

2. Goals and Objectives, Management Policies, and Alternatives

This chapter includes sections addressing three major topics: Refuge Goals and Objectives, Regional Management Direction, and Alternatives. Section 2.1 identifies refuge goals and objectives that would be implemented if the Service regional director selects the preferred alternative (Alternative B). Section 2.2 provides an introduction to regional management direction. Section 2.3 describes the management categories on Alaska's National Wildlife Refuges. Section 2.4 describes regional management policies and guidelines. Section 2.5 includes a table comparing permitted activities, uses, and facilities by management category. Section 2.6 describes the process by which the planning team developed the alternatives. Section 2.7 summarizes the alternatives considered by the planning team but eliminated from detailed study. Section 2.8 lists those elements common to both alternatives subjected to detailed study. Sections 2.9 and 2.10 discuss the two alternatives for managing the Refuge, including continuation of the current management (Alternative A) and the Service's proposed action (Alternative B). Section 2.11 is a comparative evaluation of both alternatives.

2.1 Goals and Objectives

The Refuge vision and purposes (chapter 1, section 1.4) provides a framework for developing goals and objectives for managing the Refuge. Objectives are often applicable to more than one goal. To avoid duplication, the objectives have been listed under the most applicable goal. Following each objective is the rationale for that objective.

The full range of objectives is presented here to provide an overview of the topics that are currently being addressed or might be addressed during the life of this Plan. Some of these objectives may not be addressed during the life of the Plan due to funding and/or staffing.

Cooperation with the State and federal agencies and other organizations is a critical component to successfully meeting most of the objectives. This cooperation can take a variety of forms, ranging from reviewing and revising study plans and reports to cooperating on data collection and report completion.

2.1.1 Goal 1: Conserve fish and wildlife populations and habitats in their natural diversity in a manner consistent with natural ecological processes.

Objective 1: Continue to implement and update the current Inventory and Monitoring Plan. Finalize the updates of the plan by January 2009 to reflect changes in techniques; add new projects focused on climate change, water quality, and wetlands; and include new and ongoing cooperative efforts.

Rationale: The Inventory and Monitoring Plan (I&M) step-down plan is the core of the refuge biological program. It outlines an annual cycle of wildlife and habitat surveys designed to detect trends in populations and productivity of selected species, assess health of populations and ecosystems, and provide data for decision makers and the public regarding regulatory issues. Listed below are projects included in the plan. A summary of the I&M plan can be found in appendix C.

Moose Trend Counts (annual)
5 areas on Koyukuk
3 areas on Northern Unit Innoko

2 areas on Nowitna

- Moose Population Estimation Surveys (approximately every five years)
- Moose Spring Twinning Surveys (annual)
- Moose Hunter Check Station (Nowitna, Koyukuk; annual)
- Caribou Distribution Survey (annual)
- Caribou Telemetry, Productivity, Habitat (monthly)
- Wolf Abundance Surveys (annual)
- Furbearer Aerial Track Counts (in development)
- Breeding Pair Duck Production Aerial Surveys (annual)
- Duck Banding (Koyukuk/Northern Unit Innoko; annual)
- Goose Production Float Surveys (annual)
- Goose Aerial Molting Survey (annual)
- Swan Production
 - Aerial Trend Survey (annual)
 - Statewide Census (every five years)
- Yukon River Peregrine Nesting (annual)
- Beaver Abundance Aerial Survey (annual)
- Passerines Surveys (annual)
 - Breeding Bird Survey Trend Monitoring
 - Spring Migration/Phenology Monitoring
 - Off-Road Point Count (Koyukuk)
 - Christmas Bird Count

Objective 2: Continue to work cooperatively with the Fisheries Resource Office (FRO) of the Service in Fairbanks, ADF&G, non-governmental organizations, and the public to identify key fisheries resource issues, and implement specific studies to address concerns and fill in gaps in the Refuge's knowledge of fish resources.

Rationale: Currently, we cooperate closely with FRO to operate the Gisasa River salmon weir and to conduct two research projects on sheefish. Fish populations are extremely important components of both a healthy functioning ecosystem and a healthy subsistence lifestyle. The cooperative weir project has led to vast improvements in our knowledge of Chinook salmon movements, spawning locations, and run timing. Past projects on pike have improved our knowledge of habitat use, survival, and heavy metal contaminants.

Objective 3: Upon funding, hire a new full time fisheries biologist/hydrologist to fully integrate the refuge biological program with FRO projects and expertise.

Rationale: The addition of a fisheries biologist/aquatic habitat ecologist to the refuge staff would add tremendously to our operational capabilities and knowledge base. This person would be responsible for developing and implementing I&M programs for fish, wetlands, and streams on the Refuge. Fisheries issues are (and would continue to be) of paramount importance to local users and to the ecosystem. This position would provide a vital communication link between rural users and biological experts in the FRO. A dedicated fisheries biologist at the Refuge would be able to focus on regulatory and other refuge specific issues, and enhance FRO work.

Objective 4: Continue to work cooperatively with the University of Alaska, U.S. Geological Survey, ADF&G, tribal organizations, and others to develop and implement research on global climate change, and (upon adequate funding) incorporate new monitoring efforts into our existing I&M plan that focus on detecting long-term changes to refuge ecosystems.

Rationale: Climate change has become a part of our daily language. The effects of a changing climate on northern ecosystems, people, and the health of refuge resources are not well understood. We have already initiated cooperative projects investigating (1) regional historic weather patterns and potential impacts to wildlife populations and subsistence use; and (2) patterns and causes of lake drying on portions of the Refuge. We would continue to seek out projects that would increase our understanding of how changes in climate may affect our ecosystems. Cooperative projects allow us to share expertise and limited funds across multiple organizations and to coordinate regional projects. Efforts would be made to enhance the existing I&M plan with projects designed to detect long-term changes in the ecosystem caused by climate change as time and funding allow.

Objective 5: Upon adequate funding, restore the wildlife biologist position that was removed during recent organizational changes.

Rationale: The Refuge has traditionally employed four biologists. Our current staff cannot effectively accomplish requirements of the I&M plan, cooperative research projects, and other mandatory tasks. A fourth biologist would greatly enhance our capabilities with the existing biological programs and allow us to initiate new work on topics such as global climate change and wetland ecology.

2.1.2 Goal 2: Ensure the natural character, vigor, and species diversity of the boreal forest and tundra environments by perpetuating a fire regime both natural and prescribed, which maintains a mosaic of habitats native to interior Alaska.

Objective 1: Continue to implement the Refuge's Fire Management (FMP) and Communication Plans.

Rationale: Fire is one of the main drivers of ecosystem change within the Refuge. Modern fire management practices need to be integrated into refuge habitat management. The FMP provides management strategies that enable the Service to conserve, protect, and enhance habitats. Objectives within the FMP concern ecological relationships and human health and safety. Due to the important role that fire plays in the boreal forest ecosystem, implementation of the FMP would be a fundamental step in addressing Goal 2.

Objective 2: Continue to refine the understanding of the Refuge's fire history by maintaining the most current fire history geographic information system (GIS) layer, incorporating information from other fire history studies, working collaboratively with other federal and State fire management agencies, utilizing the most current technology, and by participating in studies of Alaska fire regimes.

Rationale: Fire is the primary cause of habitat disturbance and subsequent vegetation regrowth on the Refuge. Our current knowledge of fire history patterns is rudimentary and would continue to evolve as more research is conducted to understand how climate change would affect the current fire regime.

2.1.3 Goal 3: Maintain a fire management program that helps achieve other refuge goals and objectives while providing for the protection of human life, private property, and identified cultural and natural resources.

Objective 1: Within one year of the Comprehensive Conservation Plan being approved, combine the Koyukuk and Nowitna fire management plans and incorporate changes in the revised fire management plan and the National Fire Plan.

Rationale: Combining the Koyukuk and Nowitna FMPs is in keeping with the unified management of the two refuges. Using one document would make it more efficient for the fire management officer to manage the fire program. The combined FMP would allow other agencies and the public to more easily understand and follow the refuge fire management program.

Objective 2: Within five years of the Plan being approved, contact the tribal and local governments in Tanana, Ruby, Galena, Koyukuk, Nulato, Kaltag, Huslia, and Hughes to ascertain the need for assistance with reducing hazardous fuels accumulations and developing mitigation plans (e.g., Comprehensive Wildland Fire Protection Plans). Within 10 years of the Plan being approved, assess the effectiveness of the fuels reduction projects implemented in each village.

Rationale: There is an identified need to reduce hazardous fuel accumulations around each village. Fuels reduction work will help protect villages from wildland fire and reduce the likelihood of a fire within or adjacent to a village. Fuel reduction projects, already begun in several villages, have served to strengthen relationships between the Refuge and village organizations and residents. Evaluating each fuels reduction project for the need of re-treatment would help the Fire Management Officer determine the most effective means of treating hazardous fuel accumulations surrounding interior Alaska villages.

Objective 3: Within five years of the Plan being approved, update the cultural resource values at risk GIS layer.

Rationale: Up-to-date information is needed by the Fire Management Officer, the refuge manager, and the protection agency to make an informed decision regarding the appropriate management response to each wildland fire start.

Objective 4: Continue to develop partnerships with other federal and State agencies and local governments to further the understanding of fire interactions in interior Alaska.

Rationale: Combining efforts to understand fire interactions in the interior is one way of gaining knowledge while dealing with limited budgets. Cooperative arrangements diminish the gap that sometimes exists between agencies and local governments and build healthy working relationships.

Objective 5: Upon funding, hire a fuels management technician to assist the refuge fire management officer with wildland and prescribed fire planning, monitoring, and administration.

Rationale: At current personnel and funding levels, the Refuge cannot completely implement the requirements of the Refuge Fire Management Plans administered from Galena.

2.1.4 Goal 4: Ensure the natural function and condition of water resources necessary to conserve fish and wildlife populations and habitats in their natural diversity.

Objective 1: Within 10 years of Plan approval, develop a wetland inventory and monitoring program to be incorporated into the current I&M Plan. Inventory and monitoring should address aquatic plants, fish, wetland-dependent wildlife, aquatic invertebrates, and physical and chemical properties of lakes and wetlands. Projects would be implemented as staff and funding become available.

Rationale: Data derived from wetland inventory and monitoring would greatly advance the understanding of lakes and wetlands within refuge boundaries, including the plants and wildlife dependent on them, and would establish a baseline for comparison of future conditions. Changes in wetland characteristics can affect the diversity and abundance of fish, wildlife, and

plants within the Refuge, but we currently do not assess and monitor existing conditions. The refuge staff would work with specialists from other Service branches or outside the Service to design and implement feasible and productive studies.

Objective 2: Within 10 years of Plan approval, work with the Service’s Water Resources Branch to develop a river and stream resources inventory and monitoring program to be incorporated into the current I&M Plan. Inventory and monitoring should address aquatic plants, river-dependent fish and wildlife, aquatic invertebrates, riparian and floodplain habitat, and physical and chemical properties of rivers and streams. Projects would be implemented as staff and funding become available.

Rationale: We currently know very little about existing conditions. Data derived from river and stream resources inventory and monitoring would greatly advance our understanding of refuge water and help the Refuge meet legal mandates pertaining to the protection and management of water quality and quantity. Projects would describe and monitor water flowing throughout the Refuge, including natural hydrologic processes that create the dynamic habitat necessary to support plants, wildlife, and fisheries. Changes in rivers and streams can affect the diversity and abundance of fish, wildlife, and plants within the Refuge. The refuge staff would work with specialists from other Service branches or outside the Service to design and implement useful and feasible studies.

Objective 3: Within five years of Plan approval, review the Refuge’s 1985–1988 baseline evaluation of placer mining sedimentation and occurrence of heavy metals on associated aquatic ecosystems of the Refuge, and develop and implement a repeat survey (when additional funding is obtained).

Rationale: Although all placer mining activities are taking place outside refuge boundaries, potential on-refuge impacts exist due to downstream sediment transportation, stream flow disturbance, and accelerated release of heavy metals associated with gold-bearing minerals during placer mining operation. Project assessment, development, implementation, and review would be coordinated with current Service environmental contaminants and fisheries resource programs, tribal watershed management programs, and the river and stream resources portion of the I&M Plan.

2.1.5 Goal 5: Provide information and maintain open communication for a greater understanding and appreciation of fish and wildlife ecology, habitat preservation, and refuge management that assists in addressing resource issues important to local residents, the Service, and others.

Objective 1: Conduct school programs and/or community meetings in Hughes, Huslia, Koyukuk, Nulato, Kaltag, Galena, Ruby, and Tanana at least once a year. Presentations should cover topics such as local wildlife, habitats, and management; wildlife surveys and current population status or trends; subsistence foods, health benefits, and contaminant risks; fire ecology and management; and climate change.

Rationale: Face-to-face interaction with students and other local residents continues to be the most efficient and requested form of outreach for the Refuge. Refuge staff should continue to coordinate with local village organizations and schools to develop and schedule public presentations that highlight current biological research and issues of concern for local residents. These programs build community awareness and support of the Refuge, its resources, and the purposes of the National Wildlife Refuge System.

Objective 2: Maintain existing resource library and continue to work with local schools to develop resources for environmental education, including curricula, teaching kits, and teacher workshops on natural resources and refuge-related topics.

Rationale: The Refuge has been successful in developing locally relevant teaching resources and facilitating their use in schools and should continue to support and expand these efforts. Outreach to schools provides a tremendous opportunity to instill in young people awareness and support of the local environment, refuge resources and programs, and responsible environmental stewardship. Today's students are potential future users of the Refuge, local community leaders, and decision makers. By providing teachers with resources and skills to bring conservation knowledge to their students, refuge capabilities for outreach are expanded.

Objective 3: Continue to provide the public with timely and accurate information about the Refuge through a variety of communication tools such as informational kiosks, displays, radio programs, newsletters, brochures, and Web sites. Information provided using these tools should be evaluated and updated at least once a year.

Rationale: The Refuge has successfully developed a variety of tools to provide the public with accurate, up-to-date information relevant to refuge resources and programs. These would continue to be effective only if they are periodically evaluated and updated to provide the most accurate information. The Refuge should continue to explore possibilities for development of new avenues for outreach.

Objective 4: Maintain partnership with Galena City Schools and Loudon Tribal Council to annually conduct the Galena Science Camp. Participate in other local science and cultural camps when opportunities arise.

Rationale: Since 2000, the Galena Science Camp has provided local students with opportunities to learn about local wildlife, plants, ecosystems, geology, prehistory, and environmental stewardship. Staff participation in other area youth programs, including camps organized by local schools and tribal organizations, provides similar opportunities throughout the region. These efforts should continue as funding and personnel are available.

Objective 5: Increase cooperation with the Friends of Alaska National Wildlife Refuges, and the Central Representatives in particular, to develop new materials and outlets for interpretation and environmental education.

Rationale: The non-profit organization Friends of Alaska National Wildlife Refuges was formed in 2005 to provide public education, assistance to refuges, and funding for refuge-oriented projects in any of Alaska's 16 national wildlife refuges. Recently a family residing near the Nowitna Refuge became central representatives for the group and expressed interest in cooperating with the Refuge on research and education projects. This partnership would provide the Refuge with new opportunities for outreach and project funding.

2.1.6 Goal 6: Continue to provide quality opportunities for hunting, fishing, wildlife observation and photography, and other outdoor recreation in a natural setting.

Objective 1: Within five years of Plan approval, review current public use monitoring methods and implement new methodology if needed. At a minimum, continue to annually compile and summarize data from the Koyukuk River (Ella's Cabin) check station, Nowitna River check station, and the refuge guide and air taxi reports to assess levels of public use.

Rationale: Accurate public use data is a critical component in evaluating existing levels of service to the public, documenting results of public use programs, determining if the Refuge is

meeting its resource management goals, and ensuring public uses remain compatible with the purposes of the Refuge. The highest level of use occurs during the fall moose season. By gathering data through the check stations and guide and /air taxi reports, we gain a minimum amount of public use data for the Refuge at the peak use period. Summarizing the data would allow the Refuge to inform the users of the levels of use and any potential conflicts that the Refuge may need to address. The Refuge should continue to support these efforts in order to sustain the current level of information.

Objective 2: Working with communities, and State and federal authorities, continue to develop the refuge law enforcement program through activities such as hunter education, village visits, aerial surveillance, and annual special use permit reviews. Produce annual summaries of activities.

Rationale: To enhance visitor experiences and help protect refuge resources, the Refuge needs a good strategy for ensuring visitor safety and compliance with existing rules and regulations. Violations that do occur are often due to misunderstanding, misinformation, or lack of knowledge, and outreach efforts may reduce such incidents.

2.1.7 Goal 7: Provide and promote the opportunity for local residents to continue their subsistence activities on the Refuge, consistent with the subsistence priority and with other refuge purposes.

Objective 1: Continue the Refuge Information Technician (RIT) program to enhance information exchange with local communities on refuge issues, particularly those dealing with subsistence. Restore second RIT position upon funding.

Rationale: Due to their remoteness, residents of most villages in and adjacent to refuge lands generally have less contact with refuge staff than do residents of Galena. In the past, RITs have been able to bridge this gap. RITs are able to devote time to contacting tribes, corporations, and individuals who do not have ready access to the refuge office. This person prepares information specifically for the villages and visits the villages on a regular basis. While in the village, the RIT can personally deliver information, answer questions, and return with feedback for refuge staff. An important RIT position at the station was terminated in 2006 as part of regional downsizing.

Objective 2: Continue to conduct annual informational meetings in each village associated with the Refuge's biological program. Regularly attend other subsistence-related meetings, providing information regarding the status of subsistence resources and their use and commenting on proposals related to subsistence management within the Refuge. Maintain a respectful dialogue with refuge resource stakeholders and subsistence users.

Rationale: The Refuge is mandated by ANILCA to provide the opportunity for continued subsistence uses by local residents, when consistent with other refuge purposes. However, it is essential that affected parties work cooperatively towards common subsistence goals. Face-to-face meetings in local villages are the most effective forum for reviewing and explaining federal subsistence harvest regulations and discussing issues of concern with local subsistence users.

Objective 3: Continue to work closely with tribal councils, State fish and game advisory committees, the Federal Subsistence Western Interior Regional Advisory Council, other local and regional working groups, Alaska Department of Fish and Game, and the Office of Subsistence Management to address issues and concerns of the local subsistence users.

Rationale: The Refuge is mandated by ANILCA to provide the opportunity for continued subsistence uses by local residents, when consistent with other refuge purposes. It is essential that affected parties work cooperatively toward achieving common subsistence goals.

Objective 4: Continue to coordinate with and assist the Division of Migratory Bird Management in completing the annual Migratory Bird Harvest Survey (dependent upon available funding).

Rationale: The Migratory Bird Treaty Act Protocol Amendment provides for harvest of migratory birds during spring and summer; however, the amendment states that there would not be a significant increase in the number of birds harvested relative to their continental population sizes. The need for harvest surveys was officially specified at the time the amendment was approved. Harvest survey data document the harvest level each year and help ensure that harvest does not significantly increase over the coming years. The Refuge is committed to continued work with the Migratory Bird Management Office and assisting with harvest surveys to obtain this critical information.

Objective 5: Continue to coordinate with and assist the Yukon River Drainage Fisheries Association in completing the annual In-Season Fish Harvest Assessment.

Rationale: The primary purpose of Yukon River Drainage Fisheries Association is to coordinate in-season subsistence fishing by hosting teleconferences with people participating in personal use and commercial fishing and the State and federal managers along the Yukon River. Teleconferencing gives the fishermen a voice on current salmon runs, harvest needs and success, management strategies, and anticipated management based on preseason projections. Teleconferencing gives an interim goal to allow subsistence and aboriginal harvest by Alaskan and Canadian fishermen.

Objective 6: Cooperate with village organizations and other agencies to develop opportunities to educate local youth and adults in traditional subsistence ways related to fish, wildlife, and plants of the Refuge. Continue to develop outreach tools that make subsistence regulations understandable to the public.

Rationale: The Refuge can play an important role in perpetuating the continued use of subsistence resources by providing opportunities for the public to learn from those skilled in traditional subsistence activities. Clear communication of subsistence regulations facilitates subsistence activity and encourages compliance with policy.

Objective 7: Monitor and assess the use of off-road vehicles (ORVs) such as 4-wheelers and ARGOs on refuge lands by federally qualified subsistence users. Within three years of Plan approval, produce a report that determines if ORVs were traditionally used for subsistence access and examines the need for regulation of ORV use.

Rationale: Current evidence suggests that ORVs were not traditionally used for subsistence access to the Refuge. The Refuge has concerns that ORV use would expand beyond the existing off-refuge trails onto refuge land. The Refuge is concerned that ORV use could have adverse effects on habitat and wildlife populations.

2.1.8 Goal 8: Maintain the special values of the Nowitna Wild River and Koyukuk Wilderness and the wild character of the Refuge.

Objective 1: Continue to monitor activities on the Nowitna Wild River and in the Koyukuk Wilderness for compliance with the Wild and Scenic Rivers and Wilderness acts and ANILCA. If problems are detected, appropriate actions would be taken.

Rationale: This approach is a practical way of maintaining these values given the existing staffing level of the Refuge.

2.1.9 Goal 9: Conserve, appreciate, and interpret the cultural, historic, and prehistoric resources of the Refuge.

Objective 1: Prepare a Cultural Resources Management Plan by 2010.

Rationale: A Cultural Resources Management Plan would assist the refuge staff in meeting legal requirements to manage, protect, and interpret cultural resources on the Refuge. The plan will include management needs and projects identified by the refuge staff, in consultation with the regional archaeologist, to set priorities for future research. This will enable the Refuge and regional office cultural resource staff to derive the most benefits from scarce funding and personnel resources.

Objective 2: Provide Archaeological Resources Protection Act and National Historic Preservation Act training to all permanent refuge personnel every 2–5 years.

Rationale: Training would provide all employees with information on their roles and responsibilities for managing cultural resources. Cultural resource trainers would become acquainted with refuge staff and better understand their specific issues and interests.

Objective 3: Identify sites at risk from vandalism and erosion, and monitor with annual inspections to document physical condition.

Rationale: Sites in the region are at risk from a number of threats, including looting and increased soil erosion due to the effects of climate change.

Objective 4: Identify priority areas to inventory for archaeological and other cultural sites, and conduct surveys as time and personnel allow.

Rationale: Perform surveys at a level sufficient to evaluate the eligibility of identified sites for inclusion in the National Register of Historic Places. Nominate selected sites to the National Register of Historic Places. Identify sites or areas at risk for vandalism and monitor with periodic law enforcement patrols. The National Historic Preservation Act requires federal agencies to inventory cultural resources and evaluate them for eligibility in the National Register of Historic Places.

Objective 5: Work with local tribes, elders, the University of Alaska Fairbanks, and regional archaeological staff to compile a place name directory and atlas of cultural and historic sites. This should include the production of a comprehensive GIS layer of sites for use in Refuge management. Create a working database within two years of Plan approval.

Rationale: Place names contain an enormous amount of information on traditional uses, culturally significant locations, historic camps and settlements, and other culturally important information. Resources for this work include published material and local knowledge. As elders pass away, their tremendous in-depth knowledge of local history and place names is lost to future generations if not properly documented. Cultural resource mapping is necessary to protect sites from fire, recreational use, and other refuge activities. The National Historic Preservation Act and Service Policy require that the Refuge protect sites of cultural importance.

Objective 6: Develop an active bibliography and library collection of published and unpublished materials relating to cultural, paleontological, and natural history of the Refuge. This may include books, interviews, and journals, maps, and photos collected by explorers,

missionaries, biologists, and researchers. An initial bibliography would be completed within two years of Plan approval.

Rationale: Valuable cultural, historic, and scientific information about the Refuge is contained in existing published and unpublished material. This information is an untapped archive that could potentially benefit both the Refuge and surrounding communities. Compiling all known information would make it possible to evaluate information needs and set priorities for surveys and research. This work would facilitate Objective 2.

Objective 7: Continue to work with regional archaeology staff, the University of Alaska Fairbanks, and other researchers to investigate and evaluate known cultural sites and identify new sites within the Refuge.

Rationale: Cooperative projects with museums, universities, and other institutions allow pooling of scarce funding and resources and increase the amount of work completed. They allow the Service to receive the advantages of working with recognized experts in the region, which greatly increases the value of completed work. The Refuge has been successful in developing partnerships that have resulted in considerable advances in the understanding of early human activities in the region.

Objective 8: Continue to work with research partners to explore the unique paleontological resources of the Palisades site.

Rationale: The Palisades site is an extensive silt-loam bluff complex located on the south bank of the Yukon River in the Nowitna Refuge. The bluffs contain substantial paleontological material, including flora and faunal remains and ancient volcanic ash layers. Scientists from the University of Alaska Fairbanks and other institutions have led investigations resulting in several publications and illumination of an outstanding record of past ecological communities and conditions present at the site. The Refuge would continue to facilitate this research.

Objective 9: Continue to cooperate with tribes, other agencies, universities, KIYU radio, and local residents to develop and enhance programs that capture the traditional knowledge of elders and others about the cultural and natural history of the Refuge.

Rationale: Knowledge of fish and wildlife population dynamics, ecology, and behavior is integral to people and cultures dependent on these resources. The roots of traditional environmental knowledge extend back thousands of years, and lifetimes of on-the-ground knowledge about local resources can produce valuable insights for refuge biologists and researchers. Documentation of traditional knowledge preserves this information for future generations and provides baseline knowledge about refuge environments for comparison with current and future conditions. The Refuge should continue to support programs such as Raven Story (oral history radio pieces) whenever funding and personnel are available.

2.1.10 Goal 10: Promote close working relationships through effective coordination, interaction, and cooperation with other federal agencies, State agencies, local communities, tribes, organizations, industries, the public, and the landowners within and adjacent to the Refuge whose programs relate to refuge management activities.

Objective 1: Continue to collaborate with staffs of other refuges, federal and State agencies, research institutions, schools, tribal and city councils, and others to facilitate resource management, inventory and monitoring, biological research, public outreach, and education at the Refuge and in the region. See Objectives 2 and 4 of Goal 2.1.1, Objective 2 of Goal 2.1.2,

Objectives 2 and 5 of Goal 2.1.3, Objectives 4 and 5 of Goal 2.1.5, Objectives 1 and 2 of Goal 2.1.6, Objectives 2, 3, and 6 of Goal 2.1.7, and Objectives 2, 4, 5, and 6 of Goal 2.1.9.

Rationale: Partnering is a cost-effective means of accomplishing necessary inventory and monitoring work, research projects, day-to-day management of refuge resources, and public outreach and education goals. Cooperative arrangements allow the refuge staff to obtain information they would not normally be able to collect and provides an opportunity for the Refuge to contribute to regional programs.

2.1.11 Goal 11: Provide and maintain adequate facilities and equipment in Galena to ensure a safe and secure working environment to accomplish refuge purposes, goals, and mandates.

Objective 1: Secure funding for construction or purchase of an administrative office, shop, and warehouse that provide sufficient facilities for refuge personnel and property in Galena.

Rationale: Since 1991, the Refuge staff has operated out of leased space (main office, shop/warehouse). A national directive has specified that we move toward owning our own facilities. Our current office does not comply with various health and safety standards, but we are unable to perform necessary upkeep or upgrades because it is leased. The shop and warehouse are also inadequate for long-term refuge needs.

Objective 2: Maintain and upgrade quarters, bunkhouse, and administrative cabins to provide safe and secure living accommodations for employees in subarctic conditions. Continue to explore alternative energy sources for our facilities to reduce costs for the government and lessen our environmental impact.

Rationale: Preventive maintenance is the best way to keep our real property assets in working condition. To conserve resources and reduce environmental impacts, we should continue to become more energy and water use efficient. By policy, we are required to use “green” products when cost effective or feasible.

Objective 3: Explore options and secure funding to acquire an adequate float plane facility and operations site on Alexander Lake in Galena.

Rationale: Currently our float plane operations occur on Alexander Lake behind Quarters #3. Occupants of this house have limited personal yard space because an aircraft fuel tank and shed are stationed behind the house. Frequent summer traffic in and out of the residence driveway can occasionally cause an inconvenience for the family occupying this house. The float dock currently extends into the neighbor’s lot and could cause potential future conflicts.

2.1.12 Goal 12: Ensure the Refuge has adequate personnel to meet operational needs.

Objective 1: Seek funding to restore the Refuge’s wildlife biologist position and second refuge information technician position. Create and fill positions for a fisheries biologist/hydrologist and an assistant fire management officer.

Rationale: Due to regional budget cuts and downsizing, several important positions at the Refuge have been cut. The restoration of these positions, and the addition of several new positions, would be necessary for the success of refuge operations.

Objective 2: Seek funding to hire an additional biological technician to assist the refuge biologists conducting inventory and monitoring projects.

Rationale: As additional projects are developed, especially to meet the increasing demand for information regarding climate change and its effect on interior Alaska ecosystems, biological staff would need greater assistance with project implementation.

Objective 3: Work with regional high schools and universities in recruiting and educating diverse candidates for positions as they become available. This includes providing internship opportunities such as the cooperative Alaska Native Science and Engineering Program (ANSEP) program in which the University of Alaska promotes the educational development of Alaska Natives in scientific fields.

Rationale: Recruitment of individuals with knowledge of the local area and culture facilitates refuge efforts to interact as well as possible with local residents and resource users. Staff familiarity with local areas and ecosystems is also a tremendous asset to the refuge biological program.

Objective 4: Maintain a minimum of three pilots on staff and add staff with piloting expertise as biological, habitat, and/or fisheries positions are developed and funded.

Rationale: The Refuge is remote and roadless, and the nature of biological and other programs require the use of aircraft. Current staffing (three pilots) is generally sufficient to cover program needs but would need reconsideration as additional projects are developed. Use of local air taxi services may alleviate some shortfalls in project needs (point-to-point flights) but are not always cost effective and are inadequate for many more specialized flights (e.g., aerial surveys, etc.).

2.2 Regional Management Direction Introduction

Sections 2.3, 2.4, and 2.5 present an overview of the management direction for national wildlife refuges in Alaska. The primary sources of this management direction are the laws governing the National Wildlife Refuge System (Refuge System) and the regulations, policies, and other guidance, both national and regional, developed to implement these laws. Although each refuge is unique, it is only one piece of this system. The management direction presented here represents the common base for management of the Alaska refuges and identifies appropriate sideboards for management of individual refuges.

Some deviations from these region-wide management policies and guidelines are likely to appear in each comprehensive conservation plan, given differing establishing orders or refuge purposes. Any refuge-specific departures will be clearly described, along with supporting rationale, in each revised comprehensive conservation plan.

These sections contain the following:

- Descriptions of the management categories and their associated general management intent
- Policies and guidelines specific to each category
- A table that displays activities, public uses, commercial uses, and facilities by management category

Until a final revised comprehensive conservation plan is adopted for a refuge, if there is any conflict between the existing refuge plan and these management guidelines, the direction in the existing plan will take precedence over that contained in these guidelines, unless the conflict is the result of changes in law, judicial rulings, or other non-discretionary guidance.

2.3 Management Categories

The management category descriptions in this Plan are not the same as those in the 1987 Plan. These management category descriptions will remain constant for all of the comprehensive conservation plans unless a well-justified exception is warranted. Until a final revised Plan is adopted for the Refuge, if there is any conflict between the existing Plan and the new management categories, the direction in the existing Plan will take precedence over that contained in these guidelines, unless the conflict is the result of changes in law, judicial rulings, or other non-discretionary guidance.

Five management categories (Intensive Management, Moderate Management, Minimal Management, Wilderness, and Wild and Scenic Rivers) are used to describe the management levels throughout all Alaska refuges. A management category is used to define the level of human activity appropriate to a specific area of the Refuge. It is a set of refuge management directions applied to an area, in light of its resources and existing and potential uses, to facilitate management and the accomplishment of refuge purposes and goals. Lands within the Refuge fall into three of these five management categories: Minimal Management, Wild and Scenic Rivers, and Wilderness (see Figure 2-1, Figure 2-2 and Figure 2-3). The Management Activities Table (Table 2-1) shows the management activities, public uses, commercial uses, and facilities that may be allowed in each management category and under what conditions.

2.3.1 Intensive Management

This category is designed to allow compatible management actions, public facilities, and economic activities that may result in alterations to the natural environment. In Intensive management areas, the presence of human intervention may be very apparent. Roads, buildings, and other structures are likely to be seen. Intensive management is applied to the smallest area reasonable to accommodate the intended uses. When Intensive management is proposed for an area, the specific purposes for its establishment will be described.

Natural processes or habitats may be modified through human intervention. Habitats may be highly modified to enhance conditions for one or more animal species. For example, water regimes may be artificially controlled to improve habitat for waterfowl.

High levels of public use may be accommodated and encouraged through modifications to the natural environment such as paving, buildings, developed campgrounds, and other facilities that could alter the natural environment in specific areas. Public facilities are designed to provide a safe and enjoyable experience of the natural environment and an increased understanding of refuge resources for a wide range of visitors. Facilities may accommodate a large number of visitors while protecting refuge resources from damage through overuse.

Compatible economic uses of refuge resources that result in alterations to the natural environment may be authorized in Intensive management areas. All economic uses are subject to the compatibility standard, must contribute to the purposes of the refuge, and require official authorizations such as special use permits.

2.3.2 Moderate Management

Moderate management is meant to allow compatible management actions, public uses, commercial uses, and facilities that may result in changes to the natural environment that are temporary or permanent but small in scale and that do not disrupt natural processes. The

natural landscape is the dominant feature of Moderate management areas, although signs of human actions may be visible.

Management actions in the category of Moderate management will focus on maintaining, restoring, or enhancing habitats to maintain healthy populations of plants and animals where natural processes predominate. For example, logging and prescribed burning may be used to convert mature forests to an early seral stage to enhance browse for moose. In general, management facilities, both temporary and permanent, will be allowed for the purposes of gathering data needed to understand and manage resources and natural systems of the refuges. Structures will be designed to minimize overall visual impact.

Public facilities provided in Moderate management will, while protecting habitats and resources, allow the public to enjoy and use refuge resources in low numbers over a large area, or they will encourage the short-term enjoyment of the Refuge in focused areas. The emphasis is on small facilities that encourage outdoor experiences. Facilities such as public use cabins, rustic campgrounds, kiosks, viewing platforms, trails, and toilets may be provided. Facilities will be designed to blend with the surrounding environment.

Compatible economic activities may be allowed where impacts to natural processes and habitats are temporary (e.g., small-scale logging where an earlier seral stage meets management goals; facilities in support of guiding and outfitting services such as tent platforms or cabins that encourage enhanced public use). All economic activities and facilities require authorizations such as special use permits.

2.3.3 Minimal Management

Minimal management is designed to maintain the natural environment with very little evidence of human-caused change. Habitats should be allowed to change and function through natural processes. Administration will ensure that the resource values and environmental characteristics identified in the Comprehensive Conservation Plan are conserved. Public uses, economic activities, and facilities should minimize disturbance to habitats and resources. Ground-disturbing activities are to be avoided whenever possible.

Management actions in this category focus on understanding natural systems and monitoring the health of refuge resources. Generally, no roads or permanent structures are allowed (except cabins). Temporary structures may be allowed in situations in which removal is planned after the period of authorized use, and the site can be rehabilitated using plants native to the immediate area. Existing cabins may be allowed for administrative, public use, subsistence, or commercial or economic (e.g., guiding) purposes. New subsistence or commercial cabins may be authorized if no reasonable alternatives exist. Public use or administrative cabins may be constructed if necessary for health and safety.

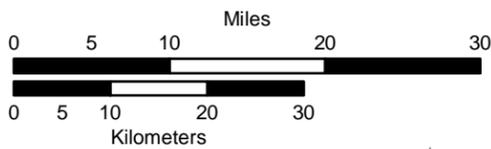
Public use of the Refuge for wildlife-dependent recreation and subsistence activities is encouraged. Public use facilities are generally not provided. Mechanized and motorized equipment may be allowed when the overall impacts are temporary or where its use furthers management goals.

If a transportation or utility system, as defined in section 1102 of the Alaska National Interest Lands Conservation Act (ANILCA), is proposed to cross an area in Minimal management, the authorization process would incorporate a corresponding Comprehensive Conservation Plan amendment to change the management category in the affected area from Minimal management to Moderate or Intensive management, as appropriate.

Figure 2-1
Koyukuk
Management Categories

Features

-  Refuge Boundary
-  Minimal Management
-  Designated Wilderness
-  Private



Produced in the Division of Realty & Natural Resources, Anchorage, AK
Current to: Sept. 18, 2008

19-0026

66°0'0"N

66°0'0"N

66°0'0"N

66°0'0"N

160°0'0"W

159°0'0"W

158°0'0"W

157°0'0"W

156°0'0"W

155°0'0"W

154°0'0"W

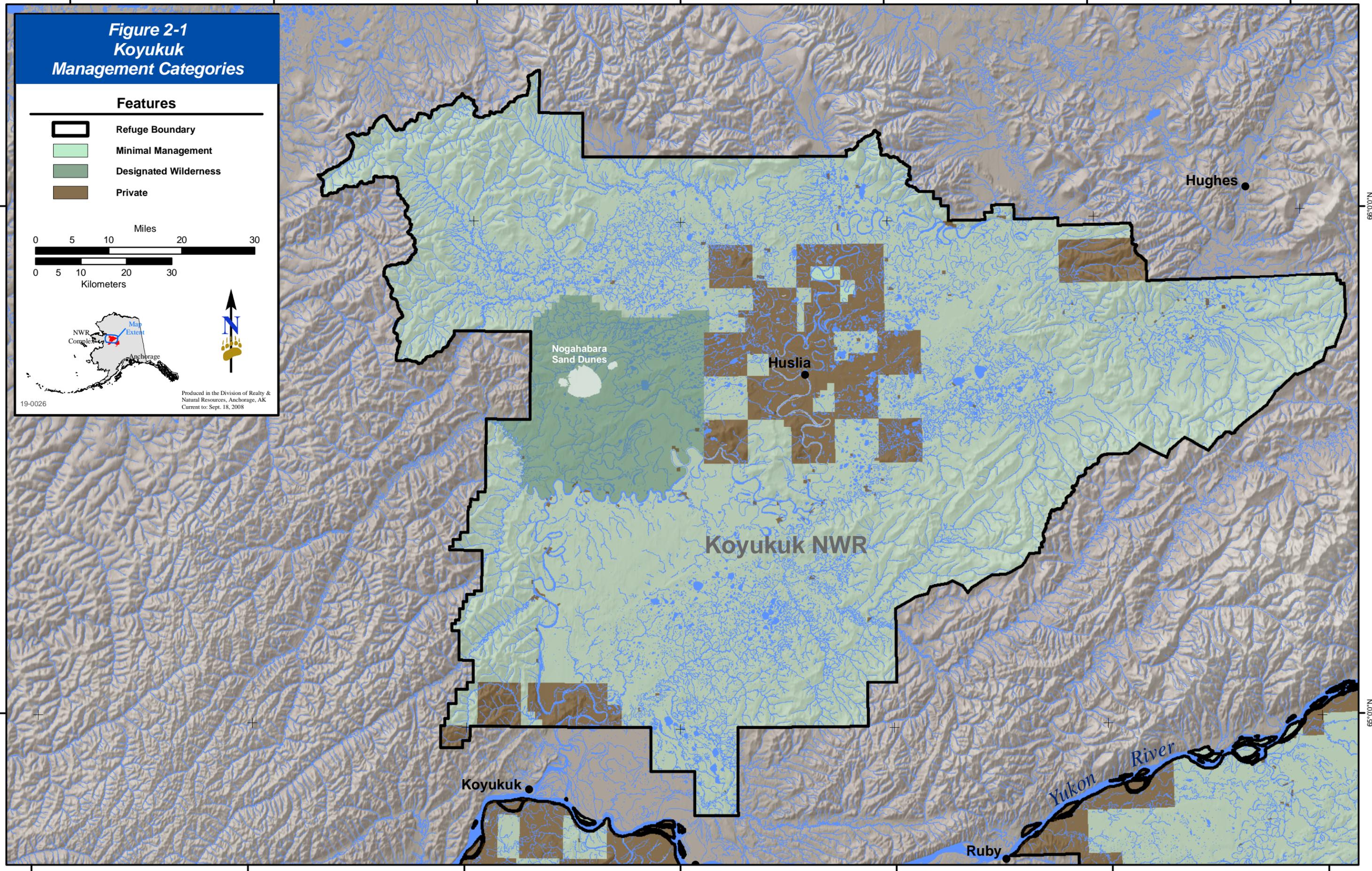
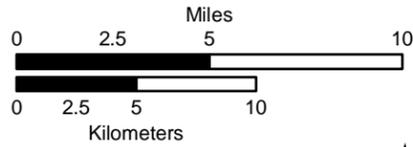


Figure 2-2
N. Innoko
Management Categories

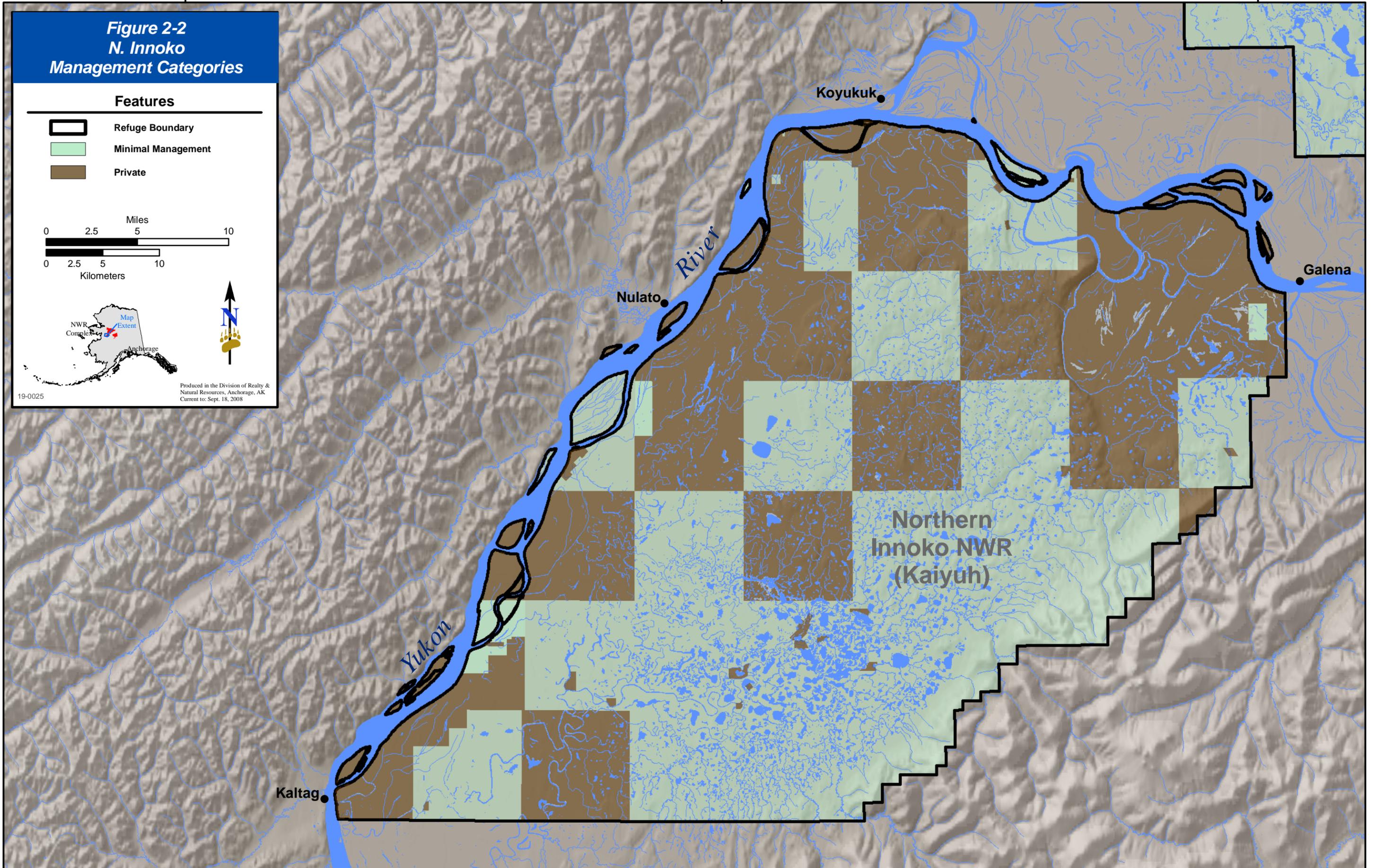
Features

-  Refuge Boundary
-  Minimal Management
-  Private



Produced in the Division of Realty &
Natural Resources, Anchorage, AK
Current to: Sept. 18, 2008

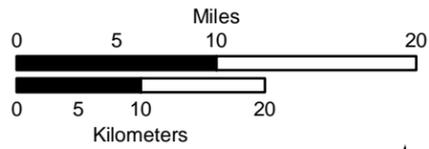
19-0025



**Figure 2-3
Nowitna
Management Categories**

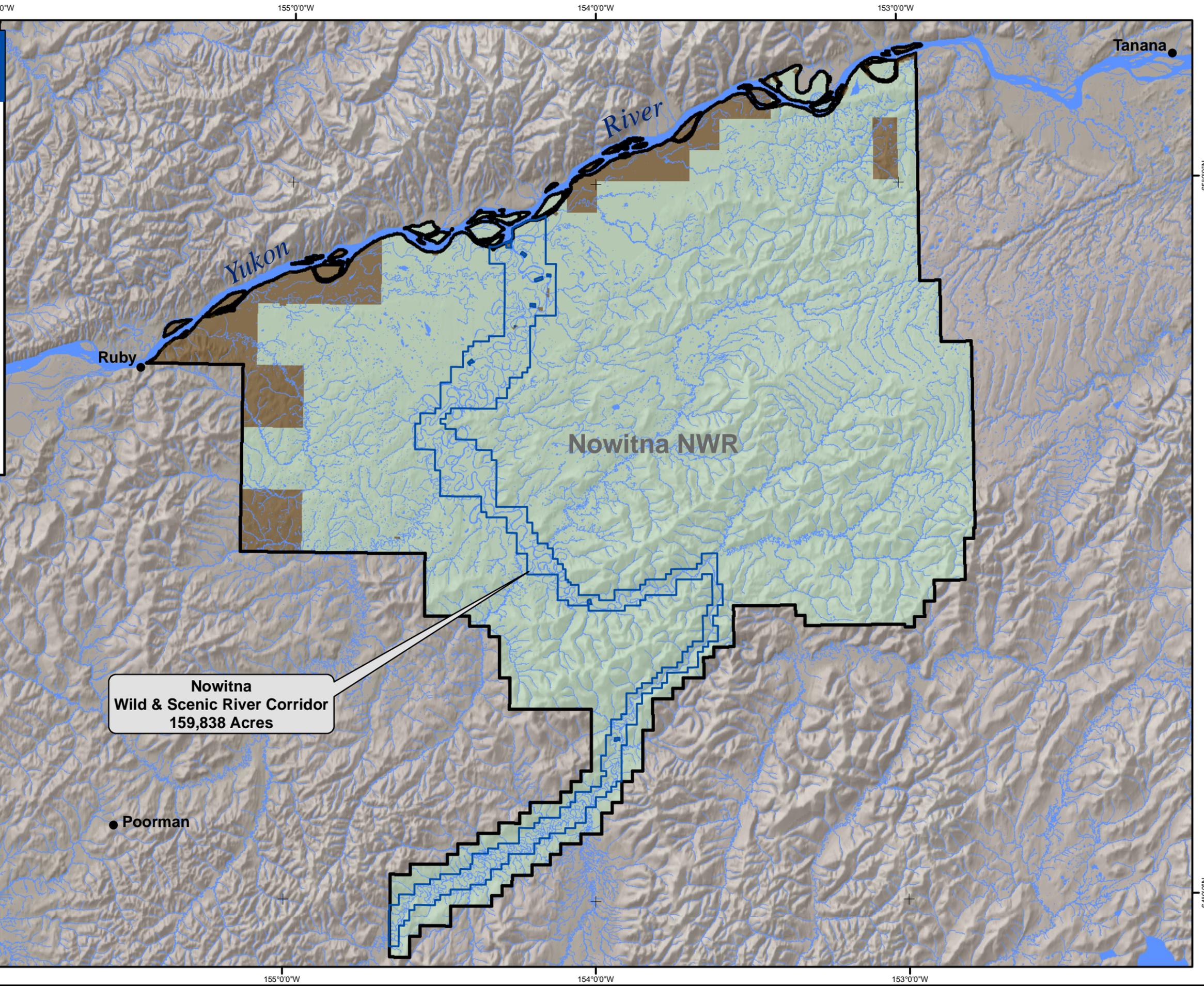
Features

-  Refuge Boundary
-  Minimal Management
-  Private
-  Wild River Corridor



Produced in the Division of Realty & Natural Resources, Anchorage, AK
Current to: May 13, 2008

19-0027



**Nowitna
Wild & Scenic River Corridor
159,838 Acres**

Compatible economic activities may be allowed where the evidence of those activities does not last past the season of use, except as noted in the preceding discussion of cabins. The primary economic activities are likely to be guiding and outfitting of recreation activities such as hunting, fishing, hiking, river floating, and sightseeing. All economic activities and facilities require authorizations such as special use permits.

2.3.4 Wilderness

This category applies only to areas designated by Congress as units of the National Wilderness Preservation System. The Refuge manages the Koyukuk Wilderness Area, a 400,000-acre Wilderness designated in 1980. The Nogahabara Sand Dunes is the most notable feature of the Wilderness Area. Any areas proposed for Wilderness designation will be managed under Minimal management, consistent with section 1317(c) of ANILCA and U.S. Fish and Wildlife Service (Service) policy. Designated Wilderness will be managed under the Wilderness Act of 1964 and the exceptions provided by ANILCA. Because the Koyukuk Wilderness Area is part of a nationwide, multi-agency system, the Service recognizes that responsibilities for managing the Wilderness go beyond the mission of the Service and that the purposes of the Wilderness Act are within and supplemental to the other purposes for which individual refuges were established. See also section 2.4.19 for additional guidelines on management of Wilderness Areas in Alaska.

The history and intent behind the Wilderness Act make Wilderness more than just another category of land management. Wilderness encourages having a broadened perspective of the refuge landscape, one that extends beyond managing it solely as wildlife habitat. Wilderness is managed as an area “retaining its primeval character and influence.” In addition, Wilderness provides human visitors with opportunities for solitude or a primitive and unconfined type of recreation, which may be characterized in terms of experiential dimensions such as discovery, self-reliance, and challenge.

Wilderness Areas are managed to preserve their experiential values as well as aesthetic, scientific, and other related values. Research has shown that some values of Wilderness extend beyond their boundaries to people who may never visit but who benefit from the protection of natural ecological processes—benefits such as clean air and water and the simple knowledge that such places exist. In managing Wilderness, managers are encouraged to consider in decision making these off-site and symbolic values as well as tangible resource values.

Permanent structures are generally prohibited; examples of exceptions are historic and cultural resources and, in certain circumstances, administrative structures or cabins that predate ANILCA, cabins that are necessary for trapping, and public use cabins necessary for the protection of human health and safety. Facilities and structures are rustic and unobtrusive in appearance.

Compatible commercial uses of Wilderness Areas are generally limited to those activities that facilitate wilderness recreation (e.g., guided fishing, hunting, and wilderness trips). All commercial activities and facilities require authorizations, such as special use permits.

Actions such as prescribed fires or invasive species control may be conducted when it is necessary to protect life or property or when it is necessary to restore, maintain, or protect wilderness values. Management activities in Wilderness must be found to be the minimum requirements for the administration of the area as Wilderness.

2.3.5 Wild and Scenic Rivers

The Wild and Scenic Rivers category applies to those rivers and corridors of the adjacent lands that have been designated by Congress as part of the Wild and Scenic Rivers System. This is a national system of designated rivers that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. All designated rivers on refuges in Alaska are classified as Wild Rivers. Wild Rivers are those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and waters unpolluted. The lower 223-mile section of the Nowitna River corridor has been designated as a Wild River within the Nowitna Refuge. The river contains outstandingly remarkable scenic, geologic, wildlife, historic, and recreational values.

Within this management category, water bodies are maintained in natural, free-flowing, and undisturbed conditions. Emphasis is placed on maintaining the natural function of the river system, and the appearance and sense of wildness are preserved. Evidence of human activities is minimal. The Nowitna River possesses the following outstandingly remarkable values, as identified informally by refuge staff during this planning process:

- **recreational** – hunting, fishing, wildlife observation and photography, floating, fishing, and camping trips;
- **subsistence** – hunting, house logs and firewood;
- **scenic** – forested river corridor and diverse landscape and examples of succession,
- **wildlife and habitats** – nationally significant species, migratory waterfowl, and large game;
- **fisheries** – sheefish and whitefish populations;
- **cultural/historic/prehistoric** – transportation corridor and abandoned camps;
- **geologic** – agates; and, **hydrologic** – free-flowing state and oxbow lakes/wetlands.

Each river within the Wild and Scenic Rivers System has particular values for which it was designated; the management of a Wild River must protect those specific values. Management actions focus on understanding, monitoring, and maintaining the resources, natural ecosystem function, and aesthetics of the river corridor.

Permanent structures generally are not allowed, with the exception of historic and cultural resources and, in certain limited circumstances, subsistence or administrative cabins and associated structures. Cabins, temporary structures, and hardened sites will be visually shielded from the river wherever possible. Where shielding is not practical, facilities and structures are as rustic or unobtrusive in appearance as possible. Public use facilities would provide opportunities for primitive recreation experiences.

Compatible uses of the Nowitna Wild River corridor will be allowed where those activities do not detract from the values for which the corridor was designated. Primary commercial uses are likely to be recreation services such as guided float, sightseeing, fishing, and hunting trips. A variety of management actions may be taken to maintain the values and classification of the corridor. All commercial activities and facilities require authorizations such as special use permits.

2.3.6 Special Management

Special management lands are managed within one of the categories described previously but have additional requirements because of their status.

2.3.6.1 Management of Selected Lands

The Service retains management responsibility for lands selected but not yet conveyed to Native village and regional corporations or to the State of Alaska. The appropriate Native corporation or agency of the State of Alaska will be contacted and its views considered prior to issuing a permit involving these lands. Fees collected for special use or right-of-way permits will be held in escrow until the selected lands are conveyed or relinquished. Management of these lands will be the same as for adjacent refuge lands.

2.4 Management Policies and Guidelines

2.4.1 Introduction

Refuge management is governed by federal laws such as the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd), as amended, (Refuge Administration Act); the National Wildlife Refuge System Improvement Act of 1997, an amendment to the Refuge Administration Act (P.L. 105-57) (Refuge Improvement Act); and ANILCA; by regulations implementing these laws; by treaties; by Service policy; and by principles of sound resource management—all of which establish standards for resource management or limit the range of potential activities that may be allowed on the refuges.

ANILCA authorizes traditional activities such as subsistence, the exercise of valid commercial fishing rights, hunting, fishing, and trapping in accordance with State and federal laws. Under Service regulations implementing this direction, “[p]ublic recreation activities within the Alaska National Wildlife Refuges are authorized as long as such activities are conducted in a manner compatible with the purposes for which the areas were established” (50 CFR 36.31(a)). Such recreation activities include but are not limited to sightseeing, nature observations and photography, hunting, fishing, boating, camping, hiking, picnicking, and other related activities. The Refuge Administration Act, as amended by the Refuge Improvement Act, defines “wildlife-dependent recreation” and “wildlife-dependent recreational use” as “hunting, fishing, wildlife observation and photography, or environmental education and interpretation” (16 U.S.C. § 668ee). These uses are encouraged and would receive emphasis in management of public use on refuges.

2.4.2 Management Emergencies

It may be necessary, when emergencies occur on the Refuge, to deviate from policies and guidelines discussed in the Comprehensive Conservation Plan. Activities not allowed on the Refuge or under a specific management category, as shown in Table 2-1, may occur during or as a result of emergencies. For example, if naturally occurring or human-caused actions (e.g., landslides, floods, fires, droughts) adversely affect refuge resources, it may be necessary to undertake rehabilitation, restoration, habitat improvement, water management, fisheries enhancement, or other actions that would not otherwise be allowed to the same extent on the Refuge. Threats to human health and safety may also result during emergencies. In emergencies, the refuge manager is authorized to take prudent and reasonable actions to protect human life and to address immediate health, safety, or critical resource-protection needs.

2.4.3 Land Exchanges and Acquisitions

Under section 1302 of ANILCA, and subject to certain restrictions, the Service may acquire by purchase, donation, or exchange any lands within the boundaries of Alaska refuges. Proposed land exchanges or acquisitions must benefit fish and wildlife resources, satisfy other purposes for which the refuge was established, or be necessary to satisfy other national

interests. The Service can also purchase conservation easements or enter into cooperative management agreements to meet these objectives.

2.4.4 Land Protection Plans

Department of Interior and Service policies require development of a step-down plan, called a land protection plan, addressing priorities for habitat conservation within refuge boundaries. Land protection plans inform private landowners what land within refuge boundaries the Service would like to see conserved for fish and wildlife habitat. The plans do the following:

- Identify the private lands within the refuge boundary that the Service believes should be conserved.
- Display the relative protection priority for each parcel.
- Discuss alternative means of land and resource conservation.
- Analyze the impacts on local residents of acquisition.

The Service only acquires land from willing landowners. It is Service policy to acquire land only when other methods of achieving goals are not appropriate, available, or effective. Sometimes resource conservation goals can be met through cooperative management agreements with landowners or by similar means. The Refuge would work with all landowners to ensure that overall fish and wildlife and habitat values within the refuges are conserved.

A land protection plan for the Refuge is scheduled to be completed by December 31, 2008.

A pre-acquisition environmental site assessment is required for all real property proposed for acquisition by the Service or for public domain lands returning to Service jurisdiction (Service Manual 341 FW 3).

2.4.5 Appropriate Refuge Uses

Comprehensive conservation plans include a review of the appropriateness and compatibility of existing refuge uses and of any planned future public uses. All uses of a national wildlife refuge over which the Service has jurisdiction must be determined to be appropriate uses under the Appropriate Refuge Uses Policy (Service Manual 630 FW 1). An appropriate use of a national wildlife refuge is a proposed or existing use on a refuge that meets at least one of the following four conditions.

- (1) The use is a wildlife-dependent recreational use as identified in the Refuge Improvement Act (hunting, fishing, wildlife observation and photography and environmental education and interpretation).
- (2) The use contributes to fulfilling the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the Refuge Improvement Act was signed into law.
- (3) The use involves the take of fish and wildlife under State regulations.
- (4) The refuge manager has evaluated the use following guidelines in the Service Manual 603 FW 1.11 in the subsequent text and found it appropriate.
 - (a) Do we have jurisdiction over the use?
 - (b) Does the use comply with applicable laws and regulations (federal, State, tribal, and local)?

- (c) Is the use consistent with applicable Executive orders, Department and Service policies?
- (d) Is the use consistent with public safety?
- (e) Is the use consistent with goals and objectives in an approved management plan or other document?
- (f) Has an earlier documented analysis not denied the use, or is this the first time the use has been proposed?
- (g) Is the use manageable within available budget and staff?
- (h) Will this be manageable in the future within existing resources?
- (i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?
- (j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality, compatible, wildlife-dependent recreation into the future?

This Plan identifies those existing and proposed uses that are found appropriate and compatible in appendix D. The following uses were found appropriate:

- Alaska Department of Fish and Game Management and Bureau of Wildlife Enforcement Activities
- Commercial Big Game Hunting Guide Services
- Subsistence and Trapping Cabins
- Commercial Recreational Fishing Guide Services
- Fishing (general and other)
- Helicopter Landings to Support Authorized Activities by Other federal, Tribal, State, and Local Governments, Universities, etc.
- Subsistence Harvest of House Logs
- Recreational Hunting
- Non-Wildlife Dependent Recreational Activities
- Wildlife Observation and Photography, Environmental Education and Interpretation
- Reburial of Archaeological Human Remains per State and federal Guidelines
- Commercial Recreational Guide Services
- Research and Surveys
- Subsistence Activities
- Native Allotment Surveys
- Commercial Transporter Services
- Trapping

All current appropriate use documentation is on file at the refuge headquarters and the Alaska Regional Office. If additional uses not addressed in this Plan are proposed for the Refuge, the refuge manager will determine if they are appropriate uses following the guidance in Service Manual 603 FW 1.

2.4.6 Compatibility Determinations

The Refuge Administration Act states that “the Secretary [of the Interior] is authorized, under such regulations as he [or she] may prescribe, to... permit the use of any area within the [Refuge] System for any purpose, including but not limited to hunting, fishing, public recreation and accommodations, and access whenever he [or she] determines that such uses are compatible”

A compatible use is a proposed or existing wildlife-dependent recreation use or any other use of a national wildlife refuge that, based on sound professional judgment, would not materially interfere with nor detract from the fulfillment of the Refuge System mission or the purposes for which the national wildlife refuge was established. Economic uses must contribute to achieving refuge purposes and the Refuge System mission.

Compatibility determinations are not required for refuge management activities, except economic activities. They are also not required where statute directs mandatory approval of the activity, as in the case of facilities for national defense.

If a use is found to be incompatible, the Refuge would follow normal administrative procedures for stopping the action. If the use was a new use requiring a special use permit, the refuge manager would not issue a permit. If the use was an existing use already under permit, the refuge manager would work with the permittee to modify the use to make it compatible or would terminate the permit.

Ending incompatible uses that do not require a special use permit or other formal authorization, or that cannot be addressed by other federal or State agencies, would require the Refuge to go through the normal rule-making process. This would include publishing the proposed regulations in the *Federal Register* and providing opportunity for public comment.

Draft compatibility determinations for refuge uses are included in this draft Comprehensive Conservation Plan in appendix D. Public comments on the draft determinations will be addressed in the final determinations released with the final Comprehensive Conservation Plan.

Compatibility determinations for existing hunting, fishing, wildlife observation and photography, and environmental education and interpretation must be re-evaluated with the preparation or revision of a comprehensive conservation plan or at least every 15 years, whichever is earlier. Refuge compatibility determinations for all other uses must be re-evaluated every 10 years or earlier if conditions change or significant new information relative to the use and its effects becomes available.

To review completed compatibility determinations for all refuges in Alaska, go to <http://alaska.fws.gov/nwr/planning/completed.htm>

Additional details on applying compatibility standards and completing refuge compatibility determinations are found in the compatibility regulations at 50 CFR (parts 25, 26, and 29) and in the Service Manual (603 FW 2).

2.4.7 Mitigation

In the interest of serving the public, it is the policy of the Service, throughout the nation, to seek to prevent, reduce, or compensate for losses of fish, wildlife, and their habitats, and uses thereof, from land and water development. To that end, the Service developed a Mitigation Policy in 1981 that includes measures ranging from avoiding an activity that results in loss of such resources to seeking compensation by replacement of or substitution for resource loss.

The Service will promulgate regulations, develop stipulations, and issue permits to reduce or eliminate potential adverse impacts resulting from compatible activities that may be authorized under this Plan. These regulations, stipulations, and permits would mitigate impacts in a variety of means, as stipulated in the Mitigation Policy guidelines (Service Manual 501 FW 2.1). The means, in order of application, are as follows:

1. Avoiding the impact altogether by not taking a certain action or parts of an action
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
5. Compensating for the impact by replacing or providing substitute resources or environments

When determining whether activities or uses are compatible, projects should be designed first to avoid adverse impacts. The Service generally does not allow compensatory mitigation on Refuge System lands. Only in limited and exceptional circumstances related to existing rights-of-way could compensatory mitigation be used to find a use compatible. The Service Manual (501 FW 2 and 603 FW 2) provides more information.

Mitigation may consist of standard stipulations such as those attached to right-of-way permits; special stipulations that may be attached to leases or permits on a site-specific basis; and site-specific, project-specific mitigation identified through detailed step-down management plans or the environmental assessment process. In all instances, mitigation must support the mission of the Refuge System and must be compatible with the purposes of the refuges. The degree, type, and extent of mitigation undertaken would depend on the site-specific conditions present and the management goals and objectives of the action being implemented.

2.4.8 Cooperation and Coordination with Others

2.4.8.1 Federal, State, and Local Governments

The Refuge will continue to work closely with those federal, State, and local governments and agencies whose programs affect, or are affected by, the refuges. State and local government input will be sought during the development of regulatory policies addressing management of the Refuge System (Executive Order 13083, “Federalism”). When possible, the Service will participate in interagency activities (such as joint fish and wildlife surveys and co-funded research), cooperative agreements, sharing data, and sharing equipment and/or aircraft costs to meet mutual management goals and objectives.

The Refuge and the State of Alaska will cooperatively manage fish and wildlife resources within the refuges. The Master Memorandum of Understanding between the Service and the Alaska Department of Fish and Game, dated March 13, 1982, defines the cooperative management roles of each agency (see appendix B). In this agreement, the Alaska Department of Fish and Game agreed to “recognize the Service as the agency with the responsibility to manage migratory birds, endangered species, and other species mandated by federal law, and on Service lands in Alaska to conserve fish and wildlife and their habitats and regulate human use.” Correspondingly, the Service agreed to “recognize the right of the Alaska Department of Fish and Game as the agency with the primary responsibility to manage fish and resident wildlife within the State of Alaska.” Further discussion of

intergovernmental cooperation regarding the preservation, use, and management of fish and wildlife resources is found in 43 CFR 24, “Department of the Interior Fish and Wildlife Policy: State and Federal Relationships.”

The Service does not require refuge compatibility determinations for State wildlife management activities on a national wildlife refuge pursuant to a cooperative agreement between the State and the Service where the refuge manager has made a written determination that such activities support fulfilling the refuge purposes or the Refuge System mission. When the activity proposed by the State is not part of a cooperative agreement or the State is not acting as the Service’s agent, a special use permit may be required, and a refuge compatibility determination will need to be completed before the activity may be allowed. Separate refuge compatibility determinations addressing specific proposals will be required for State management activities that propose predator management, fish and wildlife control (with the exception of emergency removal of individual rogue animals), reintroduction of species, non-native species management, pest management, disease prevention and control, fishery restoration, fishery enhancement, native fish introductions, non-native species introductions, construction of facilities, helicopter and off-road vehicle access, or any other unpermitted activity that could alter ecosystems on the refuges.

The Service Region 7 (Alaska) has a memorandum of understanding with the Alaska Fire Service (AFS) which articulates how the two agencies work together regarding fire protection services provided by AFS and mandated by law. The Service will cooperate with other State agencies such as the Department of Natural Resources and Department of Transportation and Public Facilities on matters of mutual interest and may enter into informal and formal management agreements.

2.4.8.2 Tribes and Native American Organizations

The Service’s Native American Policy (USFWS 1994) identifies general principles that guide the Service’s government-to-government relationships with tribal governments in the conservation of fish and wildlife resources. Additional guidance has been provided by Executive Order 13084, “Consultation and Coordination with Indian Tribal Governments,” issued May 14, 1998, and the Department of the Interior–Alaska Policy on Government-to-Government Relations with Alaska Native Tribes, issued January 18, 2001. The Refuge will maintain government-to-government relationships with tribal governments. The Refuge will also work directly with regional and village corporations and respect Native American cultural values when planning and implementing refuge programs.

2.4.8.3 Owners of Refuge Inholdings and Adjacent Lands

The Refuge will work cooperatively with inholders and adjacent landowners, providing information on refuge management activities and policies. The Refuge will consult periodically with them regarding topics of mutual interest; will respond promptly to concerns over refuge programs; and, will participate in cooperative projects (e.g., water quality monitoring and fish and wildlife management).

2.4.8.4 Fish and Wildlife Service Jurisdiction over Waters within the Koyukuk, Northern Unit Innoko, and Nowitna National Wildlife Refuges

Where the United States holds title to submerged lands beneath waters within the Refuge, the Service has jurisdiction over certain activities on the water. In 1980, under ANILCA, the United States Congress established or expanded 16 national wildlife refuges. These areas of land and water may contain both navigable and non-navigable waters. Where water bodies

are non-navigable within the refuge boundaries, the Service has management authority over most activities on water where adjacent uplands are federally owned. Where State of Alaska lands exist beneath navigable water bodies or where the State, a Native corporation, or a Native allottee owns the adjacent uplands within the refuge boundaries where the withdrawal process started after statehood, the Service's management authority is more limited.

The Service's statutory authority to manage these lands and waters comes from ANILCA; the Service manages these lands pursuant to the Refuge Administration Act. Under provisions of ANILCA, the Service manages the federal subsistence program on all inland waters within and adjacent to the external boundaries of the Refuges (50 CFR 100.3(b)).

2.4.8.5 Other Constituencies

The Refuge will inform local communities, special interest groups, and others who have expressed an interest in or are affected by refuge programs about refuge management policies and activities. The Refuge will seek input from these constituents when issues arise that may affect how the Refuge is managed. When appropriate, local residents and other stakeholders will be asked to participate in refuge activities so their expertise and local knowledge can be incorporated into refuge management.

2.4.9 Ecosystem and Landscape Management

Species do not function alone; they function together in the environment as part of an ecosystem. Refuge resources will be managed by employing ecosystem-management concepts. Individual species are viewed as integral to the diversity of those ecosystems and as such are indicators of the healthy functioning of the entire ecosystem. When the Service identifies species to use as indicators of the health of an ecosystem, it will do so through a rigorous peer-reviewed scientific process involving experts from other federal agencies and the Alaska Department of Fish and Game.

Inventorying, monitoring, and maintaining a comprehensive database of selected ecosystem components are critical for making refuge management decisions and for ensuring proper long-term ecosystem stewardship. This includes regular and recurring monitoring of status and trends of ecosystem components such as fish, wildlife, plants, climatic conditions, soils, and water bodies. All monitoring will employ appropriate disciplines, new technologies, and scientific capabilities whenever practical.

2.4.9.1 Air Quality

The Service's authorities for air quality management are included in several laws. The most direct mandates to manage air resources are found in the Clean Air Act and the Wilderness Act.

The Service is required by the Clean Air Act to preserve, protect, and enhance air quality and air quality-related values on Service lands. Air quality-related values include visibility, plants, animals, soil, water quality, cultural and historical resources, and virtually all resources that are dependent upon and affected by air quality. In addition, the Wilderness Act requires the Service to protect and preserve the wilderness character, including the pristine air quality, of designated areas.

Class I air quality sites receive the highest level of protection. Very little deterioration is allowed in these areas, and the federal land manager has an "affirmative responsibility" to protect air quality-related values on those lands. With the exception of three Class I air quality sites in designated Wilderness on the Alaska Maritime National Wildlife Refuge, all other lands managed by the Service in Alaska are classified as Class II and receive protection

through the Clean Air Act. Moderate deterioration, associated with well-managed population growth, is allowed in Class II areas.

If air quality or related resources are at risk, the refuge manager will work with the Service's Air Quality Branch; the regional air quality coordinator; the Alaska Department of Environmental Conservation and other State, local, and federal agencies; and the public, as appropriate, in developing an air quality management plan as outlined in the Service Manual (563 FW 2.8).

2.4.9.2 Water Resources (Hydrology) Management

Every national wildlife refuge in Alaska shares the common purpose of ensuring that water resources are maintained and protected. The ANILCA mandates that the Service safeguard water quality and necessary water quantity within refuges and to conserve fish and wildlife populations and habitats in their natural diversity.

Although the Service has reserved water rights sufficient to accomplish the purposes of the Refuge, the Refuge Administration Act and the Service Manual (403 FW 1 through 3) direct the Service to obtain, to the extent practicable, water supplies of adequate quantity and quality for Service facilities, for refuge purposes and as trust resources, and to obtain the legal right to use that water through State laws, regulations, and procedures.

The Alaska Region of the Service conducted a water resources threats analysis (Harle 1994) for the purpose of guiding water resource investigations and protecting water resources by acquiring in-stream water rights. Based on the results of the threats analysis, the Service's regional office developed a strategic plan for systematically quantifying the surface water on refuges within Alaska (Bayha et al. 1997).

Using existing data, or through the collection of hydrologic and biologic data, the Service applies to the State of Alaska for appropriate water rights, for in-stream water reservations, and for water withdrawals to meet the Service's needs. Establishing State water rights is only a part of a management strategy to protect refuge resources and to understand ecosystem processes. Collection of hydrologic data allows the Service to accomplish the following:

- Plan floodplain and riparian zone management.
- Estimate flow for ungauged streams within the refuges.
- Supplement historical or current fisheries and wildlife studies.
- Detect and evaluate future natural or human-induced changes in the hydrologic system.
- Provide stream profile and velocity data for the design of fish weirs or other structures.
- Estimate the potential for future flooding and erosion.
- Analyze the impacts of proposed projects on stream flow and water supply.
- Provide a basis for decision making about commercial operations on some important streams.
- Provide baseline water quality information.

All facilities and activities on refuges must comply with pollution-control standards set by federal laws (e.g., the Clean Water Act 33 U.S.C. 1251 and the Safe Drinking Water Act 42 U.S.C. 300f); State laws where federal law so provides; and the regulations, policies, and standards implementing these laws.

2.4.9.3 Visual Resource Management

Visual resource management has two primary purposes: (1) to manage the quality of the visual environment and (2) to reduce the visual impact of development activities. To accomplish these purposes, the Refuge will identify and maintain scenic values and will, within the constraints imposed by the Comprehensive Conservation Plan, minimize the visual impacts of refuge development and uses. All activities and facilities on the refuges will be designed to blend into the landscape to the extent practical. The Service will cooperate with other federal, State, local, tribal, and private agencies and organizations to prevent significant deterioration of visual resources.

2.4.9.4 Cultural, Historical, and Paleontological Resources

The Service has long-term responsibilities for cultural resources on refuge lands. Cultural resources on refuge lands are managed under a number of laws, Executive orders, and regulations, including the Antiquities Act; the National Historic Preservation Act, as amended; the Archaeological Resources Protection Act; the American Indian Religious Freedom Act; the Native American Graves Protection and Repatriation Act; Executive Order 11593, “Protection and Enhancement of the Cultural Environment”; Executive Order 13007, “Indian Sacred Sites”; and 36 CFR 800.

The 1980 amendments to the National Historic Preservation Act direct the Service to inventory and evaluate cultural resources for their eligibility for inclusion on the National Register of Historic Places. Pending a complete evaluation, all cultural resources will be considered potentially eligible for the National Register of Historic Places. All significant historic, archaeological, cultural, and paleontological resources on the Refuge will be protected and managed in accordance with federal and State law.

A cultural resource management guide for the Refuge was completed in October 1995. The guide provides guidance for cultural resource management on the Refuge. It outlines legal mandates and considerations, reviews current information about resources, and establishes goals and objectives for the program. The cultural resource guide should be updated every five years.

It is illegal to collect archaeological materials and/or paleontological remains on the Refuge without a permit. Historic aircraft and other World War II material will be managed in accordance with the policy published December 20, 1985, in the *Federal Register* (FR 50:51952-51953). These materials may be collected on refuge lands only as authorized by a permit issued to a qualified organization or individual. Cultural resource research permits will only be issued to qualified individuals operating under appropriate research designs. The Refuge will encourage archaeologists, historians, ethnologists, and paleontologists from educational institutions and other government agencies to pursue their research interests on refuge lands as long as these research interests are compatible with refuge purposes. Research that collects data from threatened sites and minimizes disturbance to intact sites will be encouraged.

When any federal undertaking—including any action funded or authorized by the federal government and having the potential to directly or indirectly affect any archaeological or historic site—is planned, a consultation must be initiated with the State Historic Preservation Officer, under section 106 of the National Historic Preservation Act. If sites that may be affected are found in the project area, their significance will be evaluated to determine their eligibility for inclusion in the National Register of Historic Places. For eligible sites,

consultation will result in a course of action causing the least possible impact. Impacts may be minimized in a variety of ways, including relocation or redesign of a project, site hardening, mitigation through information collection, or cancellation of the project if no alternatives are feasible. To protect archaeological and historic sites, other uses may be precluded. Private interests proposing to conduct commercial uses on the Refuge will normally be required to fund studies necessary for consultation and for mitigation of impacts.

The Refuge will implement Executive Order 13007, “Indian Sacred Sites”, allowing access to identified sacred sites and avoiding adversely affecting the physical integrity of these sites. Where appropriate, the Service will maintain the confidentiality of sacred sites.

Further information on cultural resources management can be found in the Service Manual (614 FW 1 through 5) and the Cultural Resource Management Handbook (USFWS 1992).

2.4.10 Fish and Wildlife Habitat Management

2.4.10.1 Habitat Management

Habitats are managed in keeping with the purposes, goals, and objectives of a refuge. In Alaska, this means habitats are largely managed to maintain natural diversity and natural processes. However, in some cases, habitats are manipulated to maintain or improve conditions for selected fish and wildlife populations, to control invasive plant species, or to manage accumulations of natural fuels on refuge land. These habitat management and manipulation activities will be carried out in support of the purposes, goals, and objectives of the Refuge. Generally, refuges use the least intrusive management measures needed. Where practical and economically feasible, habitat management practices should maintain a natural appearance on the landscape. Habitat management practices, even those carried out for the benefit of a single species or small group of species, will—to the extent possible—maintain the natural diversity of native (indigenous) wildlife species and habitat types.

Habitat management and manipulation may be achieved by mechanical, chemical, and/or manual methods, including the use of natural and prescribed fire, or by a combination of methods. Mechanical treatment could include mechanical removal, crushing, cutting, or mowing. When applicable, State and federal guidelines for timber management will be followed. Mechanical treatment could also include the construction of fish passages, fish ladders, fish barriers, water impoundments and structures such as fences or artificial nests, and rising or lowering of water levels to manage wildlife or waterfowl habitat. Riparian or aquatic habitat management and manipulation may be achieved by acquiring in-stream flow reservations or making beneficial water diversions.

Chemical treatment involves the use of chemicals to restore nutrient levels in a lake system (through fertilization) for fisheries restoration, to reduce hazardous fuel accumulations, or to eliminate invasive plant and animal species, normally by killing them or destroying their ability to spread or prosper. Before chemical treatment is approved for use, the Refuge will analyze the need for action, the options for treatment, and the potential impacts of those options through the National Environmental Policy Act (NEPA) process. Pest control, including integrated pest management, is discussed in subsequent text.

Manual treatment could include the use of hand tools to remove, reduce, or modify plants or to modify habitats (e.g., removal of beaver dams).

Aquatic habitat modification may include activities and structures such as stream bank restoration, passage structures, and fish barriers or obstacle removal that results in physical

modification of aquatic or riparian habitats to benefit fish species. These activities would be undertaken to maintain or restore native fish populations and may require appropriate NEPA compliance and refuge compatibility determinations.

2.4.10.2 Fire Management

Fire management is the full range of activities necessary to protect human life and property, cultural resources, and other identified values and to conserve, protect, and enhance habitat and to maintain desired ecological conditions for the benefit of fish and wildlife. Fire management activities include preparedness, emergency suppression operations, wildland fire use, fire prevention, education and outreach, monitoring, research, prescribed fire, hazardous fuel reduction, and mechanical treatments. All activities will be conducted in accordance with refuge, Service, and Department of Interior policies and approved interagency and refuge-specific fire management plans. Additional guidance on fire management can be found in the 2001 Federal Fire Policy, (620 DM 1 and 2), Service Manual 621 FW 1 through 3, the Service Fire Management Handbook, and the Refuge Fire Management Plans.

Refuge specific fire management plans (FMP) provide the basis for integrating fire as a critical natural process into other refuge plans and activities at a landscape scale. The Koyukuk FMP (November 2005) and the Nowitna FMP (January 2006) provide specific information on the application and management of fire on the Refuge. The Alaska Interagency Wildland Fire Management Plan (AIWFMP, amended October 1998) provides a cooperative framework and operational guideline for the suppression and management of wildland fires. The suppression of human-caused and unwanted wildland fires and utilization of wildland fire use, and prescribed fires as management tools are important management prerogatives.

Wildland Fire Suppression: Fire suppression activity is the work of confining, constraining, controlling, or monitoring a fire or a portion of a fire to protect, prevent, or reduce the loss of identified values. Suppression takes place, with the highest priority being the safety of firefighters and the public, using the appropriate management response based on values to be protected. The AIWFMP and the refuge FMPs are the guiding documents for suppression actions. The AIWFMP establishes four management options—critical, full, modified, and limited—that direct a range of wildfire management responses. Refuge lands have been classified using these fire management options, with all facilities mapped.

The Bureau of Land Management Alaska Fire Service (AFS) provides emergency suppression services on refuge lands in Alaska (Memorandum of Agreement for Wildland Fire Suppression Services and Related Activities, August 2006), as directed by the refuge manager. Through a cooperative agreement with AFS, the State of Alaska Division of Forestry provides emergency suppression services on refuge lands in State protection zones, as directed by the refuge manager. The Refuge is located in the AFS Galena and Tanana Fire Management Zones, with suppression services provided by the Alaska Fire Service.

Wildland Fire Use: Wildland fire use is the application of the appropriate management response to naturally ignited wildland fires to accomplish beneficial resource management objectives as outlined in the fire management plans. Wildland fires may be used to protect, maintain, and enhance natural and cultural resources and, as nearly as possible, wildland fires will be allowed to function in their natural ecological role. Optional management is described in the Refuge Fire Management Plans.

Prescribed Fire: Prescribed fires are ignited by management action to meet specific wildland fuel, vegetation, and/or habitat management objectives. Prior to each ignition, a written, approved burn plan outlining prescription conditions is required. Use of prescribed fires must also comply with the Alaska Enhanced Smoke Management Plan for Prescribed Fire. This plan provides guidance and direction concerning smoke management issues related to prescribed fire.

2.4.11 Fish and Wildlife Population Management

Conservation of habitats is a key element in maintaining the natural diversity of fish and wildlife populations on the Refuge, and management of these populations is an important component of maintaining healthy ecosystems. The Refuges will be managed in accordance with their respective purposes and consistent with the Policy on Maintaining Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System (Service Manual 601 FW 3) to ensure native species are managed in their natural diversity and abundance.

The Refuge will work with the State of Alaska to conserve fish and wildlife populations, recognizing that populations may experience fluctuations in abundance because of environmental factors and may require management actions for conservation purposes. The Refuge will be managed to maintain the genetic variability of wild, native fish stocks.

2.4.11.1 Wildlife Inventory and Monitoring Plan

To assess presence, relative abundance, distribution, and trends in populations of fish, wildlife, and plants, the Refuge completed a Wildlife Inventory and Monitoring Plan (I&M Plan) in 2002 and revised it in 2008. The I&M Plan describes objectives, justification, methods, management implications, geographic scale, report schedules, and database management for studies on species targeted for inventory and monitoring. The I&M Plan includes studies that address environmental parameters (e.g., weather) and hydrology, soils, and fire history to explain potential changes in the distribution, relative abundance, and populations of fish, wildlife and plants. The Refuge will review the I&M Plan every two years. Regional office review is required every five to eight years. Updates to the I&M Plan will be made as indicated from these reviews.

2.4.11.2 Scientific Peer Review

Biologists, ecologists, botanists, and other refuge personnel conducting scientific investigations will adhere to refuge, regional, Service, and Department of Interior policies on scientific conduct, including the Management of Fish and Wildlife Service Scientific Publications Recommended Outlets, Procedures, and Policies. The overall goal of scientific peer review is to ensure that information collected, analyzed, interpreted, and reported to the public, and upon which policy and management decisions are based, meets established standards of the scientific community. To achieve this goal, all study plans and reports to be disseminated outside the originating office must be peer-reviewed. The region's peer review procedure is available upon request. The type and level of review shall be commensurate with the potential significance of the scientific information and its likely influence on policy and management actions.

2.4.11.3 Compliance with the Animal Welfare Act

The Animal Welfare Act of 1996, as amended, established legal standards for animal care and use. To prescribe methods and set standards for the design, performance, and conduct of animal care and use, research facilities and federal agencies must establish an Institutional

Animal Care and Use Committee (IACUC). Field studies conducted or authorized by refuge employees within the purview of the Animal Welfare Act will require review and approval of an IACUC. Any refuge study that involves an invasive procedure or that harms or materially alters the behavior of an animal under study should be reviewed and approved by an IACUC prior to implementation of field work. Note that a scientific collection permit is also required from the Alaska Department of Fish and Game under 5 Alaska Administrative Code 92.033.

2.4.11.4 Marking and Banding

These activities include fish and wildlife capture, marking, banding, radio-collaring, release, tracking, and other information-gathering techniques. Cooperation with appropriate partners, including the Alaska Department of Fish and Game, will be stressed, and specific protocols will be followed, taking advantage of all appropriate disciplines and new technologies wherever possible.

2.4.11.5 Threatened or Endangered Species

The Refuge will consult with the U.S. Fish and Wildlife Service Ecological Services field office on actions that may affect listed, proposed, or candidate species or designated or proposed critical habitat. These actions include refuge operations, public use programs, private lands and federal assistance activities, promulgating regulations, and issuing permits (USFWS 1973, section 7 Consultation Handbook 1998).

2.4.11.6 Reintroductions

A species may be introduced on a refuge only if that species is native to the refuge (i.e., a reintroduction). Non-native species may not be introduced. Definitions of native and non-native species are found in the glossary.

Reintroductions can be useful tools for restoring species to natural ranges and reestablishing a refuge's natural fish, wildlife, and habitat diversity. Reintroductions would require appropriate NEPA compliance; a review to ensure consistency with the Policy on Maintaining Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System; an ANILCA section 810 determination, and a refuge compatibility determination. Reintroductions also require extensive coordination with adjacent landowners and with the State of Alaska. In evaluating the project, the cause(s) of the extirpation should be evaluated and management actions taken to alleviate the cause(s) prior to reintroduction.

The environmental requirements of the species and the ecological dynamics of the area proposed for the reintroduction need to be thoroughly reviewed prior to a reintroduction. Some factors to consider include behavior, diseases, general ecology of the species, habitat requirements, inter- and intra-species competition, life history, genetics, management practices, population dynamics, and predators. Consideration should be given to whether there have been significant habitat changes since the species' extirpation (e.g., is the area still within the species' natural range?).

2.4.11.7 Fish and Wildlife Control

These activities involve the control, relocation, and/or removal of native species, including predators, to maintain natural diversity of fish, wildlife, and habitats. These management actions may be employed with species of fish and wildlife within their original range to restore other depleted native populations.

Predator management includes the relocation, removal, sterilization, and other management of native predators to accomplish management objectives. The Service considers predator management to be a legitimate conservation tool when applied in a prudent and ecologically sound manner and when other alternatives are not practical. Appendix E describes what it would take to implement a predator control program on the Refuge. The key requirements are that a predator management program be ecologically sound and biologically justified. In keeping with the Service's mandate to first and foremost maintain the biological integrity, diversity, and environmental health of fish and wildlife populations at the refuge scale, a predator population will not intentionally be reduced below a level consistent with the low end of natural population cycles (see Service Manual 601 FW 3).

A predator management program requires appropriate NEPA compliance, an ANILCA section 810 determination, and, if conducted by other than the Service or an agent of the Service, a refuge compatibility determination. Alternative management actions must be evaluated prior to pursuing direct predator control activities. Any proposal to allow or implement a predator management program on national wildlife refuges in Alaska will be subjected to public review and closely coordinated with the Alaska Department of Fish and Game, local communities, tribal governments, and adjacent landowners and/or managers. Predator management activities must be monitored and evaluated for effectiveness and resource impacts.

Normal environmental education and population management activities—such as trapper education programs and regulation changes that allow for increased harvests of predatory animals by licensed trappers and hunters—are not considered to be “predator management.” The control or extirpation of non-native predators is not considered to be “predator management” (see section 2.4.11.8).

2.4.11.8 Management of Non-native, Invasive and Pest Species

In general, the presence of non-native species (including feral domestic animals) on the Refuge is not compatible with refuge purposes or with Refuge System policies. When a non-native species (fish, wildlife, or plants) occurs on a refuge, the Service may control or eliminate that species. Where a population of a non-native species has already been established on a refuge and this population does not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the Refuge, the species may be managed as part of the Refuge's diverse ecosystems.

Pests are defined as those organisms (vertebrates, invertebrates, plants, and microorganisms and their vectors), which are detrimental to fish, wildlife, human health, fish and wildlife habitat, or to established management goals. Pests also include noxious weeds and other organisms, which are classified as pests by law (Administrative Manual 30 AM 12).

Invasive species are non-native species whose introduction causes or is likely to cause economic or environmental harm, or harm to human health. The federal government is prohibited by Executive order, law, and policy from authorizing, funding, or carrying out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere (Service Manual 620 FW 1). Refuge managers conduct habitat management activities to prevent, control, or eradicate invasive species using techniques described through an integrated pest management plan or other similar management plan. Refuge integrated pest management planning will address the advantages and limitations of potential techniques, including chemical, biological, mechanical, and cultural techniques. Management of invasive species on refuges is guided by the National Strategy for Invasive

Species Management and conducted within the context of applicable policy (Service Manual 620 FW 1).

By definition, invasive species cause significant impacts to the land and water resources or to the species of plants and animals that use these habitats. To manage invasive plants, the Refuge will include weed inventories as part of all habitat inventories. The Refuge will review a proposed action's potential to introduce or spread invasive plants and will take measures to reduce the hazards (e.g., require weed-free feed for pack animals).

Introduced vertebrates (e.g., fox and rats) may also adversely affect wildlife populations, particularly in island ecosystems where species historically occurred without vertebrate predators. Presence of these invasive species may interfere with attainment of refuge purposes and management goals.

Pests on refuges may also be controlled to prevent damage to private property, and routine protection of refuge buildings, structures and facilities is addressed in refuge policy (Refuge Manual 7 RM 14).

The Refuge will coordinate with other landowners and agencies and use integrated pest management practices to enhance the detection, prevention, and management of invasive species and other pests. Use of chemical control measures on refuge lands requires regional office review and approval of a pesticide-use proposal (Administrative Manual 30 AM 12 and Refuge Manual 7 RM 14).

2.4.11.9 Disease Prevention and Control

Certain disease organisms, viruses, or vectors of disease (e.g., rabies or parasites) may threaten human health or the health and survival of native wildlife or plant species. These threats may be managed or eliminated after consideration of all reasonable options and consultation with the State of Alaska and other concerned parties. This will normally only occur when severe resource damage is likely or when public health or safety is jeopardized. Wherever possible, an integrated approach to pest management will be used in accordance with the Service's Administrative Manual (30 AM 12) and Refuge Manual (7 RM 14). If chemical controls are used, a pesticide-use proposal must be approved.

2.4.11.10 Fishery Restoration

Fishery restoration is any management action that increases fishery resources to allow full use of available habitat or to reach a population level based on historical biologic data. It can also include restoration and protection of habitat to maintain, increase, or improve fishery resources. Although the goal of restoration is self-sustaining populations, situations may exist in which some form of fishery management or facilities could continue indefinitely.

Where fishery resources have been severely adversely affected, the Refuge will work with the State of Alaska, local tribes, and other partners to restore habitats and populations to appropriate, sustainable conditions. Restoration emphasis will focus on strategies that are the least intrusive to ecosystems and do not compromise the viability or genetic characteristics of the depleted population. This may include regulatory adjustments and/or evaluations of escapement goals. If the stocks have been reduced or are threatened, temporary restoration facilities may be allowed in designated Wilderness or Wild River areas, as long as the facilities will not significantly detract from the values for which those areas were established.

2.4.11.11 Fishery Enhancement

Fishery enhancement is any management action or set of actions that is applied to a fishery stock to supplement numbers of harvestable fish to a level beyond that which could be naturally produced based on a determination or reasonable estimate of historic levels. This could be accomplished by stocking barren lakes, providing access to barren spawning areas (fish passages), constructing hatcheries, out-stocking in productive systems, or fertilizing rearing habitat.

Refuge management priorities will focus on conserving naturally diverse ecosystems. Fishery enhancement facilities for the purpose of artificially increasing fish populations normally will not occur within any management category.

Proposals for fishery enhancement projects will be subject to the provisions of NEPA regulations, an ANILCA section 810 determination, and a refuge compatibility determination. Only temporary fishery enhancement facilities may be authorized in Minimal, Wild River, and Wilderness management areas. Proposals for facilities within designated Wilderness require a minimum-requirements analysis to determine if the facilities are necessary within the Wilderness Area and would not significantly detract from the values for which those areas were established.

2.4.12 Subsistence Use Management

Providing the opportunity for continued subsistence use by local residents is one of the purposes of the Refuge, as stated in title III of ANILCA. Title VIII of ANILCA further provides that rural Alaska residents engaged in a subsistence way of life be allowed to continue using resources within refuges for traditional purposes. These resources include fish and wildlife, house logs and firewood, and other plant materials. Many aspects of subsistence management are addressed outside of refuge comprehensive conservation plans. The Federal Subsistence Board, through its rule-making process, addresses seasons, harvest limits, and customary and traditional use determinations. The Federal Subsistence Board has established Regional Subsistence Advisory Councils to provide for meaningful public input to the rule-making process.

The Refuge will work with others to monitor subsistence harvest. The Refuge will supplement the State's ongoing harvest and resource monitoring programs to provide additional information on the status of fish and wildlife populations harvested for subsistence uses. This monitoring is intended to identify potential problems before populations of fish and wildlife become depleted and to ensure preference is given to subsistence users as required by law. All information the Refuge gathers through subsistence monitoring will be shared with local State fish and game advisory committees, tribes, and other entities. Refuge staff will attend various subsistence-related meetings, including those of local fish and game advisory committees and Regional Subsistence Advisory Councils, and provide information on the status of subsistence resources and management.

The noncommercial gathering by local rural residents of fruits, berries, mushrooms, and other plant materials for subsistence uses and of dead standing or down timber for firewood is allowed without a special use permit. Harvest of live standing timber for house logs, firewood, or other uses is allowed, although specific requirements vary by size and location. A special use permit is required to cut live trees greater than six inches diameter at breast height (4 ½ feet above ground level). No more than 20 live trees between three and six inches diameter at breast height (dbh) can be cut annually without a special use permit. No cutting may be done

within 50 feet of a stream, lake, or river, and no more than one tree in five may be cut in any specific stand. Cutting of live trees less than three inches dbh does not require a special use permit. Timber stocks subject to subsistence use will also be monitored to ensure they remain available over the long term.

Under section 816 of ANILCA, refuge lands may be closed to the taking of fish and wildlife if closure is deemed necessary for reasons of public safety, administration, or to ensure the continued viability of particular populations of fish or wildlife. Emergency closure to subsistence taking generally would occur only after other consumptive uses competing for the resources were restricted or eliminated.

2.4.12.1 Access for Subsistence Purposes

Access to refuge lands by traditional means will be allowed for subsistence purposes in accordance with section 811 of ANILCA, subject to reasonable regulation (50 CFR 36.12). Traditional means include snowmobiles, motorboats, dog teams, four-wheelers, and other means of surface transportation traditionally used by local rural residents engaged in subsistence activities. Use of these traditional means of travel will be in compliance with State and federal law in such a manner to prevent waste of harvested resources or damage to the Refuge and to prevent herding, harassment, hazing, or driving of wildlife.

2.4.12.2 Section 810 Evaluations

The Refuge will evaluate the effects of proposed activities on subsistence use to ensure compliance with section 810 of ANILCA. The Refuge will work with the Federal Subsistence Board, Regional Subsistence Advisory Councils, local fish and game advisory committees, tribes, Native corporations, the Alaska Department of Fish and Game, and other appropriate local sources to determine whether a proposed activity would “significantly restrict” subsistence uses. If the Refuge determines that a proposal would probably result in adverse effects to subsistence use, the Refuge would follow the requirements identified in section 810 before making a final decision on the proposal.

2.4.13 Public Access and Transportation Management

2.4.13.1 Snowmobiles, Motorboats, Airplanes, and Non-motorized Surface Transportation

Section 1110(a) of ANILCA allows the use of snowmobiles (during periods of adequate snow cover and frozen river conditions), motorboats, airplanes, and non-motorized surface transportation methods for traditional activities and for travel to and from villages and home sites. Such access shall be subject to reasonable regulations to protect the natural and other values of the Refuges (43 CFR 36.11). Specific areas may be closed, in accordance with these regulations, to such uses. The refuge manager is responsible for determining when snow cover is adequate to protect the underlying vegetation and soil from damage by snowmobile use.

2.4.13.2 Off-Road Vehicles

The regulations at 43 CFR 36.11(g) restrict the use of off-road vehicles within the Refuge. The definition of off-road vehicles in 50 CFR 36.2 excludes snowmobiles but includes air boats and air-cushion vehicles along with motorized wheeled vehicles. Off-road vehicles such as four-wheelers may be allowed only on designated routes or areas within Intensive and Moderate management areas or by special use permit.

2.4.13.3 Helicopters

The use of a helicopter in any area other than at designated landing areas pursuant to the terms and conditions of a permit issued by the Service, or pursuant to a memorandum of understanding between the Service and another party, or involved in emergency or search and rescue operations is prohibited (43 CFR 36.11(f)(4)).

Helicopter landings for volcano monitoring, geologic hazards evaluations, and fisheries and wildlife management activities may be authorized under special use permit or other authorization, subject to site-specific stipulations. Helicopter landings for initial-attack fire suppression must comply with the Refuge fire management plans and operational guidance in the Alaska Interagency Wildland Fire Management Plan. Helicopter landings by commercial operators and for public access are generally not allowed in designated Wilderness. Where such use was established prior to Wilderness designation, it may be allowed to continue.

2.4.13.4 Access to Inholdings

Section 1110(b) of ANILCA ensures adequate and feasible access, for economic or other purposes, across a refuge for any person or entity that has a valid inholding. An inholding is defined as state-owned or privately-owned land, including subsurface rights underlying public lands, valid mining claims, or other valid occupancy that is within or effectively surrounded by one or more conservation system units. When a right-of-way permit is necessary under this provision (e.g., construction of permanent or long-term facilities), the Service will review and process the application in accordance with regulations at 43 CFR 36 and 50 CFR 29. Such permits are subject to terms and conditions as specified in the regulations.

2.4.13.5 Temporary Access

43 CFR 36.12(a)(2) defines temporary access as “limited, short-term (i.e., up to one year from issuance of the permit) access which does not require permanent facilities for access to state or private lands.” Temporary access is limited to survey, geophysical, exploratory, or other temporary uses of non-federal lands and where access is not otherwise provided for in 43 CFR 36.10 or 43 CFR 36.11.

The Refuge will evaluate applications for temporary access across the Refuge and shall issue a permit with the necessary stipulations and conditions to ensure that the access granted is compatible with the purposes for which the three refuges were established, that it complies with the provisions of section 810 of ANILCA, and that it ensures that no permanent harm will result to refuge resources.

2.4.13.6 Subsistence Access

See Access for Subsistence Purposes under Subsistence Use Management (section 2.4.12.1).

2.4.13.7 Transportation and Utility Systems

Transportation and utility systems include roads, highways, railroads, airports, pipelines, electrical transmission lines, communication systems, and related structures and facilities reasonably and minimally necessary for the construction, operation, and maintenance of such systems (section 1102 of ANILCA). Anyone seeking to acquire a right-of-way across refuge lands for a transportation or utility system must, consistent with 43 CFR 36, file an application with the regional office. Regulations at 43 CFR 36 and 50 CFR 29 establish specific procedures and time constraints for application review, compliance with NEPA, decision making, and appeals.

The Service will decide whether to approve or disapprove that portion of a transportation or utility system that would cross refuge lands, except for those on designated Wilderness. When the proposed transportation or utility system would cross a designated Wilderness Area, the Service tentatively approves or disapproves the application subject to the President's subsequent decision. If the President approves, a recommendation is submitted to Congress for final approval.

A right-of-way for a transportation or utility system across refuge lands can be granted only if the system meets the compatibility standard, the criteria outlined in section 1104(g)(2) of ANILCA, and the regulations at 43 CFR 36.7(a)(2), and if there is no economically feasible and prudent alternative route for the system. If approved, permits issued for a transportation or utility system will contain terms and conditions as required under regulations at 43 CFR 36.9(b) and 50 CFR 29.21 through 29.24. Rights-of-way that cross any area within the boundaries of a Wild and Scenic River unit will assure that the stream flow of, and transportation on, such river are not interfered with or impeded and that the facility is located and constructed in an environmentally sound manner (section 1107(b) of ANILCA and the regulations at 43 CFR 36.9(c) and (d)). Additional special requirements apply to rights-of-way for pipelines issued under the Mineral Leasing Act of 1920 (30 U.S.C. 185), section 1107(c) of ANILCA, and regulations at 43 CFR 36.9(d).

When considering an application for a transportation or utility system, the authorization process would incorporate a corresponding comprehensive conservation plan amendment to update the desired management category(s) of the affected area if the system were to be approved.

2.4.13.8 State Transportation Planning

Federal transportation planning regulations require each state to develop a long-range statewide transportation plan in consultation and coordination with other government agencies and the public. In Alaska, transportation projects nominated for funding are evaluated and ranked by the Alaska Department of Transportation and Public Facilities. When appropriate, the Refuge will participate in the State transportation planning process and provide input regarding environmental considerations of proposed projects affecting refuge lands and resources. See sections 3.1.1.8 and 3.4.6 of this Plan for a discussion of State-identified potential transportation and utility systems that cross Refuge lands.

2.4.13.9 RS 2477 Rights-of-Way

The State of Alaska identifies numerous claims to roads, trails, and paths across federal lands under Revised Statute 2477 (RS 2477), a section in the Mining Act of 1866 that states, "The right-of-way for the construction of highways over public lands, not reserved for public uses, is hereby granted." RS 2477 was repealed by the Federal Land Policy and Management Act of 1976, subject to valid existing claims.

Assertion and identification of potential rights-of-way does not establish the validity of these claims nor the public's right to use them. The validity of all RS 2477 rights-of-way will be determined on a case-by-case basis, either through the courts or by other legally-binding document. The State of Alaska has currently identified in Alaska Statute 19.30.400 three routes on the Refuge it claims may be asserted as rights-of-way under RS 2477 (see appendix F).

2.4.13.10 17(b) Easements

Section 17(b) of the Alaska Native Claims Settlement Act of December 18, 1971, authorizes the Secretary of the Interior to reserve easements on lands conveyed to Native corporations to

guarantee access to public lands and waters. Easements across Native lands include linear easements (e.g., roads and trails) and site easements. Site easements are reserved for use as temporary campsites and to change modes of transportation.

The Service is responsible for administering those public easements inside and outside refuge boundaries that provide access to refuge lands. Service authority for administering 17(b) easements is restricted to the lands within the easement. The size, route, and general location of 17(b) easements are identified on maps filed with conveyance documents. Conveyance documents also specify the terms and conditions of use, including the acceptable periods and methods of public access. See appendix G for additional information.

2.4.13.11 Navigation Aids and other Facilities

Section 1310 of ANILCA authorizes reasonable access to and operation and maintenance of existing air and water navigation aids, communications sites, and related facilities. It authorizes existing facilities for weather, climate, and fisheries research and monitoring subject to applicable laws and regulations. Reasonable access to and operation and maintenance of facilities for national defense and related air and water navigation are also provided for, including within designated Wilderness areas.

New facilities shall be authorized only after consultation with the head of the federal department or agency undertaking the establishment, operation, or maintenance and in accordance with mutually agreed to terms and conditions.

2.4.14 Recreation and Other Public Use

Public recreation activities compatible with refuge purposes are authorized unless specifically prohibited (50 CFR 36.31). Compatible recreation uses of the Refuge will continue. The Refuge Administration Act identifies compatible hunting, fishing, wildlife observation and photography, and environmental education and interpretation as priority public uses. These uses are encouraged and will receive emphasis in public use management.

Both consumptive (e.g., hunting, fishing, and trapping) and non-consumptive (e.g., wildlife observation and photography) recreation uses are appropriate. Some recreational uses are incidental to others. For example, camping and hiking may be related to hunting, fishing, wildlife photography, or other recreational uses.

There is often a fine line between subsistence and recreational use (e.g., berry picking). Subsistence uses are addressed under Subsistence Use Management (section 2.4.12). When it is necessary to restrict the taking of fish and wildlife on a refuge to protect the continued viability of such populations, the taking of fish and wildlife for non-wasteful subsistence uses on refuges shall be accorded priority over the taking of fish and wildlife for other purposes, in accordance with title VIII of ANILCA.

The Refuge will be managed to provide recreation experiences in generally natural wildland settings. Recreational use is managed consistent with the designated management category in each area. Intensive and Moderate management areas will be managed for greater concentrations of visitors than will be Minimal management and Wilderness areas. The Refuge will manage all recreational use to avoid crowded conditions and to minimize adverse effects to cultural resources, fish and wildlife, wilderness, and other special values of the Refuge. “Leave No Trace” will be the standard.

The least intrusive means of managing use will be employed. Education will be the primary management tool for recreation management, using brochures, maps, signs, and personal

contacts. However, if voluntary methods fail, other actions may be taken, including limiting commercial guiding and outfitting; regulating use and access subject to the provisions of section 1110(a) of ANILCA; and recommending changes in State and/or federal fishing, hunting, and/or trapping regulations. When necessary, recreation opportunities may be seasonally or otherwise restricted to minimize user conflicts and to protect the natural or other values of the Refuge.

Any restrictions on public use will follow the public participation and closure procedures at 50 CFR 36, 43 CFR 36, or other applicable regulations. State management actions available through the Master Memorandum of Understanding (see appendix B) and other State management tools will also be used where mutually desirable.

A Visitor Services Plan may be prepared for the Refuge, or more specific management plans may be prepared for areas of relatively concentrated use.

2.4.15 Public Use Facilities

Facilities may be provided to support certain recreation and other public uses. Recreation facilities may be located on refuge lands and at administrative sites. Visitor centers and highly developed environmental education and interpretive sites may be located off refuge lands at administrative sites or other appropriate locations. Public use facilities may include roads, trails, boat launch sites, airstrips, campgrounds, interpretive sites, environmental education sites, visitor centers, public use cabins, visitor contact facilities, and signs.

All new buildings (e.g., visitor centers, restrooms, public use cabins, and visitor contact buildings), some recreation facilities (e.g., fishing platforms), and additions and alterations to existing buildings will comply with current accessibility standards. Other non-building recreation facilities (e.g., campgrounds, trails) are not currently covered under these standards, although access for the disabled will be considered in the design of new or upgraded facilities. As funds are available, existing buildings will be updated to meet these standards.

The level of development and appearance of facilities will be appropriate for the management category of the area in which they are located. More elaborate facilities will be constructed in the Intensive management category; more rustic and rudimentary facilities will occur in the other management categories.

2.4.15.1 Cabins

Special use permits are required for subsistence and commercial cabins. Management of existing cabins and review of proposals for construction of new cabins for traditional uses will be in accordance with the Service's cabin regulations (50 CFR 36.33) and regional cabin policy (see appendix O). Private recreational use cabins will not be authorized.

Public use cabins are intended to provide the public with unique opportunities to enjoy and use the Refuge. They also help ensure public health and safety in bad weather and emergencies.

2.4.15.2 Temporary Facilities for the Taking of Fish and Wildlife

Per section 1316 of ANILCA, the Refuge will allow the use of temporary campsites, tent platforms, shelters, and other temporary facilities and equipment directly and necessarily related to the taking of fish and wildlife, provided these facilities are not detrimental to refuge purposes. Special use permits may be issued for tent frames, caches, smokehouses, and other facilities. Appropriate stipulations will be included in the special use permits to ensure protection of refuge resources. Permits for these facilities within the Refuge will only be

required for tent frames located in the Nowitna Wild River corridor and the Koyukuk Wilderness Area.

The following criteria will be considered in evaluating applications for temporary facilities:

- Where feasible, they will be located in a manner to not displace or compete with existing public uses.
- They will be located away from the vicinity of existing cabins.
- They will be located on sites that are not currently popular campsites.
- They will be located to minimize displacement of wildlife.

The following conditions may be imposed on temporary facility special use permits:

- The time of occupancy will coincide with the State and/or federal hunting, fishing, and/or trapping season for the species for which the temporary facility is being used.
- At the end of the specified occupancy, tents and other readily portable materials will be removed.
- To the extent feasible, temporary structures will be built with materials that blend into and are compatible with the surrounding landscape.
- To the extent feasible, temporary facilities will be screened from water and located so that they are as unobtrusive as possible when viewed from trails and areas of significant public use.

2.4.16 Outreach

Outreach is two-way communication between the Refuge and the public to establish mutual understanding, promote public involvement, and influence public attitudes and actions. The Refuge will continue to take advantage of partnership opportunities in providing these services, including working with the Alaska Geographic Association; Alaska Public Lands Information Centers; Friends of Alaska National Wildlife Refuges; local, State, and other federal agencies; local schools; tribal governments; Alaska Native organizations; and others.

Use of outreach as a management tool is key to the success of many of the management activities outlined in this Plan. Two outreach activities—environmental education and interpretation—are included in the six priority public uses identified in the Refuge Improvement Act. Many other activities are also available for use by the refuge staff in its outreach program, which may be developed in more detail as a step-down management plan. All outreach activities must be continually evaluated to determine whether they fulfill refuge management goals and objectives. The Refuge will ensure that these services are available to all segments of the public, including those with disabilities and those who speak languages other than English.

Refuge staff will work with the news media; attend public meetings and workshops; develop informational displays, brochures, Web pages, and teaching materials; invite the public to the Refuge (open houses); visit local schools and communities; and foster one-on-one communication.

2.4.17 Commercial-Use Management

Commercial uses are activities involving use of a refuge or its resources for a profit. Subsistence uses are not included in commercial uses. Refer to section 2.4.12 for policies related to subsistence.

Except for mining on valid claims under the 1872 Mining Law, of which there are none located within the boundaries of the Refuge, other activities where specific property rights are held by entities other than the federal government, or where specifically exempted by law, all commercial uses must comply with both NEPA and the compatibility requirements of the Refuge Administration Act. A written authorization (such as a special use permit) is required to conduct commercial activities on any refuge. Compliance with NEPA and a refuge compatibility determination will be required prior to deciding whether to authorize a commercial use. Prior to authorizing any economic use of a natural resource, the refuge manager must determine that each use, except for proposed activities authorized by ANILCA, contributes to the achievement of refuge purposes or the Refuge System mission (50 CFR 29.1). Except for commercial services described previously such as air charters and guided hunting and fishing, commercial enterprises are prohibited in designated Wilderness.

2.4.17.1 Commercial Recreation Services

Air-taxi and water-taxi operators, wildlife-viewing guides, tour operators, wilderness guides, recreational fishing guides, big-game hunting guides, and others providing recreation services are required, under 50 CFR 27.97, to obtain special use permits to operate on refuge lands. Where the number of special use permits is limited, refuge managers will award permits competitively (50 CFR 36.41). Special use permits require compliance with all applicable laws and regulations (e.g., United States Coast Guard licensing regulations). Permit stipulations ensure that camps; travel methods; storage of food, fish, and game meat; and activities are compatible with Refuge purposes and reduce the potential for impacts to resources and to other refuge users. If problems arise relating to commercial recreation activities—such as disturbance of active nests, conflicts with subsistence use, chronic incidence of bears getting into food, or violations of State or federal regulations—the Refuge may modify or terminate use under the special use permit stipulations. The Refuge will monitor the number and type of guides and outfitters operating on the Refuge and the number of clients and will, if necessary, further regulate use.

Under section 1307 of ANILCA, local preference is provided for all new commercial visitor services except guiding for recreational hunting and fishing. Regulations defining local preference are at 50 CFR 36.37.

2.4.17.2 Mineral Exploration and Development

Oil and Gas Assessment: Geological and geophysical studies, including subsurface core sampling and seismic activities, require special use permits with site-specific stipulations that ensure compatibility with refuge purposes and consistency with the management objectives of this Plan. Decisions to allow exploration will be made on a case-by-case basis. These activities will not be allowed in designated Wilderness.

Oil and Gas Leasing: Oil and gas leasing may be allowed only in Intensive management areas. Oil and gas leasing will not be authorized until completion of the following:

- An assessment of potential
- A national interest determination
- A refuge compatibility determination, where applicable
- A Comprehensive Conservation Plan amendment

During this process, the Service will seek the views of State and local governments and other interested parties, in accordance with section 1008(b)(2) of ANILCA.

If leasing is authorized, lease holders will be subject to federal leasing regulations (43 CFR 3100) and appropriate State regulations. Leases will be subject to stipulations on access, seasonal use, and site restoration; operators would be required to use technology that minimizes impacts on fish, wildlife, and habitat. The Refuge will work closely with lease holders to minimize adverse effects of mineral exploration and extraction on refuge resources and recreation opportunities.

Sand, Gravel, and Other Common Variety (Saleable) Minerals: Common variety minerals—such as sand, gravel, and stone—may be sold pursuant to the Materials Act of July 31, 1947 (30 U.S.C. 601 and 602), as amended. Regulations are found at 43 CFR 3600. Disposal is also authorized under the Refuge Revenue Sharing Act (16 U.S.C. 715s). Also see 612 FW 1 of the Service Manual. Extraction may be authorized, where compatible, in Intensive and Moderate management areas to support construction and maintenance projects on or near refuge lands if no reasonable material sites exist off refuge lands.

Other Mineral Leasing: In general, mineral leasing is not allowed on refuge land. Geothermal leasing is not allowed on refuges under section 1014(c) of the Geothermal Steam Act (30 U.S.C. 1014). Coal mining is also prohibited, subject to valid existing rights, under section 16 of the Federal Coal Leasing Amendment Act of 1975 (30 U.S.C. 201 Notes) and the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1272; 43 CFR 3400.2). In specific cases of national need, however, mineral exploration, development, or extraction may be permitted under section 1502 of ANILCA. The President must determine that the national need for the mineral activity outweighs the other public values of the land. Any recommendation by the President would take effect only after enactment of a joint resolution by Congress.

2.4.17.3 Commercial Fishing and Related Facilities

Under section 304(d) of ANILCA, the Service will continue to allow individuals with valid commercial fishing rights or privileges to operate on the Refuge. The use of campsites, cabins, motor vehicles, and aircraft on the Refuge in support of commercial fishing is subject to reasonable regulation. Section 304(d) provides for restricting commercial fishing rights if the use is determined to be inconsistent with refuge purposes *and* to be a “significant expansion of commercial fishing activities . . . beyond the level of such activities during 1979.” The Service recognizes that fishery levels are cyclic and will take that into consideration when applying the 1979 level criteria. Any new fishery and related facilities and equipment will have to meet the compatibility standard.

Aquaculture and mariculture support facilities may be allowed in Intensive management areas, subject to provisions of State and federal laws. Seafood processing plants will not be allowed.

2.4.17.4 Commercial Harvest of Timber and Firewood

Commercial harvest of timber and firewood will only be authorized under a special use permit and when necessary to fulfill overall refuge management objectives. Within Moderate, Minimal, and Wild River management categories, commercial harvest of timber and firewood to accomplish management objectives will only occur when an approved refuge fire management plan identifies the need to reduce fuel loads in an area. Applicable federal and State of Alaska guidelines for timber management will be followed. Commercial harvest of timber and firewood is not allowed in designated Wilderness.

2.4.17.5 Commercial Gathering of Other Resources

Commercial gathering of other resources (e.g., antlers or mushrooms) requires a special use permit under 50 CFR 27.51 and may be authorized in Intensive and Moderate management areas.

2.4.17.6 Commercial Filming and Recording Activities

It is Service policy to provide Refuge access and/or assistance to firms and individuals in the pursuit of commercial visual and audio recordings when they are compatible with refuge purposes or the mission of the Refuge System. Commercial films, television production, or sound tracks made within the Refuge for other than news purposes require a special use permit or authorization (43 CFR 5.1).

Commercial filming or recording activities such as videotaping, audio taping, and photography for the purpose of advertising products and services are subject to an A/V Production Permit (Refuge Manual 8 RM 16).

Permits are not required for still photography on refuge lands open to the public, including commercial still photography, so long as no models or props which are not a part of the site's natural or cultural resources or administrative facilities are used (16 U.S.C. 460l-6d(c)).

2.4.17.7 Other Commercial Uses

Generally, other commercial uses such as grazing, agriculture, and hydroelectric power development will not be allowed. An exception may be made for low-head or small run-of-the-river hydropower facilities. These may be authorized in Intensive and Moderate management areas on a case-by-case basis. See section 2.4.13.9 for transmission lines, pipelines, and other rights-of-way mentioned in title XI of ANILCA.

2.4.18 Environmental Contaminants Identification and Cleanup

One goal of the Refuge Administration Act, as amended, is to maintain the biological integrity, diversity, and environmental health of the Refuge System. In support of this goal, the Service studies environmental contaminants that may threaten trust species (i.e., those species for which the Service has primary jurisdiction) and other resources of the Refuge. This work will continue as new concerns are identified and as funding allows.

An assessment of known or suspected contaminants threats is normally completed for each refuge as part of the national Contaminants Assessment Process. During comprehensive conservation plan revisions, existing information will be reviewed, and an assessment of potential contaminants threats will be entered into an electronic database. A contaminant assessment report will also be prepared.

When contaminants are identified on refuge lands, the Service will initiate discussions with the responsible party or parties to remedy the situation. If the Service caused the contamination, funds will be sought to define the extent and type of the contamination and to remedy it. Appropriate environmental regulations—including the Resource Conservation Recovery Act, Comprehensive Environmental Response and Compensation Liability Act, Oil Pollution Act of 1990, and State of Alaska regulations (e.g., 18 AAC 75)—would be followed during remediation work.

All spills of petroleum products and hazardous materials must be reported to the Alaska Department of Environmental Conservation and to the National Response Center. Incidents also need to be reported to the U.S. Fish and Wildlife Service Regional Spill Response

Coordinator. The Refuge will refer to the U.S. Fish and Wildlife Service Region 7 Spill Response Contingency Plan and other relevant plans when responding to spills.

2.4.19 Management of Designated Wilderness

Designated Wilderness within the Refuge will be managed in accordance with the Wilderness Act of 1964, as modified by provisions of ANILCA; Service guidelines as found in the Refuge Manual (6 RM 8) and part 610 of the Service Manual, when approved; and regional policy. Preserving the wilderness character of the area is the management focus for designated Wilderness. A minimum requirements analysis will be conducted for administrative activities proposed in Wilderness areas. This two-step decision process involves determining if an activity should be conducted in the Wilderness Area and, if so, determining the minimum tool, which is the least intrusive tool, equipment, device, force, regulation, or practice deemed necessary to achieve a management objective in Wilderness.

Certain activities are legislatively prohibited in designated Wilderness, including oil, gas, and other mineral leasing and most surface-disturbing activities. Section 4(c) of the Wilderness Act generally prohibits roads, commercial enterprises, motor vehicles, motorboats, other forms of mechanical transport, motorized equipment, the landing of aircraft, and structures and installations in Wilderness areas. Provisions of ANILCA, however, provide exceptions to some of these prohibitions for specific purposes, such as allowing motorized public access for traditional activities, and for the continuation of pre-existing commercial and private use cabins. Following are some of the ANILCA provisions and their applicable sections affecting public use of Wilderness areas:

- Access for subsistence purposes (section 811)
- Access for traditional activities and to and from villages and home sites (section 1110(a))
- Access to state- or privately-owned lands (including subsurface rights), valid mining claims, or other valid occupancy (section 1110(b))
- Construction and use of cabins for traditional and customary uses (section 1303)
- Use of facilities associated with the exercise of valid commercial fishing rights (section 304(d))

Other provisions of ANILCA affect the administrative uses of Wilderness areas, including the following:

- Access for mineral assessment purposes, as part of the Alaska Mineral Resources Assessment Program (section 1010)
- Construction and maintenance of navigation aids and other facilities (section 1310)
- Continuation of existing, and construction of new, public use cabins (sections 1315(c) and (d))

Under 50 CFR 35.5(b), regional policy allows local residents engaged in subsistence activities to use chainsaws. Other motorized equipment not related to transportation (such as generators and water pumps) are not allowed.

Granting rights-of-way for transportation or utility systems through designated Wilderness requires Presidential and congressional approval (section 1106(b) of ANILCA; see also section 2.4.13.7).

A step-down Wilderness Stewardship Plan may be prepared for the Koyukuk Wilderness Area to address in greater detail its resources, uses, and management. Specific details would be included on how the broad management direction provided in the Comprehensive Conservation Plan would be applied to the Wilderness Area to preserve the wilderness character. The step-down plan would be prepared in cooperation with the State and other partners. Public involvement would be an essential part of preparation of the stewardship plan.

2.4.20 Administration of the Koyukuk, Northern Unit Innoko, and Nowitna National Wildlife Refuges

2.4.20.1 Administrative Sites and Visitor Facilities

Administrative sites include temporary and permanent field camps, residences, offices, and associated storage, communication, and transportation facilities. The type of administrative site and level of development will be consistent with the management intent of the management category in which they are constructed. Administrative field camps or other administrative facilities within Minimal, Wild River and Wilderness management categories will only be allowed when required to meet management objectives, when no reasonable alternative sites exist, and when the facilities are essential to protect the health and safety of employees. New facilities would only be the minimum required to meet long-term needs.

Fuel storage or other hazardous-material storage in conjunction with administrative sites will meet all federal and State requirements for spill containment and storage. Hazardous materials stored within the Wild River and Wilderness management categories will be in small (55-gallon or less) containers.

Under section 1306 of ANILCA, the Secretary of the Interior may establish administrative sites and visitor facilities, either within or outside the boundaries of a conservation system unit, in accordance with the unit's management plan and for the purposes of ensuring the preservation, protection, and proper management of the unit. Section 1306 (a)(2) further states that "To the extent practicable and desirable, the Secretary shall attempt to locate such sites and facilities on Native lands in the vicinity of the unit."

Department of Interior guidelines, developed in 1995 and implementing section 1306, require that prior to initiating a search for an administrative site or visitor facility, site-selection criteria be developed, with public input, and all proposals be evaluated according to the site-selection criteria. If it is determined that Native lands satisfy the site-selection criteria and are desirable and practicable for the intended use, the highest-ranked Native lands shall be selected as the preferred site, subject to a specific site evaluation. If no Native lands satisfy the site-selection criteria, the highest-ranked parcel will become the preferred site. Public comments will be considered prior to making a final decision.

Applicability of Refuge Regulations to Off-Refuge Administrative and Visitor Facility Sites:

Under 50 CFR 36.1(c) the Service is authorized to enforce regulations concerning public safety and protection of government property, and State of Alaska fish and wildlife regulations, on administrative and visitor facility sites that may be held in fee or less-than-fee title and are either inside or outside the approved boundaries of the Refuges. In the case of the Koyukuk, Northern Unit Innoko, and Nowitna National Wildlife Refuges, these sites are primarily located in the village of Galena.

2.4.20.2 Refuge Management Plans

Some management programs are addressed in sufficient detail in the Comprehensive Conservation Plan to be integrated directly into the budgetary process. For other programs, it may be necessary to prepare step-down management plans to implement general strategies identified in this Plan. Additional information on the step-down planning process can be found in 602 FW 3 of the Service Manual.

A list of refuge step-down management plans is found in section 5.1 of this Plan.

2.4.21 Alaska Mineral Resource Assessment Program

Section 1010 of ANILCA requires that all federal lands be assessed for their oil, gas, and other mineral potential, although section 304(c) prohibits new hard rock mining on refuges. Mineral assessment techniques that do not have lasting impacts—such as side-scanning radar, trenching, and core drilling—may be allowed throughout the Refuge. Special use permits issued to other government agencies or their contractors for assessment work would include stipulations to ensure that the assessment program is compatible with refuge purposes. For example, stipulations may limit access during nesting, calving, spawning, or other times when fish and wildlife may be especially vulnerable to disturbance.

2.5 Management Categories Table

2.5.1 Introduction

Table 2-1 lists activities, public uses, commercial uses, and facilities by management category. In some cases, it provides very specific guidance (such as for highway vehicles). In other cases (such as for research and management facilities), the direction is general. While facilities may be allowed in all management categories, the types of facilities and how they would be constructed and operated vary by management category. The descriptions of the management categories reflect a clear distinction in the level of action and constraints that may be placed on activities or development within the management categories. The descriptions of the management categories should be used to reflect the desired future condition of the area when site-specific proposals are being evaluated. Activities allowed or authorized within the different categories will be managed differently depending on the management category in which they occur. Those management categories and activities, public uses, commercial uses, and facilities that generally do not apply to the Refuge are shaded in gray.

2.5.1.1 Definitions for Management Categories Table

The following are definitions for terms used in the table.

Allowed—Activity, use, or facility is allowed under existing NEPA analysis, appropriate use findings, refuge compatibility determinations, and applicable laws and regulations of the Service, other federal agencies, and the State of Alaska.

May be allowed—Activity, use, or facility may be allowed subject to site-specific NEPA analysis, an appropriate use finding (when required), a specific refuge compatibility determination (when required), and compliance with all applicable laws and regulations of the Service, other federal agencies, and the State of Alaska.

May be authorized—Activity, use, or facility may be allowed; a special use permit or other authorization is required.

Not allowed—Activity, use, or facility is not allowed.

The following terms are used in the table and throughout this chapter.

NEPA analysis—All activities, uses, and facilities proposed for a refuge that have the potential to result in significant effects on the environment require an analysis of potential environmental impacts under the National Environmental Policy Act. This analysis may be documented as a categorical exclusion (CE), an environmental assessment (EA), or an environmental impact statement (EIS), depending on the nature of the proposed project.

Appropriate Use—All uses over which the Service has jurisdiction must be determined to be appropriate following direction in Service Manual 630 FW 1. Hunting, fishing, wildlife observation and photography, and environmental education and interpretation are considered appropriate by national policy with no further analysis required. See section 2.4.1 for a description of the criteria used to determine if other uses are appropriate.

Compatibility—All activities, uses, and facilities allowed on the refuge, except management actions undertaken by or for the Service, must be compatible with the purposes of the refuge and the mission of the Refuge System. The analysis that occurs results in a refuge compatibility determination. Management activities undertaken by the Service or by volunteers, cooperators, or contractors working for the Service, with limited exception, are exempt from compatibility review (part 603 of the Service Manual).

Regulations—All activities, uses, and facilities allowed on a refuge must comply with any applicable regulations, as published in the Code of Federal Regulations. Regulations are developed by the Service through a public process to implement the legal authorities under which the Service manages the Refuge System. For more information on these regulations, see the appropriate topic in the Management Policies and Guidelines section of this chapter. For some activities, other federal agency and/or State regulations may also apply.

Temporary—A continuous period of time not to exceed 12 months, except as specifically provided otherwise. Special use permits or other authorizations may prescribe a longer period of time, but the structures or other human-made improvements need to be readily and completely dismantled and removed from the site when the period of authorized use terminates.

The following guidelines apply to all activities, uses, and facilities on a refuge.

Area or time restrictions—All activities and uses allowed on a refuge may be restricted in certain areas or at certain times, at the discretion of the refuge manager and with the appropriate level of public involvement, by emergency (short-term) or permanent regulation, if necessary to protect refuge resources or human health and safety.

Management emergencies—Activities, uses, and facilities not allowed on a refuge or in specific management categories may be allowed if naturally-occurring or human-caused actions adversely affect refuge resources or threaten human health and safety.

Table 2-1. Activities, public uses, commercial uses, and facilities by management category.

Note: Those management categories that do not apply to the Refuges are shaded grey.

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
ECOSYSTEM, HABITAT, AND FISH AND WILDLIFE MANAGEMENT					
Ecosystem and Landscape Management					
Collecting Information on and Monitoring Ecosystem Components Data gathering, monitoring, and maintaining a comprehensive data base of selected ecosystem components (plants, animals, fish, water, air). (See sections 2.4.11 and 2.4.11.2)	Allowed*; see section 2.4.19	Allowed	Allowed	Allowed	Allowed
Research and Management Access and collection of data necessary for management decisions or to further science by the Service. (See section 2.4.11)	Allowed*; see section 2.4.19	Allowed	Allowed	Allowed	Allowed
Access and collection of data necessary for management decisions or to further science by ADF&G.	Allowed*; see section 2.4.19	Allowed	Allowed	Allowed	Allowed
Access and collection of data necessary for management decisions or to further science by other researchers.	May be authorized*; see section 2.4.19	May be authorized	May be authorized	May be authorized	May be authorized

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
Research and Management Facilities May be permanent or temporary structures or camps, including weirs, counting towers, and sonar counters. (See section 2.4.20.1)	May be allowed*; consistent with section 2.3.4	May be allowed	May be allowed	May be allowed	May be allowed
Fish and Wildlife Habitat Management					
Describing, Locating, and Mapping Habitats Development of quantitative, written, and graphic descriptions of fish and wildlife habitat, including water, food, and shelter components. (See section 2.4.10.1)	Allowed*; see section 2.4.19	Allowed	Allowed	Allowed	Allowed
Habitat Management (See section 2.4.10.1) <i>Mechanical Treatment:</i> Activities such as cutting, crushing, or mowing of vegetation; water control structures; fencing; artificial nest structures.	Not allowed*; with exceptions consistent with sections 2.3.4. See also section 2.4.19	May be allowed; with exceptions consistent with section 2.3.5	Not allowed; with exceptions consistent with section 2.3.3	May be allowed	May be allowed
<i>Chemical Treatment:</i> Use of chemicals to remove or control non-native species. (See section 2.4.11.8)	May be allowed*; see section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed
<i>Manual Treatment:</i> Use of hand tools to remove, reduce, or modify hazardous plant fuels or exotic plant species, or to modify habitats (e.g., remove beaver dams).	May be allowed*; see section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
<p>Aquatic Habitat Modifications Activities such as stream bank restoration, passage structures, fish barriers, or removal of obstacles which result in physical modification of aquatic habitats to maintain or restore native fish species. (See section 2.4.10.1)</p>	<p>May be allowed*; consistent with section 2.3.4. See also section 2.4.19</p>	<p>May be allowed; consistent with section 2.3.5</p>	<p>May be allowed</p>	<p>May be allowed</p>	<p>May be allowed</p>
<p>Fire Management—Prescribed Fires Fire ignited by management actions to meet specific management objectives. (See section 2.4.10.2)</p>	<p>May be allowed*; see section 2.3.4</p>	<p>May be allowed</p>	<p>May be allowed</p>	<p>May be allowed</p>	<p>May be allowed</p>
<p>Fire Management—Wildland Fire Use The planned use of naturally occurring fires to meet management objectives. (See section 2.4.10.2)</p>	<p>May be allowed*</p>	<p>May be allowed</p>	<p>May be allowed</p>	<p>May be allowed</p>	<p>May be allowed</p>
<p>Fire Management—Fire Suppression Management actions intended to protect identified resources from a fire, extinguish a fire, or alter a fire’s direction of spread. (See section 2.4.10.2)</p>	<p>Allowed</p>	<p>Allowed</p>	<p>Allowed</p>	<p>Allowed</p>	<p>Allowed</p>
<p>Non-native and Pest Plant Control Monitoring, extirpation, control, removal and/or relocation, and other management practices for pest and non-native plant species. (See section 2.4.11.8)</p>	<p>May be allowed*; see section 2.4.19</p>	<p>May be allowed</p>	<p>May be allowed</p>	<p>May be allowed</p>	<p>May be allowed</p>

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
Water Quality and Quantity Management Monitoring of water quality and quantity to identify baseline data and for management purposes; includes installation of gauging stations. (See section 2.4.9.2)	Allowed*; see section 2.4.19	Allowed	Allowed	Allowed	Allowed
Fish and Wildlife Population Management					
Reintroduction of Species The reintroduction of native species to restore natural diversity of fish, wildlife, and habitats. (See section 2.4.11.6)	May be allowed*; see section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed
Fish and Wildlife Control The control, relocation, sterilization, removal, or other management of native species including predators, to maintain natural diversity of fish, wildlife, and habitats; favor other fish or wildlife populations; protect reintroduced, threatened, or endangered species or to restore depleted native populations. (See section 2.4.11.7)	May be allowed*; see section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed
Non-native Species Management The removal or control of non-native species (including predators). (See section 2.4.11.8)	May be allowed*; see section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
<p>Pest Management and Disease Prevention and Control Relocation or removal of organisms that threaten human health or survival of native fish, wildlife, or plant species. Management practices directed at controlling pathogens that threaten fish, wildlife, and people, such as rabies and parasite control. (See section 2.4.11.9)</p>	May be allowed*; see section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed
<p>Fishery Restoration Actions taken to restore fish access to spawning and rearing habitat, or actions taken to restore populations to historic levels. Includes harvest management, escapement goals, habitat restoration, stocking, egg incubation boxes, and lake fertilization. (See section 2.4.11.10)</p>	May be allowed*	May be allowed	May be allowed	May be allowed	May be allowed
<p>Fishery Restoration Facilities Fisheries facilities may be permanent or temporary and may include hatcheries, fish ladders, fish passages, fish barriers, and associated structures. (See sections 2.4.11.1 and 2.4.20.1)</p>	May be authorized*	May be authorized	May be authorized	May be authorized	May be authorized
<p>Fishery Enhancement Activities applied to a fish stock to supplement numbers of harvestable fish to a level beyond what could be naturally produced based upon a determination or reasonable estimate of historic levels. (See section 2.4.11.11)</p>	May be allowed*; consistent with section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
Fishery Enhancement Facilities May be permanent or temporary and may include hatcheries, egg incubation boxes, fish ladders, fish passages, fish barriers, and associated structures. (See sections 2.4.11.11 and 2.4.20.1)	May be authorized*	May be authorized	May be authorized	May be authorized	May be authorized
Native Fish Introductions Movement of native fish species within a drainage on the Refuge to areas where they have not historically existed. (See section 2.4.11.6)	May be allowed*	May be allowed	May be allowed	May be allowed	May be allowed
Non-native Species Introductions Introduction of species not naturally occurring within the Refuge. (See section 2.4.11.6)	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
SUBSISTENCE (See section 2.4.12)					
Subsistence Activities					
Fishing, Hunting, Trapping, and Berry Picking The taking of fish and wildlife and other natural resources for personal consumption, as provided by law.	Allowed	Allowed	Allowed	Allowed	Allowed
Collection of House Logs and Firewood Harvesting live standing timber greater than 6 inches diameter at breast height for personal or extended family use.	May be authorized	May be authorized	May be authorized	May be authorized	May be authorized

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
Collection of House Logs and Firewood Harvesting live standing timber between 3 and 6 inches diameter at breast height for personal or extended family use.	20 trees or less per year allowed; more than 20 trees per year may be authorized; consistent with section 2.4.12	20 trees or less per year allowed; more than 20 trees per year may be authorized; consistent with section 2.4.12	20 trees or less per year allowed; more than 20 trees per year may be authorized; consistent with section 2.4.12	20 trees or less per year allowed; more than 20 trees per year may be authorized; consistent with section 2.4.12	20 trees or less per year allowed; more than 20 trees per year may be authorized; consistent with section 2.4.12
Collection of Plant Materials Harvesting trees less than 3 inches diameter at breast height, dead standing or downed timber, grass, bark, and other plant materials used for subsistence purposes.	Allowed	Allowed	Allowed	Allowed	Allowed
Temporary Facilities Establishment and use of tent platforms, shelters, and other temporary facilities and equipment directly related to the taking of fish and wildlife. (See section 2.4.15.2)	Tent platforms may be authorized; all others may be allowed	Tent platforms may be authorized; all others may be allowed	Tent platforms may be authorized; all others may be allowed	Allowed	Allowed
Subsistence Cabins – See Cabins (See also section 2.4.15.1)					
Subsistence Access – subject to reasonable regulations under provisions of section 811 of ANILCA (See section 2.4.12.1)					
Use of snowmobiles, motorboats, four-wheelers, and other means of surface transportation traditionally employed for subsistence purposes.	Allowed	Allowed	Allowed	Allowed	Allowed

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
ACCESS (See sections 2.4.12.1 and 2.4.13) Restrictions subject to provisions of section 1110 of ANILCA as applicable; see also Subsistence Access section above.					
Foot	Allowed	Allowed	Allowed	Allowed	Allowed
Dogs and Dog Teams	Allowed	Allowed	Allowed	Allowed	Allowed
Other Domestic Animals Includes horses, mules, llamas, etc. (certified weed-free feed required)	Allowed	Allowed	Allowed	Allowed	Allowed
Nonmotorized Boats Includes canoes, kayaks, rafts, etc.	Allowed	Allowed	Allowed	Allowed	Allowed
Motorized					
Use of snowmobiles, motorboats, airplanes, and nonmotorized surface transportation methods for traditional activities and for travel to and from villages and home sites.	Allowed	Allowed	Allowed	Allowed	Allowed
Highway Vehicles	Not allowed	Not allowed	Not allowed	May be allowed on designated roads	Allowed on all-weather roads
Off-Road Vehicles (All-Terrain Vehicles) Includes air boats and air-cushion vehicles. (See sections 2.4.12.1 and 2.4.13.2)	Not allowed; with exceptions consistent with section 2.4.12	Not allowed; with exceptions consistent with section 2.2.12.2	Not allowed; with exceptions consistent with section 2.4.12.2	May be allowed	May be allowed
Helicopters Includes all rotary-wing aircraft. (See section 2.4.13.3)	May be authorized; consistent with sections 2.3.4 and 2.4.19	May be authorized	May be authorized	May be authorized	May be authorized

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
PUBLIC USE, RECREATION, and OUTREACH ACTIVITIES Also see ACCESS and Commercial Recreation sections.					
Hunting, Fishing, Wildlife Observation, Wildlife Photography, Interpretation and Environmental Education Note: All activities listed are priority public uses. (See sections 2.4 and 2.4.14)	Allowed	Allowed	Allowed	Allowed	Allowed
Trapping, Walking, Hiking, Camping at Undeveloped Sites, and Dog Sledding (See sections 2.4 and 2.4.14)	Allowed	Allowed	Allowed	Allowed	Allowed
General Photography See also COMMERCIAL USES. (See sections 2.3 and 2.4.14)	Allowed	Allowed	Allowed	Allowed	Allowed
Outreach Activities (See sections 2.3 and 2.4.16)	Allowed	Allowed	Allowed	Allowed	Allowed
Public Use and Recreation Facilities – level of development is consistent with management intent of the category (See section 2.4.15)					
All Weather Roads And associated developments including bridges.	Not allowed	Not allowed	Not allowed	May be allowed	May be allowed
Unimproved Roads Note: while unimproved roads are not allowed in Minimal management, Wilderness, and Wild Rivers, roads may exist. In these management categories, the roads would not be designated for use or maintained.	Not allowed	Not allowed	Not allowed	May be allowed	May be allowed
Designated Off-Road Vehicle (All-Terrain Vehicle) Trails and Routes	Not allowed	May be allowed	Not allowed	May be allowed	May be allowed
Roadside Exhibits and Waysides	Not applicable	Not applicable	Not applicable	May be allowed	May be allowed
Constructed and Maintained Airstrips	Not allowed	Not allowed	Not allowed	May be allowed	May be allowed

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
Cleared Landing Strips and Areas Includes unimproved areas where airplanes land. Minor brush cutting or rock removal by hand is allowed for maintenance.	Existing strips allowed to remain*; new strips not allowed; see section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed
Constructed Hiking Trails Includes bridges, boardwalks, trailheads, and related facilities.	May be allowed*	May be allowed	May be allowed	May be allowed	May be allowed
Designated Hiking Routes Unimproved and unmaintained trails; may be designated by signs, cairns, and/or on maps.	Allowed	Allowed	Allowed	Allowed	Allowed
Boat Launches and Docks Designated sites for launching and storing watercraft or tying up a float plane.	May be allowed*	May be allowed	May be allowed	May be allowed	May be allowed
Visitor Contact Facilities A variety of staffed and unstaffed facilities providing information on the Refuge and its resources to the public; facilities range from visitor centers to kiosks and signs. (See section 2.4.15)	Generally not allowed*; see sections 2.3.4 and 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed
Campgrounds Developed sites accessible by highway vehicles.	Not applicable	Not applicable	Not applicable	May be allowed	May be allowed

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
<p>Hardened Campsites Areas where people can camp that are accessible by vehicle or on foot but where the only facilities provided are for public health and safety and/or resource protection; may include gravel pads for tents, hardened trails, and/or primitive toilets. (See section 2.4.15)</p>	Allowed*; consistent with section 2.4.19	Allowed	Allowed	Allowed	Allowed
<p>Temporary Facilities Includes tent frames, caches, and other similar or related facilities; does not include cabins. See also SUBSISTENCE, COMMERCIAL USES, and Administrative Facilities. (See section 2.4.15.2)</p>	Tent platforms may be authorized; all others may be allowed	Tent platforms may be authorized; all others may be allowed	Tent platforms may be authorized; all others may be allowed	Tent platforms may be authorized; all others may be allowed	Tent platforms may be authorized; all others may be allowed
Cabins – also other related structures such as outdoor toilets, food caches, storage sheds, and fish drying racks (See section 2.4.15.1)					
<p>Public Use Cabin A cabin administered by the Service and available for use by the public; intended only for short-term public recreational use and occupancy.</p>	Existing cabins allowed to remain*; new cabins may be allowed; consistent with section 2.4.19	Existing cabins allowed to remain; new cabins may be allowed	Existing cabins allowed to remain; new cabins may be allowed	Existing cabins allowed to remain; new cabins may be allowed	Existing cabins allowed to remain; new cabins may be allowed
<p>Administrative Cabin Any cabin primarily used by refuge staff or other authorized personnel for the administration of the Refuge. (See section 2.4.20.1)</p>	May be allowed*; consistent with section 2.4.19	May be allowed	May be allowed	May be allowed	May be allowed
<p>Subsistence Cabin Any cabin necessary for health and safety and to provide for the continuation of ongoing subsistence activities; not for recreational use.</p>	Existing cabins allowed to remain; new cabins may be authorized; consistent with section 2.4.19	Existing cabins allowed to remain; new cabins may be authorized	Existing cabins allowed to remain; new cabins may be authorized	Existing cabins allowed to remain; new cabins may be authorized	Existing cabins allowed to remain; new cabins may be authorized

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
<p>Commercial Cabin Any cabin which is used in association with a commercial operation, including but not limited to commercial fishing activities and recreational guiding services.</p>	Existing cabins allowed to remain; new cabins not allowed consistent with section 2.4.19	Existing cabins allowed to remain; new cabins may be authorized	Existing cabins allowed to remain; new cabins may be authorized	Existing cabins allowed to remain; new cabins may be authorized	Existing cabins allowed to remain; new cabins may be authorized
<p>Other Cabins Cabins associated with authorized uses by other government agencies.</p>	May be authorized; consistent with section 2.4.19	May be authorized	May be authorized	May be authorized	May be authorized
Administrative Facilities (See section 2.4.20.1)					
<p>Administrative Field Camps Temporary facilities used by refuge staff and other authorized personnel to support individual (generally) field projects; may include, but not limited to, tent frames and temporary/portable outhouses, shower facilities, storage/maintenance facilities, and caches.</p>	May be allowed*	May be allowed	May be allowed	May be allowed	May be allowed
<p>Administrative Field Sites Permanent facilities used by refuge staff or other authorized personnel for the administration of the Refuge. Includes administrative cabins and related structures (see Cabins) and larger multi-facility administrative sites necessary to support ongoing field projects, research, and other management activities. Temporary facilities, to meet short-term needs, may supplement the permanent facilities at these sites.</p>	Use of existing sites allowed, including replacement of existing facilities as necessary; new sites may be allowed*; consistent with sections 2.3.4 and 2.4.19	Use of existing sites allowed including replacement of existing facilities as necessary; new sites may be allowed	Use of existing sites allowed including replacement of existing facilities as necessary; new sites may be allowed	Use of existing sites allowed including replacement of existing facilities as necessary; new sites may be allowed	Use of existing sites allowed including replacement of existing facilities as necessary; new sites may be allowed

* subject to minimum requirements analysis

Chapter 2: Goals and Objectives, Management Policies, and Alternatives

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
Refuge Administrative Office Complex Facilities necessary to house refuge operations, outreach, and maintenance activities, and associated infrastructure; includes staff offices, storage, maintenance, parking lots, and other similar facilities.	Not allowed	Not allowed	Not allowed	Not allowed	May be allowed
Hazardous Materials Storage Sites, including appropriate structures and equipment, necessary for the storage and transfer of fuels and other hazardous materials used for administrative purposes; must be in compliance with all federal and State requirements.	May be allowed	May be allowed	May be allowed	May be allowed	May be allowed
Residences Residential housing for refuge staff and their families; includes single and multi-family dwellings.	Not allowed	Not allowed	Not allowed	Not allowed	May be allowed
Bunkhouses Quarters to house temporary and similar employees, volunteers, visitors, and other agency personnel.	Not allowed	Not allowed	Not allowed	May be allowed	May be allowed
Aircraft Hangars and Facilities for Storage of Aircraft.	Not allowed	Not allowed	Not allowed	Not allowed	May be allowed
Boat Launches and Docks Designated sites for launching and storing watercraft or tying up a float plane.	May be allowed*	May be allowed	May be allowed	May be allowed	May be allowed
Radio Repeater Sites Sites used to maintain radio communications equipment; may include helispots for access.	May be allowed*	May be allowed	May be allowed	May be allowed	May be allowed

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
COMMERCIAL USES					
Except as noted, a special use permit or other authorization is required for economic use of a refuge.					
Commercial Recreation – includes all forms of guiding, including those operated by nonprofit, educational, and other noncommercial groups (See section 2.4.17.1)					
Guiding and Outfitting	May be authorized	May be authorized	May be authorized	May be authorized	May be authorized
Transporting	May be authorized	May be authorized	May be authorized	May be authorized	May be authorized
Fixed-Wing Air Taxis	May be authorized	May be authorized	May be authorized	May be authorized	May be authorized
Helicopter Air Taxis	Not allowed; with exceptions consistent with section 2.4.13.3	May be authorized	May be authorized	May be authorized	May be authorized
Bus and Auto Tours	Not applicable	Not applicable	Not applicable	May be authorized	May be authorized
Mineral Exploration (See section 2.4.17.2) See section 2.4.21 for information on the Alaska Mineral Resource Assessment Program.					
Surface Geological Studies Includes surface rock collecting and geological mapping activities (includes helicopter or fixed-wing access).	Not allowed	May be authorized	May be authorized	May be authorized	May be authorized
Geophysical Exploration and Seismic Studies Examination of subsurface rock formations through devices that set off and record vibrations in the earth. Usually involves mechanized surface transportation, but may be helicopter supported; includes studies conducted for the Department of the Interior.	Not allowed	May be authorized	May be authorized	May be authorized	May be authorized

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
Core Sampling Using helicopter transported motorized drill rig to extract subsurface rock samples; does not include exploratory wells; includes sampling conducted for Department of the Interior.	Not allowed	May be authorized	May be authorized	May be authorized	May be authorized
Other Geophysical Studies Helicopter-supported gravity and magnetic surveys and other minimal impact activities that do not require mechanized surface transportation.	Not allowed	May be authorized	May be authorized	May be authorized	May be authorized
Mineral Development (see section 2.4.17.2)					
Oil and Gas Leasing Leasing, drilling, and extraction of oil and gas for commercial purposes. Includes all associated above and below ground facilities.	Not allowed	Not allowed	Not allowed	Not allowed	May be authorized
Sale of Sand, Gravel, and Other Common Variety Minerals Extraction of sand, gravel, and other saleable minerals for commercial purposes; includes commercial use by federal, State, and local agencies.	Not allowed	Not allowed	Not allowed	May be authorized	May be authorized
Other Mineral Leasing Includes the extraction of coal, geothermal resources, potassium, sodium, phosphate, sulfur, or other leasable minerals for commercial purposes. For cases of national need, see section 2.4.17.2.	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
Mining of Hardrock Minerals Development of valid (pre-ANILCA) mining claims (lode, placer, and mill sites) on refuge lands for the purpose of extracting hardrock minerals. There are no valid claims on the Refuge.	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
Other Commercial Activities					
Commercial Filming, Videotaping, and Audio taping (See section 2.4.17.6)	May be authorized	May be authorized	May be authorized	May be authorized	May be authorized
Grazing (See section 2.4.17.7)	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
Agriculture (Commercial) (See section 2.4.17.7)	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
Commercial Fishery Support Facilities At or below 1979 levels. (See section 2.4.17.3)	Allowed	Allowed	Allowed	Allowed	Allowed
Commercial Fishery Support Facilities Above 1979 levels. (See section 2.4.17.3)	Not allowed	May be authorized	May be authorized	May be authorized	May be authorized
Seafood Processing (See section 2.4.17.3)	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
Aquaculture and Mariculture Support Facilities (See section 2.4.17.3)	Not allowed	Not allowed	Not allowed	Not allowed	May be authorized
Commercial Timber and Firewood Harvest (See section 2.4.17.4)	Not allowed	May be authorized	May be authorized	May be authorized	May be authorized
Commercial Gathering of Other Refuge Resources (See section 2.4.17.5)	Not allowed	Not allowed	Not allowed	May be authorized	May be authorized

* subject to minimum requirements analysis

ACTIVITY	MANAGEMENT of WILDERNESS	MANAGEMENT of WILD RIVERS	MINIMAL MANAGEMENT	MODERATE MANAGEMENT	INTENSIVE MANAGEMENT
<p>Transportation and Utility Systems Includes transmission lines, pipelines, telephone and electrical power lines, oil and gas pipelines, communication systems, roads, airstrips, and other necessary related facilities. Does not include facilities associated with on-refuge oil and gas development. (See section 2.4.13.7)</p>	May be authorized by Congress	May be authorized	May be authorized; would require a plan amendment	May be authorized	May be authorized
<p>Navigation Aids and Other Facilities Includes air and water navigation aids and related facilities, communication sites and related facilities, facilities for national defense purposes and related air/water navigation aids, and facilities for weather, climate, and fisheries research and monitoring; includes both private and government facilities. (See section 2.4.13.11)</p>	May be authorized*	May be authorized	May be authorized	May be authorized	May be authorized
<p>Major Hydroelectric Power Development Hydroelectric dams creating a change in stream flow with an elevation change and reservoir behind the dam. (See section 2.4.17.7)</p>	Not allowed	Not allowed	Not allowed	Not allowed	Not allowed
<p>Small Hydroelectric Power Development Hydroelectric generation by low-head or in-stream structures that do not change the flow of the river. (See section 2.4.17.7)</p>	Not allowed	Not allowed	Not Allowed	May be authorized	May be authorized

* subject to minimum requirements analysis

2.6 Process Used to Develop Alternatives

Alternatives were developed to address issues, to meet goals, and to comply with laws, regulations, and policies. As discussed in chapter 1, issues of concern to the public were identified from responses to planning updates, a worksheet, and at nine meetings held in neighboring villages.

The National Environmental Policy Act (NEPA) directs that we develop a range of alternatives that includes all reasonable alternatives. NEPA also directs that alternatives that were eliminated from detailed study (section 2.7) be discussed briefly to explain the reasons for their having been eliminated (40 CFR 1502.14(a)). The no action alternative (Alternative A) would continue current management under the 1987 comprehensive conservation plans. The proposed alternative (Alternative B) is responsive to the laws and regulations governing management of the National Wildlife Refuge System, to the mission and goals of the Service and the Refuge System, and to the purposes for which the refuge was established. Alternative B includes the goals and objectives and the management policies and guidelines presented in sections 2.1 through 2.5 of this chapter.

The Plan revision core team developed the proposed action during their January 24–25, 2008, meeting. They examined what had been done to manage the Refuge during the past 21 years (the No-Action Alternative – A) and listed what changes they wanted to see, which became the Action Alternative – B. The alternatives were reviewed and refined by the core team during the April 30, 2008, Plan meeting. Because we are revising an existing plan and because we are not proposing major changes in management direction, only two alternatives are considered in detail.

2.7 Alternatives Considered But Eliminated from Detailed Study

Actions and strategies considered in preliminary alternatives, but subsequently eliminated from detailed consideration, included the following.

2.7.1 Recommending Rivers for Inclusion in the National Wild and Scenic Rivers System

As a result of concerns expressed by the State of Alaska and subsequent analysis of those concerns by the Service, alternatives that would have recommended Congress consider rivers for inclusion in the National Wild and Scenic Rivers System were eliminated from detailed consideration. In compliance with section 304(g) of ANILCA, special values of the Refuge, including river-related values, are discussed in this plan (see chapter 3); however, recommendations for designations are not included in the proposed action. Current and proposed management direction will provide adequate protection for all river-related values.

2.7.2 Recommending Additional Lands for Designation as Wilderness

As a result of concerns expressed by the State of Alaska and subsequent analysis of those concerns by the Service, alternatives that would have recommended Congress consider additional lands for inclusion in the National Wilderness Preservation System were eliminated from detailed consideration. With passage of ANILCA in 1980, approximately 400,000 acres of land within the boundaries of the Koyukuk were designated as Wilderness. Additionally, as directed by sections 304(g) and 1317 of ANILCA, lands administered by the Refuge were reviewed in 1987 during development of the Refuge's first comprehensive conservation plans "as to their suitability or non-suitability for preservation as wilderness." The review found all non-designated refuge lands suitable for designation as Wilderness. The records of decision signed by the Service Alaska regional director on December 2, 1987, did not recommend any

lands for inclusion in the National Wilderness Preservation System. In compliance with section 304(g) of ANILCA, special values of the Refuge, including wilderness values, are discussed in chapter 3 of this plan; however, recommendations for designations are not included in the proposed action. Current and proposed management direction should provide adequate protection for wilderness values.

2.7.3 A Designated ORV Trail System

Refuge staff had concerns about future ORV use on the Refuge that could result in unacceptable impacts and would result in designation of an ORV trail system. Further discussion among the staff resulted in developing a monitoring strategy, which was incorporated into one of the objectives in Alternative B. The monitoring strategy would establish a baseline of current of use and provide a means of assessing impacts over time.

2.8 Comparison of Alternatives

2.8.1 Elements Common to Both Alternatives

This section identifies some of the key elements that will be included in the Comprehensive Conservation Plan regardless of the alternative selected. Both alternatives would do the following:

- Continue to reflect existing laws, Executive orders, regulations, and policies governing Service administration and operation of the National Wildlife Refuge System.
- Protect and maintain the wildlife and habitat values and natural diversity within the Refuge.
- Provide opportunities to pursue traditional subsistence activities, recreational hunting, fishing, and other wildlife-dependent activities in sustainable manners.
- Provide methods of access currently allowed by law and regulation.
- Provide opportunities to pursue research.
- Conduct wildlife and habitat management activities consisting primarily of research, inventory, and monitoring projects rather than manipulative management. Management would focus on natural processes, using the least intrusive methods on a majority of the Refuge. This management would cause minimal disturbance to wildlife, habitat, and the visiting public.
- Preserve the wild, unaltered character of the Refuge; no roads, hardened trails, or visitor facilities would be developed on the refuge unless needed to prevent degradation of resources.
- Continue to allow compatible private and commercial uses of the Refuge.

2.8.2 Comparison of Current and New Regional Management Policies and Guidelines

Table 2-2 highlights the primary changes in management direction between Alternative A (Current Management) and Alternative B (Proposed Action). Management direction under Alternative A is taken from the 1987 Koyukuk and Northern Unit Innoko (USFWS 1987a) and Nowitna National Wildlife Refuge Comprehensive Conservation Plans (USFWS 1987b) and Records of Decision (USFWS 1987c, USFWS 1987d), as modified by subsequent step-down management plans. Alternative B proposes adoption of new regional management direction that is applicable to the Refuge (see sections 2.2 through 2.5). Direct comparison of current and proposed management direction is difficult because the organization of the tables and level of detail provided for various categories of actions are quite different.

2.8.3 Management Direction Common to Both Alternatives

This section identifies management direction that would be implemented on the Refuge regardless of which alternative is selected. It is the same under Alternatives A and B. The following list does not identify regional management direction that does not apply to the Refuge (e.g., major hydroelectric power development). **Please refer to section 2.4 for specific information about management direction.**

The following would be **allowed**¹ in Minimal, Wild River, and Wilderness management categories under both alternatives:

- Collecting information on and monitoring ecosystem components
- Research conducted by the Service and ADF&G
- Describing, locating, and mapping habitats
- Wildland fire suppression
- Water quality and quantity management
- Subsistence hunting, fishing, trapping, and berry picking
- Collection of plant materials
- Subsistence access
- Foot access
- Dog and dog team access
- Motorized and non-motorized access for traditional activities and for travel to and from villages and home sites
- Hunting, fishing, wildlife observation, wildlife photography, interpretation, and environmental education
- Trapping, walking, hiking, camping in undeveloped sites, and dog sledding
- General photography
- Outreach activities
- Existing public use cabins
- Existing subsistence cabins
- Existing commercial cabins

¹**Allowed:** “Activity or use is allowed under existing NEPA analysis, appropriate use findings, refuge compatibility determinations, and applicable laws and regulations of the Service, other federal agencies and the State of Alaska.”

The following **may be allowed**² in Minimal, Wild River, and Wilderness management categories under both alternatives:

- Habitat management
- Aquatic habitat modifications
- Prescribed fire use
- Wildland fire use
- Non-native and pest plant control
- Reintroduction of species
- Fish and wildlife control
- Non-native species management
- Pest management and disease prevention and control
- Fishery restoration
- Fishery enhancement
- Temporary subsistence facilities
- Designated cleared landing strips and areas
- Designated hiking routes
- Administrative field sites
- Hazardous materials storage
- Radio repeater sites

²**May be allowed:** “Activity, use, or facility may be allowed subject to site-specific NEPA analysis, an appropriate use finding (when required), a specific refuge compatibility determination (when required), and compliance with all applicable laws and regulations of the Service, other federal agencies and the State of Alaska.”

The following activities and/or facilities **may be authorized**³ in Minimal, Wild River, and Wilderness management categories under both alternatives:

- Research conducted by others
- Fishery restoration facilities
- Fishery enhancement facilities
- Helicopters (not for general public access)
- Subsistence collection of house logs and firewood
- New subsistence cabins
- Temporary public use facilities
- New public use cabins
- Other cabins
- Guiding and outfitting
- Transporting
- Fixed-wing air taxis
- Commercial filming, videotaping, and audio taping
- Transportation and utility systems

³**May be authorized:** “Activity, use, or facility may be allowed; a special use permit or other authorization is required.”

The following activities and/or facilities **may be authorized** in the Minimal management category under both alternatives:

- Helicopter air taxis
- Core sampling
- Geophysical exploration and seismic studies

The following activities and/or facilities **would not be allowed**⁴ in Minimal, Wild River, and Wilderness management category under both alternatives:

- Non-native species introductions
- Designated off-road vehicle trails and routes
- Oil and gas leasing
- Sand and gravel removal
- Other mineral leasing (e.g., coal, geothermal resources, etc.)

⁴**Would not be allowed:** Activity, use, or facility would not be allowed.

2.9 Alternative A – Current Management (No-Action Alternative)

Alternative A (No-Action Alternative) describes current management of the Refuge. It provides the baseline against which to compare Alternative B (Proposed Action).

2.9.1 General Management Direction

Management of the Refuge would continue to follow the 1987 Refuge Comprehensive Conservation Plans, as amended by subsequent step-down management plans. Refuge management would continue to reflect existing laws, Executive orders, regulations, and policies governing Service administration and operation of the National Wildlife Refuge System. The entire Refuge would continue to be managed to protect existing wilderness values following guidelines identified and described in the 1987 Refuge Comprehensive Conservation Plans. Alternative A would continue to protect and maintain existing wildlife values, natural diversity, and ecological integrity of the Refuge. Human disturbances to fish and wildlife habitats and populations would be minimal. Public uses of the Refuge employing existing access methods would continue to be allowed. Opportunities to pursue traditional subsistence activities, and recreational hunting, fishing, and other wildlife-dependent activities would be maintained. Private and commercial uses of the Refuge would be unchanged. Opportunities to pursue research would be maintained. The appropriate wildland fire suppression, wildland fire use, or prescribed fire response would be utilized to provide for

public and firefighter safety in and around the Refuge and to maintain a relatively intact natural fire regime.

2.9.2 Management Categories

Lands within the Refuge would be managed under three management categories (see Table 2-1). For information about management of these lands see sections 2.3.3, 2.3.4, and 2.3.5.

Minimal Management – Lands in this category would be managed to maintain the condition of those areas that have high fish and wildlife and wilderness values but have not been designated by Congress as part of the National Wilderness Preservation System. Public uses, economic activities, and facilities are managed consistently with the management intent of this category. Approximately 5,502,078 acres (91 percent) of refuge land would be managed under the Minimal management category.

Wilderness Management – Lands in this category have been designated by Congress as Wilderness. This management category preserves the pristine and unmodified character of these areas. Natural fish and wildlife population dynamics and habitats are emphasized, although regulated hunting, fishing, and trapping is allowed. Some motorized access is allowed (see ANILCA sections 811 and 1110). This is the most protective of the management categories. Approximately 400,000 acres (seven percent) of refuge land is managed under the Wilderness management category.

Wild and Scenic River Management – Lands in this category have been designated by Congress as the Nowitna Wild River. This management category preserves the “outstandingly remarkable” values of that river. Natural fish and wildlife population dynamics and habitats are emphasized, although regulated hunting, fishing, and trapping is allowed. Two hundred twenty three miles of the Nowitna River is managed under the Wild and Scenic River management category, which includes approximately 142,400 acres (two percent) of refuge land.

2.9.3 Specific Management Direction

The following discussion describes how Alternative A would address the significant issues identified during public scoping. It provides management direction for major refuge programs as they would be implemented under the alternative.

2.9.3.1 Issue 1: How will the Refuge maintain/manage wildlife populations, especially moose, in the face of competition between users and predators?

The Refuge would continue to annually implement the Inventory and Monitoring Plan for a variety of species. The refuge moose population is a large component of this Plan. Surveys are designed to assess trends in and the health of the moose population and provide the data needed to make recommendations to the Board of Game and Federal Subsistence Board on hunting regulations, seasons, and bag limits. Moose habitat information would be gathered to assess the quality and quantity of available moose browse. This information would be used to determine if some form of habitat manipulation (normally prescribed fire) is needed. The Refuge would participate in and assist with studies of moose and their habitat and other wildlife conducted by agencies, universities, and wildlife management organizations. Wolf surveys would be conducted periodically to assess the overall population, its general health, and distribution. The Refuge would continue to monitor the Galena Mountain caribou herd. General outreach would continue to share and assess wildlife population trends with the public.

Annual migratory bird surveys would be conducted to monitor populations of waterfowl species. Tundra and trumpeter swan research has been conducted in the past three years and would continue depending upon funding. Currently there are no active furbearer inventories outside of the fall beaver cache survey. This survey would continue on an annual basis. Other mammal surveys have not been routinely conducted and are not planned for the immediate future.

2.9.3.2 Issue 2: How will the Refuge address future (off-refuge) mining, oil, and gas development and its effect on the refuge environment?

We are currently investigating options to include some ongoing water quality monitoring in our Inventory and Monitoring Plan.

2.9.3.3 Issue 3: How will the Refuge identify and address contaminants that affect the wild food we eat and water quality?

The contaminant baseline data for water, sediments, and fish on the Refuge that was completed in the early 1980s would be listed in the Inventory and Monitoring Plan to be updated within the next 10 years. The following rivers would be re-done on the Koyukuk Refuge – Hogatza River mouth, Koyukuk River at the northeast boundary of the Koyukuk west of Higgins Island, Koyukuk River five miles upstream from the Hogatza River, Clear Creek mouth with Hogatza River, Caribou Creek mouth with Hogatza River, Huslia River mouth, Kateel River mouth, Dulbi River mouth, and Gisasa River mouth; on the Northern Unit Innoko Refuge – Bonanza Creek east of the entrance of Camp Creek and Bishop Creek; and on the Nowitna Refuge – Nowitna River mouth, Sulatna River mouth, Titna River mouth, Sulatna River at the refuge boundary, Sulatna River mouth, California Creek mouth with Titna River, Sulukna River mouth with Nowitna River, and Nowitna River at southern refuge boundary.

The Refuge would continue to assist Service field offices, the State, and other federal agencies with the monitoring of heavy metals in fish and wildlife.

2.9.3.4 Issue 4: How will the Refuge monitor and address the effects of climate change?

At present there are no climate change-specific monitoring plans in place. Changes in climate would be deduced from changes measured/observed in existing wildlife and habitat monitoring efforts.

2.9.3.5 Issue 5: How will the Refuge address maintaining the wild character of the Refuge and wilderness quality?

The Refuge would continue to manage the Koyukuk Wilderness in a manner that insures its wilderness quality. The Nowitna River would continue to be managed to maintain the “outstandingly remarkable” values that lead it to be designated as a Wild River. The wild character of refuge lands would be maintained under Minimal Management.

2.9.3.6 Issue 6: How will the Refuge address future public use of the Refuge?

We anticipate that public use would continue to occur at a low level due to the remoteness of the refuges and the difficulty and cost of access. There are no major developments planned for any of the refuges. Current uses would remain unchanged.

2.9.3.7 Issue 7: How can the refuge fire management program help villages address their hazardous fuel accumulations?

The fire management program would continue to work with any nearby villages to help them address their hazardous fuel accumulations around the village. Funding for such projects is dependent upon national funding levels and variable from year to year.

2.9.3.8 Issue 8: How will the Refuge address the need for more outreach and better communication with the public?

Public outreach and environmental education would continue to be one of the major focuses of the Refuge. Requests for environmental education and outreach would be addressed primarily by the Refuge Ranger, but public outreach and education can be done by all refuge employees throughout the year. Annual informational meetings would be held in each village to provide an overview of annual work and an opportunity for discussion.

2.9.4 Funding and Personnel Requirements

The Refuge operational budget for fiscal year 2008 was \$1,923,900. This includes \$1.8 million for refuge operations and \$123,900 for fire funding. To maintain the current level of services, an additional 3.5 percent is needed each year to offset inflation.

Major maintenance and/or construction projects planned for the next five years include (1) replacement of the existing hangar, (2) building a new office and maintenance shop or purchasing the existing facility, and (3) routine maintenance of Service housing. No cost estimates have been made for those projects.

Only one additional staff member has been identified under this alternative: a fisheries biologist/hydrologist position.

2.10 Alternative B – The Proposed Action

2.10.1 General Management Direction

Although most of the general management direction described in Alternative A would continue, some specific directions and actions occurring under the current management would be altered or not pursued under this alternative. The major difference between the two alternatives is that under Alternative B, refuge programs are defined in more detail and have been expanded to meet the current needs of refuge users. These differences are displayed in Table 2-2.

2.10.2 Management Categories

The acreages within each of the three management categories would remain the same as in Alternative A. Several changes would be made to the management activities for these three categories with substantial changes reflected in Table 2-1.

2.10.3 Specific Management Direction

2.10.3.1 Issue 1: How will the Refuge maintain/manage wildlife populations, especially moose, in the face of competition between users and predators?

The same as for Alternative A.

2.10.3.2 Issue 2: How will the Refuge address future (off-refuge) mining, oil, and gas development and its effect on the Refuge environment?

The Service would comment on all proposed off-refuge mining, oil, and gas development proposals and potential effects on the Refuge.

The Regional Office Water Resources Branch is scheduled to do a baseline water quantity and quality assessment of the Refuge starting in 2018, assuming adequate budget and staffing are available. This would be a six-year investment to assess water quality and quantity.

Upon request, the Refuge would assist the Tanana, Ruby, Galena, Koyukuk, Nulato, Kaltag, Huslia, or Hughes tribal or city councils with the monitoring of contaminants in the rivers and streams that lie within refuge lands.

2.10.3.3 Issue 3: How will the Refuge identify and address contaminants that affect the wild food we eat and water quality?

The same as for Alternative A. Also, see Issue 2 immediately preceding this text.

2.10.3.4 Issue 4: How will the Refuge monitor and address the effects of climate change?

Projects that specifically address climate related concerns (such as changing wetland dynamics) would be incorporated into the Inventory and Monitoring Plan. Whenever possible, monitoring would be conducted in conjunction with regional efforts so that refuge data would contribute to a broader scale of understanding of the effects of climate change. This information would be shared with other interested parties. The wildlife habitat biologist would be responsible for keeping abreast of climate change literature and research and sharing that information with the rest of the staff.

The Refuge would continue to cooperate with partners such as the University of Alaska Fairbanks to conduct research on local evidence and impacts of global climate change. The Refuge's existing historic and current weather records database for the refuge area would be updated annually for use in conjunction with long-term biological datasets to explore relationships between climate and wildlife populations.

2.10.3.5 How will the Refuge address maintaining the wild character of the Refuge and wilderness quality?

The same as Alternative A.

2.10.3.6 Issue 6: How will the Refuge address future public use of the Refuge?

The same as Alternative A.

2.10.3.7 Issue 7: How can the refuge fire management program help villages address their hazardous fuel accumulations?

The fire management officer would meet with leaders from Koyukuk and Ruby to assess the hazardous fuels condition of their villages and to determine the best course of action. The villages of Kaltag, Nulato, and Tanana have been or would be working with the Alaska Fire Service to address their hazardous fuel conditions. The Refuge would continue to support the Galena collaborative fuels reduction project with both funding and technical assistance until completion.

The Refuge would continue to provide technical assistance to the villages upon request—dependent upon staffing and funding. The Refuge would continue to participate in the statewide FIREWISE program and further the principles of the program.

2.10.3.8 Issue 8: How will the Refuge address the need for more outreach and better communication with the public?

The same as Alternative A.

2.10.4 Funding and Personnel Requirements

The Refuge operational budget would increase between \$100,000 and \$500,000 to fund the additional positions, which would support the biological and fire programs.

The Refuge would add three permanent positions: a fisheries biologist/hydrologist, a wildlife biologist, and a biological technician. Two permanent seasonal positions would be added: an assistant fire management officer and a refuge information technician. One seasonal position would be added: a biological technician. Three to five volunteers would be used during the summer to support the education, outreach, and biological programs.

Table 2-2 summarizes information presented in the preceding text while providing a comparison of the two alternatives by general topic (management categories, goals and objectives, management activity, and staffing and budget requests). Additional information about the Management Activities section may be found in Table 2-1.

Table 2-2. Comparison of the Alternatives A and B identified by management category, goals and objectives, management activity, and staffing and budget requests.

	Alternative A (Current Management)	Alternative B (Proposed Action)
MANAGEMENT CATEGORIES		
Minimal Management	5,502,078 acres (91% of total)	Same as Alternative A
Wild River	142,400 acres (2% of total)	Same as Alternative A
Designated Wilderness	400,000 acres (7% of total)	Same as Alternative A
GOALS AND OBJECTIVES*		
Biological Program		
2.1.1 Goal 1: Conserve fish and wildlife populations and habitats in their natural diversity in a manner consistent with natural ecological processes.	A-1 Inventory and monitor populations on an annual basis as delineated in the Wildlife Inventory Plan consistent with funding, time, weather, equipment, etc.	<p>Objective 1: Continue to implement and update the current Inventory and Monitoring Plan. Finalize the updates of the plan by January 2009 to reflect changes in techniques; add new projects focused on climate change, water quality, and wetlands; include new and ongoing cooperative efforts.</p> <p>Objective 4: Continue to work cooperatively with organizations such as the University of Alaska, U.S. Geological Survey, ADF&G, and tribal organizations to develop and implement research on global climate change, and (upon adequate funding) incorporate new monitoring efforts into our existing I&M Plan that focuses on detecting long-term changes to refuge ecosystems.</p>

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
	A-8 Update and continue implementing the Refuge's fisheries management plans in cooperation with the Fisheries Resource Office within the next five years.	<p>Objective 2: Continue to work cooperatively with the Fisheries Resource Office (FRO) of the Service in Fairbanks, ADF&G, non-governmental organizations, and the public to identify key fisheries resource issues, and implement specific studies to address concerns and fill in gaps in the Refuge's knowledge of fish resources.</p> <p>Objective 3: Upon funding, hire a new full time fisheries biologist/hydrologist to fully integrate the refuge biological program with FRO projects and expertise in Fairbanks.</p> <p>Objective 5: Upon adequate funding, restore the wildlife biologist position that was removed during the recent organizational changes.</p>
2.1.2 Goal 2: Ensure the natural character, vigor, and species diversity of the boreal forest and tundra environments by perpetuating a fire regime both natural and prescribed, which maintains a mosaic of habitats native to interior Alaska.	<p>B-1 Complete revision of the refuge fire management plans by June 1997.</p> <p>B-5 Continue the collection, analysis, and application of fire management information needed for sound management decisions as described in plans and technical reports.</p>	<p>Objective 1: Continue to implement the Refuge's Fire Management and Communication Plans.</p> <p>Objective 2: Continue to refine the understanding of the Refuge's fire history by maintaining the most current fire history (GIS) layer, incorporating information from other fire history studies, working collaboratively with other federal and State fire management agencies, utilizing the most current technology, and participating in studies of Alaska fire regimes.</p>

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
<p>2.1.3 Goal 3: Maintain a fire management program that helps achieve other refuge goals and objectives while providing for the protection of human life, private property, and identified cultural and natural resources.</p>		<p>Objective 1: Within 1 year of the Plan being approved, combine the Koyukuk and Nowitna Fire Management Plans and incorporate changes in the revised Plan and the National Fire Plan.</p> <p>Objective 2: Within five years of the Plan being approved, contact the tribal and local governments in Tanana, Ruby, Galena, Koyukuk, Nulato, Kaltag, Huslia, and Hughes to ascertain the need for assistance with reducing hazardous fuels accumulations and developing mitigation plans (e.g., Comprehensive Wildland Fire Protection Plans). Within 10 years of the Plan being approved, assess the effectiveness of the fuels reduction projects implemented in each village.</p> <p>Objective 3: Within five years of the Plan being approved, update the cultural resource and values at risk (cabin) GIS layer.</p> <p>Objective 4: Continue to develop partnerships with other federal and State agencies and local governments that further the understanding of fire interactions in interior Alaska.</p> <p>Objective 5: Upon funding, hire a fuels management technician to assist the refuge fire management officer with wildland and prescribed fire planning, monitoring, and administration.</p>

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
<p>2.1.4 Goal 4: Ensure the natural function and condition of water resources necessary to conserve fish and wildlife populations and habitats in their natural diversity.</p>	<p>C-3 Develop a program for collecting baseline information on water quality and quantity at the level necessary to detect potential changes from mining activities on the Northern Unit of Innoko by the end of FY 1997. Implement the program as soon as possible.</p>	<p>Objective 1: Within 10 years of Plan approval, develop a wetland inventory and monitoring program to be incorporated into the I&M Plan. Inventory and monitoring should address aquatic plants, fish, wetland-dependent wildlife, aquatic invertebrates, and physical and chemical properties of lakes and wetlands. Projects would be implemented as staff and funding become available.</p> <p>Objective 2: Within 10 years of Plan approval, work with Service Water Resources Branch to develop a river and stream resources inventory and monitoring program to be incorporated in the current Inventory and Monitoring (I&M) Plan. This inventory will lead to instream flow water right protection. Inventory and monitoring should address aquatic plants, river-dependent fish and wildlife, aquatic invertebrates, riparian and floodplain habitat, and physical and chemical properties of rivers and streams, within the life of this plan. Projects would be implemented as staff and funding become available.</p> <p>Objective 3: Within 5 years of CCP approval, review the Refuge’s 1985–1988 baseline evaluation of placer mining sedimentation and occurrence of heavy metals on associated aquatic ecosystems of the Refuge, and develop and implement a repeat survey (when additional funding is obtained).</p>

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
OUTREACH AND EDUCATION		
<p>2.1.5 Goal 5: Provide information and maintain open communication for a greater understanding and appreciation of fish and wildlife ecology, habitat preservation, and refuge management that assists in addressing resource issues important to local residents, the Service, and others.</p>	<p>D-1 Conduct school programs and community meetings in each village at least once a year.</p>	<p>Objective 1: Conduct school programs and/or community meetings in the villages of Hughes, Huslia, Koyukuk, Nulato, Kaltag, Galena, Ruby, and Tanana at least once a year. Presentations should cover topics such as local wildlife, habitats, and management; wildlife surveys and current population status or trends; subsistence foods, health benefits, and contaminants risks; fire ecology and management; and climate change.</p> <p>Objective 2: Maintain existing resource library and continue to work with local schools to develop resources for environmental education, including curricula, teaching kits, and teacher workshops on natural resources and refuge-related topics.</p> <p>Objective 3: Continue to provide the public with timely and accurate information about the Refuge through a variety of communication tools such as informational kiosks, displays, radio programs, newsletters, brochures, and Web sites. Information provided using these tools should be evaluated and updated at least once a year.</p> <p>Objective 4: Maintain partnership with Galena City Schools and Loudon Tribal Council to annually conduct the Galena Science Camp. Participate in other local science and cultural camps when opportunities arise.</p>
	<p>D-2 Continue to work with local school districts to develop teacher workshops on natural resource and refuge-related topics.</p>	
	<p>D-3 Continue to respond to requests from the public and other agencies for information about the refuge.</p>	

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
PUBLIC USE		
2.1.6 Goal 6: Continue to provide quality opportunities for hunting, fishing, wildlife observation and photography, and other outdoor recreation in a natural setting.	<p>E-3 Continue to monitor public use, and use this information to investigate potential conflicts and make management decisions.</p> <p>E-4 Continue the annual hunter check station on the Nowitna River during the moose season.</p> <p>E-6 Continue law enforcement activities as necessary throughout the year.</p>	<p>Objective 1: Within 5 years of Plan approval, review current public use monitoring methods, and implement new methodology if needed. At a minimum, continue to annually compile and summarize data from the Koyukuk River (Ella’s Cabin) check station, Nowitna River check station, and the refuge guide/air taxi reports to assess levels of public use.</p> <p>Objective 2: Continue to operate the Nowitna River hunter check station annually during the fall moose season to collect hunter effort and harvest information. Summarize data in report form.</p> <p>Objective 3: Working with communities, and State and federal authorities, continue to develop the refuge law enforcement program through activities such as hunter education, village visits, aerial surveillance, and annual special use permit reviews. Produce annual summaries of activities.</p>

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
SUBSISTENCE MANAGEMENT		
<p>2.1.7 Goal 7: Provide and promote the opportunity for local residents to continue their subsistence activities on the Refuge, consistent with the subsistence priority and with other refuge purposes.</p>		<p>Objective 1: Continue the Refuge Information Technician (RIT) program to enhance information exchange with local communities on refuge issues, particularly those dealing with subsistence issues. Restore RIT position upon funding.</p> <p>Objective 2: Continue to conduct annual informational meetings in each village associated with the Refuge, and regularly attend other subsistence-related meetings, providing information regarding the status of subsistence resources and their use and commenting on proposals related to subsistence management within the Refuge. Maintain a respectful dialogue with refuge resource stakeholders and subsistence users.</p> <p>Objective 3: Continue to work closely with tribal councils, State fish and game advisory committees, the Federal Subsistence Western Interior Regional Advisory Council, other local/regional working groups, Alaska Department of Fish and Game, and the Office of Subsistence Management to address issues and concerns of the local subsistence users through the State and federal regulatory processes as provided in ANILCA to conserve fish and wildlife.</p> <p>Objective 4: Continue to coordinate with and assist the Division of Migratory Bird Management in completing the annual Migratory Bird Harvest Survey (dependent upon available funding).</p> <p>Objective 5: Continue to coordinate with and assist the Yukon River Drainage Fisheries Association in completing the annual In-Season Fish Harvest Assessment.</p>

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
		<p>Objective 6: Cooperate with village organizations and other agencies to develop opportunities to educate local youth and adults in traditional subsistence ways related to fish, wildlife, and plants of the Refuge. Continue to develop outreach tools that make subsistence regulations understandable to the public.</p> <p>Objective 7: Monitor and assess the use of ORVs (ATV's, ARGO's, etc.) on refuge lands by federally qualified subsistence users. Within three years of Plan approval, produce a report that examines thresholds for regulation of ORV use. If issues of ORVs arise, then the Refuge may establish threshold levels and ORV use regulations. This would be evaluated and reported on an annual basis.</p>
SPECIAL AREAS		
2.1.8 Goal 8: Maintain the special values of the Nowitna Wild River and Koyukuk Wilderness and the wild character of the Refuge.	F-1 Continue to monitor activities on the Nowitna Wild River and in the Koyukuk Wilderness for compliance with the Wild and Scenic Rivers Act, the Wilderness Act and ANILCA. If problems are detected, appropriate actions would be taken.	Objective 1: The same as Alternative A.
2.1.9 Goal 9: Conserve, appreciate, and interpret the cultural, historic, and prehistoric resources of the Refuge.	<p>G-1 Work with the regional archaeologist to determine appropriate special area designations for the Batza Tena obsidian source and the Palisades paleontological site by 1998.</p> <p>G-2 Use appropriate management tools, such as fire management and law enforcement, to protect these cultural and paleontological sites by the end of FY 1997.</p> <p>G-3 Investigate developing a stewardship program for the Batza Tena obsidian source with the village of Huslia during 1997.</p>	<p>Objective 1: Work with Regional Archaeological Staff to update the Cultural Resources Guide for Koyukuk/Nowitna Refuges within five years of the approval of this Plan. Coordinate with ongoing efforts to locate collections and field notes from archaeological excavations on and around the Refuge, and incorporate records into the guide.</p> <p>Objective 2: Work with local tribes, elders, the University of Alaska Fairbanks, and Regional Archaeological Staff, to compile a place name directory and atlas of cultural and historic sites. This should include the production of a comprehensive GIS layer of</p>

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
	<p>G-4 Continue working with partners at the University of Alaska Fairbanks to develop a field school or other research program for the Palisades paleontological site by 1998.</p>	<p>sites for use in refuge management. Create a working database within two years of Plan approval.</p> <p>Objective 3: Develop an active bibliography and library collection of published and unpublished materials relating to cultural, paleontological, and natural history of the Refuge. This may include books, interviews, journals, maps and photos collected by explorers, missionaries, biologists, and researchers. An initial bibliography would be completed within two years of Plan approval.</p> <p>Objective 4: Continue to work with regional archaeology staff, the University of Alaska Fairbanks and other researchers to investigate and evaluate known cultural sites and identify new sites within the Refuge.</p> <p>Objective 5: Continue to work with research partners to explore the unique paleontological resources of the Palisades site.</p> <p>Objective 6: Continue to cooperate with tribes, other agencies, universities, KIYU radio, and local residents to develop and enhance programs that capture the traditional knowledge of elders and other knowledge bearers as it relates to the cultural and natural history of the Refuge.</p>

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
ADMINISTRATION		
2.1.10 Goal 10: Promote close working relationships through effective coordination, interaction, and cooperation with other federal agencies, State agencies, local communities, tribes, organizations, industries, the public, and the landowners within and adjacent to the Refuge whose programs relate to refuge management activities.		Objective 1: Continue to collaborate with staffs of other refuges, federal and State agencies, research institutions, schools, tribal and city councils, and others to facilitate resource management inventory and monitoring, biological research, public outreach, and education at the Refuge and in the region.
2.1.11 Goal 11: Provide and maintain adequate facilities and equipment in Galena to ensure a safe and secure working environment to accomplish refuge purposes, goals, and mandates.	H-2 Continue to investigate leasing or constructing suitable hangar facilities in Galena for three airplanes. H-3 Maintain and upgrade quarters, bunkhouse, and administrative cabins to provide safe and secure living accommodations for employees in subarctic conditions.	Objective 1: Secure funding for construction or purchase of an administrative office, shop, and warehouse that provide sufficient facilities for refuge personnel and property in Galena. Objective 2: Secure funding for constructing a solid structure hangar facility in Galena to accommodate three refuge aircraft or more. Objective 3: Maintain and upgrade quarters, bunkhouse, and administrative cabins to provide safe and secure living accommodations for employees in subarctic conditions. Continue to explore alternative energy sources for our facilities in order to reduce costs for the government and lessen our environmental impact. Objective 4: Explore options and secure funding to acquire an adequate float plane facility and operations site on Alexander Lake in Galena.

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
2.1.12 Goal 12: Ensure the Refuge has adequate personnel to meet operational needs.	<p>I-1 Continue and enhance the refuge volunteer program.</p> <p>I-2 Hire a permanent GIS/computer specialist during FY 1997 to support refuge operations. This position could serve the Selawik refuge as well as the Koyukuk/Nowitna Refuge.</p> <p>I-3 Add a permanent fire ecologist and a permanent fisheries biologist to the refuge staff before FY 2000. These positions would also serve the Innoko and Selawik refuges.</p>	<p>Objective 1: As funding becomes available, restore the Refuge’s wildlife biologist position and RIT position. Create and fill positions for a fisheries biologist/aquatic habitat ecologist and a fuels management technician.</p> <p>Objective 2: Upon adequate funding, hire additional biological technicians to assist refuge biologists conducting inventory and monitoring projects.</p> <p>Objective 3: Work with regional high schools and universities in recruiting and educating diverse candidates for positions as they become available. This includes providing internship opportunities such as the cooperative ANSEP program in which the University of Alaska promotes the educational development of native Alaskans in scientific fields.</p> <p>Objective 4: Maintain a minimum of 3 pilots on staff and endeavor to add staff with piloting expertise as biological/habitat/fisheries positions are developed and funded.</p>
MANAGEMENT ACTIVITY		
ECOSYSTEM, HABITAT, AND FISH AND WILDLIFE MANAGEMENT		
Ecosystem and Landscape Management		
Habitat Management – Prescribed Fire	Koyukuk/Northern Unit Innoko: will be used for hazardous fuels reduction or restoration of natural vegetation patterns in Wilderness and Minimal Management. Nowitna: permitted in Wilderness, Wild River, and Minimal Management.	May be allowed; Wilderness Management may require a minimum requirements analysis. Allowed in Minimal and Wild River Management.

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)	Alternative B (Proposed Action)
Fish and Wildlife Population Management		
Fish and Wildlife Control – Chemical Habitat Modifications.	Koyukuk/Northern Unit Innoko: In all management categories may be permitted on a case-by-case basis subject to provisions of NEPA and a compatibility determination. Permanent facilities would normally not be permitted in Wilderness. Nowitna: In all management categories may be permitted on a case-by-case basis subject to the provisions of NEPA and a compatibility determination.	May be allowed in all management categories. Wilderness Management may require a minimum requirements analysis.
ACCESS		
Snowmobiles	Koyukuk/Northern Unit Innoko and Nowitna: Permitted for traditional activities, on or off designated trails, in periods of snow cover, subject to reasonable regulations.	Same as Alternative A.
Off-Road Vehicles (All-Terrain Vehicles) Includes air boats and air-cushion vehicles.	Koyukuk/Northern Unit Innoko and Nowitna: Includes all other motorized vehicles (e.g., cars, 4x4s, tracked vehicles, off-road vehicles, air boats, and air-cushion boats) permitted only on designated routes or areas; airboats and air-cushion vehicles not permitted.	Not allowed; with exceptions consistent with section 2.4.19 and in Wilderness, Wild River, and Minimal management categories.
PUBLIC USE, RECREATION, AND OUTREACH ACTIVITIES		
Administrative Facilities		
Administrative Field Sites – Permanent facilities.	Koyukuk/Northern Unit Innoko: Permitted in Minimal Management. Under Wilderness Management, may be built if needed for the protection of public health and safety. Nowitna: Permitted in all Management categories.	Use of existing sites allowed including replacement of existing facilities as necessary; new sites may be allowed in Wild River, and Minimal Management. Wilderness Management may require a minimum requirements analysis.
Public Use and Recreation Facilities		
Boat Launches and Docks – Designated sites for launching and storing watercraft or tying up a float plane.	Koyukuk/Northern Unit Innoko: Not permitted in Minimal and Wilderness Management. Nowitna: No permanent sites permitted in Minimal, Wilderness, or Wild River Management.	May be allowed. Wilderness Management may require a minimum requirements analysis.

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

Chapter 2: Goals and Objectives, Management Policies, and Alternatives

	Alternative A (Current Management)	Alternative B (Proposed Action)
Visitor Contact Facilities – A variety of staffed and unstaffed facilities providing information on the Refuge and resources to the public; facilities range from visitor centers to kiosks and signs.	Koyukuk and Northern Unit Innoko Plan: not provided under the Minimal, Wilderness, and Wild River Management categories. Nowitna Plan: permitted under the Minimal, Wilderness, and Wild River.	Allowed under Minimal and Wild River Management categories; generally not allowed in Wilderness.
Temporary Facilities – Includes tent frames, caches, and other similar or related facilities; does not include gravel pads for tents, hardened trails, and/or primitive toilets.	Koyukuk/Northern Unit Innoko: May be permitted subject to reasonable regulations under the provisions of section 1316 of ANILCA; tent platforms require a special use permit. Nowitna: May be permitted under the provisions of ANILCA 1316; a special use permit may be required per 50 CFR 27.92.	May be authorized in the Wilderness and Wild River Management categories and allowed under the Minimal Management category.
COMMERCIAL USES		
Other Commercial Activities		
Transportation and Utility Systems – Includes transmission lines, pipeline, telephone and electrical power lines, oil and gas pipelines, communications systems, roads, airstrips, and other necessary related facilities. Does not include facilities associated with on-refuge oil and gas development.	Roads: May be permitted subject to title XI of ANILCA. Not permitted in Minimal, Wilderness, and Wild River Management categories. Airstrips: Primitive airstrips may be designated; no new construction allowed under all Management categories.	Roads and Airstrips: Must be authorized by Congress under Wilderness Management; May be authorized under Wild River Management category. May be authorized under the Minimal Management category but would require a plan amendment.

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

	Alternative A (Current Management)		Alternative B (Proposed Action)	
STAFFING AND BUDGET NEEDS				
	Short-Term	Long-Term	Short-Term	Long-Term
Permanent Full-Time Employees	13	14	13	16
Permanent Seasonal Employees	1	1	1	3
Temporary Seasonal Employees	3	3	4	4
Volunteers	2-4	2-4	3-5	3-5
Total Annual Budget Needs	\$1,913,900	\$2-2.4 million	\$2-2.4 million	\$2.4-2.8 million

* The 1987 Plan did not contain goals or objectives; these objectives were formulated during a 1996 workshop at the Refuge and were used here under Alternative A to draw a comparison between the two alternatives. These objectives were interim and never formally approved. A complete list of the 1996 goals and objectives can be found in appendix H.

2.11 Evaluation of Alternatives

2.11.1 Evaluation Criteria

The two alternatives described in this chapter were evaluated against six criteria based on existing law and policy. These criteria were selected as being the most important factors for selecting the preferred alternative. Following are the criteria in order of importance:

1. How well does the alternative satisfy the purposes of the Refuge and other provisions of the Alaska National Interest Lands Conservation Act (ANILCA)?
2. How well does the alternative satisfy the mission of the National Wildlife Refuge System?
3. How well does the alternative contribute to meeting the goals of the Refuge?
4. How does the alternative address the issues and concerns identified during scoping?
5. How well does the alternative maintain biological integrity, diversity, and environmental health at the Refuge and ecosystem scales and contribute to managing the Refuge as part of an ecosystem?
6. How well does the alternative agree with Alaska Department of Fish and Game (ADF&G) management plans for the area?

Differences in how the alternatives would affect refuge management are relatively small. Therefore, differences in meeting the evaluation criteria are slight. Alternatives that would clearly not meet the purposes of the Refuge or System mission were not developed. Scoping did not identify any major issues that would result in significant changes in management direction for the Refuge.

The most important criterion used in evaluating the alternatives is the degree to which the alternatives achieve the purposes of the Refuge as mandated by ANILCA. Chapter 4 describes the physical, biological, and socioeconomic impacts of each of the alternatives and provides a summary of the projected changes.

2.11.2 Response to Refuge Purposes

Both alternatives conserve fish and wildlife populations and habitats in their natural diversity; meet international treaty obligations; provide opportunities for continued subsistence uses; and ensure water quality and quantity. Alternative B may be somewhat more responsive to the first and third purposes—conserving fish and wildlife populations and habitats in their natural diversity and providing opportunities for continued subsistence uses. Greater responsiveness to the first purpose would be achieved by expanded climate change, habitat, and wildlife inventory and monitoring. Greater responsiveness to the third purpose would be achieved by a Refuge Information Technician (RIT) program that fosters greater interaction, communication, and cooperation with subsistence communities throughout the area.

2.11.3 Response to National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System is “to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” Both alternatives would contribute similarly to the Refuge System. The Refuge manages and conserves a variety of native habitats that host an abundance and diversity of fish, wildlife, and plants. Both alternatives would continue to do so. Because of the size of the Refuge and the generally healthy condition

of its habitats and wildlife populations, most habitat management under both alternatives would continue to be passive rather than active (i.e., there is currently no need for active restoration of wildlife or fish species, plant species, or their habitats).

2.11.4 Response to Refuge Goals

The Refuge’s 1987 Comprehensive Conservation Plan did not include specific goals and objectives for fulfilling refuge purposes and conserving refuge resources, though they are implied through management direction identified in the Plan. As such, implementation of Alternative A would not include the goals and objectives identified as part of this plan (section 2.1). Selection of Alternative B would include those activities identified in the goals and objectives identified in this Plan. Although each alternative differs in specific management strategies used to ensure that fish and wildlife populations, their habitats, and other resources on the Refuge are properly cared for, they are both in conformance with law and policy. Common to each alternative is the promotion of close and productive working relationships with the State of Alaska, local communities, and other partners. Each alternative provides opportunities for compatible uses on the Refuge, including subsistence, wildlife-dependent recreation, and certain approved commercial activities.

2.11.5 Response to Planning Issues

This section summarizes the potential management actions that directly address the main planning issues identified in chapter 1, section 1.8 of this document (Table 2-3).

Table 2-3. Evaluation of alternatives based on issues

Issue	Alternative A (Current Management)	Alternative B (Proposed Management)
How will the Refuge maintain/manage wildlife populations, especially moose, in the face of predation and competition between users?	The Refuge would continue to annually monitor moose populations; share data and cooperate with the ADF&G; and informally monitor predator populations. The Refuge would continue to cooperate/co-fund research on moose, wolf, and bear populations and their interactions.	Same as Alternative A. Plus Goals (and associated objectives) 1 (Sec. 2.1.1), 2 (Sec. 2.1.2), 3 (Sec. 2.1.3), 4 (Sec. 2.1.4), 7 (Sec. 2.1.7), and 10 (Sec. 2.1.10) address this issue.
How will the Refuge address future (off-refuge) mining, oil, and gas development and its effect on the refuge environment?	The Service would ensure that oil and gas development follow federally mandated procedures and agency policy. Water Resources would be requested to assist in monitoring downstream water quality monitoring.	Same as Alternative A. Plus Goals 4 (Sec. 2.1.4) and 10 (Sec. 2.1.10) and their objectives along with Goal 12 and its Objective 1 directly and indirectly address this issue.

How will the Refuge identify and address contaminants that affect the wild food we eat and water quality?	The Refuge would continue to cooperate with the State on monitoring water quality. Water Resources is scheduled to conduct a refuge inventory of water resources/quality in 2012.	Same as Alternative A. Plus Goals 4 (Sec. 2.1.4) and 10 (Sec. 2.1.10) and their objectives address this issue.
How will the Refuge monitor and address the effects of climate change?	The Refuge would participate in the Service's national and regional efforts to monitor the effects of climate change. The Refuge would cooperate with agencies in climate change studies and assist universities with climate change research.	Same as Alternative A. Plus Goal 1 (Sec. 2.1.1) Objective 1, Goal 2 (Sec. 2.1.2) Objective 2, and Goal 10 (Sec. 2.1.10) address this issue.
How will the Refuge address maintaining the wild character of the Refuge and wilderness quality?	The Refuge would periodically (at a minimum, every time this Plan is revised) evaluate overall use of the Refuge to ensure wild character is being maintained. Compatibility determinations would take into consideration maintaining the Refuge's wild character.	Same as Alternative A. Plus Goal 8 (Sec. 2.1.8) Objective 1 specifically addresses this issue.
How will the Refuge address future public use of the Refuge?	This would be addressed through the Service's Compatibility Determination process.	Same as Alternative A.
How will the Refuge fire management program help villages address their hazardous fuel accumulations?	The refuge fire management staff would assist requesting villages with formulating a hazardous fuels management plan and Community Wildland Fire Protection Plan along with possible funding (this would occur as time, staff, and funding permitted).	Same as Alternative A.
How will the Refuge address the need for more outreach and better communication with the public?	The refuge park ranger would be the primary contact for public outreach/education.	The Refuge would annually hold at least one public information meeting in each village. All refuge staff would assist with public outreach through various ways. The refuge park ranger would continue to be the major public contact.

2.11.6 Response to Biological Integrity and Ecosystem Management

Service policy on maintaining biological integrity, diversity, and environmental health of the National Wildlife Refuge System provides refuge managers with direction while achieving refuge purposes. Policy provides a means to evaluate refuge needs and (through resource

assessment, planning, and compatibility processes) set appropriate management direction to maintain and, where appropriate, restore biological integrity, diversity, and environmental health. Consistent with this policy and refuge purposes, each alternative evaluated in this Plan provides management direction that maintains the biotic and abiotic conditions on the Refuge within historic ranges. Natural processes such as wildland fire, succession, and flooding are the dominant forces at work within the Refuge. Prompted by agency policy and public concerns, both alternatives would, for the most part, continue longstanding refuge management practices. Under Alternative B, new objectives designed to improve conservation of biological integrity, diversity, and environmental health through improved environmental monitoring would be implemented. Hunting, fishing, and wildlife observation would continue to dominate public use of the Refuge. Continued compatibility of these activities would be ensured through effective use of education and management by State and federal regulatory actions.

Ecosystem management is more an approach than an end product. It embodies the concepts of a constantly changing landscape and recognizes and incorporates the role that humans play in affecting their environment. It compels refuge staff to examine local, refuge, and regional scales to improve understanding of the effects of their conservation actions. It also requires the refuge manager to consider long-term and cumulative effects of actions over a period of years and decades.

The Service divided Alaska into several broad ecosystems and established interdisciplinary teams to address issues within each of the ecosystems. The Refuge is within the Interior Ecoregion, which is bounded by the Brooks Range to the north, the Alaska Range to the south, the Canadian border to the east, and the delta region of the Yukon and Kuskokwim Rivers to the west. The Interior Ecosystem Team developed a plan in 2001 that included issues of concern and goals for the Interior Ecosystem (Interior Alaska Ecosystem Team 2001), many of which are similar to concerns and goals of the Refuge.

Both alternatives maintain the biological integrity, diversity, and environmental health of the Refuge and integrate scientific knowledge into its management.

2.11.7 Agreement with the Alaska Department of Fish and Game Management Plans

This Plan was developed in consultation with ADF&G. The Service routinely consulted with ADF&G personnel during the planning process. ADF&G personnel had the opportunity to participate in all planning team meetings and workshops. The Plan attempts to achieve a high level of consistency with ADF&G management plans and objectives for fish and wildlife, as discussed in chapter 2, section 2.1 (Refuge Goals and Objectives), and in chapter 3, section 3.3 (Biological Environment). Both alternatives acknowledge ADF&G's role in managing fish and wildlife on National Wildlife Refuges in Alaska, consistent with the Master Memorandum of Understanding (appendix B).