of time and in areas of concentration such as caribou calving grounds, or during stressful periods during life history ( i.e. caribou and moose calving, post calving aggregations, winter habitats, bear natal dens and foraging concentrations, bird nesting and staging areas). OHV use may result in habitat abandonment or changes in density or species population, age, and sex composition in the vicinity of the trail.

Indirect effects include habitat degradation and alteration, and increased access into habitats. Remote areas will become more accessible over time as OHVs become more powerful and as the human population in the planning area increases. Improved technology and increased demand for resources may lead to increased harvest of wildlife. Snowmachine use compacts snow and may inhibit movement under the snow by small rodents. Fragile habitats such as wetlands and riparian areas may be degraded seasonally by OHV use.

#### ***(9) Effects to Wildlife from Renewable Energy (Common to all)***

Renewable energy sources such as wind could be developed on BLM-managed lands within the planning area under all Alternatives. Should such development take place, there would be both direct and indirect impacts on wildlife. Direct impacts would include disturbance during construction and maintenance activities, mortality due to bird strikes on wind towers, and mortality of small, less mobile animals such as small mammals or nesting birds during construction and maintenance. Indirect impacts would include minor loss of habitat due to facility construction. Higher mortality may be expected if wind towers are sighted in bird movement corridors. To be most useful, these types of development need to be located near population centers. However, most land near villages is private. Due to the remoteness of BLM unencumbered lands, little renewable energy development is anticipated on BLM-managed lands, actual impacts would be minimal, and would not have population level effects. The increasing cost of fuel may make wind energy more cost effective in the future, including power for mineral development. At this time, solar energy technology options do not appear to have the potential for impact on wildlife on BLM lands. Limited opportunity for using available geothermal energy, and local, small scale opportunity for use of solar energy would result in insignificant impacts.

#### ***(10) Effects to Wildlife from Climate (Common to all)***

The climate within the Bay planning area is described as maritime near the coasts, and more transitional farther inland. Current scientific evidence suggests the climate warming in Alaska can be linked to changes occurring in the structure and function of terrestrial ecosystems throughout the state. These changes include the thawing of permafrost, the conversion of tundra to more shrub habitats, and the drying and decrease in areas of closed basin lakes, causing alteration and conversion of wildlife habitats. Climate change has also been linked to changes in disturbance regimes such as fire potential and insect outbreaks, further affecting ecosystem processes and causing habitat changes in some areas. Warming climates may be instrumental in the introduction of disease and parasites previously unknown in the planning area. Current research suggests that these trends will continue, and will likely occur to a greater extent and magnitude at higher latitudes first. These climatic changes and subsequent habitat changes will impact wildlife by expanding habitats for some species, and limiting habitat for other species, thereby altering the distribution and abundance of some species, particularly those dependent on wetlands, tundra, shrub or closed forest habitats. BLM lands in the Bay planning area will be subjected to these climate and habitat changes.

#### ***(11) Effects to Wildlife from Lands and Realty Actions (Common to All)***

There would be both direct and indirect impacts to wildlife from lands and realty actions under all Alternatives. Wildlife may be temporarily displaced or disturbed or movement patterns disrupted during activities authorized under this program. There may be direct mortality and/or habitat abandonment by wildlife species. Actions that increase access may create increased harvest opportunities. Wildlife habitat may be destroyed, fragmented, or degraded. Acquisitions and exchanges may benefit wildlife by

consolidating and protecting important wildlife habitats. Disposal action may fragment blocks of land, remove protections for wildlife habitats, and make them available for other uses detrimental to wildlife.

## **b) Effects to Wildlife for Alternative A**

Under the current management system, Alternative A, compliance, monitoring, and mitigation requirements for wildlife are determined on a case-by-case basis during the permitting process.

### ***(1) Effects to Wildlife from Soil, Water, and Vegetation Management (Alternative A)***

Effects to wildlife from the soil, water, and vegetation management programs would be the same as those discussed under Common to All Alternatives.

### ***(2) Effects to Wildlife from Realty and Lands Actions (Alternative A)***

The nature of impacts would be the same as discussed under those Common to All Alternatives. Under this Alternative, no lands would be identified for disposal or land exchange, ANCSA 17(d)(1) mineral entry withdrawals would be retained. The degree of impacts that would occur to wildlife and wildlife habitat under this Alternative would be less than under Alternatives B, C, or D. Avoidance or exclusion areas and specific mitigation requirements would be identified on a case-by-case basis for Rights-of-Way, including access and utility corridors and ancillary facilities.

### ***(3) Effects to Wildlife from Minerals (Alternative A)***

**Fluid Leasable Minerals.** Under Alternative A, in some situations, BLM has the authority to lease lands where oil and gas is being drained. No lands would be open for fluid mineral leasing, with the exception of drainage from an adjacent ownership. In those areas, leases are subject to standard lease terms, including seasonal or other constraints. Geophysical exploration would be considered on a case-by-case basis. Impacts to wildlife would be the same as discussed under Common to All Alternatives.

**Locatable Minerals.** Under Alternative A, most BLM lands within the planning area would remain closed to locatable mineral entry due to existing ANCSA 17(d)(1) withdrawals. However, some BLM lands are open, and there are some active mining operations on BLM-managed lands where exploration or mining could take place or continue. Existing placer mining operations could continue. These operations and any future proposals for locatable minerals exploration and development would be subject to review through the administration of Plans of Operations. Measures to maintain the integrity of wildlife habitat in these areas would be implemented; where unavoidable, compensation for habitat loss would be identified and required as part of the individual mine operating plan.

**Salable Minerals (Mineral Materials).** Impacts to wildlife would be the same as under Impacts Common to All Alternatives. No impacts would be expected in areas withdrawn from mineral entry.

### ***(4) Effects to Wildlife from Recreation Management (Alternative A)***

**Recreation Experience Opportunities** - Under Alternative A, both commercial and non-commercial recreation would continue to be managed on a case-by-case basis. Consequently, no areas would be identified for commercial or non-commercial use limits, and impacts to wildlife associated with these activities would continue to be handled on a case-by-case basis. No recreation facility construction would be considered, which could lead to localized habitat degradation at heavy-use dispersed camp sites. Kinds of impacts to wildlife would be the same as discussed under those Common to All Alternatives.

**Special Recreation Management Areas** - Under Alternative A, no Special Recreation Management Areas would be established. Impacts to wildlife would be the same as those discussed under Common to All Alternatives.

**Visual Resource Management** - Under Alternative A, no VRM classes would be established in the Bay planning area. Impacts to wildlife would be the same as those discussed under Common to All Alternatives.

***(5) Effects to Wildlife from Travel Management (Alternative A)***

Kinds of impacts to wildlife would be the same as discussed under Impacts Common to All Alternatives. Under Alternative A, there would be no OHV designations within the Bay planning area. No vehicle weight limit would exist, and there would be no route restrictions. Cross country travel would be allowed everywhere on BLM-administered lands within the Bay planning area. The degree of potential impacts to wildlife and wildlife habitat would be greater than in Alternatives C or D.

***(6) Effects to Wildlife from Special Management Area Designations (Alternative A)***

**Wild and Scenic Rivers** - Under Alternative A, no Wild and Scenic Rivers would be recommended in the Bay planning area. These areas would therefore be open to all multiple use activities permitted on BLM lands except for mineral exploration and development in most areas. Impacts to wildlife from those activities would be the same as those discussed for each activity under Common to All Alternatives.

**Area of Critical Environmental Concern** - Under Alternative A, no Areas of Critical Environmental Concern would be recommended in the Bay planning area. BLM would manage wildlife habitat and would address concerns on a case-by-case basis during the review of permits. No habitat management plan would be developed for wildlife habitat.

**c) Effects to Wildlife for Alternative B**

***(1) Effects to Wildlife from Soil, Water, and Vegetation Management (Alternative B)***

There would be beneficial impacts to wildlife from proper management of soils, water, and vegetation resources. Implementation of Required Operating Procedures, stipulations, and project-specific requirements would reduce disturbance to wildlife habitats and would assist the recovery of habitat from permitted uses.

***(2) Effects to Wildlife from Realty and Lands Actions (Alternative B)***

**Land Exchanges** - Large blocks of BLM-managed lands would be retained in Federal ownership, reducing the potential for habitat fragmentation. Small isolated parcels identified in Alternative B for disposal could result in privatization of some tracts and could increase levels of access and human activity in wildlife habitat. Wildlife may be displaced from preferred habitats, and habitat may be destroyed or degraded. Exchanges could result in larger, contiguous blocks of BLM lands that are of high wildlife value. Land would have to meet the criteria for disposal in the Federal Land Policy Management Act (FLPMA).

**Withdrawals** - ANCSA 17(d)(1) withdrawals would be revoked under this Alternative. Because of the constraints currently in place under these withdrawals, rejection of the withdrawals could increase potential resource development and wildlife and habitat disturbing activities. Associated impacts to wildlife and wildlife habitat would be expected from minerals exploration and development and infrastructure development. Proposals would be handled on a case-by-case basis, and would be subject to Required Operating Procedures and Stipulations.

**Rights-of-Way** - Impacts to wildlife from Rights-of-Way would be the same as those in Alternative A.

***(3) Effects to Wildlife from Minerals (Alternative B)***

**Fluid Leasable Minerals**

Under Alternative B, ANCSA 17(d)(1) withdrawals would be removed. Because of the constraints currently in place under these withdrawals, removal of the withdrawals could increase resource development and wildlife and habitat disturbing activities. Potentially wildlife and habitat disturbing activities associated with oil and gas exploration and development would be limited in footprint. However, another risk to wildlife and wildlife habitat would be presented by the possibility of an oil, fuel, or diesel spill. Impacts to wildlife from leasable minerals could come from several activities.

**Seismic Exploration** - Seismic exploration would have direct impacts on wildlife, including temporary disturbance or stress on wildlife. In one study, seismic activities within 1.15 miles of a grizzly bear den caused changes in heart rate and movement of the female bear and cubs (Reynolds et al. 1986). The investigators suggest that seismic testing activities within approximately 600 feet of the den may cause abandonment of the den.

For approximately the past 15 years, the Mulchatna Caribou Herd has been inconsistent and unpredictable in its choice of overwintering and calving areas within the larger herd range (Hinkes et al. 2005). In spring 2006 there are two large calving groups, one located near Lime Village and the other located south of Koliganek, in a generalized area that includes BLM unencumbered lands. Caribou are also in the Goodnews Bay area this year (J. Denton 2006, Pers. Comm.). Planning for seismic exploration on BLM lands in the Bay planning area for a time when caribou are not present could prove challenging with such unpredictable behavior.

The National Research Council's report, *Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope* (2003), suggests that the optimum time to conduct seismic activities in caribou winter range and primary calving areas is in summer when caribou are not present. However, even in winter on winter range, the Committee believed that direct effects on caribou in the National Petroleum Reserve - Alaska in the 1970s and 1980s from low intensity two-dimensional (2-D) surveys with low seismic line density were temporary and minor (NRC 2003). Wintering bands of caribou tend to be small and often widely dispersed, so few caribou would have come in contact with seismic activities at the same time. Additionally, Roby (1978, NRC 2003) suggests that caribou appear least sensitive to human-induced disturbance during winter.

Dyer and others (2001) suggests that avoidance of seismic lines and the attendant human activity could reduce caribou's ability to avoid areas of deep snow. Bradshaw and others (1998) propose that the energy costs of multiple encounters with seismic disturbance could increase winter weight loss and reduce calf production and survival (NRC 2003).

Information about the effects of noise on moose was gathered for the Mackenzie Gas Project in Canada (AMEC 2005). In a 1974 study recording the response of moose in the Richardson Mountains to fixed-wing aircraft, McCourt and others found that of 46 observations, moose reacted visibly to aircraft overflights of less than 60 meters of altitude 55% of the time, and to overflights of 60 meters to 180 meters 37.5% of the time. Moose are known to avoid roads, pipelines and seismic lines (Horesji 1979, Rolley and Keith 1980, Morgantini 1984, Rudd and Irwin 1985, Singer and Beattie 1986, Jalkotzy et al. 1997). Horesji (1979) also reported that moose were less likely to be found within 1 km of seismic lines while seismic operations were underway.

Based on data from prior studies, caribou, moose, and bears can all be hazed away from their habitats by seismic testing. The following factors would be key in the degree of effects:

- The timing and location of tests and whether caribou, moose, or bears are present or absent.
- The number of seismic lines involved, the amount of temporary infrastructure developed, and the amount of ancillary human activity accompanying the testing, including helicopter activities.
- The total duration and intensity of the project or cumulative projects in a specific area.
- The type of testing, subsurface or above ground; 2-D or 3-D procedures.



Seismic camps may provide additional food sources for foxes and bears at dumpster sites near the galley and dining halls and at dump sites (Eberhardt et al. 1982, Rodrigues et al. 1994). However, seismic crews are required by stipulation to incinerate and remove waste materials from BLM lands. This activity is not expected to enhance the survival of foxes. Bears would generally be hibernating during seismic exploration it is carried out in winter, and so would not be expected to be affected by human sources of food. Testing by helicopter-supported ground crews could easily be done in summer months (which has been the case in the past) and so would also be expected not to be a source of impacts.

Small mammals (lemmings, voles) and their predators would be affected locally at camps and along seismic lines by direct mortality and loss of habitat. The numbers lost would be insignificant in the greater population.

Should seismic surveys occur during winter months, many birds are absent from the region. Overwintering birds including ravens, ptarmigan, and gyrfalcons could be temporarily displaced by seismic activities. In the unlikely event that a seismic operation extended into May, disturbance of early breeding season activities of some species could occur. Because the campsites and survey areas are occupied for relatively brief periods, and most of the birds are dispersed in relatively low numbers over a large area, the duration of disturbance incidents is likely to be brief and infrequent. Stipulations, Required Operating Procedures, and project-specific requirements such as those describing seasonal activities and buffers, for example, would be available to minimize potential impacts.

Indirect impacts to wildlife from seismic operation may include degradation of habitat (impacts to soil and vegetation) due to seismic exploration. These types of impacts would be reduced by implementation of the Required Operating Procedures, including limiting seismic surveys to the winter when the ground is frozen and covered with snow.

**Exploratory Drilling** - Effects to wildlife from exploratory drilling for oil and gas or coal would be similar to those discussed under seismic exploration. As exploratory drilling should occur during winter, potential disturbance would come primarily from aircraft and surface traffic, and activities associated with road and drill pad construction. Numerous studies show that wildlife such as caribou react to low flying aircraft by exhibiting various behaviors from panic to strong escape responses (Calef et al. 1976). Disturbance reactions to each incident with aircraft would be brief, lasting only minutes to less than one hour; however, effects of cumulative incidents must also be considered. Wildlife may be temporarily disturbed from ground traffic and activities associated with ice road construction. Wildlife may temporarily avoid the local area but would reoccupy the area after the exploration activities were complete. Small and less mobile animals such as lemmings and voles may suffer direct mortality during ice road or pad construction. These losses would not result in population level effects.

**Development** - Based on the Reasonably Foreseeable Development Scenario, one site in the Koggiling Block of BLM lands is explored and potentially developed for natural gas and a pipeline is constructed to Dillingham. Using this scenario, the following effects could occur.

Although initial construction could occur primarily during winter, development of oil and gas resources would bring year-round facilities and activities to wildlife habitat on BLM unencumbered lands in the southern part of the Nushagak - Kvichak drainages. Potential effects of development activities include direct habitat loss for bears, caribou, moose, waterfowl, small mammals and their predators, and other animals from gravel mining and oil field facilities, and indirect habitat loss through reduced access caused by physical or behavioral barriers created by roads, pipelines, and other ancillary facilities, and by road and air traffic. Depending on location and season, oil and gas activities, and human conduct in areas where waterfowl, caribou, moose, bear and other species occur could result in increased disturbance and mortality to individual animals from routine aircraft operations, gravel-mining operations, presence of gravel pads and facilities, associated improved human access for vehicle and foot traffic from both workers and the general public.

For example, the National Research Council (2003) found that intensive oil and gas development on the North Slope has altered the distribution of female caribou during the summer insect season, and that elsewhere a network of roads, pipelines, and facilities has interfered with caribou movements between

coastal insect relief and inland feeding areas. Radio-collared female caribou west of the Sagavanirktok River shifted their calving concentration area from developed areas near the coast to undeveloped areas inland, to an area of lower green-plant biomass. During a six year period parturition rates of radio-collared females in regular contact with oil-field infrastructure were lower than those of undisturbed females, exacerbated by intense insect harassment during the period. Possible consequences of these disturbances include reduced nutrient acquisition and retention throughout the calving and midsummer periods, poorer condition in autumn, and a lowered probability of producing a calf the following spring (NRC 2003).

Disturbance and stress impacts would be similar to those discussed under Seismic Exploration, but would be more extensive and long term due to the yearlong exposure. Various species could be affected to some extent by disturbance events such as passage of aircraft, although most incidents are expected to result in negligible effects from which individuals would recover within hours to one day. However, the cumulative effect of repeated disturbance could extend for longer periods and potentially may adversely affect physiological condition, reproductive success, productivity, and the use of key seasonal and life function habitats.

Disturbance impacts to grizzly bears would be similar to those discussed under seismic impacts. A similar effect could occur from construction activities within 600 feet of dens. The National Research Council (2003) found that oil and gas activities on Alaska's North Slope had changed the demographics of the grizzly bear population. Harding and Nagy (1980) found that grizzly bears initially avoid human settlements because of the noise and disturbance, but if the area includes an important food source, some bears are likely to habituate to the noise and human presence, leading to an increase in encounters and mortalities.

Fox populations also increase, primarily because of the availability of human food sources. One concern is that increasing fox populations could affect regional populations of some bird species.

Development of infrastructure in the region would increase potential hunter access by road and airstrip and would enhance opportunity for both legal and unauthorized harvest of wildlife as well as introduce injury or mortality factors such as vehicle collisions. Contaminated food, hydrogen sulfide gas poisoning, and other oil-development related sources could contribute to increased wildlife mortality. Defense of life and property mortality for brown bears could increase with increase in human residence and increased presence of human food. Increased access to caribou, moose, bears, and migratory waterfowl for sport and subsistence hunting could increase the number of animals taken with the development of additional roads and landing strips.

Other effects on birds observed at other oil and gas sites in Alaska include shifts in nesting distribution of shorebirds and artificially high densities of ravens and gulls (NRC 2003).

**Effects of Oil, Gasoline, or Diesel Spills** - Oil or diesel spills and water treatment pits could negatively affect wildlife in several ways. Animals may be coated with oil or diesel and suffer from loss of thermal insulation, loss of flight capability, and buoyancy; breathe toxic aromatics; ingest oil during grooming; or absorb toxic hydrocarbons through the skin. Oil or diesel may be ingested through contamination of forage or prey.

Oil may adhere to birds' feathers, causing the feathers to lose their insulating capabilities, resulting in hypothermia (Patten et al. 1991). This effect would be particularly severe for birds that come in contact with water where feather integrity is necessary to maintain their water-repellent qualities and buoyancy. Birds could also suffer toxic effects from ingestion of oil by consumption of food contaminated by a spill or from oil ingestion resulting from preening oiled feathers (Hansen 1981). Oil contacting bird eggs could cause toxic effects to embryos (Patten and Patten 1979, Stickel and Dieter 1979). Oil could come in contact with eggs directly as a result of a spill, or indirectly from oiled feathers of incubating adults.

A spill occurring during the summer breeding, fledging, and molting seasons would have a greater impact on birds than a spill occurring during the winter, when most birds are on wintering grounds. Cleanup of spilled oil during periods when water is ice-covered or during periods of broken ice, and lingering oil may

be present and may be hazardous to spring migrating birds. Lingering effects from a winter spill could impact returning birds during the following breeding season if clean up activities did not adequately remove contaminants from bird habitats. In addition, oiled carcasses of dead birds could also be hazardous to scavenging birds and mammals.

Adult caribou may ingest, inhale, or absorb toxic hydrocarbons through the skin. The oiling of young calves could reduce their thermal insulation, leading to death (BLM and MMS 1998). Control and clean up operations at a spill site would frighten caribou and moose away from the spill and would limit the likelihood that they would ingest oiled vegetation.

If an oil spill were to contaminate grizzly bear habitat, some bears (and other predators and scavengers, such as bald eagles) would likely ingest contaminated food. An oiling experiment on captive polar bears indicated that if a bear's fur becomes oiled and the bear ingests a considerable amount of oil while grooming, kidney failure and other complications could lead to the bear's death (Oritsland et al. 1981). One young bear on the Shelikof Strait Coast in an area effected by the EXXON Valdez oil spill, was observed to have oil on its fur and to be consuming oil contaminated foods. The bear died with high concentrations of aromatic hydrocarbons in its bile and might have died from oil ingestion (Lewis and Sellers 1991).

**Treatment** - Clean up response may result in temporary disturbance and displacement of wildlife, or may put wildlife at risk. Bears in Katmai National Park were observed seeking out and rolling in fuel-contaminated soil that had been removed from a contaminated site and was being treated in another location (McClenahan 2006, Pers. Comm.). This behavior has been commonly observed in logging areas where equipment waste oil dump sites are used by bears in a similar way (Denton 2006, Pers. Comm.).

Chemical dispersants, used to treat spills, break up substances such as oil into small droplets. They contain surfactants. They should only be used when the associated impacts of dispersed oil are less harmful than non-dispersed oil. All wildlife in the dispersant target zone should be identified prior to approving the use of dispersants. Birds within the dispersant target zone should be hazed or they should be captured if they become contaminated. Dispersants should not be applied where there are large concentrations of birds (FWS 2005).

### **Locatable Minerals**

This Alternative would anticipate the greatest exploration and development for locatable minerals given the revocation of all ANCSA 17(d)(1) withdrawals. Dependent on gold prices, a moderate increase in small placer operations on BLM-managed lands could occur during the life of this plan. Large operations could be possible, but would most likely occur on State or Native lands. Roads or infrastructure necessary for those operations, however, could cross BLM-managed lands.

Approximately 1,176,269 acres would be available for locatable mineral entry. Existing placer mining operations would continue. Approximately 3,999 acres would remain withdrawn due to other withdrawals. Existing mining operations and any future proposals for locatable minerals exploration and development would be subject to review and Required Operating Procedures through the administration of Plans of Operations. Measures to maintain the integrity of wildlife habitat in these areas would be implemented; and where unavoidable, compensation for habitat loss would be identified and required as part of the individual mine operating plan.

The Required Operating Procedures (ROPs) common to Alternatives B, C, and D are designed to minimize or prevent impacts to wildlife and wildlife habitats. Strict adherence to the ROPs would minimize effects to wildlife and wildlife habitat within the planning area. The protection provided to wildlife and wildlife habitat under Alternatives B, C, and D would be superior to that provided under Alternative A.

### **Salable Minerals (Mineral Materials)**

Impacts to wildlife would be the same as under Impacts Common to All Alternatives. No impacts would be expected in areas withdrawn from mineral entry.

***(4) Effects to Wildlife of Off-highway Vehicles (Alternative B)***

Impacts to wildlife would be the same as those discussed under Common to All Alternatives. Under Alternative B, all lands would be open to OHV use, a vehicle weight limit of 2000 GVWR would exist, and there would be no route restrictions. In the Bay planning area, vehicles weighing 2000 GVWR currently are the vehicles of choice off established highways, and so establishing the vehicle weight limit would do little to change the current situation with regard to effects to wildlife and wildlife habitat. Lack of restrictions in this Alternative would mean that cross country travel would be allowed everywhere on BLM-administered lands within the Bay planning area. Wildlife harvest could potentially increase and impacts of access could affect important wildlife habitat, and access to important seasonal and life function habitats could still occur. Impacts from OHVs on fish and fish habitat might impact terrestrial predators and scavengers by altering availability, seasonal abundance, and distribution of important fish-related food resources.

***(5) Effects to Wildlife of Recreation Experience Opportunities (Alternative B)***

Under Alternative B, lands would be managed as roaded natural under the Recreation Opportunity spectrum. Impacts to wildlife would be the same as those in Alternative A.

***(6) Effects to Wildlife of Recreation -Special Recreation Management Areas (Alternative B)***

Under Alternative B, lands would be managed as an Extensive Recreation Management Area. Wildlife impacts would be mitigated with Required Operating Procedures, Stipulations, and other conservation actions.

***(7) Effects to Wildlife of Visual Resource Management (Alternative B)***

Under Alternative B, all lands would be managed under VRM class IV. This classification could result in fragmentation of wildlife habitat and may indirectly affect population distribution, productivity and movements.

***(8) Effects to Wildlife of VRM in Special Management Areas (Alternative B)***

Under Alternative B, no Special Management Areas are proposed. BLM lands would be managed under VRM class III. This classification could result in fragmentation of wildlife habitat and may indirectly affect population distribution, productivity and movements outside of the viewshed.

***(9) Effects to Wildlife of Special Management Area Designations - Wild and Scenic Rivers Effects on Wildlife (Alternative B)***

Under Alternative B, the impacts to wildlife would be the same as for Alternative A.

***(10) Effects to Wildlife of Special Management Area Designations - Area of Critical Environmental Concern (Alternative B)***

Impacts to wildlife would be the same as in Alternative A.

**d) Effects to Wildlife for Alternative C*****(1) Effects to Wildlife from Soil, Water, Air, and Vegetation Management (Alternative C)***

There would be beneficial impacts to wildlife from proper management of soils, water, and vegetation resources. Implementation of Required Operating Procedures, stipulations, and project-specific



requirements would reduce disturbance to wildlife habitats and would assist the recovery of habitat from permitted uses.

### ***(2) Effects to Wildlife of Reality and Lands Actions (Alternative C)***

**Land Exchanges** - Impacts to wildlife for land exchanges and acquisitions would be the same as for Alternative A.

**Withdrawals** - Actions addressing ANCSA 17(d)(1) withdrawals would be the same as in Alternative B, except for withdrawals on proposed wild river segments on the Alagnak, Goodnews mainstem and Goodnews Middle Fork (97,344 acres) would be retained until Congress had had an opportunity to act. This would be beneficial for wildlife habitat.

**Rights-of-Way** - Impacts to wildlife from Rights-of-Way would be the same as in Alternative A, with the exception that the proposed Bristol Bay and Carter Spit ACECs would be identified as avoidance areas. This would conserve important wildlife habitats and high interest species.

### ***(3) Effects to Wildlife of Minerals (Alternative C)***

#### **Fluid Leasable Minerals**

Under Alternative C, ANCSA 17(d)(1) withdrawals to mineral entry would be removed, with the exception of 15,125 acres in the Alagnak, Goodnews and Goodnews Middle Fork Rivers, where (d)(1) withdrawals would be retained until Congress has had an opportunity to act. The retention of the withdrawal would conserve wildlife habitat within these areas. Outside those areas, removal of the withdrawals could increase potential resource exploration and development and wildlife and habitat disturbing activities. Impacts to wildlife would be the same as under Impacts Common to all Alternatives.

#### **Locatable and Salable Minerals (Alternative C)**

**Locatable Minerals** - The effects to wildlife of Locatable Minerals would be the same as those in Alternative B, except segments of the Alagnak River, the mainstem of the Goodnews River, and the Goodnews Middle Fork, the proposed Carter Spit ACEC, and the proposed Bristol Bay ACEC would be closed to mineral entry. Conservation of these areas would benefit fish and wildlife by protecting important habitats.

**Salable Minerals (Mineral Materials)** - Same as Alternative A except the proposed Carter Spit ACEC, the proposed Bristol Bay ACEC, and segments of the Alagnak, Goodnews mainstem and Goodnews Middle Fork rivers proposed for Wild and Scenic River designation would be closed to mineral sales. This Alternative would provide the highest benefit to wildlife populations by protecting important river and coastal habitats.

### ***(4) Effects to Wildlife of Off-highway Vehicles (Alternative C)***

Under Alternative C, all lands would receive a "limited" designation for OHV use, which would require vehicles to stay on existing trails whenever possible. A vehicle weight limit of 2000 pounds would be proposed. These restrictions would benefit wildlife by reducing proliferation of trails and degradation of habitats, and would reduce the indirect impacts to wildlife created by noise and disturbance, causing abandonment from preferred habitats.

### ***(5) Effects to Wildlife of Recreation Experience Opportunities (Alternative C)***

Under Alternative C, the entire recreation area setting would be managed as semi-primitive motorized. Impacts to wildlife would be the same as those common to all Alternatives.

### ***(6) Effects to Wildlife of Recreation - Special Recreation Management Areas (Alternative C)***

Impacts to wildlife would be the same as those identified in Alternative B.

***(7) Effects to Wildlife of Visual Resource Management (Alternative C)***

Under Alternative C, portions of the planning area would be managed under VRM Class III up to 5 miles from established trail systems and National Conservation Units. All other BLM lands would be managed at VRM Class IV. This Alternative would offer some benefit to wildlife near areas where development is more restricted, but would still result in loss of habitat and restriction of movement to wildlife and may indirectly affect population distribution and productivity.

***(8) Effects to Wildlife of Visual Resource Management in Special Management Areas (Alternative C)***

Under Alternative C, lands in the proposed Carter Spit and Bristol Bay ACECs and the Alagnak, Goodnews and Middle Fork Goodnews proposed as National Wild and Scenic Rivers would be managed under VRM class III. This classification could result in less fragmentation of wildlife habitat and could indirectly positively affect population distribution, productivity and movements, and could benefit wildlife by conserving habitat within the viewshed in the two ACECs and three proposed Wild and Scenic Rivers.

***(9) Effects to Wildlife of Special Management Area Designations - Wild and Scenic Rivers (Alternative C)***

Under Alternative C, segments of the Alagnak, Goodnews mainstem and Middle Fork Goodnews rivers would be proposed as Wild and Scenic Rivers, closed to mineral exploration or development. These actions would be beneficial to wildlife by protecting riparian habitats from disturbance and providing undisturbed wildlife habitats to riparian species.

***(10) Effects to Wildlife of Special Management Area Designations - Areas of Critical Environmental Concern (Alternative C)***

Under Alternative C, the Carter Spit ACEC (62,862 acres) and the Bristol Bay ACEC (989,202 acres) would be proposed. These designations would benefit wildlife populations by proposing development of Habitat Management Plans that would to mitigate impacts from development and other resource uses.

**e) Effects to Wildlife for Alternative D**

***(1) Effects to Wildlife from Soil, Water, Air, and Vegetation Management (Alternative D)***

There would be beneficial impacts to wildlife from proper management of soils, water, and vegetation resources. Implementation of Required Operating Procedures, stipulations, and project-specific requirements would reduce disturbance to wildlife habitats and would assist the recovery of habitat from permitted uses.

***(2) Effects to Wildlife of Realty and Lands Actions (Alternative D)***

**Land Exchanges** - Impacts to wildlife habitat would be the same as those discussed for Alternative B.

**Withdrawals** - Impacts to wildlife habitats from removing ANCSA 17(d)(1) withdrawals would be the same as those in Alternative B.

**Rights-of-Way** - Impacts to wildlife from Rights-of-Way would be the same as those for Alternative A; however, the proposed Carter Spit ACEC would be identified as an avoidance area for Rights-of-Way.

***(3) Effects to Wildlife of Minerals (Alternative D)***

**Leasable Minerals.** Under Alternative D, ANCSA 17(d)(1) withdrawals would be removed. Because of the constraints currently in place under these withdrawals, removal of the withdrawals could increase potential resource development and wildlife and habitat disturbing activities. Impacts to wildlife would be the same as under Impacts Common to All Alternatives.

Portions of the leasable lands in the Goodnews Block and the Bristol Bay area would be open to leasing, subject to seasonal and other minor constraints (included in project-specific requirements). In addition, Required Operating Procedures and Stipulations would be required. However, impacts to wildlife in all Alternatives would still occur, but potentially to a lesser degree.

**Locatable Minerals.** Impacts to wildlife of Locatable Minerals would be the same as for Alternative B, except that the proposed Carter Spit ACEC would be subject to more stringent Required Operating Procedures and project-specific requirements.

**Salable Materials (Mineral Materials).** Impacts to wildlife would be the same as for Alternative B, except the Carter Spit ACEC (62,862 acres) would be closed to mineral sales. This Alternative would benefit wildlife populations by protecting important riverine and coastal habitats.

#### ***(4) Effects to Wildlife of Off-highway Vehicles (Alternative D)***

Under Alternative D, all lands would be designated as limited to OHV use, which requires vehicles to stay on existing trails whenever possible. A maximum vehicle weight of 2000 pounds would be designated. These restrictions would benefit wildlife by reducing the proliferation of trails and degradation of habitats, and would reduce the indirect impacts to wildlife of noise and disturbance, and wildlife abandonment from preferred habitats. In addition, OHV limitations in the proposed Carter Spit ACEC would be developed to meet the proposed objectives of the Special Management Area. These limitations would benefit wildlife by protecting riverine and coastal habitats in the ACEC.

#### ***(5) Effects to Wildlife of Recreation Experience Opportunities (Alternative D)***

Impacts to wildlife would be the same as those discussed in Alternative C.

#### ***(6) Effects to Wildlife of Recreation - Special Recreation Management Areas (Alternative D)***

Impacts to wildlife would be the same as those discussed in Alternative B.

#### ***(7) Effects to Wildlife from Visual Resource Management Effects on Wildlife (Alternative D)***

Under Alternative D, portions of the planning area would be managed under VRM Class III up to 1 mile from certain rivers and National Conservation Units. All other BLM lands would be managed at VRM Class IV. This Alternative would offer some benefit to wildlife near areas where development is more restricted, but would still result in loss of habitat and restriction of movement to wildlife and could indirectly affect population distribution and productivity. This Alternative would offer less protection to wildlife than Alternative C, but more than Alternatives A and B.

#### ***(8) Effects to Wildlife from VRM in Special Management Areas (Alternative D)***

Under Alternative D, lands in the Carter Spit would be managed under VRM Class III. This classification could result in less fragmentation of wildlife habitat and may indirectly affect population distribution, productivity and movements, and would benefit wildlife by conserving habitat within the Carter Spit ACEC. This Alternative would provide less wildlife habitat conservation than Alternative C, but more than Alternative A or B.

#### ***(9) Effects to Wildlife from Special Management Area Designations - Wild and Scenic Rivers (Alternative D)***

Impacts to wildlife would be the same as in Alternative A.

***(10) Effects to Wildlife from Special Management Area Designations -Area of Critical Environmental Concern (Alternative D)***

Under Alternative D, the Carter Spit ACEC (62,862 acres) would be proposed. This designation would benefit wildlife populations in this area by preparing a Habitat Management Plan that would further plan to mitigate impacts from development and other resource uses.

***6. Direct and Indirect Effects for Special Status Species: Fish, Wildlife, and Vegetation Species***

**Direct and Indirect Effects for Special Status Fish Species**

There are no known Special Status fish species in the Bay planning area.

**Direct and Indirect Effects for Special Status Wildlife Species**

Proposed management of the following resources, resource uses or programs would have no anticipated effects on Special Status Animal Species: Cultural Resources, Paleontological Resources, Visual Resources, Forest Products, Fisheries Management, Wild and Scenic Rivers, Social and Economic Conditions, and Subsistence.

**a) Direct and Indirect Effects to Special Status Wildlife Species Common to All Alternatives**

***(1) Effects to Listed Species (Common to All)***

Four listed species are present or potentially present in the Bay planning area: *Numenius borealis*, the Eskimo curlew (extremely rare or extinct; has not been seen in the Bay planning area); *Polystricta stelleri*, Steller's eider; *Eumetopias jubatus*, Steller sea lion (there are no sea lion haulouts on BLM lands in the Bay planning area); and *Somateria fischeri*, spectacled eider. Of those, the Eskimo curlew is an "accidental species," or one that does not breed regularly or occur annually in western North America. Curlews are shorebirds that breed in tundra-covered mountainous areas in summer and winter on ocean beaches.

The Steller sea lion is not likely to be found on BLM lands in the Bay planning area. The only ocean beaches under BLM jurisdiction in the planning area are in Goodnews block, and there are no known sea lion haulouts on coastal BLM lands there.

The Steller's eider and the spectacled eider are diving ducks. They inhabit coastal tundra habitats during spring and fall migration. They spend much of their lives at sea. The Carter Spit area and the adjacent spits and wetlands in the Goodnews Block are important to the Steller's eider and the spectacled eider, which are present during spring and fall migration. The area provides important staging and tundra nesting, molting and brooding habitat (Larned 1998, Seppi 1997, Shaw et al. 2005) among the tundra lakes and ponds.

***(2) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation (Common to all)***

Wildlife Special Status Species would benefit from proper management of soil, water, air and vegetation resources in the planning area. Implementation of mitigation measures to protect these resources on a



project-specific basis would reduce disturbance to habitat of special status wildlife and would facilitate the recovery of habitat from permitted uses.

### ***(3) Effects to Special Status Wildlife Species from Fire and Fire Management (Common to all)***

**Listed Species** - Effects on Steller's and spectacled eiders are described in more detail in the Land Use Plan Amendment for Wildland Fire and Fuels Management for Alaska Environmental Assessment (BLM 2004). Both of these species are Federally listed as threatened.

Fire within the breeding habitat of either eider species could have negative effects on the breeding population. However, fire frequency in the wet tundra habitat of the coastal Bay planning area is very low, and the threat of wildland fires to the breeding population of Steller's and spectacled eider and their habitat is negligible. Since fire frequency is so low in these habitats, no fire suppression activity would be likely to occur on BLM-administered lands and there would be no impacts from suppression activities to eiders or their habitat. There is no designated critical habitat within the Bay planning area.

**Candidate Species** - Fire within the breeding habitat of Kittlitz's murrelet, which uses talus slopes of high mountain habitats for nesting, could have negative effects on the breeding populations. However, fire is rare in these mountainous habitats, and there is rarely adequate vegetation to burn on unstable rock falls and talus slopes. The threat of wildland fire to breeding Kittlitz's murrelet is negligible. Since fire frequency is so low in these habitats, no fire suppression activity would be likely to occur and there would be no impacts from suppression activities. Other than nesting, this bird inhabits ocean waters and bays, and so would not otherwise be impacted by fire or fire suppression activities.

**BLM Sensitive Species** - Some sensitive species would benefit from fire suppression that minimizes loss of individuals, populations, or habitats. However, fire suppression activities can also affect sensitive species through mortality, disturbance, displacement, and damage or alteration of key habitat components (BLM 2004b).

It is difficult to generalize impacts of fire on passerine birds due to the great variety of habitat requirements. Shrub communities often support the greatest number and diversity of passerine birds (Spindler and Kessel 1980, Kessel 1989). Shrub communities are maintained by periodic fires. Within forested areas, fire creates openings in the forest and provides snags used for nesting, perching, and foraging. Fire may cause direct impacts to birds when it occurs during the nesting season, killing nestlings and destroying nests. Raptors may benefit from fire due to increased populations of small mammals and birds in response to vegetative changes after fire. The timing of the benefit varies depending upon the type of prey favored by the raptor. Over the short-term, fires reduce cover available for prey species, making them more visible to hunting raptors and other predators.

Fire suppression activities also cause both direct and indirect impacts to wildlife. Wildlife habitat may be destroyed, fragmented, or degraded due to construction of fire breaks or use of OHVs. Small mammals may be killed by the use of mechanized equipment. Mitigation measures designed to reduce the impacts of suppression activities include limitations on the use of tracked, or off-road vehicles; measures to prevent the introduction of invasive or noxious plant species; establishment of riparian buffer zones; and rehabilitation of fire and dozer lines. These types of impacts are expected to be minimal within the planning area as most BLM-managed lands are well removed from the road system, minimizing the potential for the use of mechanized equipment.

Potential direct and indirect effects from fire management include:

- Mortality or injury of adults, young, or eggs from smoke inhalation, or crushing by vehicles or equipment used during fire management activities.
- Disturbance or displacement of individuals from smoke, noise, and other human activities associated with fire management operations. This disturbance or displacement may affect foraging, roosting, or reproductive behavior.
- Nest abandonment or mortality of young, resulting in the loss of one year's recruitment.
- Loss or conversion of key habitat components needed for nesting, foraging, roosting, or cover.

- Creation of key habitat components.
- Increased risk of predation associated with removal of cover.
- Changes in the quantity or quality of available forage and prey species.
- Long-term changes in habitat quality or quantity for nesting, roosting, foraging, or cover that affects the ability of a species continuing to occupy an area or facilitating the return of a species to its historic range.

#### ***(4) Effects to Special Status Wildlife Species from Livestock Grazing (Common to all)***

Special Status wildlife species that are found or that have the potential to be found in the Bay planning area are birds, which are only present during spring and fall migration for feeding, molting and brooding, generally in the Goodnews Block of BLM-administered lands. Currently there are no livestock grazing or reindeer herding operations in the Bay planning area, and no interest has been expressed for decades. It is unlikely that this type of activity would be a source of impact. Should such activities take place, potential impacts might include trampling of vegetation, cratering and exposure of mineral soils by grazing animals, potential direct mortality of nestling birds or eggs of ground nesting species due to trampling by grazing animals, or by OHVs used in association with herding activities.

#### ***(5) Effects to Special Status Wildlife Species from Minerals (Common to all)***

**Locatable Minerals.** Some mining exploration and development activity could occur under any Alternative. Potential impacts to Special Status wildlife would include temporary disturbance or displacement in very localized areas, temporary loss of habitat, long-term degradation of habitat, and possible direct mortality of nestling birds or eggs. These impacts would be minimal due to the low level of activity anticipated, and the temporary nature of the activity.

**Mineral Materials.** *Impacts from mineral material acquisition and disposal would be negligible under all Alternatives. Sufficient material sources exist on State and private lands located nearer to most communities than BLM-administered lands. One exception is mineral materials needed for oil and gas development. These impacts are discussed under fluid leasable minerals, Alternatives B, C, and D.*

#### ***(6) Effects to Special Status Wildlife Species from Recreation Management (Common to all)***

Minor impacts to Special Status wildlife could occur from both commercial and non-commercial recreation activities under all Alternatives. The primary impacts would be temporary stress and displacement of individual animals due to recreational activities, or to recreation associated access such as aircraft overflight and landing in remote areas. In areas that are repeatedly used for camping sites, there may be minor, site-specific degradation of habitat. OHV use associated with commercial recreational activities could occasionally result in mortality of nestlings and eggs of ground nesting birds. Given the low to moderate level of recreational use on most BLM-managed lands within the planning area, these impacts would be minimal and would not have population level effects.

#### ***(7) Effects to Special Status Wildlife Species from Renewable Energy (Common to all)***

Impacts to Special Status wildlife would be the same as those described under wildlife, common to all Alternatives. There is a potential for bird mortality due to collisions with wind turbines. Some of the avian mortality could involve Special Status Species, particularly if wind-generating facilities were located within breeding habitats for these species. Since BLM unencumbered lands in the Bay planning area are fairly remote from villages, use of BLM lands for development of such projects is unlikely during the life of this plan.

#### ***(8) Effects to Special Status Wildlife Species from Lands and Realty Actions (Common to all)***

Upon completion of conveying BLM selected lands to the State and Native corporations, anticipated by 2010, only approximately 5% of lands in the Bay planning area will remain in BLM jurisdiction. These lands are generally remote, and the numbers and kinds of Realty actions that will be required would be limited under any Alternative. While there would be both direct and indirect impacts to Special Status wildlife under all Alternatives, including temporary displacement and disturbance during activities authorized under this program, those impacts would be expected to be low, and to affect a very small percentage of BLM-managed land in the planning area. Impacts would vary among species depending on the proposal, the species' range, life history, and habitat preferences.

## **b) Effects to Special Status Wildlife Species for Alternative A**

### ***(1) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation (Alternative A)***

Impacts would be the same as they are today. Proposals would be managed on a case-by-case basis. Projects would have project-specific guidelines.

### ***(2) Effects to Special Status Wildlife Species from Livestock Grazing (Alternative A)***

Impacts would be the same as they are today. Proposals would be managed on a case-by-case basis. Projects would have project-specific guidelines.

### ***(3) Effects to Special Status Wildlife Species from Minerals (Alternative A)***

**Leasable Minerals.** No impacts to Special Status wildlife under this Alternative would occur because all BLM lands in the Bay planning area would remain withdrawn from Leasable Mineral entry under ANCSA 17(d)(1).

**Locatable Minerals.** Impacts to Special Status wildlife under this Alternative from locatable minerals would be similar to those for leasable minerals. Most of the BLM lands in the Bay planning area would remain withdrawn from Locatable Mineral entry under ANCSA 17(d)(1).

**Salable Minerals.** Impacts to wildlife would be the same as for Locatable Minerals. No impacts would be expected in areas withdrawn from mineral entry.

### ***(4) Effects to Special Status Wildlife Species from Recreation Management (Alternative A)***

There would be minor impacts to special status wildlife from both commercial and non-commercial recreation activities. The primary impacts would be temporary stress and displacement of individual animals due to recreational activities, or to recreation associated access, such as aircraft overflight and landing in remote areas. In areas that are repeatedly used for camping sites, there may be minor, site-specific degradation of habitat. OHV use associated with commercial recreational activities could occasionally result in mortality of nestlings and eggs of ground nesting birds. Recreational use of most BLM-managed lands within the planning area is believed to be low to moderate. The described impacts would be expected to be minimal and would not have population level effects.

### ***(5) Effects to Special Status Wildlife Species from Travel Management (Alternative A)***

The planning area would remain undesignated with regard to OHV use, and so the impacts would remain similar to today, with some possible increase in intensity should population increase. Currently effects from OHVs on BLM-administered lands is limited to areas immediately adjacent to villages, to areas between the Alagnak River and Lake Iliamna, and to portions of the Goodnews Block. Most access to BLM unencumbered lands is by aircraft or by boat. No vehicle weight limits would be recommended; however, off-road vehicles in use today on the remote BLM-administered lands in the Bay planning area

are 2,000 pounds GVWR. Impacts from heavier vehicles would not be expected during the life of this plan.

***(6) Effects to Special Status Wildlife Species from Special Designations (Alternative A)***

No ACECs or Wild and Scenic River designations would be proposed under this Alternative.

**c) Effects to Special Status Wildlife Species for Alternative B**

***(1) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation Management (Alternative B)***

There would be beneficial impacts to special status wildlife from proper management of soils, water, air, and vegetation resources. Implementation of Stipulations and Required Operating Procedures would reduce disturbance to special status wildlife habitats and assist in the recovery of habitat from permitted uses. Proactive management of vegetative resources would benefit Special Status wildlife. Vegetation would be managed to maintain a diversity of habitats. Proactive management to prevent introduction and spread of invasive and noxious plants would help maintain habitats in good condition.

***(2) Effects to Special Status Wildlife Species from Livestock Grazing (Alternative B)***

Impacts would be the same as discussed under Common to All Alternatives.

***(3) Effects to Special Status Wildlife Species from Minerals (Alternative B)***

**Leasable Minerals**

Under this Alternative, ANCSA 17(d)(1) withdrawals would be removed, and all unencumbered BLM lands would be open for mineral leasing. Potential impacts would be of several kinds:

**Seismic Exploration** - Seismic exploration would only occur in the Koggiling Block, in the south central portion of the planning area, during the life of this plan based on the Reasonable Foreseeable Development Scenario. This area includes habitat for the geese and the trumpeter swan, the eiders, the sea ducks, the gray-cheeked thrush, and the olive-sided flycatcher. In the event that seismic exploration occurs during the winter months, there would be no effect on these species as they are not present in the planning area at this time.

However, summer geophysical work, including field sampling would involve helicopter support and could have negative effects on these species depending on the location of the work in relation to their habitat. Summer seismic work, including aircraft overflights would have temporary and non-lethal effects on special status wildlife, the effects probably lasting less than an hour (BLM 2003b). Elevated activity and air traffic in the vicinity of large summer camps could result in minor impacts on both local and regional populations of these species. The Steller's eider, the spectacled eider, all but two of the other sea ducks, the geese, and the trumpeter swan are ground nesters in tundra habitats. The eggs and the nestlings could be susceptible to trampling or crushing. Depending on the nature of the effects and the nature and duration of behavioral changes caused by disturbance, such effects could be considered a "taking" under the Endangered Species Act for the listed species.

It is not known if lynx, a sensitive species, inhabit the Koggiling Creek block, which is largely a tundra environment. Isolated patches of forest along drainages may provide sufficient habitat for lynx, who seek boreal forest settings. Lynx have been observed at Brooks River in Katmai National Park, for example. Lynx may be temporarily disturbed or displaced by seismic activities, with reoccupation of the area after the exploration activities are complete.



Indirect impacts to special status wildlife from seismic operations may include degradation of habitat through impacts to soil and vegetation. These types of impacts would be minimized by implementation of the Stipulations and Required Operating Procedures, including limiting seismic exploration to the winter when many of these species are not present.

**Exploratory Drilling for Oil and Gas** - Based on the Reasonable Foreseeable Development Scenario for oil and gas, exploratory drilling would only be expected to occur in the Koggiling Block in the planning area, which may be utilized seasonally by migratory waterfowl, including the Federally- listed threatened Steller's eider and spectacled eider, and by a number of sensitive migratory waterfowl species, including the Tule white-fronted goose, the dusky Canada goose, isolated instances of the trumpeter swan (whose summer concentrations tend to be northeast of Koggiling Block) (Seppe 2006, Pers. Comm.), the king eider, the long-tailed duck, the black scoter, the surf scoter, and the red-throated loon. Other migratory waterfowl on the sensitive species list would be considered to be rare or accidental visitors to the Koggiling Block. Sensitive species of land birds that may be found in the Koggiling Block include the rusty blackbird, the gray-cheeked thrush, the olive-sided flycatcher, and the blackpoll warbler. The American peregrine falcon and the Arctic peregrine falcon, two sensitive species, might also be present in the Koggiling Block. All of these birds, if present, are in this area during spring through fall. Exploratory drilling in the Koggiling Block if carried out in the winter would not affect these species. Lynx, a possible year-round inhabitant of the Koggiling Block, may be temporarily disturbed or displaced by exploratory drilling, with reoccupation of the area after the exploration activities are complete.

**Oil and Gas Development** - Although construction would occur primarily during winter, development would bring year-round facilities and activities to the Koggiling Block in the planning area, which includes seasonal habitat for migratory waterfowl, including the Federally- listed threatened Steller's eider and spectacled eider, and for a number of sensitive migratory waterfowl species, including the Tule white-fronted goose, the dusky Canada goose, isolated instances of the trumpeter swan (whose summer concentrations tend to be northeast of Koggiling Block), the king eider, the long-tailed duck, the black scoter, the surf scoter, and the red-throated loon. Other migratory waterfowl on the sensitive species list would be considered to be rare or accidental visitors to the Koggiling Block. Sensitive species of land birds that may be found in the Koggiling Block include the gray-cheeked thrush, the olive-sided flycatcher, and the blackpoll warbler. The American peregrine falcon and the Arctic peregrine falcon, two sensitive species, might also be present in the Koggiling Block. All of these birds, if present, are in this area during spring through fall. Oil and gas development in the Koggiling Block would have the potential to affect these species directly and indirectly. Lynx, a shy creature and a possible year-round inhabitant of the Koggiling Block, would also be potentially affected. Potential sources of disturbance would be ground vehicles, humans on foot, and low-flying aircraft associated with oil development. Potential effects would include direct and indirect habitat loss. Direct loss of habitat would result from gravel mining and gravel deposition on the tundra for roads, pads, and airstrips. Indirect habitat loss could occur through reduced access caused by physical or behavioral barriers created by roads, pipelines, and other facilities.

The oil and gas development activities with the greatest potential for causing loss of habitat are gravel mining and placement (BLM 2005b). Roads and pads are constructed using gravel, and tundra covered by gravel would no longer be available for nesting, brood-rearing, or foraging for those tundra-nesting threatened and sensitive migratory waterfowl species listed above and others that use this habitat. This loss of habitat would continue for as long as the proposed development was in operation. If abandonment plans called for allowing gravel pads and roads to "bed" naturally, loss of habitat might extend considerably longer than the end of the operational life of the field. Under this Alternative, development of one gas discovery could affect approximately 1,280 acres in the Koggiling Block. Because of the density of migratory waterfowl use of this area, this potential loss of breeding, feeding and staging habitat for most species would likely result in some population effects. To provide perspective, there are 159,732 acres of unencumbered BLM land in the Koggiling Block, of which 48,230 acres or roughly 30%, are wetlands and open water (lakes, ponds, streams and rivers).

Steller's and spectacled eiders may use the Koggiling Block during spring migration and during fall migration for feeding, molting and staging. Currently Steller's eiders and spectacled eiders breed along the coastal fringe of the Yukon-Kuskokwim Delta, and so, while a few may breed and brood in the planning area, no impacts to eiders at a population level are anticipated.



**Effects of Oil, Gasoline, or Diesel Spills** - The Reasonable Foreseeable Development Scenario for Oil and Gas development in the planning area includes assumptions that only one field would be developed over the life of the plan, and it would be natural gas. Potential impacts related to this field would include potential associated mechanical equipment and storage facility spills (for example, fuel bladders). Impacts to special status species would be similar to those discussed under Wildlife, Effects of Spills in a previous section. Most of the BLM sensitive species occurring in the planning area are migratory birds that are only found in the area from spring through fall. The area where an oil or diesel spill might occur includes habitat for migratory waterfowl, including the Federally-listed threatened Steller's eider and spectacled eider, and for a number of sensitive migratory waterfowl species, including the Tule white-fronted goose, the dusky Canada goose, isolated instances of the trumpeter swan (whose summer concentrations tend to be northeast of Koggiling Block) (Seppi 2006, Pers. Comm.), the king eider, the long-tailed duck, the black scoter, the surf scoter, and the red-throated loon. Other migratory waterfowl on the sensitive species list would be considered to be rare or accidental visitors to the Koggiling Block. Sensitive species of land birds that may be found in the Koggiling Block include the gray-cheeked thrush, the olive-sided flycatcher, and the blackpoll warbler. The American peregrine falcon and the Arctic peregrine falcon, two sensitive species, might also be present in the Koggiling Block. All of these birds, if present, are in this area during spring through fall. The Canada Lynx might also be present in the Koggiling Block. Oil spills onto tundra, into freshwater, or into marine habitats could negatively impact these species. Birds may be oiled, causing feathers to lose their insulating ability, resulting in hypothermia. This effect would be more severe in fresh water and marine habitats than in tundra habitats. Birds could also suffer toxic effects from inhalation of hydrocarbon aromatics and from ingestion of oil from preening or oil contaminated foods (Hansen 1981). Oil contacting bird eggs could cause toxic effects to embryos (Patten and Patten 1979, Stickel and Dieter 1979).

A spill occurring in the spring to fall migrating, staging, breeding, molting season would have greater impact than a spill occurring during the winter when most of these species are on wintering grounds. However, lingering effects from a winter spill could impact birds during the following breeding season.

Steller's and spectacled eiders are believed to breed outside of the Koggiling Block of the Bristol Bay area, but likely migrate through the area. Although it is outside of their primary breeding area on the Yukon-Kuskokwim Delta, it is possible that a few Steller's or spectacled eiders breed in the area; however, they do move through the area during migratory seasons (Seppi 2006, Pers. Comm.), and so a few individual eiders could potentially be affected by a spill.

### **Locatable Minerals**

Impacts would be the similar to those discussed under Impacts Common to All Alternatives. However, under Alternative B, ANCSA 17(d)(1) withdrawals would be removed and lands currently closed to locatable mineral exploration and development would be open. Based on the Reasonable Foreseeable Development Scenario for Locatable Minerals (RFD), two types of mining activity could take place in the Bay planning area, lode mineral exploration and development and placer mining. Should locatable mineral activity occur on every existing operation, an estimated total of 115 acres could potentially be disturbed in the Bay planning area, including 14 acres on BLM unencumbered land, 36 acres on State-selected land, 47 acres on Native-selected land, and 18 acres on active Federal claims on Native land. These existing operations are all small. While removal of the ANCSA 17(d)(1) withdrawals would open BLM unencumbered lands to the potential for more mineral exploration and development, it is most likely that should any placer mining projects occur they would occur at sites of existing operations, at locations where mineral deposits are already known to exist.

**Lode Mineral Activities** - Lode mineral activities in the Goodnews Bay area could occur on BLM unencumbered lands at Tatlignagpeke Mountain and at Mitlak Mountain within the life of this plan. The RFD suggests that the platinum group elements (PGE) content of Tatlignagpeke Mountain might be explored during the life of this plan, with disturbance on BLM unencumbered land projected sometime before 2026.

Additionally, lode activities could occur on Native-selected lands at the Wattamuse-Granite Lode property, in the Kasna Creek area at South Current Creek and Upper South Current Creek properties, in the Kijik Lake area at the Dicks Lode, Gull, and Kijik Mountain properties, and in the Pebble Copper area at Hill 1759. On State-selected lands, lode operations could occur in the Iliamna/Fog area at the Dutton, Easy, Karen, and Meadow properties.

While migratory waterfowl move through the Goodnews Bay corridor in very large numbers during migratory seasons and many of the species listed above can be found nesting on BLM lands in the Goodnews Block, they probably would be unlikely to be found in these mountainous areas. However, BLM sensitive species that might seek out this kind of habitat during breeding and nesting season are the rare Kittlitz's murrelet, the marbled murrelet and the harlequin duck, all of which are sea birds that nest inland at higher elevations. The sensitive American peregrine falcon and the arctic peregrine falcon might also be found in these areas.

Overall, projected lode mineral activities on BLM lands in the Bay planning area are not anticipated to have a population-level effect on any BLM Special Status animal species during the life of this plan.

**Placer Mineral Activities** - Placer mineral activities in the Goodnews Bay area could occur at the Barnum Creek, Domingo Creek, Faro Creek, and Jacksmith Creek Tributary on BLM unencumbered land, which could result in surface disturbance to a total of 14 acres of BLM unencumbered lands. Placer activities on selected land includes Slate Creek, which could result in disturbance to a total of 36 acres on selected land. Placer activities on the Arolik River, Malaria Creek, Snow Gulch, Tyrone Creek, and Wattamuse Creek in the Goodnews area, and lands in the Iliamna/Fog area and unnamed property west of Chekok on selected land could impact up to 47 acres of selected land. An additional 18 acres on active Federal claims on Native land could be disturbed on the Salmon River.

All locatable mineral related activities occurring on BLM-managed land are subject to current BLM surface regulations as outlined in 43 CFR 3809. Operators are required to have an approved Plan of Operations which contains site-specific guidelines as listed in the BLM-Alaska Required Operating Procedures. All operations are required to meet applicable Federal and State air and water quality standards for permitting. Placer mineral activities are not expected to have population-level effects on any BLM Special Status animal species during the life of this plan.

#### **Salable Minerals (Mineral Materials)**

Salable material (sand and gravel) activities on Federally administered surface/minerals and split estate are available for exploration and development unless specifically closed by Public Land Order (PLO). Approximately 1,176,269 acres of BLM unencumbered lands are available for the sale of mineral materials. Native-selected lands would be made available if their selections are revoked or relinquished. An additional 3,000 acres are closed to material sales due to withdrawals other than 17(d)(1).

As discussed in a previous section, sand and gravel would be needed for the construction of access roads and gravel pads should oil and gas exploration and development go forward in the Koggiling Block sometime in the future. Since the entire Bay planning area consists of glacial rubble, large reserves of salable material exist on State and Native land, much of it in greater proximity to villages and potential oil and gas project sites than BLM unencumbered lands. No disturbance of BLM unencumbered land is anticipated for this purpose during the life of this plan. Should BLM unencumbered land be judged to be the closer and more practical source of these materials for an oil and gas-related project, because the materials are so common, borrow pits can be selected carefully so as to avoid impacts to other resources.

Should they occur, mineral materials projects would require an approved Plan of Operations containing Required Operating Procedures based on site-specific resource concerns and would be subject to all BLM and State laws and regulations. No effects from mineral materials projects to BLM Special Status animal species are anticipated during the life of this plan.

#### ***(4) Effects to Special Status Wildlife Species from Recreation Management (Alternative B)***

Impacts would be the same as discussed under Alternative A.

***(5) Effects to Special Status Wildlife Species from Travel Management (Alternative B)***

Impacts would be the same as discussed under Alternative A.

***(6) Effects to Special Status Wildlife Species from Special Designations (Alternative B)***

No special designations would be proposed under Alternative B.

**d) Effects to Special Status Wildlife Species for Alternative C**

***(1) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation (Alternative C)***

Impacts would be the same as discussed under Alternative A.

***(2) Effects to Special Status Wildlife Species from Livestock Grazing (Alternative C)***

Impacts would be the same as discussed under Alternative A.

***(3) Effects to Special Status Wildlife Species from Minerals (Alternative C)***

**Leasable Minerals.** Impacts to Special Status wildlife species from Leasable Mineral activities would be greater than in Alternative A, and would be similar to those in Alternative B. Based on the Reasonable Foreseeable Development Scenario, Leasable Mineral exploration and development would consist of one site, potentially located in the Koggiling Creek Block of BLM unencumbered land, for gas exploration and development. Development probably would not occur during the life of the plan. Because it is part of a proposed Area of Critical Environmental Concern, any project proposal for this location would include Stipulations, Required Operating Procedures, and project-specific requirements.

**Locatable Minerals.** Impacts to Special Status wildlife under this Alternative would be the same as discussed under Alternative B. However, based on the Reasonable Foreseeable Development Scenario, proposed projects would be expected to most likely occur on BLM unencumbered lands in the Goodnews Block, outside of the proposed Carter Spit ACEC. Two types of Locatable Mineral activity could occur, exploration and development of placer mines, and exploration and development of lode mines. No Special Status wildlife species would be expected to be affected by placer mining in the Goodnews Block; however, the Kittlitz's murrelet nests along most coastal regions from southwestern to western Alaska (Day et al. 1999). The scarcity of breeding records makes determination of exact breeding range difficult. Nesting habitat consists of unvegetated scree slopes or steep, rocky slopes. Nesting sites are most often inland, up to 16 miles from the coast (Kessel 1989). This species is sparsely distributed within the planning area. The only potential nesting area where a risk to the habitat might exist is on the scree-covered slopes of lode-bearing mountains on BLM-administered lands in the Goodnews block. To date no Kittlitz's murrelets have been observed nesting in that area.

**Salable Minerals.** Impacts from Mineral Materials would be the least under Alternatives A and C. The Carter Spit and Bristol Bay ACECs would be closed to use of Salable Minerals. Additionally, because of the ready availability of mineral materials from State and Native corporation lands, it is unlikely that BLM-administered lands would be utilized for their extraction for oil and gas or other infrastructure-development projects. The Koggiling Block, potential site of future oil and gas development, is located in the proposed Bristol Bay ACEC. It would be closed to development of Mineral Materials, which would have to be brought in from lands other than BLM unencumbered lands in this area.

***(4) Effects to Special Status Wildlife Species from Recreation Management (Alternative C)***

Impacts would be the same as discussed under Impacts Common to All Alternatives.

***(5) Effects to Special Status Wildlife Species from Travel Management (Alternative C)***

Impacts to special status wildlife from OHV use and travel management would be similar to that discussed under Common to All Alternatives but would be fewer because the planning area would be designated as "limited" to designated roads and trails. Additional restrictions such as seasonal closures might be implemented within ACECs. The proposed Carter Spit ACEC and Bristol Bay ACEC could receive additional protection from OHV impacts.

***(6) Effects to Special Status Wildlife Species from Lands and Realty (Alternative C)***

Impacts would be the same as under Impacts Common to All Alternatives.

***(7) Effects to Special Status Wildlife Species from Special Designations (Alternative C)***

Designation of 1,052,065 acres as ACECs and proposing an additional 15,125 acres as Wild Rivers would provide additional protection of special habitats. Designation of the two ACECs would provide protection to the threatened Steller's eider and spectacled eider and to the list of sensitive migratory birds that utilize the flyways that pass through the Goodnews Bay and Bristol Bay areas for feeding, resting, and molting during the spring and fall migrations, and some that use the areas for nesting and brooding.

Determination of three river segments as suitable for designation as wild under the WSR Act would provide some additional protection of habitats for Special Status Species using these habitats.

**e) Effects to Special Status Wildlife Species for Alternative D**

***(1) Effects to Special Status Wildlife Species from Soil, Water, Air, and Vegetation (Alternative D)***

Impacts would be the same as discussed under Impacts Common to All Alternatives.

***(2) Effects to Special Status Wildlife Species from Livestock Grazing (Alternative D)***

Impacts would be the same as discussed under Impacts Common to All Alternatives.

***(3) Effects to Special Status Wildlife Species from Minerals (Alternative D)***

**Leasable Minerals.** Impacts would be the same as discussed under Alternative C, except that no Bristol Bay ACEC would be proposed. However, the Koggiling Creek Block would be open to Leasable Mineral exploration and development subject to seasonal and other minor constraints as well as Stipulations and Required Operating Procedures.

**Locatable Minerals.** Impacts would be the same as discussed under Alternative C, except that no Bristol Bay ACEC would be proposed. Locatable Mineral projects would be expected to be outside of the proposed Carter Spit ACEC.

**Salable Minerals.** Impacts would be the same as discussed under Alternative B. The Carter Spit ACEC would be closed to Salable Minerals.

***(4) Effects to Special Status Wildlife Species from Recreation Management (Alternative D)***

Impacts from Recreation Management would be the same as discussed in Alternative C.

***(5) Effects to Special Status Wildlife Species from Travel Management (Alternative D)***

Impacts from Travel Management would be the same as discussed in Alternative C.

***(6) Effects to Special Status Wildlife Species from Lands and Realty (Alternative D)***

Impacts would be the same as discussed in Alternative B.

***(7) Effects to Special Status Wildlife Species from Special Designations (Alternative D)***

Impacts to Special Status wildlife would be similar to those discussed under Alternative C except that only one ACEC, the Carter Spit ACEC, would be proposed, and no rivers would be determined suitable. There would be less protection of waterfowl habitat on portions of the Alagnak and Goodnews rivers and in the Bristol Bay area.

## **Direct and Indirect Effects for Special Status Vegetation and Rare Vegetation Species**

Proposed management of the following resources, resource uses or programs would have no anticipated effects on Special Status Plants: Cultural Resources, Paleontological Resources, Visual Resources, Forest Products, Renewable Energy, Lands and Realty Actions, Wildlife and Wildlife Habitat, Fisheries Management, Wild and Scenic Rivers, Social and Economic Conditions, and Subsistence.

### **a) Direct and Indirect Effects to Special Status Vegetation Species Common to All Alternatives**

One BLM Sensitive Species of plant is located within the planning area, *Smelowskia pyriformis*, or pear-fruited smelowskia. It has been located in the western Alaska Range north of the planning area and in the southernmost Kuskokwim Mountains in the Goodnews Bay region (Drury and Rollins 1952; Hultén 1968; Murray 1981; Murray and Lipkin 1987; Parker 1994; Rollins 1993; Welsh 1974).

***(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation (Common to all)***

Special Status Species of plants would benefit from proper management of soil, water, air and vegetation resources in the planning area. Implementation of mitigation measures to protect these resources on a project-specific basis would reduce disturbance to habitat of special status plants and would facilitate the recovery of habitat from permitted uses.

***(2) Effects to Special Status Vegetation Species from Wildlife (Common to all)***

Special Status plants would benefit indirectly as a result of protecting wildlife habitats and mitigating impacts to wildlife habitat through the NEPA and permitting processes.

***(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Common to all)***

It is unlikely for the Bay planning area that the issue of whether or not the smelowskia would benefit from fire suppression activities, or whether fire is a natural and beneficial part of the plant's natural history would arise. The known plants' habitat consists of isolated, steep, sparsely vegetated, unstable alpine scree from 2,000 to 5,500 feet in elevation. Wildland fires are uncommon in the Bay planning area, and fire is not likely to burn well on this type of unvegetated scree.



***(4) Effects to Special Status Vegetation Species from Livestock Grazing (Common to all)***

Although there is currently no form of livestock grazing in the Bay planning area, livestock grazing could be permitted on a case-by-case basis under all Alternatives. Livestock grazing has the potential to negatively impact special status plants. Depending on the type of grazing animal, either part of the plant or the entire plant including its roots could be removed. In addition, trampling of vegetation could occur. The degree of impact from livestock would depend not only on the number and class or type of animals but also the timing and duration of their presence in the area of special status plants. Because the plant lives on sparsely vegetated unstable alpine screes at higher elevations, some animals might not elect to graze there if better grazing opportunities were available.

***(5) Effects to Special Status Vegetation Species from Leasable Minerals (Alternatives B, C, and D)***

Oil, gas, and coalbed natural gas exploration are not expected to occur on BLM-managed lands in the Goodnews Bay area or in the Bristol Bay area at elevations between 2,000 and 5,500 feet during the life of this plan.

***(6) Effects to Special Status Vegetation Species from Minerals (Alternatives B, C, and D)***

**Locatable Minerals.** There is a low probability for BLM-managed lands in the Bristol Bay area and a low to moderate probability for BLM-managed lands in the Goodnews Bay area for locatable mineral exploration activities to take place at elevations between 2,000 and 5,500 feet asl during the life of this plan. Only one area of BLM unencumbered lands, Tatignagpeke Mountain in the Goodnews Bay region, has both habitat for the smelowskia and known lode mineral occurrences, with elevations of as much as 2,500 feet.

Other locations in the Goodnews Bay region with potential habitat but no known mineral resources include Twin Mountain and Figure Four Mountain, in the proposed Carter Spit ACEC, and the southern half of Figure 4 Mountain, located just south of the proposed ACEC. An area of BLM unencumbered lands in the northeast Bristol Bay region with potential habitat but no known mineral resources is the Chekok Creek area, with elevations to 4,000 feet.

Existing and future locatable mineral activities have the potential to unfavorably impact Special Status plants and their habitat by stripping away the vegetative mat as part of mine site overburden, trampling or eliminating vegetation and compacting soils throughout the mine site area by development of social trails, roads, camp buildings, airstrips, and other temporary or semi-permanent mine associated infrastructure. Site-specific mitigation measures would be implemented.

***Salable Minerals (Mineral Materials).*** *In a region of glacial deposits, including sand and gravel, quantities of materials are available on private lands, State-owned and selected lands, Native-owned and selected lands, and BLM unencumbered lands at sufficiently low elevations that it is doubtful the materials would be sought in the difficult terrain where the habitat of the smelowskia would be located.*

***(7) Effects to Special Status Vegetation Species from Recreation Management (Common to all)***

The sources of impacts to vegetation from commercial and non-commercial recreation activities would include hiking, aircraft landings at remote sites, occasional or repeated use of remote camp sites and associated social trails. Potential effects might include trampling and crushing of plants and disturbance or compaction of the soil. With respect to the Special Status plant the smelowskia and its habitat, the only potential effect might occur from hiking. However, the potential location of the plant on steep unconsolidated scree-covered slopes would present a hazard to hikers, who might elect other more favorable areas to hike. These plants also appear to inhabit areas as isolated, scattered individual plants. The likelihood of impacts from recreational activities in this lightly-populated, lightly-used region would be low, and would not have population level effects.

***(8) Effects to Special Status Vegetation Species from Travel Management (Common to all)***

Direct and indirect impacts to vegetation could occur from travel management and OHV use, including the potential to destroy the vegetation mat, compact soils, accelerate permafrost melt, and contribute to soil erosion. Higher, rockier terrain in remote areas, where the smelowskia and its habitat might be located, are becoming more accessible over time as OHVs become more sophisticated and powerful. However, the population and visitation in the Bay planning area in the more mountainous regions is low.

**b) Effects to Special Status Vegetation Species for Alternative A**

***(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation (Alternative A)***

Special Status Species of plants would benefit from proper management of soil, water, air and vegetation resources in the planning area. Implementation of mitigation measures to protect these resources on a project-specific basis would reduce disturbance to habitat of special status plants and would facilitate the recovery of habitat from permitted uses.

***(2) Effects to Special Status Vegetation Species from Wildlife (Alternative A)***

Special Status plants would benefit indirectly as a result of protecting wildlife habitats and mitigating impacts to wildlife habitat through the NEPA and permitting processes.

***(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Alternative A)***

It is unlikely for the Bay planning area that the issue of whether or not the smelowskia would benefit from fire suppression activities, or whether fire is a natural and beneficial part of the plant's natural history would arise. The known plants' habitat consists of isolated, steep, sparsely vegetated, unstable alpine screes from 2,000 to 5,500 feet in elevation. Wildland fires are uncommon in the Bay planning area, and fire is not likely to burn well on this type of unvegetated scree.

***(4) Effects to Special Status Vegetation Species from Livestock Grazing (Alternative A)***

Although there is currently no form of livestock grazing in the Bay planning area, livestock grazing could be permitted on a case-by-case basis under all Alternatives. Livestock grazing has the potential to negatively impact special status plants. Depending on the type of grazing animal, either part of the plant or the entire plant including its roots could be removed. In addition, trampling of vegetation could occur. The degree of impact from livestock would depend not only on the number and class or type of animals but also the timing and duration of their presence in the area of special status plants. Because the plant lives on sparsely vegetated unstable alpine screes at higher elevations, some animals might not elect to graze there if better grazing opportunities were available.

***(5) Effects to Special Status Vegetation Species from Minerals (Alternative A)***

**Leasable Minerals.** Under Alternative A, BLM-managed lands in the Bay planning area would be closed to oil and gas exploration under ANCSA 17(d)(1) withdrawals.

**Locatable Minerals.** Under Alternative A, most BLM-administered lands in the Bay planning area would be withdrawn from exploration and development under ANCSA 17 (d)(1).

**Salable Minerals.** In a region of glacial deposits, including sand and gravel, quantities of materials are available on private lands, State-owned and selected lands, Native-owned and selected lands, and BLM unencumbered lands at sufficiently low elevations that it is doubtful the materials would be sought in the difficult terrain where the habitat of the smelowskia would be located.

***(6) Effects to Special Status Vegetation Species from Recreation Management (Alternative A)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(7) Effects to Special Status Vegetation Species from Travel Management (Alternative A)***

Direct and indirect impacts to vegetation could occur from travel management and OHV use under this Alternative, which allows unrestricted travel. These impacts include the potential to destroy the vegetation mat, compact soils, accelerate permafrost melt, and contribute to soil erosion. Higher, rockier terrain in remote areas, where the smelowskia and its habitat might be located, are becoming more accessible over time as OHVs become more sophisticated and powerful. However, the population and visitation in the Bay planning area in the more mountainous regions is low.

**c) Effects to Special Status Vegetation Species for Alternative B**

***(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation Management (Alternative B)***

Special Status Species of plants would benefit from proper management of soil, water, air and vegetation resources in the planning area through measures to protect one of the resources can conflict and negatively affect another, especially Special Status Vegetation Species. An example might be a project to re-establish native grasses on a stream bank, which may eliminate a Special Status Vegetation Species unless care is taken to protect it or, in some cases, the rehabilitation project may have to be forgone or delayed. Implementation of mitigation measures to protect these resources on a project-specific basis would reduce disturbance to habitat of special status plants and would facilitate the recovery of habitat from permitted uses.

***(2) Effects to Special Status Vegetation Species from Wildlife (Alternative B)***

Special Status plants should usually benefit indirectly as a result of protecting wildlife habitats and mitigating impacts to wildlife habitat through the NEPA and permitting processes.

***(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Alternative B)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(4) Effects to Special Status Vegetation Species from Livestock Grazing (Alternative B)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(5) Effects to Special Status Vegetation Species from Minerals (Alternative B)***

**Leasable Minerals.** Oil, gas, and coalbed natural gas exploration are not expected to occur on BLM-managed lands in the Goodnews Bay area or in the Bristol Bay area at elevations between 2,000 and 5,500 feet during the life of this plan.

**Locatable Minerals.** There is a low probability for BLM-managed lands in the Bristol Bay area and a low to moderate probability for BLM-managed lands in the Goodnews Bay area for locatable mineral exploration activities to take place at elevations between 2,000 and 5,500 feet asl during the life of this plan. Only one area of BLM unencumbered lands, Tatlignagpeke Mountain in the Goodnews Bay region, has both habitat for the smelowskia and known lode mineral occurrences, with elevations of as much as 2,500 feet.

Other locations in the Goodnews Bay region with potential habitat but no known mineral resources include Twin Mountain and Figure Four Mountain, in the proposed Carter Spit ACEC, and the southern half of

Figure 4 Mountain, located just south of the proposed ACEC. An area of BLM unencumbered lands in the northeast Bristol Bay region with potential habitat but no known mineral resources is the Chekok Creek area, with elevations to 4,000 feet.

Existing and future locatable mineral activities have the potential to unfavorably impact Special Status plants and their habitat by stripping away the vegetative mat as part of mine site overburden, trampling or eliminating vegetation and compacting soils throughout the mine site area by development of social trails, roads, camp buildings, airstrips, and other temporary or semi-permanent mine associated infrastructure. Site-specific mitigation measures would be implemented through implementation of Required Operating Procedures.

**Salable Minerals.** In a region of glacial deposits, including sand and gravel, quantities of materials are available on private lands, State-owned and selected lands, Native-owned and selected lands, and BLM unencumbered lands at sufficiently low elevations that it is doubtful the materials would be sought in the difficult terrain where the habitat of the smelowskia would be located.

***(6) Effects to Special Status Vegetation Species from Recreation Management (Alternative B)***

Impacts would be the same as those discussed under Alternative A.

***(7) Effects to Special Status Vegetation Species from Travel Management (Alternative B)***

Impacts would be the same as those discussed under Alternative A.

**d) Effects to Special Status Vegetation Species for Alternative C**

***(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation Management (Alternative C)***

Except under conditions discussed previously, Special Status Species of plants would benefit from proper management of soil, water, air and vegetation resources in the planning area. Implementation of Stipulations, Required Operating Procedures, and project-specific requirements in addition to mitigation measures to protect these resources on a project-specific basis would reduce disturbance to habitat of special status plants and would facilitate the recovery of habitat from permitted uses.

***(2) Effects to Special Status Vegetation Species from Wildlife (Alternative C)***

Special Status plants would benefit indirectly as a result of protecting wildlife habitats through Required Operating Procedures, Stipulations, and project-specific requirements as well as mitigating impacts to wildlife habitat through the NEPA and permitting processes. Additional protection would be provided through designation of two ACECs and nominating three river segments as Wild Rivers.

***(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Alternative C)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(4) Effects to Special Status Vegetation Species from Livestock Grazing (Alternative C)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(5) Effects to Special Status Vegetation Species from Minerals (Alternative C)***

**Leasable Minerals.** Impacts would be the same as those discussed under Common to All Alternatives. Special Status vegetation species would benefit from Stipulations, Required Operating Procedures, and project-specific requirements.

**Locatable Minerals.** There is a low probability for BLM-managed lands in the Bristol Bay area and a low to moderate probability for BLM-managed lands in the Goodnews Bay area for locatable mineral exploration activities to take place at elevations between 2,000 and 5,500 feet asl during the life of this plan. Only one area of BLM unencumbered lands, Tatlignagpeke Mountain in the Goodnews Bay region, has both habitat for the smelowskia and known lode mineral occurrences, with elevations of as much as 2,500 feet.

Other locations in the Goodnews Bay region with potential habitat but no known mineral resources include Twin Mountain and Figure Four Mountain, in the proposed Carter Spit ACEC, and the southern half of Figure 4 Mountain, located just south of the proposed ACEC. An area of BLM unencumbered lands in the northeast Bristol Bay region with potential habitat but no known mineral resources is the Chekok Creek area, with elevations to 4,000 feet.

Existing and future locatable mineral activities have the potential to unfavorably impact Special Status plants and their habitat by stripping away the vegetative mat as part of mine site overburden, trampling or eliminating vegetation and compacting soils throughout the mine site area by development of social trails, roads, camp buildings, airstrips, and other temporary or semi-permanent mine associated infrastructure. Projects would implement Required Operating Procedures and site-specific mitigation measures.

**Salable Minerals.** Impacts would be similar to those discussed under Common to All Alternatives. The Carter Spit and Bristol Bay ACECs would be closed to Salable Minerals.

***(6) Effects to Special Status Vegetation Species from Recreation Management (Alternative C)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(7) Effects to Special Status Vegetation Species from Travel Management (Alternative C)***

Impacts would be similar to those discussed under Common to All Alternatives. However, they would be less than in Alternative A or B. Under this Alternative, travel would be designated as "limited" to existing roads and trails.

**e) Effects to Special Status Vegetation Species for Alternative D**

***(1) Effects to Special Status Vegetation Species from Soil, Water, Air, and Vegetation Management (Alternative D)***

Impacts would be the same as those discussed under Alternative C.

***(2) Effects to Special Status Vegetation Species from Wildlife (Alternative D)***

Impacts would be the same as those discussed under Alternative C.

***(3) Effects to Special Status Vegetation Species from Fire and Fire Management (Alternative D)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(4) Effects to Special Status Vegetation Species from Livestock Grazing (Alternative D)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(5) Effects to Special Status Vegetation Species from Minerals (Alternative D)***



**Leasable Minerals.** Impacts would be the same as those discussed under Common to All Alternatives.

**Locatable Minerals.** Impacts would be the same as those discussed under Alternative C.

**Salable Minerals (Mineral Materials).** Impacts would be similar to those discussed under Alternative C. Carter Spit ACEC would be closed to Salable Minerals.

***(6) Effects to Special Status Vegetation Species from Recreation Management (Alternative D)***

Impacts would be the same as those discussed under Common to All Alternatives.

***(7) Effects to Special Status Vegetation Species from Travel Management (Alternative D)***

Impacts would be the same as those discussed under Alternative C.

## ***7. Direct and Indirect Effects for Cultural Resources***

### **a) Direct and Indirect Effects to Cultural Resources Common to All Alternatives**

Both Federal undertakings and unauthorized uses have the potential to cause irreversible harm to cultural resources. BLM authorized undertakings will avoid impacts to cultural resources through project redesign or alternative siting. Unavoidable impacts from undertakings will be mitigated through data recovery investigations in accordance with the National Cultural Programmatic Agreement and the Alaska Protocol for Managing Cultural Resources. Unauthorized impacts will be addressed as feasible through monitoring, law enforcement investigation and public education efforts.

All undertakings occurring on BLM managed land are evaluated by a qualified cultural resources specialist. Because of budget, personnel, and seasonal constraints, level I inventories (literature searches) are a common practice. Level III (Class III) inventory (intensive on the ground survey) occurs when the potential for cultural resources is considered to be high or surface disturbance is likely. This is due to funding and accessibility issues as well as low resource development in this area. Therefore, the exact number, kind, and variability of cultural resources within the planning area are unknown. New cultural resources will continue to be found and evaluated for eligibility to the National Register of Historic Places as future inventories are completed. If significant sites are found they will be appropriately mitigated under Federal law and policy.

### **b) Direct and Indirect Effects to Cultural Resources for Alternative A**

Under Alternative A, existing management practices would continue. Few impacts to cultural resources are anticipated from authorized activities due to the remoteness of most BLM-managed lands and the nature of most permitted activities. Currently the primary permitted activity in the planning area is Special Recreation Permits for big game guides, and these involve little potential for impacts. Other activities that have been authorized under current management included geophysical surveys, Plan of Operations for a platinum mine, rights-of-way for an existing power line and a gravel airstrip, leases for a trapping cabin, a gravel airstrip and a road, and film permits. These activities have happened infrequently, and to date significant conflicts with cultural resources have not occurred. There is some potential for impacts from unauthorized activities, but it is difficult to estimate the extent of this, as the cost of monitoring known sites is prohibitive and there has been no consistent attempt to track the condition of the resource in these remote areas.

The greatest impact from authorized activities occurs in the area of OHV use. Under Alternative A, there would be no travel restrictions for OHVs on BLM lands. As stated above most BLM lands are distant from

population centers; however, should activity increase in the future cultural resources could be adversely impacted.

### **c) Direct and Indirect Effects to Cultural Resources for Alternative B**

Under Alternative B, there could be an increase in the potential for impacts to cultural resources. Development of both leasable and locatable minerals would result in substantial surface disturbance. With the Stipulations, Required Operating Procedures, and project-specific requirements, impacts to cultural resources should be avoided.

Exploration for leasable minerals involves little potential for impacts, assuming that final oil and gas leasing stipulation and operating procedures are similar to those currently used in the National Petroleum Reserve-Alaska. Exploration and development of oil is considered unlikely for the life of the plan, and based on the Reasonable Foreseeable Development Scenario for oil and gas, gas exploration and development would be limited to the Koggiling Block of BLM-managed lands. However, if it occurs, such development would probably result in surface disturbance that could pose a threat to cultural resources. However, BLM would have required inventory and appropriate mitigation in advance of allowing any on-the-ground development. In some areas, it is also possible that no cultural resources may be impacted by a development. Based on the Reasonable Foreseeable Development scenario, 720 acres would be disturbed by construction of well pads, utilities, pipelines and associated airstrips and roads for each project.

Some impacts to cultural resources can be anticipated from locatable mineral development under this Alternative. Historically, placer mines have occurred in the Goodnews Bay area of the plan and this area seems to have the most potential for future mineral discovery and development.

The greatest impact from authorized activities lies in the "open" designation for OHVs on BLM lands. BLM is presently drafting a memorandum on the subject of Section 106 and OHV designations. Such designations are subject to Section 106 compliance. As stated above most BLM lands are distant from population centers; however, should activity increase in the future cultural resources could be adversely impacted. Adverse impacts to cultural resources are anticipated from other resource uses such as erosion, looting and vandalism, but it is not possible to develop a reliable estimate of the probable extent of this impact. Increased monitoring of this activity would give more information about this problem and provide insights to a solution.

### **d) Direct and Indirect Effects to Cultural Resources for Alternative C**

Impacts to cultural resources under Alternative C would be much the same as for Alternative B, although they would be expected to be fewer. A "limited" designation for OHVs under this Alternative would also provide beneficial impacts for cultural resources since OHV will be confined to existing trails. It would provide more flexibility to manage some types of potential impacts to cultural resources and to mitigate possible damage to cultural resources from OHV designations. Beneficial effects to cultural resources would also occur under this Alternative with the proposed Carter Spit ACEC, the proposed Bristol Bay ACEC, and within the proposed wild river segments of the Alagnak, Goodnews mainstream and Goodnews Middle Fork rivers.

### **e) Direct and Indirect Effects to Cultural Resources for Alternative D**

Impacts to cultural resources under Alternative D would be much the same as for Alternative C. Beneficial effects to cultural resources would also occur because of a "limited" designation for OHVs as described in Alternative C, and since OHVs will be confined to existing trails. Beneficial effects to cultural resources would also occur under this Alternative with the proposed Carter Spit ACEC (52,863 acres).

## ***8. Direct and Indirect Effects for Paleontological Resources***

### **a) Direct and Indirect Effects to Paleontological Resources Common to All Alternatives**

Federal undertakings and unauthorized uses have the potential to cause irreversible disturbance and damage to non-renewable paleontological resources. The BLM would mitigate impacts to significant paleontological resources from authorized uses through project redesign, specimen recovery or other appropriate mitigation. Geologic formations with exposures containing vertebrate and non-vertebrate fossils would be impacted from natural agents, unauthorized public collection, and vandalism. Given the little information we have about paleontological resources in most of the planning area, it is difficult to estimate the extent and nature of anticipated impacts.

### **b) Direct and Indirect Effects to Paleontological Resources for Alternative A**

Under Alternative A there are no restrictions on OHVs. This could adversely impact paleontological resources.

### **c) Direct and Indirect Effects to Paleontological Resources for Alternative B**

Under Alternative B, anticipated development associated with leasable and locatable minerals could have adverse impacts on paleontological resources.

Exploration and development of oil and gas is considered unlikely for the life of the plan; however, if it occurs, such development could result in surface disturbance that could pose a threat to paleontological resources. Based on the Reasonable Foreseeable Development scenario, 720 acres would be disturbed by construction of well pads, utilities, pipelines and associated airstrips and roads.

Some impacts to paleontological resources can be anticipated from locatable mineral development under this Alternative. Depending on the location of these mines and the methods utilized for stripping overburden, these operations could result in disturbance and destruction of paleontological materials. Historically, placer mines have occurred in the Goodnews Bay area of the plan and this area seems to have the most potential for future mineral discovery and development.

Little or no impact to paleontological resources is anticipated from other resource uses for the more isolated parcels in the planning area. A higher amount of impact to paleontological resources is anticipated in those parcels closer to inhabited areas from unauthorized OHV traffic.

Under Alternative B there is an "open" designation for OHVs. This could adversely impact paleontological resources. Other expected adverse impacts to paleontological resources would also stem from unauthorized uses and natural causes.

### **d) Direct and Indirect Effects to Paleontological Resources for Alternative C**

Impacts to cultural resources under Alternative C would be much the same as for Alternative B, with the addition that beneficial impacts to paleontological resources would also occur because of a "limited" designation for OHVs since OHVs will be confined to existing trails. Beneficial impacts to paleontological resources may also occur under this Alternative with the proposed Carter Spit ACEC, the proposed Bristol Bay ACEC, and within the proposed wild river segments of the Alagnak, Goodnews mainstream and Goodnews Middle Fork rivers.

## **e) Direct and Indirect Effects to Paleontological Resources for Alternative D**

Impacts to paleontological resources under Alternative D would be much the same as for Alternative B. Beneficial impacts to paleontological resources would also occur because of a "limited" designation for OHVs since OHVs will be confined to existing trails. Beneficial impacts to paleontological resources may also occur under this Alternative with the proposed Carter Spit ACEC (52,863 acres).

## **9. Direct and Indirect Effects for Visual Resource Management**

In order to meet responsibilities to maintain the scenic values of public lands, BLM has been utilizing a Visual Resources Management (VRM) system that considers that different levels of scenic values require different levels of management, and that assessing scenic values and determining visual effects can be a subjective process. For this plan, assessments were collected from existing long-term staff and past VRM inventory reports. The inventory process is described in detail in BLM Handbook 8410-1 (BLM 1984).

### **a) Effects to Visual Resources Management Common to All Alternatives**

#### ***(1) Effects to Visual Resources Management from Wildlife Management (Common to All Alternatives)***

Under all Alternatives, Critical Habitat Areas for listed species across Alaska has, or is in the process of being determined for USFWS and NFMS T&E species. Critical Habitat Area designation may provide additional protection for visual resources located within the area by preventing or minimizing development activities.

#### ***(2) Effects to Visual Resources Management from Vegetation Management and Fires and Fuels Management (Common to All Alternatives)***

Ninety-two percent of Alaska BLM-managed lands statewide are designated as Limited and Modified fire management option areas, meaning that naturally occurring fires are desired, but do have some constraints. Although direct loss of vegetation would occur from wildland fires, mechanical or manual treatments, and prescribed burns, the change to the existing landscape character would be considered relatively short-term. The impacts of wildland fire and fuels management will be few within the Bay planning area.

#### ***(3) Effects to Visual Resource Management from Forestry Management (Common to All Alternatives)***

No commercial forestry is carried out within the Bay planning area. Therefore, no impacts to Visual Resource Management are anticipated within the foreseeable future.

#### ***(4) Effects to Visual Resource Management from Lands and Realty Management (Common to All Alternatives)***

BLM is working to complete the conveyance of Native- and State-selected lands by 2009. Once these lands are conveyed, the entity would own both the surface and subsurface mineral rights, unless otherwise stipulated. Should BLM-managed lands be relinquished, the visual resources of those lands would likely be maintained at their current levels.

#### ***(5) Effects to Visual Resource Management from Leasable, Locatable, and Salable Minerals (Common to All Alternatives)***

Mining and oil and gas leasing may have adverse effects on the visual resources of an area. If roads were authorized through Rights of Way associated with development on non-BLM-managed lands, or other development associated with mining or oil and gas leasing, there may be localized, but long-term impacts to the form, line, color, and texture of the visual landscape.

***(6) Effects to Visual Resource Management from Renewable Energy (Common to All Alternatives)***

Under all Alternatives, land available as potential renewable energy program sites would be evaluated on a case-by-case basis. Effects to visual resources associated with renewable energy programs are generally less severe in magnitude and extent relative to other development activities.

Wind, hydroelectric and solar power projects would affect visual resources in similar ways. These effects would largely result from construction activities, such as the creation of new utility corridors, access roads, and transmission lines, creating access opportunities to new visual resources, or modifying the existing landscape character. The magnitude and extent of these effects may vary for each project.

***(7) Effects to Visual Resource Management from Socioeconomics (Common to All Alternatives)***

The lives of many Alaskan residents are tied to the natural environment. While many of the BLM-managed lands within the Bay planning area are difficult to access and not located in proximity to communities, visual resources are utilized and valued in varying degrees by Alaska residents, as well as tourists. As the population within the Bay planning area continues to increase, there would be increasing pressure on the ability to maintain visual resources that can be closely tied to regional economies, recreational opportunities, employment, and quality of life issues for residents.

**b) Effects to Visual Resource Management for Alternative A**

***(1) Effects to Visual Resource Management from Lands and Realty (Alternative A)***

**Access (Rights of Way)** - There are no avoidance or exclusion areas identified within the Bay planning area under this Alternative. Rights of Way are typically used for communication sites, utility corridors, or for access to mining claims, timber resources, and conservation areas, and usually remain under BLM management. As growth and development continues in the Bay planning area, the need for ROWs for transportation and utility corridors would increase. Potential new access routes may change the existing form, line, color, and texture of the visual landscape. However, the number of annual ROW applications for the Bay planning area is extremely low, so any effects would be minimal.

**Withdrawals** - No withdrawal review would occur under this Alternative, and all existing withdrawals would stay in place. Because of the constraints in place under these withdrawals, there would be less potential for resource development and activities that would alter the visual landscape.

***(2) Effects to Visual Resource Management by Leasable, Locatable, and Salable Minerals (Alternative A)***

BLM lands in the Bay planning area may be subject to localized adverse effects on visual resources from existing mineral claims. Potential effects from mineral exploration and development are discussed above under Direct and Indirect Effects Common to All Alternatives. For BLM-administered lands, the likelihood of these effects occurring would be low to moderate for fluid minerals, and low for metalliferous metals given the mineral potential for BLM-managed lands.

***(3) Effects to Visual Resource Management by Off-Highway Vehicles (Alternative A)***

All lands within the Bay planning area would remain open for OHV use. The numbers of OHV trails throughout planning may stay the same or increase slightly within the next ten years. These trails



fragment the natural landscape, creating varying degrees of changes to the existing visual character of the area. Braided trail sections more than 200 feet wide have been documented in Alaska (Meyer 2004). Important viewpoints and visual resources that may have been previously inaccessible may become part of an expanding network of OHV trails, especially in areas of established moderate use, such as in the north and east Goodnews area.

#### ***(4) Summary of Effects to Visual Resource Management (Alternative A)***

The management actions proposed under Alternative A would have a variety of effects on visual resources occurring on BLM-managed lands. Management would maintain any effects on visual resources at their current levels, although changes to the existing visual landscape would be expected with increases in regional populations. No VRM classes are established under this Alternative. As OHV use continues to go unmanaged, minimal adverse effects to BLM-managed visual resources may continue, primarily in area of Goodnews. Potential mineral exploration and development, and the creation of new Rights of Way both have the potential to adversely affect visual resources; however, any effects would likely be minimal based on current trends. Available information described in the sections above indicates that the adoption of the current management actions as described under Alternative A may have localized, adverse effects on visual resources.

### **c) Effects to Visual Resource Management for Alternative B**

#### ***(1) Effects to Visual Resource Management from Lands and Realty (Alternative B)***

**Exchanges** - Several parcels have been identified for exchange under this Alternative. However, due to the small, scattered nature of these parcels, any development or alterations in the visual landscape resulting from their sale would be minimal.

**Acquisitions** - Under Alternative B, the acquisition of lands and easements from willing landowners would be considered on a case-by-case basis. Easements provide access to lands managed by the NPS, USFS, or USFWS, and once lands are conveyed, the easement is managed by the respective agency. The visual quality of these easements would likely be maintained.

**Access (Rights of Way)** - There are no avoidance or exclusion areas identified within the Bay planning area under this Alternative. Rights of Way (ROWs) are typically used for communication sites, utility corridors, or for access to mining claims, timber resources, and conservation areas, and usually remain under BLM management. As growth and development continues in the Bay planning area, the need for ROWs for transportation and utility corridors would increase. Potential new access routes may change the existing form, line, color, and texture of the visual landscape. However, the number of annual ROW applications for the Bay planning area is extremely low, so any effects would be minimal.

#### ***(2) Effects to Visual Resource Management from Leasable, Locatable, and Salable Minerals (Alternative B)***

Under this Alternative, localized adverse effects to Off Highway Vehicle (OHV) use may occur through Stipulations and Required Operating Procedures. There is low to moderate potential for oil and gas development and low potential for metalliferous mineral development on BLM lands in the foreseeable future. Any permitted or leasing activities would have to comply with guidelines outlined in the Stipulations and Required Operating Procedures, which would include protections for visual resources.

#### ***(3) Effects to Visual Resource Management from Off-Highway Vehicle Management (Alternative B)***

All lands within the Bay planning area would be designated as "Open" under Alternative B. Because OHV use on BLM-managed lands is currently unrestricted, this management action would have similar effects as Alternative A. Increasing OHV trail creation and widening causes changes to the existing form, line,

color, and texture of the visual landscape. Important viewpoints and visual resources that may have been previously inaccessible may become part of an expanding network of OHV trails, especially in areas of established moderate use such as Goodnews Bay.

#### ***(4) Effects to Visual Resource Management from Wild and Scenic Rivers (Alternative B)***

There would be no Wild and Scenic Rivers recommended for designation to the National System under Alternative B. Thus, the scenic quality of river segments within the Bay planning area would not be afforded additional protections, other than those outlined in the Stipulations and Required Operating Procedures.

#### ***(5) Summary of Effects to Visual Resource Management (Alternative B)***

All lands under Alternative B would be managed as VRM Class IV, which would allow actions that make major modifications to the existing character of the landscape. OHV use would continue to be designated as Open on all lands within the Bay planning area, and may create changes in the existing landscape character and access to visual resources. Effects from Rights of Way, mining, and oil and gas developments may occur in the foreseeable future. Required Operating Procedures and Stipulations or other permit requirements around mineral exploration and development may contain protections for visual resources in specific locations. Available information described in the sections above indicates that effects would be on a localized scale, primarily in moderate OHV use areas, such as Goodnews Bay.

### **d) Effects to Visual Resource Management for Alternative C**

#### ***(1) Effects to Visual Resource Management from Lands and Realty (Alternative C)***

**Access (Rights of Way)** - The proposed Carter Spit ACEC and Bristol Bay ACEC would be identified as Special Management Areas. Projects would be designed to contain mitigation to limit impacts to biological resources. Impacts to the current visual landscape in this area would be minimized through stipulations proposed on major ground disturbing projects such as road building, which may impact the biological resources. Other areas requiring avoidance on a local level for its impacts on visual resource management would be identified on a case-by-case basis.

#### ***(2) Effects to Visual Resource Management from Leasable, Locatable, and Salable Minerals (Alternative C)***

The level of development potential and overall effects for leasable, locatable, and salable minerals would be similar to that in Alternative B.

#### ***(3) Effects to Visual Resource Management from Off-Highway Vehicles (OHVs) (Alternative C)***

Lands would be designated as limited to OHV use consistent with ADNR's *Generally Allowed Uses on State Land*, which require such actions as restricting use to existing trails whenever possible. Protections for visual resources, and limitations on OHV use would also be further refined within the proposed Carter Spit ACEC, Bristol Bay ACEC, and the nominated Wild Rivers. Limiting use within the Bay planning area may reduce adverse effects to visual resources relative to the current level of effects. Areas of low to moderate OHV use, the Goodnews Bay area, may feel the highest level of beneficial effects towards changing the existing landscape character.

#### ***(4) Effects to Visual Resource Management from Recreation (Alternative C)***

Under Alternative C, no Special Recreation Management Areas would be proposed for designation. ACECs would be proposed for the Carter Spit and Bristol Bay areas. All resources would be managed to meet the objectives of the specific Special Management Area.

### ***(5) Effects to Visual Resource Management from Wild and Scenic Rivers (Alternative C)***

Under Alternative C, BLM would recommend three river segments for Wild and Scenic River designation, and would maintain the Outstandingly Remarkable Values of the river segments if they were designated in order to maintain their wild, scenic, or recreational classifications. This designation provides legal protections from adverse development and provides a mechanism for management of the rivers' resources. Further planning efforts along these river segments may contain permitting conditions that protect the scenic quality and existing visual landscape around the rivers.

### ***(6) Summary of Effects to Visual Resource Management of Alternative C***

Effects to visual resources from management proposed under Alternative C are likely to be concentrated in specific areas. BLM would designate all lands recommended as Wild and Scenic Rivers with a "wild" classification as VRM Class III. The proposed Carter Spit and Bristol Bay ACECs would be designated as VRM Class III. Changes in the existing landscape for these areas would be low and would not attract attention. All lands within the Bay planning area would be designated as "limited" to OHV use, following ADNR's *Generally Allowed Uses on State Lands*, which may provide changes in the visual setting in moderate OHV-use areas such as the Goodnews Bay area. Effects from Rights of Way, mining, oil and gas would likely be limited in extent; consequently only a small portion of visual resources on BLM-managed lands may be affected. Resources would receive further levels of protection through the development of activity plans, such as a Special Recreation Permit management plan for guides and transporters. Three river segments would also be recommended for Wild and Scenic River designation, which may place protections around the scenic values of these rivers. The majority of these actions would have beneficial effects on visual resources through increased protections and regulation efforts. Actions that may adversely affect the visual landscape may occur in the form of mining activities BLM-managed lands.

## **E) Effects to Visual Resource Management for Alternative D**

### ***(1) Effects to Visual Resource Management by Lands and Realty (Alternative D)***

**Access (Rights of Way)** - The proposed Carter Spit ACEC would be identified as a Special Management Area. Projects would be designed to contain mitigation to limit impacts to biological resources. Impacts to the current visual landscape in this area would be minimized through stipulations proposed on major ground disturbing projects such as road building, which may impact the biological resources. Other areas requiring avoidance on a local level for its impacts on visual resource management would be identified on a case-by-case basis.

### ***(2) Effects to Visual Resource Management by Leasable, Locatable, and Salable Minerals (Alternative D)***

Under Alternative D, effects would be the same as discussed under Alternative B. Any effects to visual resources occurring on those lands would continue at current levels.

### ***(3) Effects to Visual Resource Management by Off-Highway Vehicles (OHVs) (Alternative D)***

Under Alternative D, OHV use on BLM-administered lands would be managed as described under Alternative C, designated as "limited" to OHV use. Because OHV use on BLM-managed lands is currently unrestricted (open), this management action would likely reduce OHV effects to the existing landscape character, especially in areas where activity planning has outlined further resource protection guidelines and objectives.

### ***(4) Effects to Visual Resource Management by Recreation (Alternative D)***

Management actions proposed under Alternative D are the same as those described under Alternative C. An ACEC would be designated in the Carter Spit area. In areas of moderate recreational use, the surrounding visual landscape plays an important part in the recreation experience. The area would be managed to meet the objectives of the specific Special Management Area.

#### ***(5) Effects to Visual Resource Management by Wild and Scenic Rivers (Alternative D)***

There would be no Wild and Scenic Rivers recommended for designation to the National System under Alternative D. Thus, any special management actions to help protect scenic resources associated with identified river segments within the Bay planning area would not be afforded additional protections, other than those outlined in the Stipulations and Required Operating Procedures.

#### ***(6) Effects to Visual Resource Management Summary of Alternative D***

Effects to visual resources from future management under Alternative D are likely to be concentrated in specific areas. The proposed Carter Spit ACEC would be managed as VRM Class III, where changes to the landscape character should be low, and should not be readily visible to the casual observer. BLM would designate all lands as "limited" to OHV use, following ADNR's *Generally Allowed Uses on State Lands* (Appendix F), which may provide changes in the visual landscape. Effects from Rights of Way, mining, and oil and gas development may affect a portion of visual resources on BLM-managed lands. Resources would receive further levels of protection through the development of activity plans such as a Special Recreation Permit plan addressing guides and transporters. The majority of these actions would have beneficial effects on visual resources through increased protections and regulation efforts.

## ***10. Direct and Indirect Effects for Recreation Management***

### **a) Direct and Indirect Effects on Recreation Common to All Alternatives**

Recreation use tends to be focused on existing trails accessible from small to moderate villages and communities. Soil compaction can lead to erosion, increased runoff, and potential flooding. Trail construction and use may lead to changes in soil compaction and erosion. Also, trails on ridge tops and steep slopes tended to have higher amounts of erosion (Meyer 2002). Concentrated camping can lead to soil compaction and actual loss of topsoil. Long-term camping increases both the level of soil compaction as well as the size of the spatial footprint of effects on soil.

In areas of moderate to substantial recreational foot and/or vehicle traffic, soil compaction may occur and increase the amount of impervious surface within a watershed. Impervious surfaces can lead to increases in runoff potential and downstream flooding, particularly during storm events. Sensitive riparian areas, such as lakeshores and stream banks, are especially susceptible to increased tramping and soil compaction from camping, foot traffic, and vehicles. Reduced viability and rooting capacity of the riparian vegetation can in turn reduce stream bank stability and increase erosion. The effect of soil compaction is generally more severe on moist or clay-rich soils and with higher incidents of use. Discharge from two-stroke snowmachine engines can lead to pollutant deposition on snow, and wash into surface and groundwater (Meyer 2002).

### **b) Direct and Indirect Effects on Recreation for Alternative C**

An ACEC would be designated in the Carter Spit and Bristol Bay areas. All resources would receive further levels of protection through the development of activity plans in various areas. Soil resources may receive indirect beneficial effects through the limiting of development activities.

### **c) Direct and Indirect Effects on Recreation for Alternative D**

An ACEC would be designated in the Carter Spit area. All resources would receive further levels of protection through the development of activity plans in various areas. Soil resources may receive indirect beneficial effects through the limiting of OHV use or development activities.

## ***11. Direct and Indirect Effects for Travel Management***

### **a) Direct and Indirect Effects for Travel Management Common to all Alternatives**

Off Highway Vehicle (OHV) trails may compact soil and adversely affect water resources in areas of high use. As the soil is compacted, it begins to absorb less water, thereby increasing runoff potential. Substantial runoff during storm events can result in downstream flooding. The generation of ruts and puddles can alter surface drainage, and extensive OHV use can create progressively larger ruts and further decrease soil strength and water holding capacity. Off-highway vehicle use in wetland areas and around stream banks and lakeshores can result in erosion, destruction of aquatic habitat, increased stream sedimentation, and changes to stream channel morphology (USDA 2005; USDA 2006; Sinnott 1990; Weeden 1978; Abele et al. 1984). Under all Alternatives, OHV use may adversely affect water quality as a result of fuel leaks, chemical spills, and increased littering. Deposition pollutants on snow, particularly from two-stroke engine discharge, can wash into surface and ground water and degrade water quality (Meyer 2002). Excessive use areas can result in increased erosion and sedimentation, and subsequent sediment load in receiving waters. OHV trails, especially the designation of new ones in otherwise unvisited areas, have the potential to damage important cultural and paleontological resources either directly by OHVs running over and damaging them, or indirectly by bringing in more people, leading to the potential for increased vandalism to sites. Trail designation should take into account valuable resources that may be impacted by establishing a trail through that location. The resource protection that designation allows and provides should be taken into account.

### **b) Direct and Indirect Effects for Travel Management for Alternative A**

Under Alternative A, there are no OHV designations in place within the Bay planning area. As currently managed, OHV use is allowed on all terrain, including sensitive habitats such as wetlands, near fish-bearing streams, and possibly through areas that support sensitive species. OHV use may cause some minor, localized adverse effects on water quantity and quality through soil compaction, increased levels of erosion and sedimentation, or the alteration of surface drainage patterns across scattered parcels throughout the planning area. In areas of moderate use, such as the Goodnews Block and the Alagnak Block, clear water streams that are adjacent to or feeding into the rivers can be affected without appropriate management of OHVs if use increases.

The use of OHVs is often detrimental to soil and leads to compaction and degradation (USDA 2005; USDA 2006). OHV use damages soils when the type and level of use exceed the capacity of the soil to resist impact. The capacity of a soil to resist impact varies depending on textural class, moisture level, and other environmental factors, but the processes by which soils are affected are generally the same. OHV use destroys soils through both the mechanical impact from surface traffic and the indirect impact from hydraulic modifications, soil transport, and deposition.

The level of effect from OHV use is a function of the natural resilience of the soil and the intensity of trail use. In a healthy situation, a natural balance is maintained between soils resilience and use. This leads to OHV use without soil damage, although on sites with wet, unstable, and sensitive soils, that natural equilibrium hangs precariously and is easily upset. Depending on the type of soil and its condition, even light levels of trail use can have environmental consequences. Once soils on trails have reached the degradation level that they make it difficult for OHV use, riders pioneer a new route across virgin



landscape and the sequence begins anew. Depending on the amount of snow on the ground, these effects can occur in winter as well as summer (Meyer 2002).

### **c) Direct and Indirect Effects for Travel Management for Alternative B**

All lands within the Bay planning area would be designated as “open” to OHV use. Because there are currently no OHV designations on BLM-managed lands within the Bay area, use occurs over all terrain and habitat types. Therefore, the potential adverse effects under this Alternative would be the same as described under Alternative A, although the management decision to allow unrestricted OHV use on all lands may increase the duration and/or magnitude of adverse effects on water resources, especially in areas of moderate use.

### **d) Direct and Indirect Effects for Travel Management for Alternative C**

Lands will be designated as limited to OHV use consistent with ADNR’s *Generally Allowed Uses on State Land* (Appendix F), which require such actions as restricting use to existing trails whenever possible. Limitations on OHV use would also be further refined within the proposed Carter Spit and Bristol Bay ACEC management plans. The effects to soil from OHV use under Alternative C would likely be less than those under the currently unrestricted management directive. The decrease in effects to soils would be especially pronounced in areas of previously low to moderate use.

### **e) Direct and Indirect Effects for Travel Management for Alternative D**

Under Alternative D, OHV use on BLM-administered lands would be managed as described under Alternative C, except that limitations on OHV use would be further refined within the proposed Carter Spit ACEC management plan. All lands under this Alternative would be designated as “limited” to OHV use. Limiting use within the Bay planning area may reduce adverse effects to water resources relative to the current level of effects. Areas of moderate high OHV use may feel the highest level of beneficial effects on water resources if use is limited, presuming that any area that might be designated for open OHV use in this area sufficiently guards against effects to water resources.

## **D. Resource Uses**

### ***1. Forest Products***

Currently there is no forest products program on BLM lands in the Bay planning area and, due to a lack of available timber suitable for commercial use or sale, no forest products projects are anticipated within the life of this plan. Commercial logging is not likely to occur in the reasonably foreseeable future in the planning area due to low timber volume, low productivity, unsuitability of the timber for commercial use or sale, scattered locations of timber stands, and long distances involved in timber transport.

### ***2. Livestock and Reindeer Grazing***

#### **a) Effects to Livestock and Reindeer Grazing Common to All Alternatives**

Effects to livestock and reindeer grazing would be the same under all Alternatives. Proposed management of the following resources/resource uses/programs would have no anticipated impacts to livestock grazing: Air Quality, Cultural Resources, Paleontological Resources, Visual Resources, Forest Products, Mineral Materials, Renewable Energy, Lands and Realty Actions, Wild and Scenic Rivers, and Public Safety.

***(1) Effects to Grazing from Soil Resources Management (Common to All)***

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed class and age of livestock, seasons of use, numbers and locations; application of grazing suitability of vegetative communities criteria, proper forage plant use factors, grazing suitability of topography criteria, grazing management systems, ROPs, stipulations and mitigation to protect soils from erosion, degradation and conversion from grazing may be required to protect fragile soils, soil structure, soil productivity and soil cover.

***(2) Effects to Grazing from Water Resources Management (Common to All)***

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed class and age of livestock, seasons of use, numbers and locations standardized field site evaluation and application of grazing suitability of vegetative communities criteria, proper forage plant use factors, grazing suitability of topography criteria, determine carrying capacity, grazing management systems, ROPs, stipulations and mitigation to protect soils from erosion, degradation and conversion from grazing may be required to protect water and water related resources including wetlands, riparian vegetation, fish and wildlife habitat, subsistence uses, stream bank integrity, water quality, instream flow, and Federal water rights.

***(3) Effects to Grazing from Cultural Resources Management (Common to All)***

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed grazing related structures and infrastructure, class and age of livestock, seasons of use, numbers and locations standard field inspections and cultural resource clearance and mitigation or protection requirements may be implemented to comply with laws concerning antiquities and paleontology resources and sites.

***(4) Effects to Grazing from Vegetation Management (Common to All)***

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed grazing related structures and infrastructure, class and age of livestock, seasons of use, and numbers and locations of livestock, there could be a number of requirements for operation. These might include requiring one or more of the following: a field site evaluation; application of grazing suitability criteria for vegetative communities and proper forage plant use factors; the use of grazing management systems; and implementation of protection practices for sensitive plant species, wetland and fragile tundra and other fragile vegetative communities, subsistence plant gathering traditional use areas, and targeted species of subsistence plants. The potential for introduction and damaging proliferation of invasive and noxious plants can be high with livestock grazing practices and specific monitoring and control/compliance measures may be required. There is a potential for lost or abandoned livestock to become feral and to be the source of local impacts to vegetative communities and other ecosystem components. Trespass and removal actions may be necessary.

***(5) Effects to Grazing from Fish and Wildlife Management (Common to All)***

Livestock and reindeer grazing proposals would be evaluated on a case by case basis. Depending on proposed grazing related structures and infrastructure, class and age of livestock, seasons of use, and numbers and locations of animals, some of the following requirements could be imposed: a complete site evaluation; implementation of wildlife forage allocations and other measures to maintain wildlife habitat; development of grazing systems; application and enforcement of stipulations to protect fish migration, spawning and rearing habitats, and key life function wildlife habitats such as nesting, brooding, staging, molting, and parturition areas, winter ranges, breeding ranges, and migration routes. Further modification of grazing use may be necessary to protect subsistence uses and users from alterations in fish and wildlife abundance, distribution, movement and subsistence user access. Subsistence uses of predators